

ROSACEAE

蔷薇科 qiang wei ke

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Trees, shrubs, or herbs, deciduous or evergreen. Stems erect, scandent, arching, prostrate, or creeping, armed or unarmed. Buds usually with several exposed scales, sometimes with only 2. Leaves alternate, rarely opposite, simple or compound; stipules paired, free or adnate to petiole, rarely absent, persistent or deciduous; petiole usually 2-glandular apically; leaf blade often serrate at margin, rarely entire. Inflorescences various, from single flowers to umbellate, corymbose, racemose or cymose-paniculate. Flowers usually actinomorphic, bisexual, rarely unisexual and then plants dioecious. Hypanthium (formed from basal parts of sepals, petals, and stamens) free from or adnate to ovary, short or elongate. Sepals usually 5, rarely fewer or more, imbricate; epicalyx segments sometimes also present. Petals as many as sepals, inserted below margin of disk, free, imbricate, sometimes absent. Disk lining hypanthium, usually entire, rarely lobed. Stamens usually numerous, rarely few, always in a complete ring at margin of or above disk; filaments usually free, very rarely connate; anthers small, didymous, rarely elongate, 2-locular. Carpels 1 to many, free, or ± connate and then adnate to inner surface of cupular receptacle; ovary inferior, semi-inferior, or superior; ovules usually 2 in each carpel, rarely 1 or several, anatropous, superposed. Styles as many as carpels, terminal, lateral, or basal, free or sometimes connate. Fruit a follicle, pome, achene, or drupe, rarely a capsule, naked or enclosed in persistent hypanthium and sometimes also by sepals. Seeds erect or pendulous, sometimes winged, usually exalbuminous, very rarely with thin endosperm; cotyledons mostly fleshy and convex abaxially, rarely folded or convolute.

Between 95 and 125 genera and 2825–3500 species: cosmopolitan, mostly in N temperate zone; 55 genera (two endemic) and 950 species (546 endemic) in China.

The Rosaceae are very well represented in China, with great economic and scientific importance. The Co-chairs of the Editorial Committee (Wu and Raven) here note that the patterns of relationship are complex and the group is taxonomically difficult. We consider the following treatment to be relatively traditional, with some of the generic treatments arguably out of date. The same applies to the arrangement of the subfamilies, among which the Maloideae may be the most advanced and should therefore appear last. We regard this account, the first comprehensive, English-language treatment of the Rosaceae of China, as preliminary, but consider it a useful guide for the recognition of species. Significant revisions of various groups within the family will certainly be necessary as taxonomic studies proceed.

Many plants of this family are of economic importance and contribute to people's livelihoods. The Rosaceae contain a great number of fruit trees of temperate regions. The fruits contain vitamins, acids, and sugars and can be used both raw and for making preserves, jam, jelly, candy, various drinks, wine, vinegar, etc. The dried fruits of the genera *Amygdalus* and *Armeniaca* are of high commercial value. Some plants in the genus *Rosa* containing essential oils or with a high vitamin content are used in industry. Rosaceae wood is used for making various articles, stems and roots are used for making tannin extract, and young leaves are used as a substitute for tea. Numerous species are used for medical purposes or are cultivated as ornamentals.

Yü Te-tsun, Lu Ling-ti, Ku Tsue-chih, Li Chao-luan, Kuan Ke-chien & Chiang Wan-fu. 1974, 1985, 1986. Rosaceae. *In*: Yü Te-tsun, ed., *Fl. Reipubl. Popularis Sin.* 36: 1–443; 37: 1–516; 38: 1–133.

- 1a. Fruit a dehiscent follicle, rarely a capsule; carpels 1–5(–12); stipules present or absent 1. Subfam. *Spiraeoideae*
- 1b. Fruit indehiscent; stipules present.
 - 2a. Ovary inferior or semi-inferior, rarely superior; carpels (1 or)2–5, ± adnate to inner side of cupular receptacle; fruit a pome, sometimes berrylike, rarely small and drupaceous 2. Subfam. *Maloideae*
 - 2b. Ovary superior, rarely inferior.
 - 3a. Carpels usually numerous, rarely few; fruit an achene, rarely drupaceous; sepals persistent; leaves compound, very rarely simple 3. Subfam. *Rosoideae*
 - 3b. Carpel 1(–5); fruit a drupe; sepals often deciduous; leaves simple 4. Subfam. *Prunoideae*

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1. Subfam. SPIRAEOIDEAE绣线菊亚科 *xiu xian ju ya ke*

Shrubs, rarely herbs. Leaves alternate, simple, rarely compound; stipules absent or present; leaf blade entire or serrate at margin. Carpels 1–5(–12), free or basally connate, each with 2 to several pendulous, anatropous ovules. Fruit a follicle dehiscent along suture(s), rarely a capsule. $x = 8, 9$.

About 22 genera and 260 species: widespread in N hemisphere, but mostly absent from arctic regions, extending to S hemisphere in Indonesia (Java and Sumatra) and South America; eight genera and 99 species (67 endemic) in China.

- 1a. Flowers more than 2 cm in diam.; leaves simple; fruit a capsule; seeds winged 8. *Exochorda*
 1b. Flowers less than 2 cm in diam.; leaves simple or pinnate; fruit a follicle; seeds not winged.
 2a. Carpels 1 or 2; leaves simple; stipules present, caducous.
 3a. Inflorescences racemose or paniculate; hypanthium campanulate to cylindrical; follicles usually more than 2-seeded 6. *Neillia*
 3b. Inflorescences corymbose or paniculate; hypanthium cupular; follicles 1- or 2-seeded 7. *Stephanandra*
 2b. Carpels (1–)5; leaves simple or pinnate; stipules present or absent.
 4a. Leaves pinnate or 3-foliolate.
 5a. Herbs perennial; leaves 1–3-pinnate; stipules absent; carpels 3 or 4(–8), free 3. *Aruncus*
 5b. Shrubs; leaves pinnate; stipules present; carpels 5, connate at base 4. *Sorbaria*
 4b. Leaves simple.
 6a. Stipules present; follicles inflated, dehiscent along both sutures 5. *Physocarpus*
 6b. Stipules absent; follicles not inflated, usually dehiscent along adaxial suture.
 7a. Leaf blade usually serrate or lobed at margin, rarely entire; inflorescences umbellate, umbellate-racemose, corymbose, or paniculate; carpels free 1. *Spiraea*
 7b. Leaf blade entire at margin; inflorescence a spikelike panicle; carpels connate at base 2. *Sibiraea*

1. SPIRAEA Linnaeus, Sp. Pl. 1: 489. 1753.绣线菊属 *xiu xian ju shu*

Lu Lingdi (陆玲娣 Lu Ling-ti); Crinan Alexander

Shrubs deciduous. Winter buds small, with 2–8 exposed scales. Leaves alternate, usually shortly petiolate, simple; stipules absent; leaf blade veins usually pinnate, rarely 3–5 from base, margin serrate or incised, sometimes lobed, rarely entire. Flowers in umbels, umbel-like racemes, corymbs, or panicles, bisexual, rarely \pm unisexual. Hypanthium campanulate or cupular, lined by nectariferous disk. Sepals 5, valvate or slightly imbricate, usually slightly shorter than hypanthium. Petals 5, imbricate or contorted, usually longer than sepals. Stamens 15–60, borne between disk and petals. Disk annular, usually lobed. Carpels (3–)5(–8), free; ovules (2 to) several per carpel, pendulous; styles terminal, subterminal, or abaxial; stigma capitate or disciform. Follicles bony, often dehiscent along adaxial suture. Seeds linear to oblong, minute; testa membranous.

Between 80 and 100 species: N temperate zone, extending S to mountainous subtropical areas; 70 species (47 endemic) in China.

Spiraea holorhodantha H. Léveillé (Bull. Acad. Int. Géogr. Bot. 25: 44. 1915), described from Yunnan, is *Rodgersia sambucifolia* Hemsley var. *sambucifolia* in the Saxifragaceae (see Fl. China 8: 274. 2001).

Many of the following species are ornamental, nectar-secreting plants long established in horticulture and often cultivated in gardens and parks.

In the following key, leads 1a and 1b are not quite mutually exclusive. If identifying plants with short, lateral inflorescences, it is advisable to work from lead 3a as well as 1b.

- 1a. Inflorescences borne on erect, long, leafy shoots of current year arising from base of shrub, sometimes on short, lateral branchlets arising from branches of previous year.
 2a. Inflorescences paniculate, oblong or pyramidal 1. *S. salicifolia*
 2b. Inflorescences broadly compound corymbose.
 3a. Inflorescences borne on erect, long, leafy shoots of current year.
 4a. Inflorescences glabrous; flowers white; follicles erect 7. *S. fritschiana*
 4b. Inflorescences pubescent; flowers usually pink, rarely purple-red; follicles divergent.
 5a. Leaf blade base truncate to rounded; petiole (2–)4–8 mm.
 6a. Branchlets glabrous; leaf blades 3–7 cm, glabrous on both surfaces, margin crenate to doubly serrate; flowers bisexual, dark purple-red 5. *S. purpurea*
 6b. Branchlets pubescent or subglabrous; leaf blades 2–4 cm, slightly pubescent on veins on both surfaces or glabrous adaxially, margin sharply serrate or doubly serrate; flowers usually \pm unisexual, pink, rarely white 6. *S. bella*

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- 5b. Leaf blade base cuneate to broadly so; petiole 1–3 mm.
- 7a. Leaf blades glabrous on both surfaces; inflorescences to 5 × 5.5 cm 4. *S. hayatana*
- 7b. Leaf blades pubescent on both surfaces or only on veins; inflorescences 6–12 × 4–14 cm.
- 8a. Branchlets glabrous or pubescent when young; leaf blades doubly incised serrate at margin, rarely singly serrate, apex acute to acuminate 2. *S. japonica*
- 8b. Branchlets densely yellow pubescent when young; leaf blades doubly serrate at margin, apex acute 3. *S. formosana*
- 3b. Inflorescences borne on short, lateral branchlets arising from branches of previous year.
- 9a. Buds obtuse at apex, with several exterior scales.
- 10a. Stamens 2–3 × as long as petals 8. *S. miyabei*
- 10b. Stamens shorter than to nearly equaling petals.
- 11a. Leaf blade margin with a few teeth above middle or near apex.
- 12a. Follicles glabrous or hairy only along adaxial suture 11. *S. sargentiana*
- 12b. Follicles hairy.
- 13a. Branchlets angled; leaf blades tomentose abaxially; pedicels 1–2 mm 10. *S. schochiana*
- 13b. Branchlets terete; leaf blades densely thinly villous abaxially; pedicels 4–8 mm.
- 14a. Bracts 2–4 mm; follicles thinly villous 9. *S. henryi*
- 14b. Bracts 4–6 mm; follicles densely pubescent 12. *S. wilsonii*
- 11b. Leaf blade margin entire, rarely with a few teeth apically.
- 15a. Leaf blades glabrous on both surfaces or thinly villous along margin; branchlets angled 16. *S. schneideriana*
- 15b. Leaf blades softly hairy abaxially or on both surfaces; branchlets terete.
- 16a. Follicles glabrous 15. *S. veitchii*
- 16b. Follicles softly hairy.
- 17a. Inflorescences glabrous; leaf blades glabrous or sparsely pubescent only on veins abaxially 14. *S. ovalis*
- 17b. Inflorescences and both surfaces of leaf blades softly hairy.
- 18a. Inflorescences sparsely villous; leaf blades 10–30 × 5–10 mm, villous on both surfaces, adaxially without papillae, margin entire or apically with a few teeth 12. *S. wilsonii*
- 18b. Inflorescences densely and thinly pubescent; leaf blades 6–11 × 4–7 mm, thinly pubescent on both surfaces when young, later glabrescent, adaxially with papillae, margin entire 13. *S. teretiuscula*
- 9b. Buds acute to acuminate at apex, with 2 exterior scales.
- 19a. Leaf blade margin entire or with a few teeth above middle.
- 20a. Branchlets cylindric or slightly angled; inflorescences glabrous 28. *S. uratensis*
- 20b. Branchlets angled; inflorescences puberulous to pubescent.
- 21a. Flowers red; leaf blades 0.8–1.2 cm, sometimes lobed apically; follicles usually glabrous, rarely puberulous on adaxial suture 25. *S. arcuata*
- 21b. Flowers white; leaf blades 1–3 cm, not lobed apically; follicles pubescent.
- 22a. Leaf blades ovate or obovate to obovate-lanceolate, 1–2 cm, pubescent abaxially, margin obtusely 3–5-dentate above middle 26. *S. canescens*
- 22b. Leaf blades oblong to ovate- or obovate-oblong, 1.5–3 cm, glabrous on both surfaces, margin often entire 27. *S. trichocarpa*
- 19b. Leaf blade margin singly or doubly serrate, sometimes incised.
- 23a. Buds small, shorter than petioles.
- 24a. Shrubs to 3 m tall; leaf blades abaxially slightly hairy on veins.
- 25a. Leaf blades elliptic to elliptic-ovate, margin sharply singly serrate; inflorescences and hypanthium abaxially softly hairy 17. *S. teniana*
- 25b. Leaf blades ovate to elliptic-ovate, margin obtusely singly or doubly serrate; inflorescences and hypanthium abaxially glabrous 18. *S. hingshanensis*
- 24b. Shrubs to 0.5 m tall; leaf blades abaxially glabrous.
- 26a. Leaf blades ovate or rhomboid-ovate, margin sharply singly serrate above middle; flowers white; ovary basally slightly pubescent 19. *S. morrisonicola*
- 26b. Leaf blades ovate, margin doubly serrate; flowers pink; ovary glabrous 20. *S. kweichowensis*
- 23b. Buds usually large, nearly equaling or longer than petioles, very rarely shorter.
- 27a. Inflorescences and follicles subglabrous or pilose 24. *S. longigemmis*
- 27b. Inflorescences and follicles densely softly hairy.
- 28a. Buds glabrous; leaf blades abaxially pubescent 23. *S. rosthornii*
- 28b. Buds densely tomentose-villous; leaf blades abaxially sericeous-villous, sometimes glabrescent.
- 29a. Petioles 3–5 mm; leaf blades ovate or ovate-lanceolate, abaxially sericeous-villous, later glabrescent, margin often entire 21. *S. velutina*

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- 29b. Petioles 6–10 mm; leaf blades broadly ovate or rhombic-ovate, abaxially sericeous-villous, not glabrescent, margin lobed 22. *S. lobulata*
- 1b. Inflorescences borne on short, lateral branchlets arising from (often arching) branches of previous year.
- 30a. Flowers in sessile umbels, with or without leaves at base.
- 31a. Leaf blade margin entire or with a few crenate teeth near apex; stamens equaling petals or nearly so.
- 32a. Branchlets conspicuously angled; flowers pinkish 66. *S. calcicola*
- 32b. Branchlets terete; flowers white.
- 33a. Leaf blades on sterile branches usually flabellate, ± as wide as long.
- 34a. Branchlets glabrous; leaf blades abaxially glabrous, with glaucous bloom 69. *S. compsophylla*
- 34b. Branchlets densely pubescent, later glabrescent; leaf blades abaxially densely pubescent 70. *S. aquilegifolia*
- 33b. Leaf blades on sterile branches not flabellate, longer than wide, apex acute or obtuse.
- 35a. Branchlets glabrous or puberulent; leaf blades 15–20 × 5–7 mm; follicles glabrous 67. *S. hypericifolia*
- 35b. Branchlets densely pubescent, later glabrescent; leaf blades 4–14 × 3–5 mm; follicles pubescent 68. *S. hailarensis*
- 31b. Leaf blade margin serrate or slightly lobed; stamens shorter than petals.
- 36a. Leaf blade margin sharply serrulate.
- 37a. Leaf blades ovate to oblong-lanceolate, abaxially pubescent; pedicels 10–24 mm, pubescent 59. *S. prunifolia*
- 37b. Leaf blades linear-lanceolate, abaxially glabrous; pedicels 6–10 mm, glabrous 60. *S. thunbergii*
- 36b. Leaf blade margin coarsely serrate.
- 38a. Leaf blades glabrous on both surfaces 65. *S. kwangsiensis*
- 38b. Leaf blades pubescent on both surfaces or glabrous adaxially when old.
- 39a. Branchlets terete, pubescent or tomentose; pedicels and hypanthium abaxially glabrous.
- 40a. Branchlets densely tomentose; leaf blade margin usually 3-lobed, with a few large, obtuse teeth above middle, base cuneate or broadly so 61. *S. martini*
- 40b. Branchlets pubescent; leaf blade margin not lobed, with many large, crenate teeth above base, base subrounded 62. *S. cavaleriei*
- 39b. Branchlets prominently angled, pubescent or villous; pedicels and hypanthium abaxially hairy.
- 41a. Branchlets and buds appressed villous; pedicels and hypanthium abaxially villous when young; follicles glabrous or slightly pilose on adaxial suture 63. *S. daochengensis*
- 41b. Branchlets and buds densely pubescent; pedicels, hypanthium abaxially, and follicles pubescent 64. *S. muliensis*
- 30b. Flowers in pedunculate umbels or umbel-like racemes, with clustered leaves at base.
- 42a. Buds with 2 exterior scales.
- 43a. Leaf blade margin serrate; stamens longer than petals; sepals reflexed in fruit.
- 44a. Leaf blades oblong-elliptic to oblong-ovate, margin sharply serrate above middle or near apex; petioles 2–5 mm; stamens ca. 20 55. *S. flexuosa*
- 44b. Leaf blades broadly ovate, margin minutely serrate or doubly serrate; petioles 4–7 mm; stamens 35–50 56. *S. chamaedryfolia*
- 43b. Leaf blade margin entire or apically crenate-serrate; stamens subequaling petals; sepals erect or spreading in fruit.
- 45a. Branchlets, leaf blades, and inflorescences glabrous; follicles glabrous or slightly hairy on adaxial suture 57. *S. mongolica*
- 45b. Branchlets, leaf blades, and inflorescences villous; follicles pubescent 58. *S. mollifolia*
- 42b. Buds with several exterior scales.
- 46a. Leaf blade margin entire or apically crenate-serrate.
- 47a. Leaf blades abaxially hairy; follicles hairy; sepals reflexed in fruit.
- 48a. Leaf blade margin with a few obtuse teeth above middle; racemes dense 49. *S. tarokoensis*
- 48b. Leaf blade margin entire or on sterile shoots with sharp teeth apically; racemes lax.
- 49a. Branchlets glabrous or subglabrous; leaf blades abaxially glabrous or slightly pubescent in vein axils 48. *S. media*
- 49b. Branchlets densely villous; leaf blades abaxially densely long sericeous.
- 50a. Shrubs erect, to 2 m; leaf blades ovate-elliptic or elliptic, 1.5–4.5 cm; inflorescences 15–30-flowered; stamens longer than petals 46. *S. sericea*
- 50b. Shrubs prostrate; leaf blades broadly ovate, 0.8–1.5 cm; inflorescences 7–15-flowered; stamens slightly shorter than petals 47. *S. prostrata*
- 47b. Leaf blades abaxially glabrous (pubescent in *S. xizangensis*); follicles glabrous or pilose on adaxial suture; sepals erect, spreading, or reflexed in fruit.
- 51a. Branchlets terete, glabrous; sepals reflexed 54. *S. dahurica*
- 51b. Branchlets angled, pubescent; sepals erect or slightly spreading.
- 52a. Leaf blades 2–4 mm wide; veins inconspicuous.
- 53a. Flowers white; styles subterminal, divergent 50. *S. alpina*

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- 53b. Flowers pink-red; styles abaxial, suberect 51. *S. xizangensis*
- 52b. Leaf blades 4–9 mm wide, ± conspicuously 3-veined at base.
- 54a. Inflorescences 2–4 cm; styles terminal, divergent 52. *S. myrtilloides*
- 54b. Inflorescences 1–1.5 cm; styles abaxial 53. *S. ningshiaensis*
- 46b. Leaf blade margin serrate or incised, sometimes lobed.
- 55a. Stamens longer than or rarely subequating petals; flowers in umbel-like racemes.
- 56a. Follicles pubescent or hirsute; sepals erect in fruit.
- 57a. Pedicels and hypanthium abaxially pubescent; leaf blades abaxially pubescent, margin lobed 40. *S. sublobata*
- 57b. Pedicels and hypanthium abaxially glabrous; leaf blades abaxially pubescent on veins or in vein axils, margin not lobed.
- 58a. Leaf blades oblong-elliptic to lanceolate-elliptic, abaxially pubescent in vein axils, base cuneate, margin irregularly incised serrate, sometimes doubly serrate above middle 41. *S. elegans*
- 58b. Leaf blades triangular-ovate or lanceolate-ovate, abaxially pubescent on veins, base truncate, rarely subrounded, margin doubly serrate except near base 42. *S. anomala*
- 56b. Follicles glabrous or subglabrous; sepals reflexed in fruit.
- 59a. Leaf blades ovate to elliptic-ovate, glabrous or abaxially with tufted hairs in vein axils, margin singly serrate, leaves on sterile shoots often incised doubly serrate 43. *S. laeta*
- 59b. Leaf blades oblong or ovate, margin with a few coarse teeth.
- 60a. Leaf blades sericeous-villous on both surfaces, margin with 3–7 large, acute teeth on each side above middle; inflorescences 12–20-flowered; flowers 8–10 mm in diam. 44. *S. papillosa*
- 60b. Leaf blades glabrous on both surfaces, margin with 3–5 inconspicuous, triangular, obtuse teeth on each side above middle; inflorescences 5–10-flowered; flowers 10–12 mm in diam. 45. *S. lichiangensis*
- 55b. Stamens shorter than or subequating petals; flowers in umbels.
- 61a. Leaf blades, inflorescences, and follicles glabrous.
- 62a. Leaf blade apex acute.
- 63a. Leaf blade rhombic-lanceolate to rhombic-oblong, pinnately veined, margin serrate above middle 36. *S. cantoniensis*
- 63b. Leaf blade rhombic-ovate, inconspicuously 3-veined or pinnately veined, margin usually 3-lobed, incised doubly serrate 37. *S. ×vanhouttei*
- 62b. Leaf blade apex obtuse.
- 64a. Leaf blades suborbicular, 3–5-veined, base rounded to subcordate, rarely cuneate, margin with a few crenate teeth above middle, apex usually 3-lobed 38. *S. trilobata*
- 64b. Leaf blades rhombic-ovate to obovate, inconspicuously 3-veined or pinnately veined, base cuneate, margin with a few crenate, incised teeth or 3–5 lobes above middle 39. *S. blumei*
- 61b. Leaf blades hairy abaxially.
- 65a. Inflorescences glabrous; follicles glabrous except on adaxial suture 35. *S. pubescens*
- 65b. Inflorescences and follicles hairy.
- 66a. Leaf blades glabrous adaxially, pilose or subglabrous abaxially 34. *S. siccanea*
- 66b. Leaf blades pilose adaxially.
- 67a. Leaf blades pubescent abaxially.
- 68a. Leaf blades abaxially sericeous-pubescent, margin coarsely obtusely dentate, apex usually 3-lobed; inflorescences 2–3 cm in diam.; pedicels 6–10 mm 29. *S. nishimurae*
- 68b. Leaf blades abaxially sparsely pubescent, margin obtusely or sharply serrate above middle or near apex, apex not 3-lobed; inflorescences 4–5 cm in diam.; pedicels 12–22 mm 30. *S. hirsuta*
- 67b. Leaf blades tomentose abaxially.
- 69a. Sepals ovate-lanceolate; leaf blades abaxially densely yellow tomentose, deeply sharply incised serrate 31. *S. chinensis*
- 69b. Sepals triangular to ovate-triangular; leaf blades abaxially densely white tomentose, shallowly obtusely serrate.
- 70a. Leaf blades rhombic-ovate, 2–4.5 cm, margin obtusely incised serrate or lobed, apex acute, rarely obtuse 32. *S. dasyantha*
- 70b. Leaf blades ovate to obovate, 1–2 cm, margin ± obtusely serrate or doubly serrate, apex obtuse or slightly 3-lobed 33. *S. yunnanensis*

1. *Spiraea salicifolia* Linnaeus, Sp. Pl. 1: 489. 1753.

柳叶绣线菊 liu ye xiu xian ju

Shrubs erect, to 2 m tall. Branchlets dense, yellowish brown, slightly angled, pubescent when young, later glabre-

scant; buds ovoid to oblong-ovoid, 3–5 mm, with several brown scales, apex acute. Petiole 1–4 mm, glabrous; leaf blade oblong-lanceolate to lanceolate, 4–8 × 1–2.5 cm, glabrous, occasionally thinly pubescent on margin, base cuneate, margin entire to densely and sharply serrate or deeply incised doubly

serrate, apex acute or acuminate. Panicles oblong to pyramidal, 6–13 × 3–5 mm, densely many flowered; rachis and pedicels thinly pubescent; pedicels 4–7 mm; bracts lanceolate to linear-lanceolate, 6–10 mm, slightly thinly pubescent, margin entire or with a few teeth. Flowers 5–7 mm in diam. Hypanthium campanulate, puberulous abaxially. Sepals triangular, 1–1.5 mm, ascending in fruit. Petals pink, ovate, 2–3.5 × 2–2.5(–3) mm, apex often obtuse. Stamens ca. 30, nearly 2 × as long as petals. Disk annular, with crenulate lobes. Carpels sparsely pubescent; styles shorter than stamens. Follicles erect, almost parallel, glabrous or sparsely pubescent on adaxial suture; styles recurved. Fl. Jun–Aug, fr. Aug–Sep.

River banks, meadows in valleys, damp grasslands, gullies, slopes, clearings; 200–900 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Japan, Korea, Mongolia, Russia; Europe, North America].

- 1a. Leaf blade margin entire or distantly shallowly serrate above middle, thinly pubescent 1c. var. *oligodonta*
- 1b. Leaf blade margin deeply serrate, not pubescent.
 - 2a. Leaf blade margin densely sharply serrate, sometimes doubly serrate 1a. var. *salicifolia*
 - 2b. Leaf blade margin deeply incised doubly serrate 1b. var. *grosseserrata*

1a. *Spiraea salicifolia* var. *salicifolia*

柳叶绣线菊(原变种) liu ye xiu xian ju (yuan bian zhong)

Leaf blade margin densely sharply serrate, sometimes doubly serrate.

River banks, damp grasslands, gullies, clearings; 200–900 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Japan, Korea, Mongolia, Russia; Europe, North America].

1b. *Spiraea salicifolia* var. *grosseserrata* Liou, Ill. Fl. Lign. Pl. N. E. China, 278, 564. 1955.

巨齿绣线菊 ju chi xiu xian ju

Leaf blade margin deeply incised doubly serrate.

- River banks, slopes. Heilongjiang, Jilin.

1c. *Spiraea salicifolia* var. *oligodonta* T. T. Yu, Acta Phytotax. Sin. 8: 215. 1963.

贫齿绣线菊 pin chi xiu xian ju

Leaf blade margin entire or distantly shallowly serrate above middle, thinly pubescent.

- Meadows in valleys; ca. 700 m. Heilongjiang, Nei Mongol.

2. *Spiraea japonica* Linnaeus f., Suppl. Pl. 262. 1782.

绣线菊 xiu xian ju

Shrubs erect, to 1.5 m tall. Branchlets brownish to purple-brown, slender, subterete, glabrous or pubescent when young; buds ovoid, 3–5 mm, with several scales, puberulous, apex acute. Petiole 1–3 mm, pubescent; leaf blade abaxially paler or

glaucescent pruinose, adaxially dark green, ovate or ovate-elliptic to lanceolate or oblong-lanceolate, 2–16 × 1–4 cm, abaxially usually pubescent on veins, adaxially glabrous or puberulous on veins, base cuneate to rounded, margin crenate to doubly serrate, rarely singly serrate, apex obtuse or acute to acuminate. Corymbs terminal on erect, long, leafy shoots of current year, compound, 6–14 × 2.5–14 cm, many flowered; rachis and pedicels densely pubescent; pedicels 4–6 mm; bracts lanceolate to linear-lanceolate, sometimes to 1 cm, abaxially puberulous. Flowers 4–7 mm. Hypanthium campanulate, sparsely pubescent abaxially. Sepals triangular, 1.5–2 mm, erect in fruit, apex acute. Petals usually pink, sometimes white, ovate to orbicular, 2.5–3.5 × 2–3 mm, apex obtuse. Stamens 25–30, much longer than petals. Disk annular, irregularly crenulate. Follicles divergent, glabrous or pilose on adaxial suture; styles ascending. Fl. Jun–Jul, fr. Aug–Sep.

Forests, forested slopes, forest clearings, thickets, grassy slopes, mountain valleys, gullies, river banks, alpine steppes, rocky and stony places; also commonly cultivated; 700–4000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Xizang, Yunnan, Zhejiang [Japan, Korea].

Eight varieties may be recognized in China. In addition, *Spiraea japonica* var. *stellaris* Rehder (in Sargent, Pl. Wilson. 1: 452. 1913) was described on the basis of a fruiting specimen (*A. Henry 9280*) from SE Yunnan (Mengzi Xian).

- 1a. Leaf blades glabrous on both surfaces.
 - 2a. Inflorescences glabrous 2h. var. *glabra*
 - 2b. Inflorescences pubescent.
 - 3a. Leaf blades elliptic or broadly ovate, 2–4 cm, margin crenulate to doubly serrate, apex obtuse or subacute; inflorescences 7–12 cm in diam.; flowers white 2f. var. *ovalifolia*
 - 3b. Leaf blades oblong-lanceolate, 5–10 cm, margin sharply doubly serrate, apex shortly acuminate; inflorescences 4–8 cm in diam.; flowers pink 2g. var. *fortunei*
- 1b. Leaf blades pubescent abaxially.
 - 4a. Leaf blade apex acute.
 - 5a. Leaf blades ovate to ovate-elliptic, base cuneate, margin incised doubly serrate, rarely singly serrate; inflorescences 4–14 cm in diam. 2a. var. *japonica*
 - 5b. Leaf blades ovate to elliptic, base broadly cuneate to rounded, margin distantly doubly serrate; inflorescences 2.5–4 cm in diam. 2b. var. *acuta*
 - 4b. Leaf blade apex acuminate.
 - 6a. Leaf blade margin not pinnatifid, sharply doubly serrate 2c. var. *acuminata*
 - 6b. Leaf blade margin incised pinnatifid and doubly serrate.
 - 7a. Leaf blades ovate-oblong to oblong-lanceolate, 6–9 × 1–3 cm, base broadly cuneate to

rounded; inflorescences 5–7 cm in diam. 2d. var. *incisa*
 7b. Leaf blades oblong-lanceolate, 13–16 × 3–4 cm, base cuneate; inflorescences 7–14 cm in diam. 2e. var. *pinnatifida*

2a. *Spiraea japonica* var. *japonica*

绣线菊(原变种) *xiu xian ju* (*yuan bian zhong*)

Spiraea callosa Thunberg.

Leaf blades ovate to ovate-elliptic, base cuneate, margin incised doubly serrate, rarely singly serrate. Inflorescences 4–14 cm in diam.

Commonly cultivated in China [native to Japan and Korea].

2b. *Spiraea japonica* var. *acuta* T. T. Yu, Acta Phytotax. Sin. 8: 215. 1963.

急尖绣线菊 *ji jian xiu xian ju*

Leaf blades ovate to elliptic, base broadly cuneate to rounded, margin distantly doubly serrate. Inflorescences 2.5–4 cm in diam.

• Mixed forests, grassy slopes; 2500–2700 m. Guizhou, Sichuan, W Yunnan.

2c. *Spiraea japonica* var. *acuminata* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 8: 218. 1886.

渐尖绣线菊 *jian jian xiu xian ju*

Spiraea bodinieri H. Léveillé; *S. bodinieri* var. *concolor* H. Léveillé; *S. esquirolii* H. Léveillé.

Leaf blades long ovate to lanceolate, base cuneate, margin sharply doubly serrate. Inflorescences 10–14 cm in diam.

• Clearings in mixed forests, mountain valleys, river banks; 900–4000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang.

2d. *Spiraea japonica* var. *incisa* T. T. Yu, Acta Phytotax. Sin. 8: 216. 1963.

锐裂绣线菊 *rui lie xiu xian ju*

Leaf blades ovate-oblong to oblong-lanceolate, 6–9 × 1–3 cm, base broadly cuneate to rounded, margin incised pinnatifid, deeply and sharply incised doubly serrate. Inflorescences 5–7 cm in diam.

• Thickets, alpine steppes; 3200–4000 m. Henan, Sichuan, Yunnan.

2e. *Spiraea japonica* var. *pinnatifida* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 490. 1980.

羽叶绣线菊 *yu ye xiu xian ju*

Leaf blades oblong-lanceolate, 13–16 × 3–4 cm, base cuneate, margin incised pinnatifid, sharply doubly serrate. Inflorescences 7–14 cm in diam.

• Slopes in mixed forests; ca. 2900 m. Xizang.

2f. *Spiraea japonica* var. *ovalifolia* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 8: 218. 1886.

椭圆绣线菊 *tuo yuan xiu xian ju*

Leaf blades elliptic to broadly ovate, 2–4 cm, margin crenulate to doubly serrate, apex obtuse or subacute. Inflorescences 7–12 cm in diam. Flowers white.

• Forested slopes, rocky places, gullies; 2500–3800 m. Sichuan, Yunnan.

2g. *Spiraea japonica* var. *fortunei* (Planchon) Rehder in L. H. Bailey, Cycl. Amer. Hort. 4: 1703. 1902.

光叶绣线菊 *guang ye xiu xian ju*

Spiraea fortunei Planchon, Fl. Serres Jard. Eur. 9: 35. 1853.

Leaf blades oblong-lanceolate, 5–10 cm, margin sharply doubly serrate, apex shortly acuminate. Inflorescences 4–8 cm in diam. Flowers pink.

• Slopes and open spaces in mixed forests; 700–3000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Yunnan, Zhejiang.

2h. *Spiraea japonica* var. *glabra* (Regel) Koidzumi, Bot. Mag. (Tokyo) 23: 167. 1909.

无毛绣线菊 *wu mao xiu xian ju*

Spiraea callosa Thunberg var. *glabra* Regel, Index Seminum Hort. Petrop. 1869(Suppl.): 27. 1870.

Leaf blades ovate-oblong to long elliptic, 3.5–9 cm, margin sharply doubly serrate, apex acute to shortly acuminate. Inflorescences 6–12 cm in diam. Flowers pink.

• Forests, stony places; 1600–1900 m. Anhui, Hubei, Jiangxi, Sichuan, Yunnan, Zhejiang.

3. *Spiraea formosana* Hayata, J. Coll. Sci. Univ. Tokyo 30(1): 88. 1911.

台湾绣线菊 *tai wan xiu xian ju*

Spiraea japonica Linnaeus f. var. *formosana* (Hayata) Masamune.

Shrubs. Branchlets yellow-brown to dark brown, terete, densely pubescent when young, later glabrescent; buds ovoid, ca. 5 mm, with several scales, apex acute. Petiole 2–3 mm, pubescent; leaf blade abaxially pale, oblong to oblong-ovate, 4–6(–8) × 2–2.5 cm, abaxially pubescent especially on veins, adaxially glabrous, base broadly cuneate, margin doubly serrate, apex acute. Corymbs terminal on erect, long, leafy shoots of current year, compound, 6–10 × 8–12 cm, many flowered; rachis and pedicels pubescent; pedicels 5–7 mm; bracts linear to subulate, pubescent. Hypanthium broadly campanulate, pubescent abaxially. Sepals triangular, 1.5–2 mm, reflexed in fruit. Petals orbicular, 2–3 mm in diam., apex obtuse or slightly emarginate. Stamens ca. 20, longer than petals. Disk annular, 10-lobed; lobes subobtusate at apex, rarely emarginate. Carpels adaxially pubescent; styles shorter than stamens. Follicles slightly spreading, subglabrous or puberulous on adaxial suture; styles persistent, spreading. Fl. May–Jun, fr. Aug–Sep.

- Forests, slopes; 2100–3000 m. Taiwan.

4. *Spiraea hayatana* H. L. Li, *Lloydia* 14: 237. 1951.

假绣线菊 *jia xiu xian ju*

Spiraea formosana Hayata var. *brevistyla* Hayata; *S. japonica* Linnaeus f. var. *formosana* (Hayata) Masamune subvar. *brevistyla* (Hayata) Masamune.

Shrubs to 1.5 m tall. Branches reddish brown, slender; young branchlets terete, puberulous. Petiole 1–2 mm, winged, pubescent; leaf blade paler abaxially, green adaxially, ovate-oblong, 2–3.5 × 1–1.8 cm, papery, glabrous on both surfaces, midvein and 4 or 5 pairs of lateral veins raised abaxially, slightly depressed adaxially, base cuneate, margin sharply doubly serrate, apex acute to acuminate. Corymbs terminal, compound, to 5 × 5.5 cm; rachis and pedicels finely pubescent; pedicels slender, 3–4 mm, to 6–8 mm in fruit; bracts subulate, ca. 1 mm. Flowers 4–5 mm in diam. Hypanthium rotate-campanulate, pubescent abaxially. Sepals triangular, 0.5–1 mm, apex subacute. Petals obovate, 2–3 mm, apex obtuse or subemarginate. Stamens ca. 20, long exserted; filaments 4–5 mm. Follicles erect, 2–3 mm, glabrous, slightly rostrate.

- Montane regions; 3000–3500 m. C Taiwan.

5. *Spiraea purpurea* Handel-Mazzetti, *Symb. Sin.* 7: 453. 1933.

紫花绣线菊 *zi hua xiu xian ju*

Shrubs to 1.2 m tall. Branchlets much branched in upper part, red or red-brown, terete, glabrous; buds brownish, small, with several scales, glabrous, apex shortly acuminate. Petiole 6–8 mm, slightly narrowly winged; leaf blade glaucous green abaxially, yellow-green when dry adaxially, ovate, 3–7 × 1–3 cm, glabrous on both surfaces, without papillae abaxially, midvein and 6–8 pairs of lateral veins prominent, base truncate to subrounded, margin crenate to doubly serrate, slightly revolute, apex obtuse or acute. Corymbs terminal, long pedunculate, compound, 5–7 × 5–6 cm, densely numerous flowered; rachis and pedicels pubescent; pedicels 2–4 mm; bracts linear or linear-lanceolate, 2–4 mm. Flowers bisexual, 6–7 mm in diam. Hypanthium broadly turbinate, glabrous or puberulous abaxially. Sepals triangular-ovate, 1.5–2 mm. Petals dark purple-red, orbicular, much longer than sepals. Stamens ca. 20, unequal, longer ones nearly equaling petals; anthers brown-purple. Disk annular, with prominent lobes. Styles shorter than stamens; stigma capitate. Follicles erect, glabrous. Fl. May–Jul, fr. Aug–Sep.

- Mixed forests, thickets on slopes; 2800–3300 m. Sichuan, Xizang, Yunnan.

6. *Spiraea bella* Sims, *Bot. Mag.* 50: t. 2426. 1823.

藏南绣线菊 *zang nan xiu xian ju*

Shrubs deciduous, to 2 m tall. Branchlets yellow-brown to red-brown, slightly angled, subglabrous to pubescent; buds brown to red-brown, small, with several scales, glabrous. Petiole 2–5 mm; leaf blade abaxially gray-green, adaxially bright green, ovate, elliptic-ovate, or ovate-lanceolate, 2–4 × 1–2 cm, abaxially pubescent or subglabrous on veins, adaxially glabrous, rarely puberulous, base broadly cuneate to rounded, mar-

gin sharply serrate or doubly serrate from below middle, apex acute. Corymbs terminal, compound, 2–4 × 1.5–2.5 cm, many flowered; rachis and pedicels pubescent; pedicels 5–8 mm; bracts elliptic-lanceolate, 3–5 mm, puberulous, apex acuminate. Flowers ± unisexual, 5–7 mm in diam. Hypanthium campanulate, slightly pubescent abaxially. Sepals triangular-ovate, 1.5–2.5 × 1.5–2 mm, reflexed in fruit, apex acute. Petals pinkish, rarely white, suborbicular, longer than sepals, glabrous, base shortly clawed. Stamens ca. 20, reduced and shorter than petals in female flowers, longer than petals in male flowers. Disk annular, 10-lobed. Carpels pubescent, reduced in male flowers. Follicles spreading, puberulous, sometimes only so on adaxial suture; styles spreading. Fl. May–Jun, fr. Aug–Sep.

Broad-leaved, coniferous, or mixed forests, thickets on slopes; 2300–3600 m. SW Sichuan, S Xizang, NW Yunnan [Bhutan, India, Nepal, Sikkim].

- 1a. Follicles puberulous only on adaxial suture 6a. var. *bella*
 1b. Follicles pubescent throughout 6b. var. *pubicarpa*

6a. *Spiraea bella* var. *bella*

藏南绣线菊(原变种) *zang nan xiu xian ju* (*yuan bian zhong*)

Follicles puberulous only on adaxial suture.

Mixed forests, thickets on slopes; 2400–3600 m. SW Sichuan, S Xizang, NW Yunnan [Bhutan, India, Nepal, Sikkim].

6b. *Spiraea bella* var. *pubicarpa* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 18: 490. 1980.

毛果藏南绣线菊 *mao guo zang nan xiu xian ju*

Follicles pubescent throughout.

- Mountain broad-leaved or coniferous forests; 2300–2600 m. S Xizang.

One of us (Lu) believes that *Spiraea hemicyptophyta* Grierson (*Notes Roy. Bot. Gard. Edinburgh* 44: 262. 1987), described from China (SE Xizang, NW Yunnan), N Myanmar, Nepal, and Sikkim, may be synonymous with *S. bella* and that further study is necessary to determine its identity. The new species was said to differ from *S. bella* in having stems annual, rarely branched, 20–40 cm tall, and corymbs all terminal.

7. *Spiraea fritschiana* C. K. Schneider, *Bull. Herb. Boissier, sér. 2*, 5: 347. 1905.

华北绣线菊 *hua bei xiu xian ju*

Shrubs 1–2 m tall. Branchlets purple-brown to brownish, lustrous, robust, conspicuously angled, glabrous or sparsely pubescent when young, later glabrescent; buds ovoid, 5–6 mm, with several brown scales, sparsely pubescent when young, apex acuminate or acute. Petiole 2–5 mm, pubescent initially, later glabrescent; leaf blade pale green abaxially, dark green adaxially, ovate, elliptic-ovate, or elliptic-oblong, 1.5–8 × 1.0–3.5 cm, pubescent abaxially, glabrous adaxially, rarely sparsely pubescent on veins, base broadly cuneate, margin irregularly doubly or singly serrate, apex acute or acuminate. Corymbs terminal on erect, long, leafy shoots of current year, compound, 5–8 × 6–10 cm, numerous flowered; rachis and pedicels glabrous; pedicels 4–7 mm; bracts lanceolate or linear, 4–7 mm,

puberulous. Flowers 5–6 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1.5–2 mm, about as broad as long, reflexed in fruit, apex acute. Petals white, pinkish in bud, ovate, 2–4 × 2–2.5 mm, glabrous, apex obtuse. Stamens 25–30, longer than petals. Disk annular, with 8–10 unequal, emarginate lobes. Carpels pubescent; styles shorter than stamens. Follicles suberect, spreading, glabrous or pubescent only on adaxial suture; styles terminal, erect or slightly divergent. Fl. May–Jun, fr. Aug–Sep.

• Forests, forest margins, cliffs, slopes, rocky places; 100–2400 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang.

- 1a. Leaf blades ± pubescent on both surfaces or glabrous adaxially, base broadly cuneate; fruiting inflorescences more than 6 cm in diam. 7a. var. *fritschiana*
- 1b. Leaf blades glabrous on both surfaces, base rounded; fruiting inflorescences 3–8 cm in diam.
 - 2a. Leaf blades oblong-ovate, 2.5–8 × 1.5–3 cm; fruiting inflorescences 3–8 cm in diam. 7b. var. *angulata*
 - 2b. Leaf blades broadly ovate, ovate-elliptic, or suborbicular, 1.5–3 × 1–2 cm; fruiting inflorescences 3–6 cm in diam. 7c. var. *parvifolia*

7a. *Spiraea fritschiana* var. *fritschiana*

华北绣线菊(原变种) hua bei xiu xian ju (yuan bian zhong)

Spiraea fritschiana var. *villosa* Y. Q. Zhu & D. K. Zang.

Leaf blades 3–8 × 1.5–3.5 cm, ± pubescent on both surfaces or glabrous adaxially, base broadly cuneate. Fruiting inflorescences more than 6 cm in diam.

• Mountain valley forests, rocky slopes; 100–2000 m. Gansu, Hebei, Henan, Hubei, Jiangsu, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang.

7b. *Spiraea fritschiana* var. *angulata* (Fritsch ex C. K. Schneider) Rehder in Sargent, Pl. Wilson. 1: 453. 1913.

大叶华北绣线菊 da ye hua bei xiu xian ju

Spiraea angulata Fritsch ex C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 347. 1905; *S. fritschiana* var. *latifolia* Liou.

Leaf blades oblong-ovate, 2.5–8 × 1.5–3 cm, glabrous on both surfaces. Fruiting inflorescences 3–8 cm in diam.

• Mixed forests, forest margins, cliffs, rocky places; 200–2400 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi.

7c. *Spiraea fritschiana* var. *parvifolia* Liou, Ill. Fl. Lign. Pl. N. E. China, 279, 563. 1955.

小叶华北绣线菊 xiao ye hua bei xiu xian ju

Leaf blades broadly ovate, ovate-elliptic, or suborbicular, 1.5–3 × 1–2 cm, glabrous on both surfaces. Fruiting inflorescences 3–6 cm in diam.

• Dry slopes; 800–1000 m. Hebei, Liaoning, Shandong.

8. *Spiraea miyabei* Koidzumi, Bot. Mag. (Tokyo) 23: 166. 1906.

长蕊绣线菊 chang rui xiu xian ju

Spiraea silvestris Nakai.

Shrubs erect, 1–2 m tall. Branchlets red-brown or gray-brown, terete or slightly angled, pubescent when young, finally glabrous; buds ovoid, 1–2 mm, with several scales, glabrous, apex subobtusate. Petiole 2–5 mm, glabrous; leaf blade occasionally glaucescent abaxially, ovate or oblong-ovate to broadly lanceolate, 4–7 × 1–2 cm, membranous, glabrous or slightly puberulous on both surfaces, veins slightly raised abaxially, base subrounded or broadly cuneate, margin sharply serrate or doubly serrate, sometimes incised serrate, apex acute to acuminate. Corymbs terminal, compound, 4–6(–8) × 3–6 cm, many flowered; rachis and pedicels glabrous or pubescent; pedicels 6–10 mm; bracts linear, 2–3 mm. Flowers 6–7 mm in diam. Hypanthium campanulate or obconic, glabrous abaxially. Sepals triangular-ovate, 1.5–2 mm, spreading in fruit. Petals white, orbicular or obovate, (2–)3–4 × 2–3 mm, glabrous, base shortly clawed. Stamens 20–25, 2–3 × as long as petals. Disk annular, crenulate. Carpels fusiform, slightly tomentose; styles terminal, nearly equaling carpels, much shorter than stamens. Follicles 1.5–1.8 × 0.7–0.8 mm, slightly gray tomentose; styles recurved. Seeds linear. Fl. May–Jun, fr. Jul–Aug.

Mixed forests, mountain forests, slopes, gullies; 1000–2000 m. Anhui, Hubei, Shaanxi, Sichuan, Yunnan [Japan].

Three varieties occur in China; var. *miyabei* is native to Japan.

- 1a. Leaf blades ± pubescent on both surfaces, more densely so abaxially 8c. var. *pilosula*
- 1b. Leaf blades glabrous on both surfaces.
 - 2a. Leaf blades 5–7 cm, not glaucescent abaxially, base subrounded or broadly cuneate; petiole 3–5 mm 8a. var. *glabrata*
 - 2b. Leaf blades to 7 cm, glaucescent abaxially, base cuneate; petiole to 1 cm 8b. var. *tenuifolia*

8a. *Spiraea miyabei* var. *glabrata* Rehder in Sargent, Pl. Wilson. 1: 454. 1913.

无毛长蕊绣线菊 wu mao chang rui xiu xian ju

Petiole 3–5 mm; leaf blade not glaucescent abaxially, 5–7 cm, glabrous on both surfaces, base subrounded or broadly cuneate. Inflorescences and hypanthium abaxially glabrous.

• Mixed forests, slopes, gullies; 1000–2000 m. Anhui, Hubei, Shaanxi.

8b. *Spiraea miyabei* var. *tenuifolia* Rehder in Sargent, Pl. Wilson. 1: 455. 1913.

细叶长蕊绣线菊 xi ye chang rui xiu xian ju

Petiole to 1 cm; leaf blade glaucescent abaxially, to 7 cm, glabrous on both surfaces, base cuneate. Inflorescences and hypanthium abaxially glabrous.

• Mountain slopes. C Sichuan (Emei Shan).

8c. *Spiraea miyabei* var. *pilosula* Rehder in Sargent, Pl. Wilson. 1: 455. 1913.

毛叶长蕊绣线菊 mao ye chang rui xiu xian ju

Leaf blade ± pubescent on both surfaces, more densely so abaxially, base cuneate. Inflorescences and hypanthium abaxially sparsely pubescent.

- Mountain forests; 1000–1600 m. Hubei, Sichuan, Yunnan.

9. *Spiraea henryi* Hemsley, J. Linn. Soc., Bot. 23: 225. 1887.

翠蓝茶 cui lan cha

Shrubs 1–3 m tall. Branchlets brownish, red-brown, or gray-brown, terete, pubescent when young, later glabrescent; buds brown when young, ovoid, with several scales, pubescent when young, apex usually obtuse, rarely acute. Petiole 2–5 mm, thinly villous; leaf blade adaxially dark green, elliptic, elliptic-oblong, or obovate-oblong, 2–7 × 0.8–2.3 cm, abaxially densely thinly villous, more densely on veins, adaxially glabrous or sparsely softly hairy, base cuneate, margin sometimes with a few coarse teeth above middle, sometimes entire, apex acute or subobtusate. Corymbs terminal on short, lateral branchlets, compound, 3–7 × 4–7 cm, many flowered; rachis and pedicels glabrous or villous; pedicels 5–8 mm; bracts lanceolate, rarely narrowly elliptic, 2–4 mm, more densely villous abaxially, sparsely so adaxially. Flowers 5–6 mm in diam. Hypanthium campanulate, ± thinly villous. Sepals ovate-triangular, 1–1.5 × 1–1.5 mm, erect in fruit, apex acute. Petals white, broadly obovate to suborbicular, 2–2.5 × 2–3 mm, glabrous, base shortly clawed, apex often emarginate, rarely obtuse. Stamens ca. 20, nearly equaling petals. Disk annular, with 10 thick, globular lobes. Styles slightly shorter than stamens. Follicles spreading, thinly villous; styles terminal, slightly divergent. Fl. Apr–May, fr. Jul–Aug.

- Mountain forests, roadside thickets, foothills, slopes; 1300–3000 m. Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan, Yunnan.

- 1a. Inflorescences villous; leaf blades densely thinly villous abaxially 9a. var. *henryi*
 1b. Inflorescences glabrous; leaf blades subglabrous or sparsely villous abaxially 9b. var. *omeiensis*

9a. *Spiraea henryi* var. *henryi*

翠蓝茶(原变种) cui lan cha (yuan bian zhong)

Leaf blades densely thinly villous abaxially. Inflorescences villous.

- Mountain forests, foothills, rocky slopes; 1500–3000 m. Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan, Yunnan.

9b. *Spiraea henryi* var. *omeiensis* T. T. Yu, Acta Phytotax. Sin. 8: 216. 1963.

峨眉翠蓝茶 e mei cui lan cha

Spiraea henryi var. *glabrata* T. T. Yu & L. T. Lu.

Leaf blades subglabrous or sparsely villous abaxially. Inflorescences glabrous.

- Roadside thickets, slopes; 1300–1500 m. C Sichuan (Emei Shan).

10. *Spiraea schochiana* Rehder, J. Arnold Arbor. 1: 259. 1920.

滇中绣线菊 dian zhong xiu xian ju

Shrubs erect. Branches arching; branchlets brown or red-brown, angled, densely yellow villous initially, finally glabrescent; buds ovoid, with several scales, pubescent, apex acute. Petiole 1–2 mm, densely villous; leaf blade abaxially yellowish initially, later turning gray, adaxially dark green, elliptic to obovate-elliptic, 1.5–2 × 0.8–1 cm, abaxially densely tomentose initially, later papillose, adaxially sparsely tomentose, lateral veins 3 or 4 on each side of midvein, base broadly cuneate, margin with a few coarse teeth above middle or near apex, apex acute or subobtusate and mucronate. Corymbs terminal on lateral branchlets, compound, 2–4 × 2.5–3.5 cm, densely many flowered; rachis and pedicels densely dark yellow villous; pedicels 1–2 mm; bracts lanceolate to narrowly elliptic, 4–6 mm, villous. Hypanthium campanulate, villous abaxially. Sepals triangular, 1–1.5 mm, erect or spreading in fruit, apex subobtusate. Petals suborbicular, 2–2.5 mm in diam., glabrous, base shortly clawed. Stamens 25–30, nearly equaling stamens. Disk distinct, 10-lobed. Styles slightly shorter than sepals. Follicles somewhat erect, softly hairy; styles terminal, slightly divergent.

- Forested slopes, mountain valleys; 2000–2200 m. C Yunnan.

11. *Spiraea sargentiana* Rehder in Sargent, Pl. Wilson. 1: 447. 1913.

茂汶绣线菊 mao wen xiu xian ju

Spiraea aemulans Rehder.

Shrubs to 2 m tall. Branchlets spreading, red-brown to gray-brown, slender, terete, sometimes angled, pubescent when young, finally glabrous; buds brown, ovoid, small, with several scales, pubescent initially, apex subobtusate or acute. Petiole 1–3 mm, villous; leaf blade adaxially dark green, elliptic-oblong to obovate-oblong, 1–3 × 0.7–1.2 cm, abaxially densely thinly villous, adaxially sparsely villous, base cuneate, margin with a few teeth apically, apex acute. Corymbs terminal on lateral branchlets, compound, 2.5–5 × 2.5–4 cm, many flowered; rachis and pedicels thinly villous; pedicels 2–5 mm; bracts long elliptic or oblong, 2–4 mm, thinly villous. Flowers 5–6 mm in diam. Hypanthium campanulate, villous abaxially. Sepals triangular, 1.5–2 mm, erect or reflexed in fruit, apex acute. Petals milky white, suborbicular, 2–3 × 2–2.5 mm, glabrous, base almost clawless, apex emarginate. Stamens ca. 20, nearly equaling petals. Disk annular, 10-lobed; lobes emarginate at apex. Carpels pubescent basally; styles shorter than stamens. Follicles spreading, glabrous or hairy on adaxial suture; styles terminal on abaxial side, slightly divergent. Fl. Jun–Jul, fr. Sep–Oct.

- Thickets, open slopes, roadsides; 1000–2400 m. Henan, Hubei, Sichuan, Yunnan.

12. *Spiraea wilsonii* Duthie in J. H. Veitch, Hort. Veitch. 379. 1906.

陕西绣线菊 shan xi xiu xian ju

Shrubs 1.5–2.5 m tall. Branchlets spreading, arching,

brownish or purplish turning purple-brown or gray-brown when old, terete, pubescent, finally glabrous; buds ovoid, with a few scales, pubescent, apex obtuse. Petiole 2–5 mm, villous; leaf blade abaxially gray-green, oblong, obovate, or elliptic-oblong, 1–3 × 0.5–1 cm, abaxially villous, more densely so on veins, adaxially sparsely villous, base cuneate, margin entire or with a few teeth apically, apex acute, rarely obtuse. Corymbs terminal on lateral branchlets, compound, 3–4.5 cm in diam.; rachis and pedicels villous; pedicels 4–6 mm; bracts elliptic-oblong or ovate-lanceolate, 4–6 × 1.5–3.5 mm, villous on both surfaces, base cuneate, margin entire, apex acute or obtuse. Flowers 6–7 mm in diam. Hypanthium campanulate, villous abaxially. Sepals triangular, 1–2 mm, erect in fruit, apex acute. Petals white, broadly obovate or suborbicular, 2–3 mm, almost as broad as long, apex emarginate or subobtuse. Stamens ca. 20, subequaling petals. Disk annular, 10-lobed; lobes sometimes emarginate at apex. Styles shorter than stamens. Follicles spreading, densely pubescent; styles terminal on abaxial side, slightly divergent. Fl. May–Jul, fr. Aug–Sep.

• Mountain valley forests, rocky slopes, open places, roadsides; 1000–3200 m. Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan, Yunnan.

13. *Spiraea teretifuscula* C. K. Schneider, Bot. Gaz. 63: 399. 1917.

圆枝绣线菊 yuán zhī xiù xiàn jú

Shrubs to 2 m tall. Branchlets arched, laxly branched, yellowish or purple-yellowish, grooved, puberulous; young branchlets red-brown or brownish, grayish when old, terete; buds small, ovoid, with several scales, pilose. Petiole 1–2 mm, puberulous; leaf blade abaxially gray-green, adaxially greenish, ovate or ovate-elliptic, 6–11 × 4–7 mm, abaxially gray-green, pilose initially, later glabrous, papillose, adaxially greenish, slightly pubescent when young, later glabrous, lateral veins 3 or 4 on each side of midvein, prominent abaxially, base cuneate, margin entire, apex obtuse, sometimes subemarginate. Corymbs compound, 1–3 × 1.5–2.5 cm, up to 25-flowered; rachis and pedicels densely finely pubescent; pedicels 5–9 mm; bracts lanceolate or linear, 2–3 mm, thinly pubescent. Flowers 5–6 mm in diam. Hypanthium turbinate, thinly pubescent abaxially. Sepals broadly triangular, 1–1.5 mm, about as broad as long, apex acute. Petals white, suborbicular, 1.5–2 mm in diam., glabrous, base shortly clawed. Stamens ca. 20, nearly equaling petals. Disk annular, 10-lobed. Carpels sparsely hairy basally; styles terminal, much shorter than stamens.

• Mountain forests; 2500–3000 m. S Sichuan.

14. *Spiraea ovalis* Rehder in Sargent, Pl. Wilson. 1: 446. 1913.

广椭绣线菊 guāng tuō xiù xiàn jú

Shrubs 2–3 m tall. Branches spreading, slender; branchlets dark red-brown, turning brown or gray-brown when old, terete, glabrous; buds ovoid, small, with several scales, pubescent when young, finally glabrescent, apex obtuse. Petiole 3–5 mm, glabrous or puberulous; leaf blade abaxially greenish, adaxially dark green, broadly elliptic to oblong, rarely obovate, 1.5–3.5 × 1–2 cm, glabrous on both surfaces or sparsely pubescent on veins abaxially, base broadly cuneate or subrounded, margin

entire, rarely with a few shallow teeth apically, apex obtuse, rarely acute. Corymbs terminal on lateral branchlets, compound, 3.5–6 × 3.5–5.5 cm, many flowered; rachis and pedicels glabrous; pedicels 4–7 mm; bracts elliptic to lanceolate, 7–10 × 1–1.5 mm, glabrous. Flowers 5–6 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals ovate-triangular, 1.5–2 mm, erect in fruit, apex acute. Petals white, broadly ovate or suborbicular, 1.5–2.5 × ca. 2 mm, glabrous, base shortly clawed, apex obtuse. Stamens ca. 20, subequaling to slightly longer than petals. Disk annular, with 10 thick lobes. Carpels pubescent; styles shorter than stamens. Follicles spreading, puberulous; styles terminal on abaxial side.

• Mountain valleys, grasslands; 900–2500 m. Gansu, Henan, Hubei, Shaanxi, Sichuan, Xizang.

15. *Spiraea veitchii* Hemsley, Gard. Chron., ser. 3, 33: 258. 1903.

鄂西绣线菊 è xī xiù xiàn jú

Spiraea atemnophylla H. Léveillé.

Shrubs to 4 m tall. Branchlets arching, red-brown to gray-brown, slender, terete, slightly angled, pubescent when young, later glabrous; buds ovoid, small, with several scales, pubescent, apex acute or obtuse. Petiole 2–3 mm, thinly pubescent; leaf blade abaxially gray-green, glaucescent, adaxially green, oblong, elliptic, or obovate, 1.5–3 × 0.7–1 cm, abaxially sometimes thinly pubescent, adaxially glabrous, inconspicuously pinnately veined, base cuneate, margin entire, apex obtuse or mucronulate. Corymbs terminal on lateral branchlets, compound, dense, 4–8 × 4.5–7 cm, numerous flowered; rachis and pedicels densely thinly pubescent; pedicels 3–4 mm. Flowers 4–5 mm in diam. Hypanthium campanulate, puberulous abaxially. Sepals triangular, 1–1.5 mm, erect in fruit, apex acute. Petals white, ovate or suborbicular, 1.5–2 × 1–2 mm, glabrous, base shortly clawed, apex obtuse. Stamens ca. 20, somewhat longer than petals. Disk annular, 10-lobed; lobes shallow, apex usually slightly emarginate. Carpels subglabrous; styles shorter than stamens. Follicles spreading, small, glabrous; styles terminal on abaxial side, divergent. Fl. May–Jul, fr. Jul–Oct.

• Thickets, grasslands; 2000–3600 m. Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan, Yunnan.

16. *Spiraea schneideriana* Rehder in Sargent, Pl. Wilson. 1: 449. 1913.

川滇绣线菊 chuān diān xiù xiàn jú

Shrubs 1–2 m tall. Branchlets red-brown, later gray-brown, angled, villous, later glabrescent; buds ovoid, with several brown scales, puberulous, later glabrescent, apex subobtuse or acute. Petiole 1–3 mm, usually glabrous; leaf blade ovate to ovate-oblong, 8–15 × 5–8 mm, glabrous or thinly villous near margin on both surfaces, veins indistinct, sometimes 3-veined basally, base cuneate to rounded, margin entire, rarely with a few teeth apically, apex obtuse or subacute. Corymbs terminal on short, lateral branchlets, compound, 2.5–5 × 3–6 cm, many flowered; rachis and pedicels glabrous to thinly villous; pedicels 4–9 mm; bracts lanceolate, 2–3 mm, puberulous, caducous, base cuneate, margin entire, apex acute. Flowers 5–6 mm in diam. Hypanthium campanulate, ± thinly pubescent. Sepals

ovate-triangular, 1.5–2 mm, erect in fruit. Petals white, orbicular or ovate, 2–2.5 × 2 mm, glabrous, base shortly clawed, apex obtuse or emarginate. Stamens ca. 20, slightly longer than petals. Disk annular, 10-lobed; lobes sometimes emarginate at apex. Carpels puberulous; styles shorter than stamens. Follicles spreading, glabrous or puberulous only on adaxial suture; styles terminal on abaxial side, suberect or divergent. Fl. May–Jun, fr. Jul–Sep.

- Forests, forest margins, thickets, mountain valleys, rocky slopes, stream sides; 2500–4000 m. Fujian, Gansu, Hubei, Shaanxi, Sichuan, Xizang, Yunnan.

1a. Young branchlets and inflorescences
thinly villous, rarely subglabrous

..... 16a. var. *schneideriana*

1b. Young branchlets and inflorescences

usually glabrous 16b. var. *amphidoxa*

16a. *Spiraea schneideriana* var. *schneideriana*

川滇绣线菊(原变种) chuan dian xiu xian ju (yuan bian zhong)

Young branchlets and inflorescences thinly villous, rarely subglabrous.

- Mixed forests, alpine coniferous forest margins, thickets; 2500–4000 m. Fujian, Hubei, Sichuan, Xizang, Yunnan.

16b. *Spiraea schneideriana* var. *amphidoxa* Rehder in Sargent, Pl. Wilson. 1: 450. 1913.

无毛川滇绣线菊 wu mao chuan dian xiu xian ju

Young branchlets and inflorescences usually glabrous.

- Forests, mountain valleys, rocky slopes, stream sides; 2500–3800 m. Gansu, Shaanxi, Sichuan, Xizang, Yunnan.

17. *Spiraea teniana* Rehder, J. Arnold Arbor. 1: 259. 1920.

伏毛绣线菊 fu mao xiu xian ju

Shrubs erect, 1–3 m tall. Branchlets brownish red to brown, terete, sparsely pubescent initially, finally glabrous; buds small, with 2 scales, glabrous. Petiole 1–2 mm, subglabrous; leaf blade abaxially glaucescent, adaxially dark green, elliptic or elliptic-ovate, 2–2.8 × 1–1.5 cm, abaxially accumbent pilose on veins, adaxially glabrous, lateral veins 4–6 on each side of midvein, slightly raised abaxially, base broadly cuneate, margin ciliate, sharply singly serrate except toward base, apex acute. Corymbs terminal on short, lateral branchlets, compound, 2–3.5 × 3–4 cm, densely numerous flowered; rachis and pedicels accumbent pilose; bracts leaflike, unequal, larger ones 10–15 × 4–6 mm, smaller ones 7–10 × 2–3 mm. Flowers 4–5 mm in diam. Hypanthium campanulate, pilose abaxially. Sepals triangular, 1–1.5 mm, reflexed in fruit, apex mucronate. Petals white, suborbicular, 2–4 mm in diam., glabrous, base shortly clawed. Stamens very unequal, longer ones to 4 mm, exceeding petals, shorter ones nearly equaling petals. Disk annular, irregularly crenulate. Carpels pilose basally; styles somewhat longer than sepals. Follicles erect, divergent, pilose adaxially; styles terminal, mostly straightly spreading. Fl. May–Jun, fr. Sep–Oct.

- Moist mixed forests; 2000–2400 m. Yunnan.

Lu (Acta Phytotax. Sin. 38: 276. 2000) made the combination *Spiraea teniana* var. *mairei* (H. Léveillé) L. T. Lu, based on *S. mairei* H. Léveillé (Bull. Acad. Int. Géogr. Bot. 25: 43. 1915), described from NE Yunnan (Qiaojia Xian). However, if the two species are indeed conspecific, the name *S. mairei* (1915) has priority over *S. teniana* (1920).

18. *Spiraea hingshanensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 13(1): 99. 1975.

兴山绣线菊 xing shan xiu xian ju

Shrubs 1–2 m tall. Branchlets brownish, glabrous; buds ovoid, with 2 scales, glabrous, apex acuminate. Petiole 5–7 mm, glabrous; leaf blade ovate to ovate-elliptic, 5–7.5 × 2.5–3.5 cm, abaxially softly hairy on veins and in vein axils, adaxially glabrous, base broadly cuneate, margin subobtusely singly serrate or doubly serrate, apex acute to shortly acuminate. Corymbs terminal on short, lateral branchlets, compound, 5–7 × 4–6 cm, many flowered; rachis and pedicels glabrous; pedicels 4–6 mm; bracts lanceolate or narrowly elliptic, 3–5 mm, glabrous, apex acute to shortly acuminate. Flowers 3–4 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1–1.5 × 1–1.5 mm, reflexed, rarely erect in fruit. Petals white, suborbicular, 2–3 × 2–3 mm, glabrous. Stamens much longer than petals. Disk annular, crenate. Follicles spreading, densely pubescent; styles terminal, divergent.

- Forests, thickets, shady slopes. W Hubei.

19. *Spiraea morrisonicola* Hayata, J. Coll. Sci. Univ. Tokyo 30(1): 89. 1911.

新高山绣线菊 xin gao shan xiu xian ju

Spiraea japonica Linnaeus f. var. *morrisonicola* (Hayata) Kitamura.

Shrubs or subshrubs to 50 cm tall. Branchlets brownish or red-brown to gray-brown, slender, terete, pubescent when young, gradually glabrescent; buds ovoid, minute, with 2 brownish scales, puberulous, apex acute or subobtusely. Petiole 1–3 mm, glabrous; leaf blade ovate or rhombic-ovate, 10–20 × 8–14 mm, glabrous on both surfaces, lateral veins distinctly raised abaxially, depressed adaxially, base cuneate to broadly so, rarely subrounded, margin entire toward base, grossly sharply serrate distally, apex obtuse or acute. Corymbs terminal on short, lateral branchlets, compound, 1.5–3 × 2–4 cm, densely many flowered; rachis and pedicels glabrous; pedicels 3–6 mm; bracts 8–12 mm, glabrous, apex with a few teeth or entire. Flowers 4–5 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals broadly triangular or ovate, 1–2 mm, erect in fruit, apex mucronate. Petals white, broadly obovate to suborbicular, longer than sepals, glabrous, base shortly clawed, apex obtuse. Stamens 10–12, nearly equaling to slightly longer than petals. Disk annular, 10-lobed; lobes triangular, apex obtuse. Carpels puberulous basally; styles subequaling stamens. Follicles slightly spreading, puberulous on adaxial suture; styles terminal on abaxial side, divergent, mostly deciduous when ripe. Fl. Jul–Aug, fr. Sep–Oct.

- Montane regions; below 4000 m. Taiwan.

20. *Spiraea kweichowensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 13(1): 100. 1975.

贵州绣线菊 *gui zhou xiu xian ju*

Shrubs ca. 0.5 m tall. Branchlets slightly tortuous, dark red-brown, terete, glabrous; buds long ovoid, with 2 scales, glabrous, apex acuminate. Petiole 2–5 mm, glabrous; leaf blade purplish abaxially, ovate, 1.5–4 × 1–3 cm, glabrous on both surfaces, base rounded to subcordate, margin doubly serrate, apex acute. Corymbs terminal on short, lateral branchlets, compound, 2–4 × 3–5 cm, many flowered; rachis and pedicels glabrous; pedicels 2–4 mm; bracts linear-lanceolate, longer than pedicels, glabrous. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1–1.5 × 1–1.5 mm, apex acute. Petals pink, suborbicular, longer than sepals, glabrous, base shortly clawed. Stamens 25–30, longer than petals. Disk annular; lobes inconspicuous. Carpels glabrous; styles terminal. Follicles unknown. Fl. Jun–Jul.

• Rocky mountain summits; below 2000 m. NE Guizhou (Fanjing Shan).

21. *Spiraea velutina* Franchet, Pl. Delavay. 201. 1889.

绒毛绣线菊 *rong mao xiu xian ju*

Shrubs to 2 m tall. Branchlets spreading, yellow-brown turning gray-brown, robust, slightly angled, densely villous when young, gradually glabrescent; buds long ovoid, nearly equaling to longer than petioles, with 2 scales, densely tomentose-villous, apex acuminate. Petiole 3–5 mm, densely villous; leaf blade adaxially dark green, ovate or ovate-lanceolate, 3–8 × 1.5–3.5 cm, subglabrous on both surfaces or abaxially densely sericeous-villous (especially on veins) and adaxially pilose, base cuneate, margin coarsely serrate with a few double teeth, apex acute. Corymbs terminal on short, lateral branchlets, compound, 3–6 × 4–7 cm, sometimes to 14 cm in fruit, many flowered; rachis and pedicels thin villous; pedicels 5–7 mm; bracts linear-lanceolate or ovate-lanceolate, 5–7 mm, villous on both surfaces. Flowers 5–6 mm in diam. Hypanthium campanulate, villous abaxially. Sepals triangular, 1–2 mm, reflexed in fruit, apex acute. Petals white, suborbicular, 2–3 × 2–3 mm, apex obtuse. Stamens ca. 20, longer than petals. Disk annular, 10-lobed; lobes broad, apex usually emarginate. Styles shorter than stamens. Follicles spreading, densely gray-white villous; styles terminal, slightly divergent. Fl. May–Jun, fr. Aug–Oct.

• Broad-leaved and mixed forests, thickets, slopes, gullies, river banks; 2000–3300 m. Xizang, Yunnan.

- 1a. Leaf blades densely sericeous-villous, especially on veins abaxially 21a. var. *velutina*
 1b. Leaf blades glabrescent, subglabrous, or sparsely hairy only on veins abaxially 21b. var. *glabrescens*

21a. *Spiraea velutina* var. *velutina*

绒毛绣线菊(原变种) *rong mao xiu xian ju (yuan bian zhong)*

Leaf blades densely sericeous-villous, especially on veins abaxially.

• Mixed forests, slopes, river banks; 2000–3000 m. Xizang, Yunnan.

21b. *Spiraea velutina* var. *glabrescens* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 491. 1980.

脱毛绣线菊 *tu o mao xiu xian ju*

Leaf blades glabrescent, subglabrous, or sparsely hairy only on veins abaxially.

• Broad-leaved forests, thickets on slopes, gullies; 2200–3300 m. S Xizang.

22. *Spiraea lobulata* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 490. 1980.

裂叶绣线菊 *lie ye xiu xian ju*

Shrubs 1.5–3 m tall. Branchlets brownish, densely yellow-grayish tomentose, glabrescent when old; buds shortly or long ovoid, with 2 scales, densely tomentose. Petiole 6–10 mm, densely tomentose; leaf blade broadly ovate to rhombic-ovate, 4–7 × 3–5 cm, sericeous-villous on both surfaces, more densely so abaxially, base cuneate to subrounded, margin lobed and incised doubly serrate, apex acute to shortly acuminate. Corymbs borne on lateral branchlets, compound, to 16 cm wide, densely many flowered; rachis and pedicels densely yellow-grayish tomentose; pedicels 4–6 mm; bracts linear-lanceolate or linear, tomentose. Flowers 4–6 mm in diam. Hypanthium campanulate, tomentose abaxially. Sepals triangular, spreading or rarely reflexed in fruit, apex acute. Petals white, suborbicular, 2–3 mm in diam., apex obtuse. Stamens much longer than petals; anthers white. Disk annular; lobes distinct, broad. Carpels densely hairy; styles shorter than stamens. Follicles spreading, softly hairy throughout; styles terminal on abaxial side. Fl. Jun–Aug, fr. Aug–Oct.

• Alpine coniferous forests, mixed forests in river valleys, foothill thickets, river banks; 2000–2500 m. SE Xizang.

23. *Spiraea rosthornii* Pritzl ex Diels, Bot. Jahrb. Syst. 29: 383. 1900.

南川绣线菊 *nan chuan xiu xian ju*

Spiraea prattii C. K. Schneider.

Shrubs to 2 m tall. Branchlets spreading, yellow-brown turning gray-brown, pubescent when young, later glabrescent; buds long ovoid, nearly equaling petioles, with 2 scales, glabrous, apex acuminate. Petiole 5–7 mm, hairy; leaf blade abaxially gray-green, adaxially green, ovate-oblong to ovate-lanceolate, 2.5–5(–8) × 1–2(–3) cm, abaxially pubescent, more densely so on veins, adaxially pilose, base rounded to subtruncate, margin incised doubly serrate, apex acute or shortly acuminate. Corymbs terminal on lateral branchlets, compound, 6–10 × 7–11 cm, many flowered; rachis and pedicels pubescent; pedicels 5–7 mm; bracts ovate-lanceolate to linear-lanceolate, 5–8 mm, pubescent on both surfaces, base cuneate, margin with a few teeth, apex acute. Flowers 5–7 mm in diam. Hypanthium campanulate, ± pubescent abaxially. Sepals triangular, 1–2 mm, reflexed in fruit, apex acute. Petals white, ovate to suborbicular, 2–3.5 × 2–3 mm, glabrous, base shortly clawed, apex obtuse. Stamens ca. 20, longer than petals. Disk

annular, 10-lobed; lobes broad, apex sometimes emarginate. Styles shorter than stamens. Follicles spreading, pubescent; styles terminal, divergent.

• Slopes in mixed forests, stream sides; 1000–3500 m. Anhui, Gansu, Hebei, Henan, Qinghai, Shaanxi, Sichuan, Yunnan.

24. *Spiraea longigemmis* Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 205. 1879.

长芽绣线菊 *chang ya xiu xian ju*

Shrubs to 2.5 m tall. Branchlets slightly tortuous, brown to gray-brown, slender, puberulous when young, later glabrous; buds long ovoid, usually longer than petioles, with 2 scales, glabrous, apex acuminate. Petiole 2–5 mm, glabrous; leaf blade ovate-lanceolate to oblong-lanceolate, 2–4 × 1–2 cm, abaxially glabrous or pilose on veins, adaxially pilose initially, glabrescent later, base broadly cuneate or rounded, margin incised doubly serrate and with some simple teeth, apex acute. Corymbs terminal on lateral branchlets, compound, 4–8 × 4–6(–8) cm, densely many flowered; rachis and pedicels pilose or subglabrous; pedicels 4–6 mm; bracts ovate-lanceolate to linear-lanceolate, 4–6 mm, pubescent on both surfaces when young, eventually glabrescent. Flowers 5–6 mm in diam. Hypanthium campanulate, pubescent abaxially. Sepals triangular, 1–1.5 mm, erect or reflexed in fruit. Petals white, suborbicular, 2–2.5 mm, about as broad as long, glabrous, base shortly clawed, apex obtuse. Stamens 15–20, longer than petals. Disk annular, equally 10-lobed. Carpels pubescent; styles shorter than stamens. Follicles semispreading, pilose or glabrous; styles terminal on abaxial side, divergent. Fl. May–Jul, fr. Aug–Oct.

• Dry rocky slopes, roadsides; 2500–3400 m. Gansu, Hubei, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang.

25. *Spiraea arcuata* J. D. Hooker, Fl. Brit. India 2: 325. 1878.

拱枝绣线菊 *gong zhi xiu xian ju*

Spiraea canescens D. Don var. *glabra* J. D. Hooker & Thomson.

Shrubs small. Branches arched, dark brown, shining, stout, slightly angled, deeply grooved, glabrous when old; buds long ovoid, with 2 scales. Petiole short, slender, glabrous or subglabrous; leaf blade long elliptic to obovate, 8–12 × 3–5 mm, glabrous or subglabrous on both surfaces, base cuneate, margin entire or obtusely 3–8-serrate or lobed apically, apex obtuse, rarely subacute. Corymbs terminal on short, lateral branchlets, compound, dense, many flowered; rachis and pedicels puberulous; pedicels short. Flowers 6–8 mm in diam. Hypanthium turbinate, pubescent abaxially. Sepals triangular, reflexed in fruit, apex usually acute. Petals pink, suborbicular, glabrous. Stamens slightly shorter than or subequaling petals. Disk annular, broadly crenate. Follicles spreading, wholly exerted, shining, glabrous, rarely puberulous only on adaxial suture; styles terminal on abaxial side, divergent. Fl. May–Jul, fr. Aug–Sep.

Forests, thickets on river banks, river valleys, subalpine rocky places; 3000–4200 m. Xizang, Yunnan [Bhutan, India, N Myanmar, Nepal, Sikkim].

26. *Spiraea canescens* D. Don, Prodr. Fl. Nepal. 227. 1825.

楔叶绣线菊 *xie ye xiu xian ju*

Shrubs 2–4 m tall. Branches tortuous; branchlets brown or gray-brown, angled, pubescent when young, later glabrescent; buds long ovoid, with 2 brown scales, pubescent, apex acute to shortly acuminate. Petiole 2–4 mm, pubescent; leaf blade ovate or obovate to obovate-lanceolate or oblong, 1–2 × 0.8–1.2 cm, abaxially pubescent, sometimes subglabrous or glabrous, adaxially often glabrous, base cuneate, margin entire or obtusely 3–5-dentate above middle, apex obtuse, sometimes inconspicuously 3-lobed. Corymbs terminal, compound, 2–4.5 × 3–5 cm, many flowered; rachis and pedicels densely pubescent; pedicels 4–8 mm; bracts linear, 2–4 mm, pubescent. Flowers 5–6 mm in diam. Hypanthium campanulate, pubescent abaxially. Sepals triangular, 2–2.5 mm, erect or spreading in fruit, apex acute. Petals white or pinkish, suborbicular, 2–3.5 × 2–3 mm, glabrous, base shortly clawed, apex entire or emarginate. Stamens ca. 20, subequaling to slightly longer than petals. Disk annular, 10-lobed; lobes broad, apex emarginate. Carpels slightly pubescent; styles shorter than stamens. Follicles slightly spreading, glabrous to pubescent or pilose; styles on abaxial side, divergent. Fl. Jul–Aug, fr. Sep–Oct.

Thickets, thicket margins, valleys, river banks, stream sides, dry places; 2300–4000 m. Gansu, W Sichuan, E and S Xizang, NW Yunnan [Bhutan, N India, Nepal, Sikkim].

- 1a. Leaf blades ovate or obovate to obovate-lanceolate, abaxially pubescent, sometimes subglabrous, margin entire or obtusely 3–5-dentate above middle; follicles slightly pubescent 26a. var. *canescens*
- 1b. Leaf blades oblong or obovate, abaxially glaucescent green, glabrous, margin entire or inconspicuously 3-lobed apically; follicles glabrous, rarely slightly pilose 26b. var. *glaucophylla*

26a. *Spiraea canescens* var. *canescens*

楔叶绣线菊(原变种) *xie ye xiu xian ju* (yuan bian zhong)

Spiraea rotundifolia Lindley; *S. canescens* D. Don var. *oblanceolata* Rehder.

Leaf blades ovate or obovate to obovate-lanceolate, abaxially pubescent, sometimes subglabrous, margin entire or obtusely 3–5-dentate above middle. Follicles slightly pubescent.

Thickets, river banks, dry places; 3000–4000 m. W Sichuan, S Xizang, NW Yunnan [Bhutan, N India, Nepal, Sikkim].

26b. *Spiraea canescens* var. *glaucophylla* Franchet, Pl. Delavay. 200. 1889.

粉背楔叶绣线菊 *fen bei xie ye xiu xian ju*

Spiraea canescens D. Don var. *myrtifolia* Zabel; *S. canescens* var. *sulphurea* Batalin.

Leaf blades oblong or obovate, abaxially glaucescent green, glabrous, margin entire or inconspicuously 3-lobed apically. Follicles glabrous, rarely slightly pilose.

• Thicket margins, valleys, stream sides; 2300–3000 m. Gansu, W Sichuan, E Xizang, NW Yunnan.

27. *Spiraea trichocarpa* Nakai, J. Coll. Sci. Univ. Tokyo 26(1): 173. 1909.

毛果绣线菊 mao guo xiu xian ju

Shrubs to 2 m. Branchlets brown or yellow-brown to gray-brown, angled, sterile ones glabrous, flowering ones pubescent; buds long ovoid or cylindrical, subequaling petioles, with 2 scales, glabrous or puberulous when young, apex acute or obtuse. Petiole 2–6 mm, glabrous or sparsely puberulous when young; leaf blade oblong, ovate-oblong, or obovate-oblong, 1.5–3 × 0.7–1.5 cm, glabrous on both surfaces, base cuneate, margin entire (leaves on sterile shoots with a few teeth near apex), apex acute or subobtuse. Corymbs terminal on short, lateral branchlets, compound, 4–7 × 3–5.5 cm, many flowered; rachis and pedicels densely pubescent; pedicels 5–9 mm; bracts linear or lanceolate, 4–6 mm, sometimes larger and leaflike at base of pedicels, pubescent. Flowers 5–7 mm in diam. Hypanthium campanulate, pubescent abaxially. Sepals triangular, 1.5–2 mm, usually persistent and erect in fruit, apex acute. Petals white, broadly obovate or suborbicular, 2–3.5 mm, about as broad as long, glabrous, apex emarginate or obtuse. Stamens 18–20, subequaling petals. Disk annular; lobes irregular, apex emarginate. Styles shorter than stamens. Follicles erect, densely pubescent; styles terminal on abaxial side, divergent. Fl. May–Jun, fr. Jul–Sep.

Mixed forests by streams. Jilin, Liaoning, Nei Mongol, Shanxi [Korea].

28. *Spiraea uratensis* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 5: 259. 1883.

乌拉绣线菊 wu la xiu xian ju

Shrubs to 1.5 m tall. Branchlets red-brown turning gray-brown, terete or slightly angled; buds long ovoid, with 2 scales, apex acuminate. Petiole 2–10 mm, glabrous; leaf blade oblong-ovate, oblong-lanceolate, or oblong-oblong, 1–3 × 0.7–1.5 cm, glabrous on both surfaces, base cuneate, margin entire, apex obtuse. Corymbs terminal on short, lateral branchlets, compound, 3–5.5 × 4–5 cm, many flowered; rachis and pedicels glabrous; pedicels 4–7 mm; bracts lanceolate to oblong, 2–4 mm. Flowers 4–6 mm in diam. Hypanthium campanulate or subcampanulate, glabrous abaxially. Sepals triangular, 1–2 mm, erect in fruit, apex acute. Petals white, suborbicular, 1.5–2.5 mm, glabrous, base shortly clawed. Stamens ca. 20, longer than petals. Disk annular, 10-lobed; lobes obtuse or emarginate at apex. Carpels pubescent; styles shorter than stamens. Follicles erect, spreading, puberulous; styles on abaxial side, slightly divergent. Fl. May–Jun, fr. Jul–Aug.

• Gullies, slopes, cliffs; 1000–2400 m. Gansu, Henan, Nei Mongol, Shaanxi, Shanxi.

29. *Spiraea nishimurae* Kitagawa, Bot. Mag. (Tokyo) 48: 610. 1934.

金州绣线菊 jin zhou xiu xian ju

Shrubs much branched. Branchlets tortuous, gray-brown, dark brown, or dark purple-brown, pubescent when young; buds ovoid, with several brownish scales, pubescent, apex subobtuse. Petiole 1–3 mm, densely sericeous-pubescent; leaf

blade abaxially greenish, adaxially green, rhombic-ovate to elliptic, rarely obovate, 7–24 × 4–8 mm, abaxially sericeous-pubescent, adaxially sparsely pubescent, base cuneate, margin deeply obtusely serrate, 3-lobed apically, middle lobes larger, apex obtuse. Umbels on short, lateral, leafy branchlets, pedunculate, 2–3 cm, 7–25-flowered; pedicels 6–10 mm, pubescent; bracts linear, puberulous. Flowers 5–6 mm in diam. Hypanthium campanulate, pubescent abaxially. Sepals triangular, erect in fruit, apex acute or shortly acuminate. Petals white, broadly ovate or suborbicular, 2–3 mm, about as broad as long, apex obtuse or emarginate. Stamens ca. 20, shorter than to nearly equaling petals. Disk annular, 10-lobed; lobes obtuse at apex, rarely emarginate. Carpels pubescent; styles shorter than stamens. Follicles lustrous, pubescent at base and abaxially. Fl. May–Jun, fr. Jul–Aug.

• Open woods, slopes, shaded rocks; 900–1900 m. Jilin, Liaoning, Shandong, Shanxi.

30. *Spiraea hirsuta* (Hemsley) C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 342. 1905.

疏毛绣线菊 shu mao xiu xian ju

Shrubs 1–1.5 m tall. Branchlets slightly tortuous, brownish, turning gray-brown or dark red-brown, terete, pubescent when young, later glabrous; buds ovoid, small, with several scales, apex obtuse or subacute. Petiole 5–6 mm, pubescent; leaf blade blue-green abaxially, dark green adaxially, obovate, elliptic, or ovate, 1.5–3.5 × 1–2 cm, sparsely pubescent on both surfaces initially, glabrescent when old, veins prominent, base narrowly cuneate or broadly cuneate to rounded, margin obtusely or somewhat sharply serrate above middle or near apex, apex obtuse. Umbels terminal, pedunculate, 2–3 × 4–5 cm, more than 20-flowered; pedicels clustered, 1.2–2.2 cm, densely pubescent; bracts linear, 2–3 mm, pubescent. Flowers 6–8 mm in diam. Hypanthium campanulate, pubescent abaxially. Sepals triangular or ovate-triangular, 1.5–2.5 × 1.5–2 mm, usually persistent and erect in fruit, apex acute. Petals white, broadly obovate, rarely suborbicular, 2.5–3 × 3–4 mm, glabrous, base shortly clawed, apex obtuse or emarginate. Stamens 18–20, shorter than petals. Disk annular, 10-lobed; lobes broad, apex emarginate. Carpels pubescent; styles shorter than stamens. Follicles slightly spreading, pilose; styles terminal on abaxial side, divergent. Fl. May–Jun, fr. Jul–Aug.

• Forests, thickets, slopes, stream sides, rocky places; 600–2000 m. Fujian, Gansu, Hebei, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang.

- 1a. Leaf blades obovate or elliptic, rarely ovate, base narrowly cuneate 30a. var. *hirsuta*
 1b. Leaf blades ovate, base broadly cuneate to rounded 30b. var. *rotundifolia*

30a. *Spiraea hirsuta* var. *hirsuta*

疏毛绣线菊(原变种) shu mao xiu xian ju (yuan bian zhong)

Spiraea blumei G. Don var. *hirsuta* Hemsley, J. Linn. Soc., Bot. 23: 224. 1887.

Leaf blades obovate or elliptic, rarely ovate, base narrowly cuneate.

• Thickets, slopes, rocky places; 600–1700 m. Fujian, Gansu, Hebei, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang.

30b. *Spiraea hirsuta* var. *rotundifolia* (Hemsley) Rehder in Sargent, Pl. Wilson. 1: 445. 1913.

圆叶疏毛绣线菊 *yuan ye shu mao xiu xian ju*

Spiraea blumei var. *rotundifolia* Hemsley, J. Linn. Soc., Bot. 23: 224. 1887; *S. blumei* var. *maximowicziana* (C. K. Schneider) Dunn; *S. maximowicziana* C. K. Schneider.

Leaf blades ovate, base broadly cuneate to rounded.

• Forests, thickets, stream sides; 600–2000 m. Henan, Hubei, Shaanxi, Sichuan.

31. *Spiraea chinensis* Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 193. 1879.

中华绣线菊 *zhong hua xiu xian ju*

Shrubs 1.5–3 m tall. Branchlets arched, red-brown and yellow tomentose initially, black-brown and glabrous when old; buds ovoid, 2–5 mm, with several scales, pubescent, apex acute or obtuse. Petiole 4–10 mm, shortly tomentose; leaf blade adaxially dark green, rhombic-ovate to obovate, 2.5–6 × 1.5–3 cm, abaxially yellow tomentose, adaxially pubescent, veins prominent abaxially, deeply impressed adaxially, base broadly cuneate or rounded, margin deeply sharply incised serrate or inconspicuously 3-lobed, apex obtuse or acute. Umbels pedunculate, 16–25-flowered; pedicels 5–9 mm or more, tomentose; bracts linear, 2–5 mm, pubescent. Flowers 3–10 mm in diam. Hypanthium campanulate, puberulous abaxially. Sepals ovate-lanceolate, 2–3 × 1–2 mm, erect or rarely reflexed in fruit, apex shortly acuminate. Petals white, suborbicular, 2–5 mm, nearly as broad as long, apex obtuse or emarginate. Stamens 22–25, shorter than to nearly equaling petals. Disk undulate annular or irregularly lobed. Styles shorter than stamens. Follicles erect or spreading, wholly pubescent; styles terminal, erect or divergent. Fl. Mar–Jun, fr. Jul–Oct.

• Thickets, slopes, open places, roadsides; 300–2000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Nei Mongol, Shaanxi, C Shandong, Shanxi, Sichuan, Yunnan, Zhejiang.

- 1a. Follicles erect, styles erect; pedicels more than 10 mm 31c. var. *erecticarpa*
- 1b. Follicles spreading, styles divergent; pedicels usually not more than 10 mm.
 - 2a. Flowers 3–6 mm in diam.; petals 2–3.5 mm 31a. var. *chinensis*
 - 2b. Flowers 8–10 mm in diam.; petals 4–5 mm 31b. var. *grandiflora*

31a. *Spiraea chinensis* var. *chinensis*

中华绣线菊(原变种) *zhong hua xiu xian ju (yuan bian zhong)*

Pedicels usually 5–9 mm. Flowers 3–6 mm in diam. Petals 2–3.5 mm. Follicles spreading; styles divergent.

• Thickets on slopes, open places, roadsides; 500–2000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei,

Hunan, Jiangsu, Jiangxi, Nei Mongol, Shaanxi, Shanxi, Sichuan, Yunnan, Zhejiang.

31b. *Spiraea chinensis* var. *grandiflora* T. T. Yu, Acta Phytotax. Sin. 8: 216. 1963.

大花中华绣线菊 *da hua zhong hua xiu xian ju*

Pedicels not more than 10 mm. Flowers 8–10 mm in diam. Petals 4–5 mm. Follicles spreading; styles divergent.

• Hill roadsides. SW Hubei (Hefeng Xian).

31c. *Spiraea chinensis* var. *erecticarpa* Y. Q. Zhu & X. W. Li, Bull. Bot. Res., Harbin 15: 437. 1995.

直果绣线菊 *zhi guo xiu xian ju*

Pedicels more than 10 mm. Follicles and styles erect.

• Slopes; ca. 300 m. C Shandong (Tai Shan).

32. *Spiraea dasyantha* Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 2: 97. 1835.

毛花绣线菊 *mao hua xiu xian ju*

Spiraea nervosa Franchet & Savatier.

Shrubs 2–3 m tall. Branchlets tortuous, red-brown to brown, slender, densely tomentose when young, glabrous when old; buds small, with several brown scales, softly hairy initially, later glabrescent, apex acute. Petiole 2–5 mm, densely tomentose; leaf blade adaxially dark green, rhombic-ovate, 2–4.5 × 1.5–3 cm, abaxially densely white tomentose, adaxially sparsely pubescent, rugose, prominently pinnately veined, base cuneate, margin obtusely incised serrate in upper 2/3 or lobed, apex obtuse or acute. Umbels pedunculate, densely 10–20-flowered; pedicels 6–10 mm, densely gray tomentose; bracts linear, 2–4 mm, tomentose. Flowers 4–8 mm in diam. Hypanthium campanulate, gray tomentose abaxially. Sepals triangular or ovate-triangular, 1–1.5 mm, nearly as broad as long, erect in fruit, rarely reflexed. Petals white, broadly obovate or suborbicular, 2–3 × 2–3 mm, glabrous, base shortly clawed, apex emarginate or obtuse. Stamens 20–22, ca. 1/2 as long as petals. Disk annular, 10-lobed; lobes broad. Styles shorter than stamens. Follicles spreading, white tomentose throughout; styles divergent, rarely suberect. Fl. May–Jun, fr. Jul–Aug.

• Forests, open dry slopes, roadsides; 400–1200 m. Gansu, Hebei, Hubei, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Shanxi, Zhejiang.

33. *Spiraea yunnanensis* Franchet, Pl. Delavay. 200. 1890.

云南绣线菊 *yun nan xiu xian ju*

Spiraea sinobrahuica W. W. Smith; *S. sinobrahuica* var. *aridicola* W. W. Smith; *S. tortuosa* Rehder; *S. yunnanensis* f. *tortuosa* (Rehder) Rehder.

Shrubs 1–2 m tall. Branchlets suberect, slightly bent or distinctly tortuous, brownish to gray-brown, slender, gray-white tomentose when young, later glabrous; buds ovoid, small, softly hairy initially, apex obtuse. Petiole 2–5 mm, tomentose; leaf blade adaxially dark green, obovate or ovate to suborbicular, 1–2 × 0.5–1.5 cm, abaxially densely gray tomentose, adaxially pubescent, 3–5-veined at base, lateral veins prominent, base

cuneate, margin ± obtusely serrate or doubly serrate, sometimes slightly 3-lobed, entire near base, apex obtuse. Umbels pedunculate, 1.5–3 × 2–3 cm, 5–25-flowered; pedicels 5–9 mm, densely yellow-white tomentose; bracts linear, 2–3 mm, yellow-white tomentose. Flowers 5–8 mm in diam. Hypanthium campanulate, tomentose abaxially. Sepals triangular, 1.5–2 × 1–1.5 mm, erect in fruit, apex acute or shortly acuminate. Petals white, broadly obovate or suborbicular, 3–4 × 2.5–3.5 mm, glabrous, base shortly clawed, apex emarginate or obtuse. Stamens ca. 20, ca. 1/2 as long as petals. Disk annular, almost divided into 10 emarginate lobes. Carpels gray-white pubescent; styles shorter than stamens. Follicles spreading, sparsely pubescent; styles abaxial, somewhat divergent. Fl. Apr–Jul, fr. Jul–Oct.

• Dry thickets, mountain valleys, slopes, rocks along gullies, roadsides; 1300–2800 m. W Sichuan, Yunnan.

34. *Spiraea siccanea* (W. W. Smith) Rehder, J. Arnold Arbor. 19: 205. 1933.

干地绣线菊 *gan di xiu xian ju*

Spiraea yunnanensis Franchet var. *siccanea* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 67. 1917.

Shrubs 1–1.5 m tall. Branchlets brown or red-brown, slender, terete, pubescent when young, later glabrescent; buds ovoid, with several scales, pubescent initially, apex acute. Petiole 2–5 mm, sparsely pubescent or glabrous; leaf blade abaxially gray-green, adaxially dark green, obovate or oblong, 1–2.5 × 0.7–1.8 cm, abaxially subglabrous or puberulous only on veins, adaxially glabrous, prominently 3–5-veined, base broadly cuneate or subrounded, margin irregularly crenate above middle, usually shallowly 3-lobed, apex obtuse. Umbels pedunculate, 2–3 × 2–2.5 cm, 5–17-flowered; pedicels 7–10 mm, densely pubescent; bracts linear, 1.5–3 mm, pubescent. Flowers 4–6 mm in diam. Hypanthium campanulate, densely pubescent abaxially. Sepals triangular, 1–1.5 × 1–1.5 mm, mostly erect in fruit, apex acute. Petals white, broadly obovate, 3–3.5 × 3.5–4.5 mm, glabrous, base shortly clawed, apex emarginate. Stamens 18–20, shorter than or nearly equaling petals. Disk conspicuous, 10-lobed. Styles shorter than stamens. Follicles spreading, pubescent; styles terminal, slightly divergent, ca. 1 mm. Fl. Jun–Jul, fr. Sep–Oct.

• Slopes, open rocky places; 2500–2800 m. NW Yunnan.

35. *Spiraea pubescens* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 5: 190. 1832.

土庄绣线菊 *tu zhuang xiu xian ju*

Shrubs 1–2 m tall. Branchlets spreading, slightly bent, yellow-brown to black-brown, pubescent when young, later glabrous; buds ovoid or subglobose, with several scales, pubescent, apex acute or obtuse. Petiole 2–4 mm, pubescent; leaf blade rhombic-ovate to elliptic, 2–4.5 × 1.3–2.5 cm, abaxially gray-pubescent, adaxially pilose, base broadly cuneate, margin deeply incised serrate, sometimes 3-lobed above middle, apex acute. Umbels pedunculate, 2–4.5 × 2–3.5 cm, 15–20-flowered; pedicels 7–12 mm, glabrous; bracts linear, 2–3 mm, pubescent. Flowers 5–7 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals ovate-triangular or triangular, 1.5–2 mm, erect

in fruit, apex acute. Petals white, ovate, broadly obovate, or suborbicular, 2–3.5 × 2–3 mm, apex obtuse or emarginate. Stamens 25–30, nearly equaling petals. Disk annular, 10-lobed; lobes slightly emarginate at apex. Carpels glabrous, or pubescent near base and on adaxial suture; styles shorter than stamens. Follicles spreading, puberulous on adaxial suture or wholly pubescent; styles terminal, slightly divergent or suberect. Fl. May–Jun, fr. Jul–Aug.

Mixed forests, open forests, shady slopes, open or semishaded places, dry rocky slopes; 200–2500 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan [Korea, Mongolia, Russia].

- 1a. Follicles puberulous only on adaxial suture 35a. var. *pubescens*
1b. Follicles wholly pubescent 35b. var. *lasiocarpa*

35a. *Spiraea pubescens* var. *pubescens*

土庄绣线菊(原变种) *tu zhuang xiu xian ju* (*yuan bian zhong*)

Spiraea laucheana Koehne; *S. ouensanensis* H. Léveillé.

Follicles puberulous only on adaxial suture.

Mixed forests, open or semishaded places, dry rocky slopes; 200–2500 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan [Korea, Mongolia, Russia].

35b. *Spiraea pubescens* var. *lasiocarpa* Nakai, Bot. Mag. (Tokyo) 42: 465. 1928.

毛果土庄绣线菊 *mao guo tu zhuang xiu xian ju*

Follicles wholly pubescent.

• Open forests, shady slopes; 400–1600 m. Anhui, Gansu, Henan, Shaanxi, Sichuan.

36. *Spiraea cantoniensis* Loureiro, Fl. Cochinch. 1: 322. 1790.

麻叶绣球 *ma ye xiu qiu*

Shrubs to 1.5 m tall. Branchlets arching, dark red-brown, turning gray-brown when old, slender, terete, glabrous or pubescent; buds ovoid, small, with several scales, glabrous or puberulous apically or on scale margins. Petiole 4–7 mm, glabrous; leaf blade gray-blue abaxially, dark green adaxially, rhombic-lanceolate to rhombic-oblong, 2–8 × 0.7–2 cm, glabrous or abaxially pubescent, pinnately veined, base cuneate, margin incised serrate above middle, apex acute. Umbels pedunculate, 3–4 × 2–3.5 cm, many flowered; rachis and pedicels glabrous or pubescent; pedicels 8–14 mm; bracts linear to lanceolate, 2–3 mm, glabrous or pubescent. Flowers 5–7 mm in diam. Hypanthium campanulate, glabrous or abaxially pubescent. Sepals triangular or ovate-triangular, 1–1.5 × 1.5–2 mm, erect in fruit, apex acute or shortly acuminate. Petals white, suborbicular or obovate, 2.5–4 × 3–4.5 mm, apex emarginate or obtuse. Stamens 20–28, slightly shorter than to nearly equaling petals. Disk annular, lobed; lobes unequal, suborbicular, apex emarginate. Styles shorter than stamens. Follicles straightly spreading, glabrous; styles terminal, usually divergent. Fl. Apr–May, fr. Jul–Sep.

Slopes; 200–300 m. Native at least in N Jiangxi; widely cultivated elsewhere in China [Japan].

- 1a. Branchlets pubescent; leaf blades
2–8 × 0.7–1.5 cm, abaxially
pubescent 36c. var. *jiangxiensis*
- 1b. Branchlets glabrous; leaf blades
3–5 × 1.5–2 cm, glabrous.
- 2a. Inflorescences and hypanthium
glabrous 36a. var. *cantoniensis*
- 2b. Inflorescences and hypanthium
abaxially pubescent 36b. var. *pilosa*

36a. *Spiraea cantoniensis* var. *cantoniensis*

麻叶绣球(原变种) ma ye xiu qiu (yuan bian zhong)

Spiraea reevesiana Lindley.

Branchlets glabrous. Leaf blades 3–5 × 1.5–2 cm, glabrous. Inflorescences and hypanthium glabrous.

Widely cultivated in China [Japan].

36b. *Spiraea cantoniensis* var. *pilosa* T. T. Yu, Acta Phytotax. Sin. 8: 216. 1963.

毛萼麻叶绣球 mao e ma ye xiu qiu

Branchlets glabrous. Leaf blades 3–5 × 1.5–2 cm, glabrous. Inflorescences and hypanthium abaxially pubescent.

• Mostly cultivated. Guangdong, Hunan.

36c. *Spiraea cantoniensis* var. *jiangxiensis* (Z. X. Yu) L. T. Lu, Acta Phytotax. Sin. 38: 276. 2000.

江西绣线菊 jiang xi xiu xian ju

Spiraea jiangxiensis Z. X. Yu, Bull. Bot. Res., Harbin 3(1): 151. 1983.

Branchlets pubescent. Leaf blades 2–8 × 0.7–1.5 cm, abaxially pubescent.

• Slopes; 200–300 m. N Jiangxi (Jing'an Xian).

37. *Spiraea × vanhouttei* (Briot) Carrière, Rev. Hort. 48: 260. 1876.

菱叶绣线菊 ling ye xiu xian ju

Spiraea aquilegifolia Pallas var. *vanhouttei* Briot, Rev. Hort. 37: 269. 1866.

Shrubs to 2 m tall. Branchlets arching, red-brown, turning gray-brown to black-brown when old, glabrous; buds ovoid, small, with several scales, glabrous, apex obtuse. Petiole 3–5 mm, glabrous; leaf blade bluish gray abaxially, dark green adaxially, rhombic-ovate, 1.5–3.5 × 0.9–1.8 cm, glabrous on both surfaces, inconspicuously 3-veined or pinnately veined, base cuneate, margin usually 3–5-lobed, incised doubly serrate, apex acute. Umbels pedunculate, 2.5–4 cm, many flowered, leafy at base; pedicels 7–12 mm, glabrous; bracts linear, 2–5 mm, glabrous. Hypanthium campanulate, glabrous abaxially. Sepals triangular or ovate-triangular, erect in fruit. Petals white, suborbicular, 3–4 mm, base shortly clawed, apex obtuse. Stamens 20–22, much shorter than petals, some abortive. Disk annular, unevenly lobed. Carpels glabrous; styles shorter than stamens. Follicles slightly spreading; styles suberect. Fl. May–Jun, fr. Aug–Sep.

Cultivated. Guangdong, Guangxi, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan [of cultivated, hybrid origin].

This taxon is a hybrid between *S. cantoniensis* and *S. trilobata*.

38. *Spiraea trilobata* Linnaeus, Mant. Pl. 2: 244. 1771.

三裂绣线菊 san lie xiu xian ju

Shrubs 1–2 m tall. Branchlets spreading, tortuous, yellow-brown or purple-brown, turning dark gray-brown, slender, glabrous; buds broadly ovoid, small, with several scales, glabrous, apex obtuse. Petiole 3–5 mm, glabrous; leaf blade suborbicular, 1.7–3 × 1.5–3 cm, glabrous or abaxially sparsely pubescent, conspicuously 3–5-veined, base subcordate or rounded, rarely cuneate, margin slightly crenate above middle, usually 3-lobed, apex obtuse. Umbels pedunculate, 2–4(–5) cm, 15–30-flowered; pedicels 8–13 mm, glabrous or sparsely pubescent; bracts oblanceolate or linear, 4–7 mm, deeply divided into slender lobes. Flowers 6–8 mm in diam. Hypanthium campanulate, glabrous or sparsely pubescent abaxially. Sepals triangular, 1.5–2 mm, erect in fruit, apex acute. Petals white, broadly obovate, 2.5–4 mm in diam., apex emarginate. Stamens 18–20, shorter than petals. Disk annular, 10-lobed; lobes unequal, apex emarginate. Carpels pubescent; styles shorter than stamens. Follicles spreading, glabrous or puberulous only on adaxial suture; styles slightly divergent. Fl. May–Jun, fr. Jul–Aug.

Thickets, open rocky slopes, montane regions; 400–2400 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Jiangsu, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xinjiang [Korea, Russia].

- 1a. Leaf blades, pedicels, and hypanthium
glabrous 38a. var. *trilobata*
- 1b. Leaf blades abaxially, pedicels, and
hypanthium abaxially sparsely
pubescent 38b. var. *pubescens*

38a. *Spiraea trilobata* var. *trilobata*

三裂绣线菊(原变种) san lie xiu xian ju (yuan bian zhong)

Leaf blades, pedicels, and hypanthium glabrous.

Thickets, open rocky slopes; 400–2400 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Jiangsu, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xinjiang [Korea, Russia].

38b. *Spiraea trilobata* var. *pubescens* T. T. Yu, Acta Phytotax. Sin. 8: 216. 1963.

毛叶三裂绣线菊 mao ye san lie xiu xian ju

Leaf blades abaxially, pedicels, and hypanthium abaxially sparsely pubescent.

• Montane regions, lower elevations. Nei Mongol, Shanxi.

39. *Spiraea blumei* G. Don, Gen. Hist. 2: 518. 1832.

绣球绣线菊 xiu qiu xiu xian ju

Shrubs 1–2 m tall. Branchlets spreading, dark red-brown or dark gray-brown, slender, glabrous; buds ovoid, small, with several scales, glabrous, apex acute or obtuse. Petiole 2–4 mm, glabrous; leaf blade bluish green abaxially, rhombic-ovate to obovate or broadly ovate, (0.6–0.9 or)2–3.5 × 1–1.8 cm, gla-

brous on both surfaces, inconspicuously 3-veined or pinnately veined, base cuneate, margin remotely obtusely incised crenate or 3–5-lobed above middle, apex obtuse or mucronate. Umbels pedunculate, 10–25-flowered; rachis glabrous; pedicels 6–10 mm, glabrous to puberulous; bracts lanceolate, 1–3 mm, glabrous. Flowers 5–8 mm in diam. Hypanthium shallowly campanulate, glabrous to puberulous abaxially. Sepals triangular or ovate-triangular, 1.5–2.5 mm, erect in fruit, apex acute or shortly acuminate. Petals white, broadly obovate, 2–5 mm, about as broad as long, apex emarginate. Stamens 18–20, shorter than petals. Disk annular, 10-lobed; lobes thin, apex emarginate. Carpels glabrous, puberulous only on adaxial suture, or pubescent; styles shorter than stamens. Follicles erect, glabrous or pubescent; styles abaxial, divergent. Fl. Apr–Jun, fr. Aug–Oct.

Mixed forests, slopes, limestone mountain valleys, stream sides, roadsides; 500–2000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang [Japan, Korea].

- 1a. Carpels and follicles wholly pubescent 39d. var. *pubicarpa*
- 1b. Carpels and follicles glabrous.
 - 2a. Leaf blades broadly ovate, 0.6–0.9 cm 39c. var. *microphylla*
 - 2b. Leaf blades rhombic-ovate to obovate, 2–3.5 cm.
 - 3a. Pedicels and hypanthium abaxially glabrous; petals 2–3.5 mm 39a. var. *blumei*
 - 3b. Pedicels and hypanthium abaxially puberulous; petals 4–5 mm 39b. var. *latipetala*

39a. *Spiraea blumei* var. *blumei*

绣球绣线菊(原变种) xiu qiu xiu xian ju (yuan bian zhong)

Spiraea obtusa Nakai.

Leaf blades rhombic-ovate to obovate, 2–3.5 cm. Pedicels and hypanthium abaxially glabrous. Petals 2–3.5 mm. Carpels and follicles glabrous.

Mixed forests, sunny slopes, roadsides; 500–2000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang [Japan, Korea].

39b. *Spiraea blumei* var. *latipetala* Hemsley, J. Linn. Soc., Bot. 23: 224. 1887.

宽瓣绣球绣线菊 kuan ban xiu qiu xiu xian ju

Leaf blades rhombic-ovate, to 3.5 mm. Pedicels and hypanthium abaxially puberulous. Petals 4–5 mm. Carpels and follicles glabrous.

• Stream sides, roadsides; low elevations. Anhui, Guangdong, Zhejiang.

39c. *Spiraea blumei* var. *microphylla* Rehder, J. Arnold Arbor. 9: 55. 1928.

小叶绣球绣线菊 xiao ye xiu qiu xiu xian ju

Leaf blades broadly ovate, 0.6–0.9 cm. Pedicels and hypanthium abaxially glabrous. Carpels and follicles glabrous.

• Dry sunny slopes, limestone mountain valleys; low to medium elevations. Gansu, Henan, Shaanxi.

39d. *Spiraea blumei* var. *pubicarpa* Cheng, Contr. Biol. Lab. Chin. Assoc. Advancem. Sci., Sect. Bot. 10: 130. 1936.

毛果绣球绣线菊 mao guo xiu qiu xiu xian ju

Carpels and follicles wholly pubescent.

• Slopes. Henan, Shaanxi, Zhejiang.

Spiraea alaschanica Y. Z. Zhao & T. J. Wang (Bull. Bot. Res., Harbin 20: 362. 2000), described from Ningxia, is related to *S. blumei*. Further study is necessary to determine its identity.

40. *Spiraea sublobata* Handel-Mazzetti, Symb. Sin. 7: 451. 1933.

浅裂绣线菊 qian lie xiu xian ju

Shrubs low, 1–1.5 m tall. Branchlets brownish to red-brown, tortuous, slender, pubescent when young, finally glabrous; buds ovoid, small, with several scales, pubescent, apex acute to acuminate. Petiole 1–3 mm, pubescent; leaf blade abaxially gray-green, adaxially dark green, ovate to ovate-lanceolate, 2–5 × 1.2–2.5 cm, abaxially pubescent, papillose, adaxially glabrous, base broadly cuneate to subrounded, margin deeply incised serrate or lobed above middle, apex acute. Racemes umbellate, 2–3.5 × 2–2.5 cm, 10–30- or more flowered; pedicels 5–10 mm, pubescent; bracts linear-lanceolate, 2–4 mm, pubescent. Flowers 7–9 mm in diam. Hypanthium campanulate, pubescent abaxially. Sepals ovate-triangular, 1.5–2.5 mm, erect in fruit, apex acute. Petals white, suborbicular or obovate, 2.5–4 × 2.5–3.5 mm, apex obtuse. Stamens 45–60, longer than petals. Disk annular, ca. 20-lobed; lobes obtuse at apex. Styles shorter than stamens. Follicles spreading, pubescent; styles terminal on abaxial side, somewhat divergent or suberect. Fl. May–Jun, fr. Aug–Sep.

• Broad-leaved forests, thickets, dry slopes; 1500–2800 m. W Sichuan, NE Yunnan.

41. *Spiraea elegans* Pojarkova in Komarov, Fl. URSS 9: 490. 1939.

美丽绣线菊 mei li xiu xian ju

Shrubs 1–1.5 m tall. Branchlets spreading, red-brown, turning gray-brown or dark brown when old, slightly angled, glabrous; buds ovoid, with several scales, apex acute. Petiole 4–6 mm, glabrous; leaf blade oblong-elliptic, oblong-ovate, or lanceolate-elliptic, 1.5–3.5 × 1–1.8 cm (those on sterile branchlets to 5.5 × 2.6 cm), abaxially pubescent only in vein axils, adaxially glabrous, base cuneate, margin irregularly incised serrate, sometimes doubly serrate above middle, apex subobtusely or acute. Racemes umbellate, 2–3.5 cm in diam., 6–16-flowered; pedicels 7–12 mm, to 16 mm in fruit, glabrous. Flowers 10–15 mm in diam. Hypanthium shallowly campanulate. Sepals triangular, erect in fruit, apex acute or shortly acuminate. Petals obovate or suborbicular, longer than sepals, apex obtuse. Stamens much longer than petals. Carpels pubescent; styles shorter

than stamens. Follicles erect, yellowish pubescent throughout or only at apex; styles terminal, mostly erect. Fl. May–Jun, fr. Aug–Sep.

Mixed forests, open slopes, rocks; 100–2000 m. Hebei, Heilongjiang, Jilin, Nei Mongol [Mongolia, Russia].

42. *Spiraea anomala* Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 92. 1893.

异常绣线菊 *yi chang xiu xian ju*

Shrubs small. Branchlets slightly angled, glabrous; buds ovoid, glabrous, with several scales, apex subobtuse or acute. Petiole 4–6 mm, glabrous or pilose; leaf blades triangular-ovate or lanceolate-ovate, 3–4 × 1.5–2 cm, abaxially pubescent on veins, adaxially glabrous, midvein prominent on both surfaces, lateral veins 3 or 4 on each side of midvein, base usually truncate or subrounded, margin densely doubly serrate above base, apex acuminate. Racemes borne on new, leafy shoots, umbellate, 3–5 × 2–3 cm, 3–6-flowered; pedicels 10–17 mm, pilose basally; bracts linear, 3–4 mm, glabrous, caducous. Flowers 6–9 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals broadly triangular, 2–2.5 × 2.5–3 mm, margin ciliate, apex acute to shortly acuminate. Petals white, ovate or suborbicular, 5–6 × 4–5 mm, glabrous, base shortly clawed, apex subrounded or obtuse. Stamens ca. 30, longer than petals. Disk annular. Styles shorter than stamens; stigma discoid. Follicles slightly spreading, hirsute; styles terminal. Fl. May–Jun.

- Open places, roadsides. Hubei.

43. *Spiraea laeta* Rehder in Sargent, Pl. Wilson. 1: 442. 1913.

华西绣线菊 *hua xi xiu xian ju*

Shrubs to 1.5 m tall. Branchlets often erect, sometimes tortuous, brownish to red-brown, slightly angled when young, mostly glabrous; buds oblong, 2–4 mm, with several scales, glabrous, apex acute or shortly acuminate. Petiole 4–6 mm, glabrous or pilose; leaf blade ovate, broadly so, or elliptic-ovate, 1–5.5 × 0.7–3.5 cm, glabrous on both surfaces, sometimes with tufted hairs in vein axils abaxially, or sparsely sericeous-pubescent abaxially, base cuneate to subrounded, margin irregularly serrate from base or above middle (on sterile branchlets incised doubly serrate), or sparsely shallowly incised crenate, apex acute. Racemes umbellate, 3–4 × 2–3 cm, 5–15-flowered; pedicels 8–17 mm, glabrous; bracts linear, 1.5–3 mm, glabrous. Flowers 8–12 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals broadly triangular, 2–3 × 1.5–2.5 mm, usually reflexed in fruit, apex acute. Petals white, broadly ovate or suborbicular, 2.5–5 × 2–4.5 mm, glabrous, base shortly clawed, apex obtuse. Stamens 30–40, slightly longer than petals. Disk annular, shallowly crenate. Styles shorter than stamens. Follicles slightly spreading, glabrous or slightly pubescent adaxially; styles terminal, divergent or suberect. Fl. Apr–Jun, fr. Jul–Oct.

- Mixed forests on slopes, thickets, stream sides, open places, roadsides; below 3200 m. Gansu, Guizhou, Henan, Hubei, Sichuan, Yunnan.

1a. Leaf blades sparsely sericeous-pubescent abaxially 43c. var. *subpubescens*

- 1b. Leaf blades glabrous on both surfaces or with tufted hairs in vein axils abaxially.
- 2a. Leaf blades ovate or elliptic-ovate, 1.5–5.5 × 1.4–3.5 cm, margin irregularly serrate or incised doubly serrate; inflorescences 6–15-flowered 43a. var. *laeta*
- 2b. Leaf blades ovate to broadly so, 1–2 × 0.7–1.5 cm, margin sparsely shallowly incised crenate; inflorescences 5–10-flowered 43b. var. *tenuis*

43a. *Spiraea laeta* var. *laeta*

华西绣线菊(原变种) *hua xi xiu xian ju* (*yuan bian zhong*)

Leaf blades ovate or elliptic-ovate, 1.5–5.5 × 1.4–3.5 cm, glabrous on both surfaces or with tufted hairs in vein axils abaxially, margin irregularly serrate or incised doubly serrate. Inflorescences 6–15-flowered.

- Mixed forests on slopes, thickets; 1200–2500 m. Gansu, Guizhou, Henan, Hubei, Sichuan, Yunnan.

43b. *Spiraea laeta* var. *tenuis* Rehder in Sargent, Pl. Wilson. 1: 443. 1913.

细叶华西绣线菊 *xi ye hua xi xiu xian ju*

Leaf blades ovate to broadly so, 1–2 × 0.7–1.5 cm, glabrous on both surfaces or with tufted hairs in vein axils abaxially, margin sparsely shallowly incised crenate. Inflorescences 5–10-flowered.

- Montane stream sides; 2700–3200 m. W Sichuan.

43c. *Spiraea laeta* var. *subpubescens* Rehder in Sargent, Pl. Wilson. 1: 444. 1913.

毛叶华西绣线菊 *mao ye hua xi xiu xian ju*

Leaf blades ovate, sparsely sericeous-pubescent abaxially, margin sharply incised doubly serrate. Inflorescences 5–9-flowered.

- Stream banks, open places, roadsides; low to medium elevations. Gansu, Hubei.

44. *Spiraea papillosa* Rehder in Sargent, Pl. Wilson. 1: 443. 1913.

乳突绣线菊 *ru tu xiu xian ju*

Shrubs 2–3 m tall. Branchlets brownish to purple-brown, slender, slightly angled, glabrous, puberulous, or pubescent; buds brownish, ovoid, small, with several scales, pubescent, apex obtuse or acute. Petiole 2–3 mm, sericeous-villous; leaf blade gray-green abaxially, dark green adaxially, oblong or ovate, 2–4 × 0.8–1.5 cm, appressed sericeous-villous on both surfaces, papillose abaxially, base cuneate, margin with 3–7 large, sharp teeth on each side above middle, apex acute or shortly acuminate. Racemes umbellate, 3–5 × 2–3.5 cm, 12–20-flowered; pedicels slender, 6–12 mm, glabrous or pubescent; bracts linear or lanceolate, 3–5 mm, slightly villous. Flowers 8–10 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1.5–2 × 2–3 mm, reflexed in fruit, apex acute or shortly acuminate. Petals white, suborbicular, 3.5–4.5 mm in

diam., glabrous, base shortly clawed, apex obtuse. Stamens 40–50, longer than petals. Disk annular, crenulate. Styles ca. 4 mm, shorter than stamens. Follicles suberect, glabrous or puberulous along adaxial suture; styles terminal. Fl. May–Jun, fr. Jul–Aug.

• Coniferous and broad-leaved mixed forests, thickets on slopes; 1300–3500 m. W Sichuan, NW Yunnan.

- 1a. Branchlets, pedicels, and follicles usually glabrous 44a. var. *papillosa*
 1b. Branchlets and pedicels pubescent; follicles puberulous on adaxial suture 44b. var. *yunnanensis*

44a. *Spiraea papillosa* var. *papillosa*

乳突绣线菊(原变种) ru tu xiu xian ju (yuan bian zhong)

Branchlets, pedicels, and follicles usually glabrous.

• Thickets on slopes; 1300–2000 m. W Sichuan.

44b. *Spiraea papillosa* var. *yunnanensis* T. T. Yu, Acta Phytotax. Sin. 8: 216. 1963.

云南乳突绣线菊 yun nan ru tu xiu xian ju

Branchlets and pedicels pubescent. Follicles puberulous on adaxial suture.

• Coniferous and broad-leaved mixed forests; 3300–3500 m. SW Sichuan, NW Yunnan.

45. *Spiraea lichiangensis* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 66. 1915.

丽江绣线菊 li jiang xiu xian ju

Shrubs 1.2–1.8 m tall. Branchlets brown to purple, shining, slender, glabrous; buds small, with several scales, whitish villous, apex acute. Petiole slender, 3–5 mm, glabrous; leaf blade abaxially greenish, adaxially green, broadly ovate, 2.5–3.5 × 2–2.5 cm, glabrous on both surfaces, abaxially densely minutely papillose, veins prominent, base rounded, margin with 3–5 indistinct, obtusely triangular teeth on each side above middle. Racemes pedunculate, umbellate, 2–4 × 1.5–2(–3) cm, 5–10-flowered; pedicels 1–1.5 cm, glabrous; bracts linear or lanceolate, 1.5–3 mm, glabrous. Flowers 10–12 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1–1.5 × 1.5–2 mm, apex acute. Petals white, orbicular, 4–5 mm in diam., glabrous, base shortly clawed, apex obtuse, rarely emarginate. Stamens 40–50, longer than petals. Disk annular, lobed. Carpels glabrous; styles terminal, 3–4 mm; stigma capitate. Follicles unknown. Fl. Jun–Jul.

• Open *Pinus* forests, thickets; 3500–4000 m. NW Yunnan (Lijiang Xian).

46. *Spiraea sericea* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 16: 591. 1843.

绢毛绣线菊 juan mao xiu xian ju

Spiraea confusa Regel & Körnicke var. *sericea* (Turczaninow) Regel; *S. media* Schmidt var. *sericea* (Turczaninow) Maximowicz.

Shrubs erect, to 2 m tall. Branchlets brown turning gray-brown or gray-red when old, subterete, sericeous-villous initially, later glabrescent; buds long ovoid, 3–5 × 1.5–3 mm, with

several brown scales, pubescent, apex acuminate. Petiole 1–2 mm, densely sericeous; leaf blade abaxially grayish green, adaxially dark green, ovate-elliptic or elliptic, 1.5–4.5 × 0.7–1.5 cm, abaxially densely accumbent sericeous, adaxially pilose, distinctly pinnately veined, base cuneate, margin entire (or on sterile branchlets 2–5-serrate on each side), apex acute. Racemes pedunculate, umbellate, 3–6 × 2–3(–4) cm, 15–30-flowered; pedicels 6–10 mm, glabrous or pilose; bracts linear, minute, glabrous. Flowers 4–5 mm in diam. Hypanthium subcampanulate, glabrous abaxially. Sepals ovate, 1–2 mm, reflexed in fruit, apex obtuse. Petals white, suborbicular, 2–3 mm, nearly as broad as long, base shortly clawed. Stamens 15–20, unequal, longer ones ca. 2 × as long as petals, shorter ones nearly equaling petals. Disk annular, distinctly 10-lobed. Styles shorter than stamens. Follicles divergent, pubescent; styles terminal. Fl. May–Jun, fr. Jul–Aug.

Mixed forests, grasslands, dry slopes; 500–1100 m. Gansu, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Sichuan, Yunnan [Japan, Mongolia, Russia].

47. *Spiraea prostrata* Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 184. 1879.

平卧绣线菊 ping wo xiu xian ju

Shrubs low, prostrate. Branchlets dark red-brown when old, slender, terete, densely yellow-gray villous initially, later glabrescent; buds ovoid, short, with several scales, villous, apex acute. Petiole almost absent; leaf blade broadly ovate, 0.8–1.5 × 0.5–1 cm, densely sericeous on both surfaces, with 2 pairs of prominent lateral veins basally, base rounded or broadly cuneate, margin with 3–7 teeth near apex, apex acute. Racemes shortly pedunculate, umbellate, 7–15-flowered; pedicels 7–8 mm, sparsely villous; bracts lanceolate, 2–4 mm, sparsely villous, later glabrescent. Flowers 5–6 mm in diam. Hypanthium cupular, 1–1.5 mm, sparsely villous abaxially. Sepals ovate-triangular, nearly equaling tube, reflexed in fruit, apex acute. Petals white, orbicular, base shortly clawed. Stamens somewhat shorter than petals. Disk annular, 10-lobed; lobes triangular-ovate. Styles shorter than stamens. Follicles spreading, pubescent on adaxial suture; styles terminal on abaxial side, erect or somewhat divergent. Fr. Jun–Jul.

• Thickets, mountain regions, river banks. Gansu, Hubei, Shaanxi.

48. *Spiraea media* Schmidt, Österr. Allg. Baumz. 1: 53. 1792.

欧亚绣线菊 ou ya xiu xian ju

Shrubs erect, to 2 m tall. Branchlets red-brown turning gray-brown to black-brown when old, slender, subterete, glabrous or subglabrous; buds brownish, ovoid, 1–3 mm, with several scales, glabrous, apex acute. Petiole 1–2 mm, glabrous; leaf blade elliptic to lanceolate, 1–2.5 × 0.5–1.5 cm, glabrous on both surfaces or puberulous in vein axils abaxially, pinnately veined, base cuneate, margin entire or 2–5-serrate, apex acute, rarely obtuse. Racemes pedunculate, umbellate, 2–4 × 2–3 cm, 9–15-flowered; pedicels 1–1.5 cm, glabrous; bracts lanceolate, glabrous, caducous. Flowers 0.7–1 cm in diam. Hypanthium broadly campanulate, glabrous abaxially. Sepals ovate-triangular, 1.5–2.5 mm, glabrous or puberulous, reflexed in fruit, apex

obtuse or acute. Petals white, suborbicular, 3–4.5 mm, about as broad as long, glabrous, base shortly clawed, apex obtuse or emarginate. Stamens ca. 45, longer than petals. Disk undulate annular or irregularly lobed. Styles shorter than stamens. FollICLES straightly spreading, pubescent; styles terminal, divergent. Fl. May–Jun, fr. Jun–Aug.

Mixed forests, grassy slopes, rocky montane regions; 700–1600 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Xinjiang [Japan, Korea, Mongolia, Russia; C Asia, Europe].

49. *Spiraea tarokoensis* Hayata, Icon. Pl. Formos. 9: 38. 1920.

太鲁阁绣线菊 tai lu ge xiu xian ju

Shrubs low. Branchlets brownish purple, slender, slightly angled, pubescent when young, later glabrescent; buds ovoid, small, with several scales, apex obtuse or subacute. Petiole 3–4 mm, villous; leaf blade rhombic-obovate, 12–20 × 8–14 mm, abaxially sparsely villous on veins, adaxially glabrous, veins raised abaxially, impressed adaxially, base cuneate, margin sparsely crenate-serrate above middle, apex subobtuse. Racemes terminal, pedunculate, umbellate, 15–20-flowered; peduncle villous; pedicels 7–10 mm, glabrous; bracts linear. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1–1.5 mm, about as broad as long, recurved in fruit, apex acute. Petals white, subovate or orbicular, ca. 2 × 3 mm, glabrous, base shortly clawed, apex emarginate. Stamens ca. 20, unequal; filaments ca. 2 mm; anthers reniform. Disk annular, 10-lobed; lobes emarginate at apex. Carpels villous; styles shorter than stamens. FollICLES spreading; styles abaxial. Fl. Mar–May, fr. Jun–Aug.

- Coastal limestone areas. E Taiwan.

50. *Spiraea alpina* Pallas, Fl. Ross. 1: 35. 1784.

高山绣线菊 gao shan xiu xian ju

Shrubs to 1.2 m tall, much branched. Branches erect or spreading; branchlets red-brown, turning gray-brown when old, conspicuously angled, pubescent when young, finally glabrous; buds ovoid, small, with several scales, glabrous. Leaves mostly tufted; petiole very short or nearly absent; leaf blade gray-green and glaucous bloomed abaxially, linear-lanceolate to oblong-obovate, 7–16 × 2–5 mm, glabrous on both surfaces, veins inconspicuous, base cuneate, margin entire, apex obtuse or acute. Racemes pedunculate, umbellate, 1.5–2(–3) × 1.5–2 cm, up to 20-flowered; pedicels 5–8 mm, glabrous; bracts linear, small, caducous. Flowers 5–7 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1–2 × 1.5–2 mm, erect or semispreading in fruit, apex acute. Petals white, obovate or suborbicular, 2–3 mm, about as broad as long, base shortly clawed, apex obtuse or emarginate. Stamens ca. 20, slightly shorter than to subequaling petals. Disk distinct, annular, 10-lobed. Carpels pubescent; styles shorter than stamens. FollICLES spreading, glabrous or pilose on adaxial suture; styles subterminal, divergent. Fl. Jun–Jul, fr. Aug–Sep.

Thickets, valleys, open slopes, roadsides; 2000–4000 m. Gansu, Henan, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [Mongolia, Russia, Sikkim].

51. *Spiraea xizangensis* L. T. Lu, Acta Phytotax. Sin. 38: 276. 2000.

西藏绣线菊 xi zang xiu xian ju

Spiraea tibetica T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 491. 1980, not *S. tibetica* Bureau & Franchet (1891).

Shrubs to 1.5 m tall. Branchlets red-brown or gray-brown, terete or sparsely angled, pubescent, glabrous when old; buds ovoid, small, with several scales, pubescent. Leaves fascicled; petiole almost absent; leaf blade glaucous bloomed abaxially, oblong-obovate or narrowly elliptic-lanceolate, 7–15 × 2–5 mm, pubescent on both surfaces, base cuneate, margin entire, apex subobtuse or acute. Racemes pedunculate, umbellate, 15–30-flowered; pedicels 3–6 mm, glabrous; bracts linear, glabrous. Flowers 5–7 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular or triangular-ovate, erect in fruit, apex obtuse or acute. Petals pinkish to purple-red, suborbicular or obovate, base shortly clawed, apex obtuse. Stamens 15–20, nearly equaling petals; anthers yellowish. Disk 10-lobed. Carpels glabrous or puberulous. FollICLES spreading, glabrous or pilose on adaxial suture; styles on abaxial side, suberect. Fl. May–Jun, fr. Aug–Sep.

- Thickets on slopes, river banks; 4200–4300 m. Xizang.

52. *Spiraea myrtilloides* Rehder in Sargent, Pl. Wilson. 1: 140. 1913.

细枝绣线菊 xi zhi xiu xian ju

Shrubs 2–3 m tall, much branched. Branchlets red-brown to dark brown, angled, sparsely villous or subglabrous; buds ovoid, 3–4 mm, with several brown scales, glabrous or subglabrous, apex acute. Petiole 1–2 mm, glabrous or subglabrous; leaf blade abaxially greenish, ovate to ovate-oblong or obovate-oblong, 6–15 × 4–7 mm, abaxially sparsely pubescent or glabrous, adaxially glabrous, inconspicuously pinnately veined, prominently 3-veined basally, base cuneate, margin entire or with ca. 3 obtuse teeth near apex, apex obtuse, rarely acute. Racemes umbellate, 2–4 × 2–3.5 cm, 7–20- or more flowered; rachis and pedicels glabrous or sparsely pubescent; pedicels 3–8 mm; bracts linear or lanceolate, 2–3 mm, glabrous. Flowers 5–6 mm in diam. Hypanthium campanulate, glabrous or subglabrous abaxially. Sepals triangular, 1–1.5 mm, erect or spreading in fruit, apex acute. Petals white, suborbicular, 2–3 mm, about as broad as long, glabrous, base shortly clawed, apex obtuse. Stamens ca. 20, equaling petals. Disk annular, 10-lobed. Carpels puberulous; styles shorter than stamens. FollICLES straightly spreading, glabrous, puberulous only on adaxial suture, or densely pubescent throughout; styles terminal, divergent. Fl. Jun–Jul, fr. Aug–Sep.

• Mixed forests, open forests, valleys, slopes, shady places; 1500–3100 m. Gansu, Henan, Hubei, Jiangxi, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

- 1a. FollICLES glabrous or puberulous only
on adaxial suture 52a. var. *myrtilloides*
- 1b. FollICLES densely pubescent throughout
..... 52b. var. *pubicarpa*

52a. *Spiraea myrtilloides* var. *myrtilloides*

细枝绣线菊(原变种) xi zhi xiu xian ju (yuan bian zhong)

Spiraea microphylla H. Lévillé; *S. virgata* Franchet.

Follicles glabrous or puberulous only on adaxial suture.

• Mixed forests, valleys, slopes; 1500–3100 m. Gansu, Henan, Hubei, Jiangxi, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

52b. *Spiraea myrtilloides* var. *pubicarpa* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 13(1): 101. 1975.

毛果细枝绣线菊 *mao guo xi zhi xiu xian ju*

Follicles densely pubescent throughout.

• Open forests, slopes, shady places; 2800–3000 m. Gansu.

53. *Spiraea ningshiaensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 13(1): 100. 1975.

宁夏绣线菊 *ning xia xiu xian ju*

Shrubs small. Branchlets dark red-brown, flexuose, distinctly angled, densely pubescent initially, subglabrous when old; buds ovoid, nearly equaling petioles, with several dark brown scales, pubescent. Petiole 1–3 mm, pubescent when young; leaf blade broadly ovate, 7–14 × 5–9 mm, slightly pubescent on both surfaces when young, glabrous when old, 3-veined basally, base broadly cuneate to rounded, margin entire or sometimes 3-lobed apically, apex obtuse. Racemes pedunculate, umbellate, 1–1.5 cm; rachis and pedicels glabrous; pedicels 4–5 mm, to 8 mm in fruit; bracts lanceolate to elliptic, 2–4 mm, glabrous, apex acute to shortly acuminate. Hypanthium campanulate, glabrous abaxially. Sepals triangular or ovate-triangular, 1–1.5 mm, about as broad as long, erect in fruit, apex acute. Follicles erect-spreading, slightly pubescent on adaxial suture; styles on abaxial side, divergent. Fl. May–Jun, fr. Aug–Sep.

• Mountain valleys, river banks; 1700–2000 m. N Ningxia (Helan Shan).

54. *Spiraea dahurica* (Ruprecht) Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 190. 1879.

窄叶绣线菊 *zhai ye xiu xian ju*

Spiraea alpina Pallas var. *dahurica* Ruprecht, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 15: 362. 1857.

Shrubs 1–1.5 m tall. Branchlets arching, red-brown when young, dark gray-brown when old, shining, slender, terete, glabrous; buds brownish, ovoid, 1–3 mm, with several scales, glabrous, apex acute. Petiole 1–2(–4) mm, glabrous; leaf blade long elliptic to linear-lanceolate, 0.9–2.5 × 0.4–0.9 cm, glabrous on both surfaces, pinnately veined, base cuneate, margin entire or 2–5-serrate apically, apex acute. Racemes umbellate, 1.5–2 cm, usually 10–20-flowered; rachis and pedicels glabrous; pedicels 7–18 mm; bracts linear to lanceolate, 2–3 mm, glabrous, caducous. Flowers 6–7 mm in diam. Hypanthium broadly campanulate, glabrous abaxially. Sepals shortly triangular, 1–1.5 mm, glabrous, reflexed in fruit, apex subobtuse or acute. Petals white, suborbicular or broadly ovate, 1.5–2.5 mm, about as broad as long. Disk 10-lobed; lobes suborbicular. Carpels glabrous or puberulous; styles shorter than stamens. Follicles straightly divergent, glabrous or puberulous on adaxial suture; styles terminal.

Thickets, slopes, rocks; below 1000 m. Hebei, Heilongjiang, Liaoning, Nei Mongol [Mongolia, Russia].

55. *Spiraea flexuosa* Fischer ex Cambessèdes, Ann. Sci. Nat. (Paris) 1: 365. 1824.

曲萼绣线菊 *qu e xiu xian ju*

Shrubs to 1.5 m. Branchlets, brown-yellow to purple-brown, slender and slightly flexuose, angled when young, glabrous; buds long ovoid, 2–5 mm, with 2 scales, puberulous initially, finally glabrous, apex acuminate. Petiole 2–5 mm, glabrous or pilose; leaf blade abaxially glaucous, oblong-elliptic to oblong-ovate, 1–5 × 0.9–2.5 cm, abaxially subglabrous to pubescent (especially on veins) or pilose, adaxially glabrous or pubescent, base cuneate to rounded, margin sharply serrate above middle or near apex, rarely entire, apex acute or shortly acuminate. Racemes pedunculate, umbellate, 1.5–3 × 1.5–2.5 cm, 4–10-flowered; rachis and pedicels glabrous or pilose; pedicels 5–15(–20) mm; bracts elliptic-lanceolate to linear, 1.5–3 mm, glabrous, caducous. Flowers 5–8 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals ovate-triangular, 2–2.5 × 1.5–2 mm, reflexed in fruit, apex acute. Petals white, sometimes pinkish, ovate to oblong, 3–4 mm, nearly as broad as long, glabrous, base shortly clawed, apex obtuse. Stamens ca. 20, longer than petals. Disk annular, 10-lobed. Styles shorter than stamens. Follicles erect, pubescent; styles terminal, erect. Fl. May–Jun, fr. Aug–Sep.

Broad-leaved and mixed forests, forest margins, river banks, sandy hills, slopes; 600–2000 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Xinjiang [Korea, Mongolia, Russia].

- 1a. Leaf blades subglabrous or pilose abaxially, base cuneate, rarely subrounded; inflorescences glabrous 55a. var. *flexuosa*
 1b. Leaf blades pubescent, more densely so on veins abaxially, base rounded; inflorescences pilose 55b. var. *pubescens*

55a. *Spiraea flexuosa* var. *flexuosa*

曲萼绣线菊(原变种) *qu e xiu xian ju (yuan bian zhong)*

Spiraea chamaedryfolia Linnaeus var. *flexuosa* (Fischer ex Cambessèdes) Maximowicz.

Leaf blades subglabrous or pilose abaxially, base cuneate, rarely subrounded. Inflorescences glabrous.

Broad-leaved and mixed forests, forest margins, river banks, sandy hills, rocky slopes; 600–2000 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Xinjiang [Korea, Mongolia, Russia].

55b. *Spiraea flexuosa* var. *pubescens* Liou, Ill. Fl. Lign. Pl. N. E. China, 288, 563. 1955.

柔毛曲萼绣线菊 *rou mao qu e xiu xian ju*

Leaf blades pubescent, more densely so on veins abaxially, base rounded. Inflorescences pilose.

• Mixed forests, slopes; below 1000 m. Liaoning, Nei Mongol, Shanxi.

56. *Spiraea chamaedryfolia* Linnaeus, Sp. Pl. 1: 489. 1753.

石蚕叶绣线菊 *shi can ye xiu xian ju*

Spiraea ussuriensis Pojarkova.

Shrubs 1–1.5 m tall. Branchlets brownish or red-brown,

turning gray-brown when old, slender, sometimes flexuose, slightly angled, glabrous; buds long ovoid, with 2 scales, glabrous or sparsely puberulous on scale margins, apex acuminate. Petiole 4–7 mm, glabrous or sparsely pilose; leaf blade broadly ovate, 2–4.5 × 1–3 mm, tufted pubescent in vein axils abaxially, glabrous adaxially, base rounded or broadly cuneate, margin minutely sharply serrate and doubly serrate (or on sterile branchlets sometimes incised doubly serrate), apex acute. Racemes pedunculate, umbellate, 2–4 × 2–3 mm, 5–12-flowered; rachis and pedicels glabrous; pedicels 6–10 mm; bracts linear, 2–3 mm, glabrous, caducous. Flowers 6–9 mm in diam. Hypanthium broadly campanulate, glabrous abaxially. Sepals ovate-triangular, 1.5–2.5 × 1.5–2 mm, reflexed in fruit, apex acute. Petals white, broadly ovate or suborbicular, 2.5–3.5 × 2–3 mm, glabrous, base shortly clawed, apex obtuse or somewhat incised. Stamens 35–50, longer than petals. Disk undulate annular. Carpels puberulous on adaxial suture; styles shorter than stamens. Follicles erect, appressed pubescent; styles terminal on adaxial side, slightly spreading. Fl. May–Jun, fr. Jul–Sep.

Slopes in mixed forests, forest clearings; 600–1000 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Shanxi, Xinjiang [Japan, Korea, Mongolia, Russia; Europe].

57. *Spiraea mongolica* Maximowicz, Bull. Acad. Imp. Sci. St.-Petersbourg 27: 467. 1881.

蒙古绣线菊 *meng gu xiu xian ju*

Shrubs to 3 m tall. Branchlets red-brown to gray-brown, slender, angled, glabrous or densely shortly tomentose when young; buds long ovoid, longer than petioles, with 2 brownish scales, glabrous or densely shortly tomentose, apex long acuminate. Petiole 1–2 mm, glabrous or densely shortly tomentose; leaf blade abaxially paler, oblong or elliptic, 8–20 × 3.5–7 mm, glabrous on both surfaces, rarely puberulous abaxially, pinnately veined, base cuneate, margin entire, rarely with a few teeth near apex, apex obtuse, acute, or mucronate. Racemes pedunculate, umbellate, 2–5 × 1.5–3 cm, 8–15-flowered; rachis and pedicels glabrous; pedicels 5–10 mm; bracts linear, 1.5–3 mm, glabrous, caducous. Flowers 5–7 mm in diam. Hypanthium subcampanulate, glabrous abaxially. Sepals triangular, 1–2 × 1.5–2.5 mm, erect or slightly reflexed in fruit, apex acute. Petals white, suborbicular, 2–4 mm, about as broad as long, glabrous, base shortly clawed, apex obtuse, rarely emarginate. Stamens 18–25, nearly equaling petals. Disk annular, 10-lobed; lobes orbicular. Carpels pubescent; styles shorter than stamens. Follicles straightly spreading, glabrous, wholly pubescent, or puberulous only on adaxial suture; styles abaxial. Fl. May–Jul, fr. Jul–Sep.

• Forests, thickets, sunny rocky slopes, mountain summits, rocky valleys, stream sides; 1500–4700 m. Gansu, Hebei, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang.

- 1a. Branchlets, buds, and petioles glabrous; follicles glabrous or puberulous only on adaxial suture 57a. var. *mongolica*
- 1b. Branchlets, buds, and petioles densely shortly tomentose; follicles wholly pubescent 57b. var. *tomentulosa*

57a. *Spiraea mongolica* var. *mongolica*

蒙古绣线菊(原变种) *meng gu xiu xian ju (yuan bian zhong)*

Spiraea crenifolia C. A. Meyer var. *mongolica* Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 181. 1879; *S. gemmata* Zabel.

Branchlets, buds, and petioles glabrous. Follicles glabrous, or puberulous only on adaxial suture.

• Thickets on slopes, mountain summits, rocky valleys; 1600–3600 m. Gansu, Hebei, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang.

57b. *Spiraea mongolica* var. *tomentulosa* T. T. Yu, Acta Phytotax. Sin. 8: 216. 1963.

毛枝蒙古绣线菊 *mao zhi meng gu xiu xian ju*

Spiraea mongolica var. *pubescens* Y. Z. Zhao & T. J. Wang; *S. tomentulosa* (T. T. Yu) Y. Z. Zhao (1987), not Rydberg (1908).

Branchlets, buds, and petioles densely shortly tomentose. Follicles wholly pubescent.

• Forests, thickets, sunny rocky slopes, stream sides; 1500–4700 m. Gansu, Nei Mongol, Ningxia, Xinjiang, Xizang.

58. *Spiraea mollifolia* Rehder in Sargent, Pl. Wilson. 1: 441. 1913.

毛叶绣线菊 *mao ye xiu xian ju*

Shrubs to 2 m. Branchlets brown to red-brown, conspicuously angled, villous initially, later glabrescent; buds ovoid-lanceolate, 5–7 × 3–4 mm, with 2 red-brown scales, pubescent when young, apex long acuminate. Petiole 2–6 mm, pubescent; leaf blade oblong, elliptic, rarely obovate, 1–2 × 0.4–0.8 cm, sericeous-villous on both surfaces or subglabrous to glabrous abaxially, base cuneate, margin entire or with a few obtuse teeth apically, apex obtuse or acute. Racemes pedunculate, umbellate, 2–4 × 1.5–3 cm, 10–18-flowered; rachis and pedicels villous or pilose; pedicels 4–8 mm; bracts narrowly oblong or linear, 2–4 mm, villous on both surfaces, margin entire, apex shortly acuminate. Flowers 5–7 mm in diam. Hypanthium campanulate, glabrous to villous abaxially, sometimes pilose. Sepals triangular, 1.5–2.5 × 1.5–2 mm, erect in fruit, apex acute. Petals white, suborbicular, 2–3 mm, about as broad as long, apex obtuse. Stamens ca. 20, nearly equaling petals. Disk annular, 10-lobed; lobes broadly orbicular. Styles shorter than stamens. Follicles straightly spreading, pubescent; styles subterminal on abaxial side. Fl. Jun–Aug, fr. Jul–Oct.

• Forests, forest margins, thickets, mountain valleys, subalpine meadows, slopes, river banks; 2600–4400 m. Gansu, Guizhou, Shaanxi, Sichuan, Xizang, Yunnan.

- 1a. Leaf blades abaxially, inflorescences, and hypanthium abaxially villous 58a. var. *mollifolia*
- 1b. Leaf blades abaxially glabrous or subglabrous; inflorescences pilose; hypanthium abaxially glabrous, or pilose only on tube 58b. var. *glabrata*

58a. *Spiraea mollifolia* var. *mollifolia*

毛叶绣线菊(原变种) *mao ye xiu xian ju (yuan bian zhong)*

Leaf blades abaxially, inflorescences, and hypanthium abaxially villous.

• Forests, forest margins, thickets, mountain valleys, slopes; 2600–4200 m. Gansu, Guizhou, Shaanxi, Sichuan, Xizang, Yunnan.

58b. *Spiraea mollifolia* var. *glabrata* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 492. 1980.

光秃绣线菊 *guang tu xiu xian ju*

Leaf blades abaxially glabrous or subglabrous. Inflorescences pilose. Hypanthium abaxially glabrous, or pilose only on tube.

• Valley thickets, subalpine meadows, rocky slopes, river banks; 3200–4400 m. Xizang.

59. *Spiraea prunifolia* Siebold & Zuccarini, Fl. Jap. 1: 131. 1840.

笑靥花 *xiao yan hua*

Shrubs to 3 m. Branchlets red-brown, turning gray-brown to black-brown when old, slender, slightly angled, pubescent initially, later gradually glabrescent; buds ovoid, small, with several scales, glabrous, apex subobtusate or subacute. Petiole 2–4 mm, pubescent; leaf blade ovate to oblong-lanceolate, 1.5–3 × 0.7–1.4 cm, pubescent on both surfaces initially, later glabrescent adaxially or on both surfaces, or glabrous, pinnately veined, base cuneate, margin minutely sharply serrate from base or above middle to apex, or 1–4-serrate on each side near apex, apex acute. Umbels sessile, 2–3 × 1.5–3 cm, 3–6-flowered, with a few clustered leaves at base; pedicels 10–24 mm, pubescent; bracts leaflike, 4–7 × 3–5 mm, puberulous on both surfaces initially, finally glabrescent, apex indistinctly minutely serrate. Flowers single in wild plants, double in cultivated plants (var. *prunifolia*), to 1.2 cm in diam. Hypanthium campanulate, shorter than sepals, pubescent or glabrous abaxially. Sepals triangular or ovate-triangular, 1.5–2 mm, shorter than petals, apex acute. Petals white, obovate or suborbicular, longer than sepals, glabrous. Follicles glabrous, or pubescent along adaxial suture. Fl. Mar–May.

Thickets, slopes, rocks, steep dry cliffs, sunny places; also commonly cultivated (var. *prunifolia*); near sea level to 1500 m. Anhui, Fujian, Guizhou, Guangdong, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Xizang, Zhejiang [Japan, Korea].

1a. Flowers double, 1–1.2 cm in diam. 59a. var. *prunifolia*

1b. Flowers single, to 1 cm in diam.

2a. Leaf blades glabrous abaxially, margin 1–4-serrate on each side near apex; hypanthium often glabrous abaxially 59d. var. *hupehensis*

2b. Leaf blades densely or sparsely pubescent abaxially, margin mostly minutely sharply serrate from near base or above middle to apex; hypanthium pubescent abaxially.

3a. Leaf blades sparsely thinly pubescent abaxially, glabrescent when old; follicles pubescent on adaxial suture 59b. var. *simpliciflora*

3b. Leaf blades densely persistently

appressed pubescent abaxially; follicles glabrous 59c. var. *pseudoprunifolia*

59a. *Spiraea prunifolia* var. *prunifolia*

笑靥花(原变种) *xiao yan hua* (*yuan bian zhong*)

Spiraea prunifolia var. *plena* C. K. Schneider.

Leaf blades thinly pubescent abaxially, margin minutely sharply serrate from near base or above middle to apex. Flowers double, 1–1.2 cm in diam. Hypanthium pubescent abaxially.

Commonly cultivated in China [native to Japan and Korea].

59b. *Spiraea prunifolia* var. *simpliciflora* (Nakai) Nakai, Fl. Sylv. Kor. 4: 18. 1916.

单瓣笑靥花 *dan ban xiao yan hua*

Spiraea prunifolia f. *simpliciflora* Nakai, J. Coll. Sci. Imp. Univ. Tokyo 26: 172. 1908; *Spiraea simpliciflora* (Nakai) Nakai.

Leaf blades sparsely thinly pubescent abaxially, glabrescent when old, margin mostly minutely sharply serrate from near base or above middle to apex. Flowers single, less than 1 cm in diam. Hypanthium pubescent abaxially. Follicles pubescent on adaxial suture.

• Thickets, slopes, rocks; 500–1000 m. Anhui, Fujian, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang.

59c. *Spiraea prunifolia* var. *pseudoprunifolia* (Hayata ex Nakai) H. L. Li, Lloydia 14: 236. 1951.

假笑靥花 *jia xiao yan hua*

Spiraea pseudoprunifolia Hayata ex Nakai, Bot. Mag. (Tokyo) 29: 75. 1915.

Leaf blades densely persistently appressed pubescent abaxially, margin mostly minutely sharply serrate from near base or above middle to apex. Flowers single, less than 1 cm in diam. Hypanthium pubescent abaxially. Follicles glabrous.

• Sunny places; ca. 1500 m. Taiwan.

59d. *Spiraea prunifolia* var. *hupehensis* (Rehder) Rehder, J. Arnold Arbor. 1: 258. 1920.

光笑靥花 *guang xiao yan hua*

Spiraea hypericifolia Linnaeus var. *hupehensis* Rehder in Sargent, Pl. Wilson. 1: 439. 1913.

Leaf blades glabrous abaxially, margin 1–4-serrate on each side near apex. Flowers single, less than 1 cm in diam. Hypanthium glabrous abaxially. Follicles glabrous.

• Steep dry cliffs; near sea level to 300 m. Hubei, Shaanxi.

60. *Spiraea thunbergii* Siebold ex Blume, Bijdr. Fl. Ned. Ind. 17: 1115. 1826.

珍珠绣线菊 *zhen zhu xiu xian ju*

Shrubs to 1.5 m. Branches spreading, arching, slender; branchlets brown to red-brown, angled, pubescent at first, finally glabrous; buds ovoid, very small, with several scales, gla-

brous or puberulous. Petiole 1–2 mm, pubescent; leaf blade linear-lanceolate, 25–40 × 3–7 mm, glabrous on both surfaces, pinnately veined, base narrowly cuneate, margin sharply serrate above middle, apex long acuminate. Umbels sessile, with clustered leaves at base, 10–18 mm, 3–7-flowered; pedicels slender, 6–10 mm, glabrous. Flowers 6–8 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular or ovate-triangular, 1.5–2 × 1–1.5 mm, erect or reflexed in fruit, apex acute. Petals white, obovate to suborbicular, 2–4 × 2–3.5 mm, glabrous, base shortly clawed, apex emarginate or obtuse. Stamens 18–20, to 1/3 as long as petals. Disk annular, 10-lobed. Carpels glabrous or puberulous; styles nearly equaling stamens. Follicles spreading, glabrous; styles subterminal, divergent. Fl. Apr–May, fr. Jul–Aug.

Native in E China; cultivated for ornament in Fujian, Jiangsu, Liaoning, Shaanxi, Shandong, Zhejiang, and other provinces [Japan].

61. *Spiraea martini* H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 321. 1911.

毛枝绣线菊 *mao zhi xiu xian ju*

Shrubs 1.5–2.5 cm. Branchlets terete or slightly angled, yellow-brown and densely tomentose when young, brownish to red-brown and glabrescent when old; buds ovoid, small, pubescent, with several scales, apex subobtusate. Petiole 1–2 mm, yellow pubescent initially, later glabrescent; leaf blades abaxially gray, unequal, broadly obovate, rarely suborbicular or broadly elliptic, larger ones 8–17 × 5–10 mm, smaller ones 2–5 × 2–3 mm, densely yellow tomentose on both surfaces, or abaxially densely pubescent, adaxially puberulous when young and later glabrescent, pinnately veined or prominently 3-veined, base cuneate or broadly so, margin usually 3-lobed above middle, entire or with a few coarse, obtuse teeth, apex obtuse, rarely acute. Umbels sessile, with unequal, clustered leaves at base, 1–2(–2.5) cm, 5–18-flowered; pedicels 5–15 mm, glabrous or pubescent; bracts lanceolate, 2–4 mm, puberulous or glabrous. Flowers 5–6 mm in diam. Hypanthium campanulate, 1.5–2 mm, glabrous abaxially. Sepals ovate-triangular or triangular, 1.5–2.5 mm, erect in fruit, apex acute. Petals white, suborbicular or obovate, 3–4 mm, about as broad as long, glabrous, base shortly clawed, apex obtuse. Stamens 20–25, shorter than petals. Disk prominent, annular, 10-lobed. Carpels puberulous; styles shorter than stamens. Follicles spreading, puberulous on adaxial suture or pilose; styles subterminal, erect or slightly divergent. Fl. Feb–Mar, fr. Apr–May.

• Thickets, mountain valleys, dry slopes, roadsides, sometimes on limestone; 700–2100 m. Guangxi, Guizhou, Sichuan, Yunnan.

- 1a. Leaf blades densely yellow tomentose on both surfaces 61c. var. *tomentosa*
- 1b. Leaf blades pubescent on both surfaces.
 - 2a. Pedicels 5–9 mm, glabrous; follicles glabrous or puberulous only on adaxial suture 61a. var. *martini*
 - 2b. Pedicels 8–15 mm, pubescent; follicles pilose 61b. var. *pubescens*

61a. *Spiraea martini* var. *martini*

毛枝绣线菊(原变种) *mao zhi xiu xian ju* (*yuan bian zhong*)

Spiraea fulvescens Rehder.

Leaf blades pubescent on both surfaces. Pedicels 5–9 mm, glabrous. Follicles glabrous or puberulous only on adaxial suture.

• Thickets, mountain valleys, dry slopes, roadsides; 1400–2100 m. Guangxi, Guizhou, Sichuan, Yunnan.

61b. *Spiraea martini* var. *pubescens* T. T. Yu, Acta Phytotax. Sin. 8: 217. 1963.

长梗毛枝绣线菊 *chang geng mao zhi xiu xian ju*

Leaf blades pubescent on both surfaces. Pedicels 8–15 mm, pubescent. Follicles pilose.

• Mountain thickets on limestone; ca. 700 m. SE Yunnan (Funing Xian).

61c. *Spiraea martini* var. *tomentosa* T. T. Yu, Acta Phytotax. Sin. 8: 217. 1963.

绒毛毛枝绣线菊 *rong mao mao zhi xiu xian ju*

Leaf blades densely yellow tomentose on both surfaces.

• Roadsides; ca. 2000 m. SE Yunnan (Jianshui Xian).

62. *Spiraea cavaleriei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 321. 1911.

独山绣线菊 *du shan xiu xian ju*

Shrubs small. Branchlets slender, terete, pubescent; buds small, with several brown scales, apex acute or subobtusate. Petiole 2–4 mm, densely tomentose-pubescent; leaf blade broadly ovate or suborbicular, 1.5–2(–2.5) × 1–1.5 cm, abaxially densely gray tomentose-pubescent, adaxially puberulous when young, later glabrescent, base subrounded and prominently 3-veined, margin not lobed, coarsely and obtusely crenate above base, apex obtuse, sometimes mucronate. Umbels shortly pedunculate, 2–2.5 × 2.5–3 cm, 10–12-flowered, with small, bractlike leaves at base; pedicels 1–1.5 cm, glabrous; bracts linear to lanceolate, 2–4 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1.5–2.5 mm, apex acute to shortly acuminate. Petals white, suborbicular or obovate, 3–4 × 2.5–3.5 mm, glabrous, base shortly clawed, margin entire or slightly undulate. Stamens ca. 1/2 as long as petals or slightly shorter. Disk annular, 10-lobed. Styles shorter than stamens. Follicles divergent, pubescent apically; styles subterminal. Fl. Apr–Jun, fr. Jul–Sep.

• Mountain regions. S Guizhou (Dushan Xian).

63. *Spiraea daochengensis* L. T. Lu, Bull. Bot. Res., Harbin 9(2): 49. 1989.

稻城绣线菊 *dao cheng xiu xian ju*

Shrubs small, to 2 m tall. Branchlets purple-brown, distinctly angled, appressed villous; buds ovoid, small, with several scales, villous. Petiole 1–2 mm, villous; leaf blade rhombic-elliptic, rarely ovate-elliptic, 1–2 × 0.8–1 cm, appressed villous on both surfaces, more densely so abaxially, lateral veins 5–8 on each side of midvein, base cuneate, margin not lobed, with 5–9 large, sharp teeth above middle, apex acute. Umbels sessile, 1–1.5 cm, few flowered, with a few clustered, unequal leaves at base; pedicels to 1 cm, villous; bracts lanceolate, small. Flowers unknown. Hypanthium campanulate, villous

when young, glabrous when mature. Sepals broadly ovate or triangular-ovate, 3–4 mm, reflexed or rarely erect in fruit, apex acute. Follicles straightly spreading, glabrous or puberulous on adaxial suture; styles terminal on abaxial side, divergent. Fl. Aug–Sep.

• Coniferous and mixed forests on slopes; ca. 3800 m. W Sichuan (Daocheng Xian).

64. *Spiraea muliensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 13(1): 101. 1975.

木里绣线菊 mu li xiu xian ju

Shrubs 1–2 m tall. Branchlets dark brown-red, prominently angled, densely pubescent; buds ovoid, with several scales, pubescent, apex obtuse. Petiole very short or almost absent, softly hairy; leaf blade elliptic or oblong, 1.5–2 × 0.5–0.8 cm, appressed villous on both surfaces, base cuneate, margin deeply 3–7-serrate above middle, rarely entire, apex acute. Umbels sessile, 0.8–1.2 × 1–1.5 cm; pedicels 4–8 mm, pubescent; bracts linear, shorter than pedicels, hairy. Flowers unknown. Hypanthium campanulate, pubescent abaxially. Sepals triangular, reflexed or rarely erect in fruit, apex acute or sub-obtuse. Follicles erect-spreading, pubescent, more densely so on adaxial suture; styles terminal on abaxial side, divergent. Fl. May–Jun, fr. Jul–Sep.

• Mountain summits; ca. 2700 m. SW Sichuan (Muli Xian).

65. *Spiraea kwangsiensis* T. T. Yu, Acta Phytotax. Sin 8: 216. 1963.

广西绣线菊 guang xi xiu xian ju

Shrubs erect or spreading, to 1 m tall. Branchlets slender, terete, dark red-brown and pubescent when young, subglabrous and grayish-brown when old; buds ovoid, with several brown scales. Petiole 2–4 mm, usually glabrous; leaf blades unequal, obovate, elliptic, or suborbicular, larger ones 10–18 × 8–14 mm, smaller ones 7–10 × 4–5 mm, glabrous on both surfaces, lateral veins 3 or 4 on each side of midvein, base cuneate to rounded, margin obtusely dentate above middle or near apex, sometimes slightly 3-lobed (entire or subentire on leaves on flowering branchlets), apex obtuse. Umbels sessile or shortly pedunculate, 3–8-flowered, with several clustered, unequal leaves at base; pedicels 5–9 mm, glabrous; bracts linear, glabrous. Flowers 5–7 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, erect and persistent in fruit, apex acute. Petals white, broadly obovate, 2–3 mm, about as broad as long, base shortly clawed, apex emarginate or obtuse. Stamens ca. 20, shorter than petals. Disk annular, densely toothed, sometimes 10-lobed. Styles shorter than stamens. Follicles spreading, pubescent on adaxial suture; styles terminal on abaxial side, slightly divergent or suberect. Fl. Mar–Apr, fr. Apr–Jun.

• Bare cliffs, rocky roadsides, sunny places; ca. 600 m. Guangxi.

66. *Spiraea calcicola* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 8: 131. 1913.

石灰岩绣线菊 shi hui yan xiu xian ju

Shrubs low, to 1.5 m tall. Branches spreading, arching; branchlets purple-brown, turning gray-brown to gray-black

when old, distinctly angled; buds ovoid, small, with several scales, glabrous or puberulous on scale margin, apex subobtuse or acute. Leaves fascicled on short branchlets, alternate on long branchlets; petiole very short or absent, glabrous; leaf blade obovate, rarely elliptic, 5–9 × 2–6 mm, glabrous on both surfaces, base cuneate and 3-veined, margin entire, apex obtuse. Umbels sessile, 8–12 mm, 6–10-flowered, with small, clustered leaves at base; pedicels 3–7 mm, glabrous; bracts linear-lanceolate, glabrous, caducous. Flowers 4–6 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1–1.5 × 1.5 mm, erect in fruit, apex acute. Petals pinkish, obovate, 2–3 × 2–2.5 mm, glabrous, base shortly clawed, apex emarginate or obtuse. Stamens ca. 20, slightly shorter than to subequaling petals; disk undulate annular. Carpels puberulous; styles shorter than stamens. Follicles spreading, glabrous; styles terminal on abaxial side, somewhat divergent.

• Limestone mountain slopes; 2700–2800 m. NW Yunnan.

Spiraea tibetica Bureau & Franchet (J. Bot. (Morot) 5: 25. 1891, not *S. tibetica* T. T. Yu & L. T. Lu, 1980), described from Xizang, requires further study. We are unable to treat it in this account because we have seen no specimens.

67. *Spiraea hypericifolia* Linnaeus, Sp. Pl. 1: 489. 1753.

金丝桃叶绣线菊 jin si tao ye xiu xian ju

Shrubs to 1.5 m. Branches erect, spreading; branchlets brownish to gray-brown, slender, terete, glabrous or puberulous when young; buds ovoid, small, with several brownish scales, glabrous or subglabrous, apex acute. Petiole 1–4 mm, glabrous; leaf blade oblong-obovate or obovate-lanceolate, 1.5–2 × 0.5–0.7 cm, usually glabrous, rarely pubescent on both surfaces, base cuneate, indistinctly 3-veined or pinnately veined, margin entire (or on sterile branchlets obtusely 2- or 3-dentate apically), apex obtuse or acute. Umbels sessile, 1–2.5 cm, 5–11-flowered, with several small, clustered leaves at base; pedicels 0.8–1.8 cm, glabrous or puberulous; bracts very small, caducous. Flowers 5–7 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1.5–2 mm, erect in fruit, apex acute. Petals white, suborbicular or obovate, 3–3.5 × 3–4 mm, glabrous, base shortly clawed, apex obtuse. Stamens ca. 20, slightly shorter than to subequaling petals. Disk annular, 10-lobed. Carpels pubescent or subglabrous; styles somewhat shorter than stamens. Follicles straightly spreading, glabrous; styles terminal on abaxial side, divergent. Fl. May–Jun, fr. Jun–Sep.

Sparse forests, thickets, dry sunny slopes. Gansu, Heilongjiang, Henan, Nei Mongol, Shaanxi, Shanxi, Xinjiang [Mongolia, Russia (Siberia); C and SW Asia, SE Europe].

68. *Spiraea hailarensis* Liou, Ill. Fl. Lign. Pl. N. E. China, 281, 563. 1955.

海拉尔绣线菊 hai la er xin xian ju

Spiraea arenaria Y. Z. Zhao & T. J. Wang.

Shrubs 0.5–1 m tall. Branchlets brownish to purple-brown, terete, densely pubescent when young; buds ovoid, with several brown scales, apex obtuse or acute. Petiole very short or almost

absent; leaf blade gray-green on both surfaces, oblong or obovate-oblong, 4–14 × 3–5 mm, abaxially slightly pubescent, adaxially glabrous, indistinctly pinnately veined, base cuneate, margin entire (or on sterile branchlets 3- or 4-serrate), apex obtuse or acute. Umbels usually sessile, rarely shortly pedunculate, 10–15 mm in diam., 3–7-flowered; pedicels 8–10 mm, glabrous. Flowers 5–6 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, erect or reflexed in fruit, apex acute. Petals white, suborbicular. Stamens ca. 20. Disk annular, 10-lobed; lobes obtuse at apex, rarely emarginate. Styles shorter than stamens. Follicles slightly spreading, pubescent; styles terminal on abaxial side, erect or somewhat divergent. Fl. May–Jun, fr. Jun–Jul.

- Hills; ca. 600 m. Gansu, Nei Mongol.

69. *Spiraea compsohylla* Handel-Mazzetti, Symb. Sin. 7: 450. 1933.

粉叶绣线菊 fen ye xiu xian ju

Shrubs to 1.5 m. Branchlets purple-brown when young, dark gray when old, angled, glabrous when young; buds ovoid, small, with several scales, apex subobtuse. Petiole 1–4 mm, glabrous; leaf blades unequal: those on flowering branchlets usually oblong-obovate, 4–8 × 2–4 mm, base cuneate, margin entire or 3-lobed apically, apex obtuse; those on sterile branchlets blue-gray and glaucous pruinose abaxially, flabellate, 7–10 × 8–12 mm, usually glabrous on both surfaces, base cuneate to subrounded, often 3-veined, margin deeply 3–5-lobed. Umbels sessile or shortly pedunculate, ca. 1 cm, 3–13-flowered, with several small, clustered leaves at base; pedicels 5–8 mm, glabrous; bracts linear, 1–2 mm, glabrous. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1–1.5 mm, erect in fruit, apex acute. Petals suborbicular, nearly equaling sepals, glabrous. Stamens 15–20, slightly longer than petals. Disk un-

dulate annular. Carpels puberulous. Follicles glabrous, or puberulous only on adaxial suture; styles terminal on abaxial side, divergent. Fl. Jul–Sep, fr. Sep–Oct.

- Mixed forests, rocky cliffs and gullies; 2000–4000 m. NW Yunnan.

70. *Spiraea aquilegifolia* Pallas, Reise Russ. Reich. 3: 734. 1776.

矮斗菜叶绣线菊 lou dou cai ye xiu xian ju

Spiraea hypericifolia Linnaeus var. *thalictroides* (Pallas) Ledebour; *S. thalictroides* Pallas.

Shrubs low, to 1 m tall. Branchlets brown or gray-brown, terete, densely pubescent initially, becoming subglabrous; buds ovoid, small, with several brownish scales, glabrous. Petiole 1–2 mm, minutely pubescent; leaf blades unequal: those on flowering branchlets usually obovate, 4–8 × 2–5 mm, base cuneate, margin entire or obtusely 3-lobed; those on sterile branchlets abaxially gray-green, often flabellate, 7–10 mm, about as broad as long, abaxially densely pubescent, adaxially glabrous or sparsely pubescent, base narrowly cuneate, inconspicuously 3-veined, margin 3–5-lobed. Umbels sessile, 1–1.5 cm, 3–6-flowered, with several small, clustered leaves at base; pedicels 6–10 mm, glabrous; bracts small, caducous. Flowers 4–5 mm in diam. Hypanthium campanulate, glabrous abaxially. Sepals triangular, 1–1.5 × 2–2.5 mm, erect or reflexed in fruit, apex apiculate. Petals white, suborbicular, 2–3 mm, nearly as broad as long, glabrous, base shortly clawed, apex obtuse. Stamens ca. 20, nearly equaling petals. Disk annular, deeply 10-lobed. Carpels pubescent; styles shorter than stamens. Follicles pubescent distally or on adaxial suture; styles terminal on abaxial side. Fl. May–Jun, fr. Jul–Aug.

Dry grasslands, stony slopes; 600–1300 m. Gansu, Hebei, Henan, Nei Mongol, Qinghai, Shaanxi, Shanxi [Mongolia, Russia].

2. *SIBIRAEA* Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 213. 1879.

鲜卑花属 xian bei hua shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Crinan Alexander

Shrubs deciduous, polygamo-dioecious. Branches stout, terete; buds ovoid, scales alternate, purplish brown. Leaves alternate, exstipulate, subsessile, simple, midvein distinct, lateral veins in 3–5 pairs, margin entire. Inflorescence terminal, pedunculate, a dense, spikelike, many-flowered panicle; bracts lanceolate, margin entire. Flowers shortly pedicellate, small. Hypanthium shallowly campanulate. Sepals 5, erect, persistent in fruit, margin entire, apex acute. Petals 5, white, longer than sepals. Stamens 20–25, slightly shorter to slightly longer than petals, vestigial in female flowers. Carpels 5, connate at base. Follicles erect, long ellipsoid, dehiscent along whole adaxial suture and abaxially near apex. Seeds usually 2, rather large.

About four species: W China, Russia (Siberia); Europe; three species (two endemic) in China.

The species of *Sibiraea* are very similar and are sometimes all placed in *S. laevigata*.

- 1a. Peduncle, pedicels, and leaf blades glabrous 1. *S. laevigata*
 1b. Peduncle and pedicels pubescent to villous.
 2a. Leaf blades narrowly lanceolate or oblanceolate, rarely long elliptic, glabrescent when old; peduncle and pedicels pubescent; petals white 2. *S. angustata*
 2b. Leaf blades oblong-obovate to oblanceolate, abaxially densely tomentose; peduncle and pedicels villous; petals yellow-white 3. *S. tomentosa*

1. *Sibiraea laevigata* (Linnaeus) Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 215. 1879.

鲜卑花 xian bei hua

Spiraea laevigata Linnaeus, Mant. Pl. 2: 244. 1771;
Sibiraea altaiensis (Laxmann) C. K. Schneider; *S. glaberrima*
 K. S. Hao; *Spiraea altaica* Pallas; *S. altaiensis* Laxmann.

Shrubs to 1.5 m tall. Branchlets glabrous; buds ovoid, slightly pubescent. Leaves usually solitary at axils on current year's growth, clustered on older branchlets; leaf blade linear-lanceolate, broadly lanceolate, or oblong-oblancheolate, 4–6.5 × 1–2.3 cm, glabrous on both surfaces, base attenuate, apex acute, rarely obtuse. Panicles 5–8 cm wide; peduncle glabrous; bracts ca. 3 mm, glabrous on both surfaces, apex acute to acuminate. Flowers ca. 5 mm in diam.; pedicel ca. 3 mm, glabrous. Hypanthium glabrous. Sepals triangular-ovate, ca. 1.5 mm, glabrous on both surfaces. Petals white, obovate, base attenuate with a broad, cuneate claw, apex rounded. Carpels glabrous. Follicles rarely spreading, 3–4 mm; fruiting pedicel 3–5 mm, glabrous. Fl. Jul, fr. Aug–Sep.

Open forests, slopes, meadows, stream sides. S Gansu (Min Xian, Xigu Xian), E Qinghai (Haiyan Xian, Xining Shi), E Xizang (Sog Xian) [Kazakhstan, Russia (Siberia); SE Europe (Bosnia, Croatia)].

The Asian and European populations are widely disjunct, separated by over 5000 km.

2. *Sibiraea angustata* (Rehder) Handel-Mazzetti, *Symb. Sin.* 7: 454. 1933.

窄叶鲜卑花 *zhai ye xian bei hua*

Sibiraea laevigata (Linnaeus) Maximowicz var. *angustata* Rehder in Sargent, *Pl. Wilson.* 1: 455. 1913.

Shrubs to 2.5 m tall. Branchlets slightly pubescent when young, glabrescent; buds ovoid or trigonous-ovoid, slightly pubescent on scale margins. Leaves solitary at axils on current year's growth, clustered on older branchlets; leaf blade narrowly lanceolate or oblanceolate, rarely long elliptic, 2–8 × 1.5–2.5 cm, glabrous on both surfaces, base cuneate, apex acute

or apiculate. Panicles 5–8 × 4–6 cm; peduncle densely pubescent; bracts 2–3 mm, glabrous on both surfaces, apex acuminate. Flowers ca. 8 mm in diam.; pedicel 3–5 mm, pubescent. Hypanthium pubescent abaxially. Sepals broadly triangular, ca. 1.5 mm, pubescent on both surfaces. Petals white, broadly obovate, base cuneate, apex rounded. Carpels glabrous. Follicles ca. 4 mm; fruiting pedicel 3–5 mm, pubescent. Fl. Jun, fr. Aug–Sep.

• Open forests, slopes, valley roadsides; 3000–4000 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan.

3. *Sibiraea tomentosa* Diels, *Notes Roy. Bot. Gard. Edinburgh* 5: 270. 1921.

毛叶鲜卑花 *mao ye xian bei hua*

Shrubs to 1 m tall. Branchlets sericeous-pubescent when young, almost glabrescent; buds long ovoid, slightly tomentose. Leaves clustered at tips of short branches; leaf blade oblong-obovate to oblanceolate, 5–7 × 2–2.5 cm, slightly leathery, densely white sericeous-tomentose on both surfaces when young, later sparsely tomentose only abaxially, base cuneate, apex acute. Panicle 5–8 × 3–4.5 cm; peduncle sparsely villous; bracts ca. 2 mm, slightly pubescent, apex obtuse. Flowers 5–8 mm in diam.; pedicel ca. 2 mm, slightly villous. Hypanthium sparsely villous abaxially. Sepals triangular or broadly so, ca. 1.5 mm, sparsely villous on both surfaces. Petals yellow-white, spatulate, base cuneate, apex obtuse. Carpels pubescent along adaxial suture. Follicles erect, 3–4 mm; fruiting pedicel 2–3 mm, sparsely villous. Fl. Jun, fr. Aug.

• Slopes, stream sides, moist places on rocks; 3500–4000 m. NW Yunnan.

3. **ARUNCUS** Linnaeus, *Opera* Var. 259. 1758.

假升麻属 *jia sheng ma shu*

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Crinan Alexander

Herbs perennial, sometimes woody at base, monoecious. Rhizome robust. Stems erect, angled. Leaves exstipulate, 1–3-pinnate, rarely 3-foliolate; leaflets sharply doubly serrate. Inflorescence a large, spikelike, many-flowered panicle; peduncle and pedicels pubescent and sparsely stellate hairy; bracts and bracteoles linear-lanceolate. Flowers sessile or subsessile, unisexual, rarely bisexual. Hypanthium cupular, with ringlike disk on rim. Sepals (4 or)5(or 6), persistent in fruit, triangular, abaxially glabrous or nearly so, margin entire, apex acute. Petals 5, white, obovate, base cuneate, apex obtuse. Male flowers: stamens 15–30, borne on rim of hypanthium; filaments slender, longer than petals; carpels obsolescent. Female flowers: filaments short; anthers sterile; carpels 3 or 4(–8). Follicles glabrous, pendulous in fruit, dehiscent along adaxial suture. Seeds 2.

Three to six poorly defined species: N temperate zone; two species (one endemic) in China.

- 1a. Plants to 3 m tall; leaves 2- or 3-pinnate, leaflets rhombic-ovate, ovate-lanceolate, or long elliptic, apex acuminate or long acuminate; panicle lax, 10–40 cm 1. *A. sylvester*
 1b. Plants to 0.7 m tall; leaves 1- or 2-pinnate or 1- or 2-ternate, leaflets suborbicular or broadly ovate, rarely rhombic-ovate, apex rounded, obtuse, or acute; panicle dense, 5–25 cm 2. *A. gombalanus*

1. *Aruncus sylvester* Kosteletsky ex Maximowicz, *Trudy Imp. S.-Peterburgsk. Bot. Sada* 6: 169. 1879.

假升麻 *jia sheng ma*

Spiraea aruncus Linnaeus, *Sp. Pl.* 1: 490. 1753; *Aruncus asiaticus* Pojarkova; *A. dioicus* (Walter) Fernald var. *kamtschaticus* (Maximowicz) H. Hara; *A. dioicus* var. *tenuifolius* (Nakai

ex H. Hara) H. Hara; *A. dioicus* var. *triternatus* (Wallich ex Maximowicz) H. Hara; *A. dioicus* var. *vulgaris* (Maximowicz) H. Hara; *A. kamtschaticus* (Maximowicz) Rydberg; *A. kamtschaticus* var. *tomentosus* (Koidzumi) Miyabe & Tatewaki; *A. sylvester* var. *kamtschaticus* Maximowicz; *A. sylvester* var. *tenuifolius* Nakai ex H. Hara; *A. sylvester* var. *tomentosus* Koidzumi; *A. sylvester* var. *triternatus* Wallich ex Maximo-

wicz; *A. sylvester* var. *vulgaris* Maximowicz; *A. tomentosus* (Koidzumi) Koidzumi; *Astilbe aruncus* (Linnaeus) Treviranus; *Ulmaria aruncus* (Linnaeus) Hill.

Plants to 3 m tall, woody at base. Stems dark purplish, glabrous. Leaves 2- or 3-pinnate; petiolules 4–10 mm; leaflets rhombic-ovate, ovate-lanceolate, or long elliptic, 5–13 × 2–8 cm, subglabrous on both surfaces, base cuneate, margin irregularly toothed, apex acuminate to long acuminate. Panicle lax, 10–40 × 7–17 cm; peduncle and pedicels glabrescent in fruit; bracts and bracteoles sparsely pubescent. Flowers 2–4 in diam.; pedicel ca. 2 mm. Hypanthium slightly pubescent. Sepals spreading or erect in fruit. Male flowers with filaments ca. 2 × as long as petals. Fl. Jun, fr. Aug–Sep.

Mixed forests on montane slopes, valleys; 1800–3500 m. Anhui, Gansu, Guangxi, Heilongjiang, Henan, Hunan, Jiangxi, Jilin, Liaoning, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, NW India (Himachal Pradesh), Japan, Korea, Mongolia, Nepal, Russia, Sikkim; SW Asia, Europe, ?NW North America (Alaska)].

2. *Aruncus gombalanus* (Handel-Mazzetti) Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 152. 1924.

贡山假升麻 gong shan jia sheng ma

Pleiosepalum gombalanum Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 59: 139. 1922; *Aruncus dioicus* (Walter) Fernald var. *rotundifoliolatus* H. Hara.

Plants to 70 cm tall. Rhizome thick, woody. Stems red-brown, slightly pubescent above, glabrous below. Leaves 1- or 2-pinnate or 1- or 2-ternate; petiolules absent or terminal leaflets shortly petiolulate; leaflets suborbicular or broadly ovate, rarely rhombic-ovate, 4–5 × 3–4 cm, abaxially sparsely pubescent on veins, base cuneate, rarely truncate or rounded, margin sometimes slightly lobed, apex rounded, obtuse, or acute. Panicle dense, 5–25 cm; bracts and bracteoles glabrous. Flowers ca. 4 mm in diam.; pedicel ca. 3 mm or absent. Hypanthium abaxially glabrous. Sepals spreading or reflexed in fruit. Male flowers with filaments longer than petals. Follicles parallel. Fl. Jun, fr. Aug–Sep.

• Grassy slopes on mountain summits; 3000–4000 m. E Xizang, NW Yunnan.

4. SORBARIA (Seringe ex Candolle) A. Braun in Ascherson, Fl. Brandenburg 1: 177. 1860, nom. cons.

珍珠梅属 zhen zhu mei shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Crinan Alexander

Spiraea Linnaeus sect. *Sorbaria* Seringe ex Candolle, Prodr. 2: 545. 1825; *Schizonotus* Lindley, nom. rej.

Shrubs deciduous. Branchlets yellow to green when young, later dark reddish or yellowish brown, terete; buds ovoid to cylindrical, with several exposed, alternate scales, glabrous or slightly pubescent at apex. Leaves alternate, stipulate, pinnate; leaflets opposite, sessile or subsessile, doubly serrate. Inflorescence a large, terminal panicle. Flowers small, numerous. Hypanthium shallowly cupular. Sepals 5, reflexed, short, broad, persistent. Petals 5, imbricate, white, ovate to orbicular, base cuneate, apex obtuse. Stamens 20–50, nearly equaling or longer than petals. Carpels 5, opposite sepals, basally connate, glabrous or subglabrous. Follicles glabrous, dehiscent along adaxial suture. Seeds several.

About nine species: temperate Asia; three species (two endemic) in China.

- 1a. Panicles lax, with spreading branches; fruiting pedicels recurved, pendulous 3. *S. arborea*
- 1b. Panicles rather dense, with erect branches; fruiting pedicels erect.
 - 2a. Stamens 40–50, longer than petals; style terminal 1. *S. sorbifolia*
 - 2b. Stamens ca. 20, equaling or shorter than petals; style lateral 2. *S. kirilowii*

1. *Sorbaria sorbifolia* (Linnaeus) A. Braun in Ascherson, Fl. Brandenburg 1: 177. 1860.

珍珠梅 zhen zhu mei

Shrubs to 2 m tall. Branches erect; branchlets glabrous or slightly pubescent; buds purple-brown, ovoid. Stipules ovate-lanceolate to triangular-lanceolate, 8–13 mm, abaxially slightly pubescent, apex acuminate. Leaflets 11–17, opposite, lanceolate to ovate-lanceolate, 5–7 × 1.8–2.5 cm, glabrous or subglabrous on both surfaces or abaxially densely stellate hairy, lateral veins in 12–16 pairs, base subrounded to broadly cuneate, rarely slightly oblique, apex acuminate or caudate. Panicle 10–12 × 5–12 cm; peduncle and pedicels more or less pubescent and stellate hairy; bracts ovate to linear-lanceolate, 5–10 mm, slightly pubescent on both surfaces, later glabrescent, apex acuminate. Flowers 10–12 mm in diam.; pedicel 5–8 mm. Hypanthium pubescent abaxially at base. Sepals persistent and reflexed

(rarely spreading) in fruit, triangular, abaxially sparsely pubescent, apex obtuse or acute. Petals oblong or obovate, 5–7 mm. Stamens 40–50, 1.5–2 × as long as petals. Style terminal. Follicles cylindrical, ca. 3 mm, glabrous; fruiting pedicel erect. Fl. Jul–Aug, fr. Sep.

Open forests; 200–1500 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia].

- 1a. Leaflets abaxially glabrous or subglabrous 1a. var. *sorbifolia*
- 1b. Leaflets abaxially densely stellate hairy 1b. var. *stellipila*

1a. *Sorbaria sorbifolia* var. *sorbifolia*

珍珠梅(原变种) zhen zhu mei (yuan bian zhong)

Spiraea sorbifolia Linnaeus, Sp. Pl. 1: 490. 1753.

Leaflets abaxially glabrous or subglabrous.

Open forests; 200–1500 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia].

1b. *Sorbaria sorbifolia* var. *stellipila* Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 223. 1879.

星毛珍珠梅 *xing mao zhen zhu mei*

Sorbaria stellipila (Maximowicz) C. K. Schneider.

Leaflets abaxially densely stellate hairy.

Open secondary forests; 200–300 m. Heilongjiang, Jilin [Korea].

2. *Sorbaria kirilowii* (Regel & Tiling) Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 225. 1879.

华北珍珠梅 *hu bei zhen zhu mei*

Spiraea kirilowii Regel & Tiling, Fl. Ajan. 81. 1858; *Sorbaria sorbifolia* (Linnaeus) A. Brown var. *kirilowii* (Regel & Tiling) Ito.

Shrubs to 3 m tall. Branches erect; branchlets glabrous; buds red-brown. Stipules linear-lanceolate, 8–15 mm, glabrous or subglabrous, apex obtuse or acute. Leaflets 13–21, lanceolate to oblong-lanceolate, 4–7 × 1.5–2 cm, glabrous on both surfaces or abaxially pubescent in vein axils, lateral veins in 15–23 pairs, reticulate veins conspicuous, base cuneate to rounded, apex acuminate or caudate. Panicle dense, 7–11 × 5–20 cm; peduncle and pedicels glabrous; bracts lanceolate, 2–5 mm, glabrous, apex acuminate. Flowers 5–7 mm in diam.; pedicel 3–4 mm. Hypanthium shallowly cupular, glabrous on both surfaces. Sepals persistent and reflexed (rarely spreading) in fruit, ovate to oblong, glabrous, apex obtuse. Petals white, obovate or broadly ovate, 4–5 mm. Stamens ca. 20, slightly shorter than or equaling petals. Style lateral. Follicles cylindrical, ca. 3 mm; fruiting pedicel erect. Fl. Jun–Jul, fr. Sep–Oct.

• Slopes in open mixed forests; 200–1300 m. Gansu, Hebei, Henan, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi.

This species is commonly cultivated under the name 珍珠梅 (*zhen zhu mei*).

3. *Sorbaria arborea* C. K. Schneider, Ill. Handb. Laubholz. 1: 490. 1905.

高丛珍珠梅 *gao cong zhen zhu mei*

Shrubs to 6 m tall. Branches spreading; branchlets terete, yellow-green and slightly stellate hairy or pubescent when young, later dark red-brown and glabrous; buds purple-brown, ovoid or oblong, glabrous or slightly pubescent at apex. Stipules triangular-ovate, 8–10 mm, glabrous on both surfaces or subglabrous, apex acuminate. Leaflets 13–17, opposite, sessile or nearly so, lanceolate to oblong-lanceolate, 4–9 × 1–3 cm, glabrous on both surfaces or abaxially slightly or densely stellate hairy, lateral veins in 20–25 pairs, abaxially conspicuous, base broadly cuneate, margin doubly serrate, apex acuminate.

Panicle 20–30 × 15–20 cm, many flowered; peduncle and pedicels glabrous or slightly or densely stellate hairy; bracts lanceolate to linear-lanceolate, 4–5 mm, slightly pubescent, apex acuminate. Flowers 6–7 mm in diam.; pedicel 2–3 mm. Hypanthium shallowly cupular, glabrous. Sepals oblong-ovate, glabrous, apex obtuse. Petals white, suborbicular, 3–4 mm, base cuneate, apex obtuse. Stamens 20–30, longer than petals. Carpels 5, glabrous. Follicles cylindrical, ca. 3 mm, glabrous, with persistent, reflexed sepals; fruiting pedicel pendulous. Fl. Jun–Jul, fr. Sep–Oct.

• Dense forests, forest margins, slopes, stream sides, roadsides; 1600–3500 m. Gansu, Guizhou, Hubei, Jiangxi, Shaanxi, Sichuan, Xinjiang, Xizang, Yunnan.

- 1a. Rachis, leaflets abaxially, and inflorescence densely stellate hairy 3c. var. *subtomentosa*
 1b. Rachis, leaflets abaxially, and inflorescence glabrous or slightly stellate hairy.
 2a. Rachis, leaflets abaxially, and inflorescence slightly stellate hairy 3a. var. *arborea*
 2b. Rachis, leaflets abaxially, and inflorescence glabrous 3b. var. *glabrata*

3a. *Sorbaria arborea* var. *arborea*

高丛珍珠梅(原变种) *gao cong zhen zhu mei* (*yuan bian zhong*)

Spiraea arborea (C. K. Schneider) Bean.

Rachis, leaflets abaxially, and inflorescence slightly stellate hairy.

• Slopes near forest margins or by streams; 2500–3500 m. Gansu, Guizhou, Hubei, Jiangxi, Shaanxi, Sichuan, Xinjiang, Xizang, Yunnan.

3b. *Sorbaria arborea* var. *glabrata* Rehder in Sargent, Pl. Wilson. 1: 48. 1911.

光叶高丛珍珠梅 *guang ye gao cong zhen zhu mei*

Spiraea arborea var. *glabrata* (Rehder) Bean.

Rachis, leaflets abaxially, and inflorescence glabrous.

• Dense forests, mountain slopes, stream sides; 2500–3500 m. Gansu, Hubei, Shaanxi, Sichuan, Yunnan.

3c. *Sorbaria arborea* var. *subtomentosa* Rehder in Sargent, Pl. Wilson. 1: 47. 1911.

毛叶高丛珍珠梅 *mao ye gao cong zhen zhu mei*

Rachis, leaflets abaxially, and inflorescence densely stellate hairy.

• Slopes, roadsides; 1600–3100 m. Shaanxi, Sichuan, Yunnan.

5. PHYSOCARPUS (Cambessèdes) Rafinesque, New Fl. 3: 73. 1838, nom. et orth. cons.

风箱果属 *feng xiang guo shu*

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Crinan Alexander

Spiraea Linnaeus sect. *Physocarpus* Cambessèdes, Ann. Sci. Nat. (Paris) 1: 239, 385. 1824.

Shrubs deciduous. Branches spreading; buds small, with several alternate, exposed scales. Leaves alternate; stipules caducous; leaf blade usually 3-veined, margin usually 3-lobed, serrate. Inflorescence a terminal corymb. Flowers bisexual. Hypanthium cupular. Sepals 5, valvate. Petals 5, white or pinkish, slightly longer than sepals. Stamens 20–40. Carpels 1–5, connate at base; ovary 1-loculed. Follicles inflated, dehiscent along both sutures. Seeds 2–5.

About 20 species: mostly in North America, also in NE Asia; one species in China.

1. Physocarpus amurensis (Maximowicz) Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 221. 1879.

风箱果 feng xiang guo

Spiraea amurensis Maximowicz, Mém. Acad. Imp. Sci. St.-Pétersbourg Divers Savans 9: 90. 1859; *Opulaster amurensis* (Maximowicz) Kuntze.

Shrubs to 3 m tall. Branchlets slightly curved, terete, glabrous or subglabrous; buds ovoid, pubescent. Stipules caducous, linear-lanceolate, 6–7 mm, glabrous or subglabrous, margin serrate; petiole 1.2–2.5 cm, sparsely pubescent or subglabrous; leaf blade triangular-ovate to broadly ovate, 3.5–5.5 × 3–5 cm, abaxially stellate hairy and pubescent, densely so on

veins, base cordate or subcordate, rarely truncate, margin 3(–5)-lobed, doubly serrate, apex acute or acuminate. Corymb 3–4 cm in diam., many flowered, most parts sparsely stellate pubescent to stellate tomentose; peduncle glabrescent; bracts lanceolate, serrate at apex, caducous. Flowers 8–13 mm in diam.; pedicel 1–1.8 cm. Sepals triangular, 3–4 × ca. 2 mm, margin entire, apex acute. Petals white, obovate, ca. 4 × 2 mm, apex obtuse. Stamens 20–30. Carpels 2–4; style terminal. Follicles ovoid, 9–10 mm, glabrescent; fruiting pedicel 1–1.8 cm, glabrescent. Seeds 2–4. Fl. Jun, fr. Jul–Aug.

Broad-leaved forest margins, valleys. NE Hebei (Chengde, Wuling Shan), S Heilongjiang (Mao'er Shan) [N Korea, Russia (Far East)].

6. NEILLIA D. Don, Prodr. Fl. Nepal. 228. 1825.

绣线梅属 xiu xian mei shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Crinan Alexander

Adenilema Blume.

Shrubs, rarely subshrubs, deciduous. Branchlets spreading, slender, terete or angled; buds ovoid, scales imbricate, apex acute. Leaves often 2-ranked; stipules conspicuous, deciduous; leaf blade simple, margin doubly serrate and usually 3-parted or shallowly 3–5(–7)-lobed. Inflorescence a terminal or sometimes axillary raceme or panicle; bracts linear-lanceolate to ovate, small, caducous. Flowers bisexual. Hypanthium campanulate, urceolate-campanulate, or cylindrical. Sepals 5, erect, persistent in fruit and becoming densely pubescent and stipitate glandular abaxially. Petals white or pink-red, subequaling sepals. Stamens 10–30, irregularly 2-whorled on rim of hypanthium, not exceeding petals. Carpels 1(–5); ovary with 2–10 ovules; style erect. Follicles enclosed by persistent hypanthium, dehiscent along adaxial suture. Seeds several, obovoid; testa lustrous; caruncle convex.

About 17 species: C, E, and SE Asia; 15 species (12 endemic) in China.

- 1a. Inflorescence a panicle; hypanthium campanulate.
 - 2a. Branchlets densely yellowish brown pubescent 4. *N. densiflora*
 - 2b. Branchlets glabrous to slightly pubescent.
 - 3a. Flowers 7–10 mm in diam.; petals reddish; stamens 23–27 3. *N. grandiflora*
 - 3b. Flowers 4–5 mm in diam.; petals white; stamens 10–20.
 - 4a. Hypanthium sparsely pubescent abaxially; ovules 8–12 per ovary 1. *N. thyrsiflora*
 - 4b. Hypanthium densely pubescent abaxially; ovules 3–5 per ovary 2. *N. serratisepala*
- 1b. Inflorescence a raceme; hypanthium urceolate-campanulate or cylindrical.
 - 5a. Hypanthium campanulate to urceolate-campanulate.
 - 6a. Hypanthium glabrous abaxially; branchlets, petioles, and peduncles red glandular 7. *N. sparsiflora*
 - 6b. Hypanthium pubescent abaxially; branchlets, petioles, and peduncles eglandular.
 - 7a. Subshrubs to 0.5 m; leaf blade to 3 cm; raceme to 1.8 cm, 3–7-flowered 8. *N. gracilis*
 - 7b. Shrubs to 2 m; leaf blade more than 3 cm; racemes more than 2 cm, 5–25-flowered.
 - 8a. Stipules herbaceous; ovules 2 per ovary 9. *N. uekii*
 - 8b. Stipules membranous; ovules 4 or more per ovary.
 - 9a. Buds with 2 or 3 scales; stipules entire at margin 5. *N. rubiflora*
 - 9b. Buds with 4 or 5 scales; stipules serrate at margin 6. *N. affinis*
 - 5b. Hypanthium cylindrical (longer than broad).
 - 10a. Hypanthium abaxially glabrous, sometimes glandular pubescent at base.
 - 11a. Branchlets and petioles glabrous to slightly pubescent; hypanthium 10–20 mm 10. *N. sinensis*
 - 11b. Branchlets (when young) and petioles densely pubescent; hypanthium 8–9 mm 11. *N. ribesoides*
 - 10b. Hypanthium abaxially hairy.
 - 12a. Ovary wholly pubescent.

- 13a. Racemes 4–7-flowered; ovules 2–4 per ovary 14. *N. fugongensis*
 13b. Racemes 20–40-flowered; ovules 4 or 5 per ovary 15. *N. jinggangshanensis*
 12b. Ovary hairy only on adaxial suture or at apex.
 14a. Racemes 1.5–3 cm, 5–8-flowered; ovary hairy only on adaxial suture 13. *N. breviraecemosa*
 14b. Racemes 5–15 cm, 15–25-flowered; ovary hairy only at apex 12. *N. tibetica*

1. Neillia thyrsoflora D. Don, Prodr. Fl. Nepal. 228. 1825.

绣线梅 xiu xian mei

Shrubs erect, to 2 m tall. Branchlets red-brown, angled, glabrous to slightly pubescent; buds red-brown, ovoid, with 2 or 3 scales, apex obtuse; often 2 or 3 buds superposed in axils of flowering branches. Stipules ovate-lanceolate, ca. 6 mm, subglabrous, margin remotely serrate, apex acute; petiole 1–1.5 cm, subglabrous; leaf blade ovate to ovate-elliptic, 6–8.5 × 4–6 cm, abaxially sparsely pubescent on veins or subglabrous, base rounded or subcordate, margin usually 3-parted, rarely with 3–5 equal lobes, sharply doubly serrate, apex long acuminate. Panicle 6–15.5 cm in diam., densely or laxly branched, usually many flowered; peduncle and pedicels slightly pubescent. Flowers ca. 4 mm in diam.; pedicel ca. 3 mm. Hypanthium campanulate, 2–3 mm, abaxially pubescent. Sepals triangular, equalling hypanthium, sparsely pubescent on both surfaces, margin entire, apex caudate. Petals white, obovate, ca. 2 mm. Stamens 10–15. Ovary cylindrical, glabrous or only pubescent on sutures, or wholly pubescent; ovules (8–)10–12. Follicles cylindrical. Seeds ovoid. Fl. Jul, fr. Sep–Oct.

Dense forests, open forests, forest margins in valleys, scrub; 1000–3000 m. Guangxi, Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Indonesia (Java, Sumatra), Myanmar, Nepal, Sikkim, N Vietnam].

- 1a. Panicle densely branched; ovary pubescent only on sutures 1a. var. *thyrsoflora*
 1b. Panicle few branched; ovary wholly pubescent 1b. var. *tunkinensis*

1a. Neillia thyrsoflora var. *thyrsoflora*

绣线梅(原变种) xiu xian mei (yuan bian zhong)

Spiraea thyrsoflora K. Koch.

Panicle densely branched. Ovary glabrous or pubescent only on sutures.

Scrub; 1000–3000 m. NW Yunnan (Gongshan Xian) [Bhutan, India, Myanmar, Nepal, Sikkim].

1b. Neillia thyrsoflora var. *tunkinensis* (J. E. Vidal) J. E. Vidal, Adansonia 3: 153. 1963.

毛果绣线梅 mao guo xiu xian mei

Neillia tunkinensis J. E. Vidal, Notul. Syst. (Paris) 13: 292. 1948.

Panicle laxly branched. Ovary wholly pubescent.

Dense forests, forest margins in valleys; 1000–2700 m. Guangxi, Guizhou, Sichuan, Xizang, Yunnan [N Vietnam, NE India (Assam), Indonesia (Java, Sumatra)].

2. Neillia serratisepala H. L. Li, J. Arnold Arbor. 25: 300. 1944.

云南绣线梅 yun nan xiu xian mei

Shrubs to 2 m tall. Branchlets reddish, glabrous or subglabrous; buds purple-red, long ovoid, with 3 or 4 scales slightly pubescent at margin, apex acuminate. Stipules ovate or broadly so, herbaceous, subglabrous on both surfaces, margin serrate, ciliate, apex acute; petiole 5–10 mm, slightly pubescent; leaf blade elliptic-ovate to triangular-ovate, 7–12 × 5–7 cm, abaxially pubescent on veins, adaxially glabrous or sparsely pubescent, base truncate or subcordate, margin 3(–5)-lobed, doubly serrate, apex acuminate or caudate. Panicle terminal or axillary, 3–5 cm in diam., many flowered; peduncle and pedicels glabrous or slightly pubescent. Flowers ca. 4 mm in diam.; pedicel ca. 5 mm. Hypanthium campanulate, 3–5 mm, abaxially densely pubescent. Sepals triangular, nearly equalling hypanthium, pubescent on both surfaces, margin entire, apex acuminate. Petals white, obovate, ca. 2 mm. Stamens ca. 20. Ovary cylindrical, wholly pubescent; ovules 3–5. Follicles long ovoid. Seeds ovoid. Fl. Jul–Aug, fr. Sep–Oct.

- Open forests, forest margins on slopes; ca. 2000 m. Yunnan.

3. Neillia grandiflora T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 493. 1980.

大花绣线梅 da hua xiu xian mei

Shrubs to 3 m tall. Branches red-brown, glabrous or subglabrous; buds purple, ovoid, with 3 or 4 scales pubescent at margin, apex obtuse. Stipules oblong or lanceolate, ca. 4 mm, herbaceous, subglabrous, margin entire, apex acute; petiole 1–2.5 cm, slightly pubescent; leaf blade ovate or long ovate, 4–13 × 2.5–8 cm, abaxially slightly pubescent on veins, adaxially glabrous, base cordate or subcordate, margin usually with 1 or 2 pairs of lobes, with irregular, simple or double teeth. Panicle ca. 7 × 4.2 cm, many flowered; peduncle and pedicels densely tomentose-pubescent. Flowers 7–10 mm in diam.; pedicel 4–8 mm. Hypanthium campanulate, abaxially densely tomentose-pubescent. Sepals triangular-ovate, slightly shorter than hypanthium, abaxially densely tomentose-pubescent, margin entire, apex caudate or long caudate. Petals red, obovate, 3–4 mm. Stamens 23–27. Ovary cylindrical, glabrous or slightly pubescent only at apex; ovules 10–12. Follicles cylindrical. Seeds ovoid. Fl. Jun.

- Slopes in forests; 2400–2700 m. S Xizang (Nyalam Xian).

4. Neillia densiflora T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 492. 1980.

密花绣线梅 mi hua xiu xian mei

Branches red-brown, most parts densely yellow-brown pubescent; buds purple-red, ovoid, with 3 or 4 scales, subglabrous, apex obtuse. Stipules not seen; petiole 1.5–2 cm; leaf blade abaxially pale green, adaxially dark green, triangular-ovate or long ovate, 7–11 × 5–9 cm, abaxially densely yellowish brown pubescent on veins, adaxially sparsely pubescent

or subglabrous, midvein and lateral veins prominent, adaxially impressed, base rounded or cordate, margin with irregular, simple or double teeth, apex shortly acuminate or caudate-acuminate. Panicle 3.5–4 cm in diam., densely many flowered. Pedicel 2–3 mm. Hypanthium campanulate. Sepals triangular-lanceolate, shorter than hypanthium, margin entire, apex acute. Petals and stamens not seen. Ovary cylindrical, glabrous; ovules 3 or 4. Follicles cylindrical. Seeds ovoid. Fl. Sep.

- Mixed forests; 2700–2800 m. S Xizang (Yadong Xian).

5. *Neillia rubiflora* D. Don, Prodr. Fl. Nepal. 228. 1825.

粉花绣线梅 fen hua xiu xian mei

Spiraea rubiacea Wallich.

Shrubs to 2 m tall. Branchlets red-purple, angled, hairy when young, glabrescent; buds purple-red, ovoid, with 2 or 3 scales glabrous or slightly pubescent at margin, apex acute. Stipules ovate-lanceolate or linear-lanceolate, membranous, slightly pubescent, margin entire, apex acuminate; petiole 1–2 cm, pubescent; leaf blade broadly ovate to triangular-ovate, 4–6 × 3–4.5 cm, glabrous on both surfaces or abaxially slightly pubescent, base cordate, rarely rounded, margin sharply doubly serrate, apex acuminate. Raceme 2–4 cm, 5–12-flowered; peduncle and pedicels glabrous. Flowers 5–6 mm in diam.; pedicel 2–3 mm. Hypanthium urceolate-campanulate, 2–3 mm, abaxially pubescent. Sepals triangular-lanceolate, shorter than or nearly equaling hypanthium, densely pubescent, margin entire, apex acuminate. Petals pinkish white, obovate, ca. 3 mm. Stamens 25–30. Ovary subglobose, slightly hairy at apex; ovules 8–10. Follicles ellipsoid, glabrous. Seeds ovoid. Fl. Jun–Jul, fr. Aug–Sep.

Grassy slopes by streams in mixed forests; 2500–3000 m. Sichuan, Xizang, Yunnan [Bhutan, India, Nepal, Sikkim].

6. *Neillia affinis* Hemsley, J. Linn. Soc., Bot. 29: 3. 1892.

川康绣线梅 chuan kang xiu xian mei

Shrubs to 2 m tall. Branchlets red-brown, glabrous or nearly so; buds purple-red, long ovoid, with 4 or 5 scales slightly pubescent at margin, apex obtuse or acute. Stipules long ovate to linear-lanceolate, ca. 4 mm, membranous, subglabrous, margin serrate, apex acute; petiole 8–12 mm, sparsely pubescent or subglabrous; leaf blade ovate, triangular-ovate, rarely long ovate-elliptic, 3.5–6.8 × 3–5 cm, glabrous or subglabrous, base cordate or subcordate, margin usually with 1 or 2 pairs of lobes, sharply singly or doubly serrate, apex acuminate or caudate. Raceme 3–8 cm, 5–15-flowered; peduncle and pedicels pubescent. Flowers 4–5 mm in diam.; pedicel 3–5 mm. Hypanthium urceolate-campanulate, 2–5 mm, abaxially densely pubescent and stipitate glandular. Sepals triangular-lanceolate, shorter than hypanthium, pubescent on both surfaces, margin entire, apex acuminate. Petals pink, obovate, ca. 3 mm. Stamens ca. 20. Carpels 1–5; ovary cylindrical, pubescent; ovules 4–6(–10). Follicles ellipsoid, pubescent. Seeds ovoid. Fl. May–Jun, fr. Jul–Sep.

- Mixed forests, open forests; 1100–3500 m. C Sichuan, S Xizang, NW and SE Yunnan.

1a. Carpels 3–5 6c. var. *polygyna*

1b. Carpels 1 or 2.

2a. Raceme 3–8 cm, 6–15-flowered; carpels 1 or 2, with 4–6 ovules 6a. var. *affinis*

2b. Raceme 3–4 cm, 5–10-flowered; carpel 1, with 8–10 ovules 6b. var. *pauciflora*

6a. *Neillia affinis* var. *affinis*

川康绣线梅(原变种) chuan kang xiu xian mei (yuan bian zhong)

Raceme 3–6 cm, 6–15-flowered. Carpels 1 or 2; ovules 4–6.

- Mixed forests; 1100–3500 m. C Sichuan (Emei Shan, Kangding Xian), S Xizang (Nyalam Xian), NW Yunnan (Dêqên Xian, Weixi Xian).

6b. *Neillia affinis* var. *pauciflora* (Rehder) J. E. Vidal, Adansonias 3: 156. 1963.

少花川康绣线梅 shao hua chuan kang xiu xian mei

Neillia pauciflora Rehder in Sargent, Pl. Wilson. 1: 437. 1913.

Raceme 3–4 cm, 5–10-flowered. Carpel 1; ovules 8–10.

- 2000–2300 m. SE Yunnan.

6c. *Neillia affinis* var. *polygyna* Cardot ex J. E. Vidal, Adansonias 3: 156. 1963.

多果川康绣线梅 duo guo chuan kang xiu xian mei

Carpels 3–5; ovules 4–6.

- Open forests; ca. 3400 m. NW Yunnan.

7. *Neillia sparsiflora* Rehder, J. Arnold Arbor. 5: 327. 1942.

疏花绣线梅 shu hua xiu xian mei

Branchlets red-brown, sparsely reddish glandular, glabrescent; buds not seen. Stipules ovate-lanceolate, 4–5 mm, glandular, margin ciliate, apex acute; petiole 1–1.5 cm, glandular hairy or appressed pubescent distally; leaf blade ovate or ovate-oblong, 3.5–6 × 2–3.5 cm, abaxially sparsely pubescent on veins and hairy in vein axils, adaxially glabrous, base truncate or subcordate, margin usually with 1 or 2 pairs of triangular lobes, unequally or doubly serrate, apex long acuminate. Raceme 3.5–4.5 cm, 4–6(–12)-flowered; peduncle and pedicels reddish glandular pubescent. Flowers 3–4 mm in diam.; pedicel 2–4 mm. Hypanthium urceolate-campanulate, ca. 7 mm, abaxially glabrous, adaxially pubescent. Petals pinkish, broadly elliptic, 4.5–5 mm. Stamens 20–30. Ovary cylindrical, pubescent distally; ovules 7–9. Follicles not seen. Fl. Jul.

- NW Yunnan.

8. *Neillia gracilis* Franchet, Pl. Delavay. 202. 1890.

矮生绣线梅 ai sheng xiu xian mei

Subshrubs low, to 0.5 m tall. Branchlets recurved, angled, glabrous; buds red-brown, long ovoid, with 2 or 3 subglabrous scales, apex obtuse. Stipules ovate or triangular-ovate, 4–6 mm,

subglabrous, margin serrate, ciliate, apex acute; petiole 1–6 cm, slightly pubescent; leaf blade ovate to triangular-ovate, rarely subreniform, 2.5–3 × 2–3 cm, pubescent on both surfaces or subglabrous, base cordate, margin irregularly 3–5-lobed, sharply doubly serrate, apex acute to acuminate, rarely obtuse. Racemes axillary, 1–1.8 cm, 3–7-flowered; peduncle and pedicels subglabrous. Flowers ca. 6 mm in diam.; pedicel ca. 2 mm. Hypanthium urceolate-campanulate, 3.5–4 mm, abaxially slightly pubescent. Sepals triangular-ovate, 2–3 mm, shorter than hypanthium, slightly pubescent on both surfaces, margin entire, apex acuminate. Petals white or pinkish, orbicular, ca. 4 mm. Stamens 15–20. Ovary narrowly ovoid, densely villous; ovules 2. Follicles pubescent. Seeds ovoid. Fl. May–Jul.

• Alpine meadows, moist slopes; 2800–3000 m. W Sichuan, N Yunnan.

9. *Neillia uekii* Nakai, Bot. Mag. (Tokyo) 26: 3. 1912.

东北绣线梅 dong bei xiu xian mei

Neillia millsii Dunn.

Shrubs erect, to 2 m tall. Branchlets red-brown, slender, slightly pubescent when young, glabrescent; buds purple, ovoid, with 3 or 4 scales pubescent at margin. Stipules ovate-lanceolate to triangular-lanceolate, herbaceous, margin serrate, apex acute; petiole 5–10 mm, densely pubescent; leaf blade ovate to elliptic-ovate, rarely triangular-ovate, 3–6 × 2–4 cm, abaxially slightly pubescent on veins, adaxially glabrous, base rounded to truncate, margin pinnately lobed, doubly serrate, apex long acuminate or caudate. Racemes 4–9 cm, 10–25-flowered; peduncle and pedicels slightly pubescent and stellate hairy. Flowers 5–6 mm in diam.; pedicel 3–4 mm. Hypanthium urceolate-campanulate, 3–4 mm, abaxially pubescent. Sepals triangular, slightly shorter than hypanthium, pubescent on both surfaces, margin entire, apex acuminate. Petals white, spatulate, ca. 4 mm. Stamens ca. 10. Ovary ovoid, pubescent along adaxial suture and at apex; ovules 2. Follicles long ovoid. Seeds ovoid.

SE Liaoning (Changdian) [Korea].

10. *Neillia sinensis* Oliver, Hooker's Icon. Pl. 16: t. 1540. 1886.

中华绣线梅 zhong hua xiu xian mei

Shrubs to 4 m tall. Branchlets red-brown, glabrous; buds red-brown, ovoid, with 3 or 4 scales slightly pubescent at margin, apex obtuse. Stipules lanceolate to ovate-lanceolate, membranous, margin entire, apex acute or acuminate; petiole 7–15 mm, slightly pubescent or subglabrous; leaf blade ovate or ovate-elliptic, 5–11 × 3–6 cm, glabrous on both surfaces or abaxially pubescent in vein axils, base rounded or subcordate, margin often irregularly lobed or parted, doubly serrate, apex long acuminate. Racemes 4–9 cm, many flowered; peduncle and pedicels glabrous. Flowers 6–8 mm in diam.; pedicel 1–10 mm. Hypanthium cylindric, 0.7–1.2 cm, abaxially glabrous or glandular. Sepals triangular, 3–4 mm, much shorter than hypanthium, glabrous, margin entire, apex acute to caudate-acuminate. Petals pinkish, obovate, ca. 3 mm. Stamens 10–15; filaments unequal. Ovary long ovoid, pubescent at apex; ovules 4

or 5. Follicles long ellipsoid. Seeds ovoid. Fl. May–Jun, fr. Aug–Sep.

• Valley slopes and mixed forests; 1000–2500 m. Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan.

- 1a. Pedicels 3–10 mm; hypanthium 10–12 mm, abaxially glabrous 10a. var. *sinensis*
- 1b. Pedicels 1–3 mm; hypanthium 7–8 mm, abaxially glandular or sparsely so.
 - 2a. Leaf blade margin parted, lobes caudate-acuminate at apex; pedicels 2–3 mm; sepals caudate-acuminate at apex 10b. var. *caudata*
 - 2b. Leaf blade margin lobed, lobes obtuse or acute at apex; pedicels 1–2 mm; sepals acute at apex 10c. var. *duclouxii*

10a. *Neillia sinensis* var. *sinensis*

中华绣线梅(原变种) zhong hua xiu xian mei (yuan bian zhong)

Neillia glandulocalyx H. Léveillé; *N. sinensis* f. *glanduligera* (Hemsley) Rehder; *N. sinensis* var. *glanduligera* Hemsley.

Pedicels 3–10 mm. Hypanthium 10–12 mm, abaxially glabrous.

• Valley slopes and mixed forests; 1000–2500 m. Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi Shaanxi, Sichuan, Yunnan.

10b. *Neillia sinensis* var. *caudata* Rehder in Sargent, Pl. Wilson. 1: 436. 1913.

尾叶中华绣线梅 wei ye zhong hua xiu xian mei

Neillia tibetica Bureau & Franchet var. *caudata* (Rehder) J. E. Vidal.

Leaf blade margin parted; lobes caudate-acuminate at apex. Pedicels 2–3 mm. Hypanthium ca. 8 mm, abaxially glandular. Sepals caudate-acuminate at apex.

• 2000–2100 m. SE Yunnan.

10c. *Neillia sinensis* var. *duclouxii* (Cardot ex J. E. Vidal) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 91. 1974.

滇东中华绣线梅 dian dong zhong hua xiu xian mei

Neillia tibetica var. *duclouxii* Cardot ex J. E. Vidal, Adansonia 3: 163. 1963.

Leaf blade lobed; lobes obtuse or acute at apex. Pedicels 1–2 mm. Hypanthium 7–8 mm, abaxially sparsely glandular. Sepals acute at apex.

• About 2000 m. E Yunnan.

11. *Neillia ribesioides* Rehder in Sargent, Pl. Wilson. 1: 435. 1913.

毛叶绣线梅 mao ye xiu xian mei

Neillia hypomalaca Rehder; *N. sinensis* Oliver var. *hypo-*

malaca (Rehder) Handel-Mazzetti; *N. sinensis* var. *ribesoides* (Rehder) J. E. Vidal; *N. villosa* W. W. Smith.

Shrubs to 2 m tall. Branchlets densely yellow-brown pubescent when young, later gray-brown; buds red-brown, ovoid, with 4 or 5 scales pubescent at margin. Stipules oblong to lanceolate, 5–10 mm, herbaceous, slightly pubescent, margin entire, apex obtuse; petiole ca. 5 mm, densely pubescent; leaf blade triangular to triangular-ovate, 4–6 × 3.5–4 cm, abaxially densely pubescent particularly on veins, adaxially sparsely pubescent, base truncate or subcordate, margin 3–5-lobed, sharply doubly serrate, apex acuminate. Racemes 4–5 cm, 10–15-flowered; peduncle and pedicels subglabrous. Flowers ca. 6 mm in diam.; pedicel 3–4 mm. Hypanthium cylindrical, 8–9 mm, abaxially glabrous, sparsely glandular pubescent at base. Sepals triangular, ca. 2 mm, shorter than hypanthium, margin entire, apex caudate. Petals white or pinkish, obovate, ca. 2 mm. Stamens 10–15. Ovary narrowly ovoid, pubescent only at apex; ovules 4 or 5. Follicles long ellipsoid. Seeds ovoid. Fl. May, fr. Jul–Sep.

• Open forests; 1000–2500 m. Gansu, Hubei, Shaanxi, Sichuan, Yunnan.

12. *Neillia thibetica* Bureau & Franchet, J. Bot. (Morot) 5: 45. 1891.

西康绣线梅 *xi kang xiu xian mei*

Shrubs to 3 m tall. Branchlets densely yellow-brown pubescent when young, purple-brown when old; buds purple-brown, ovoid, with 3 or 4 scales pubescent at margin, apex acute. Stipules lanceolate or ovate-lanceolate, 4–8 mm, herbaceous, pubescent on both surfaces, margin serrate or repand-serrate, ciliate, apex acute; petiole 8–10 mm, densely pubescent; leaf blade ovate to long elliptic, rarely triangular-ovate, 5–10 × 3–6 cm, abaxially pubescent, adaxially sparsely pubescent, base rounded or cordate, margin sharply doubly serrate, often irregularly 3–5-lobed or distinctly lobed ca. 1/2 way to midvein, apex acuminate. Racemes 5–15 cm, 3–5-flowered; peduncle and pedicels densely pubescent. Flowers ca. 4 mm in diam.; pedicel 3–4 mm. Hypanthium cylindrical, 5–6 mm, densely pubescent on both surfaces. Sepals triangular, 2–3 mm, shorter than hypanthium, densely pubescent on both surfaces, margin entire, apex caudate. Petals pinkish white, obovate, ca. 3 mm. Stamens 15–20. Ovary cylindrical, pubescent only at apex; ovules 5–8. Follicles cylindrical. Seeds ovoid. Fl. May–Jun, fr. Jul–Sep.

• Stream sides in mixed forests; 1500–3000 m. W Sichuan, NW Yunnan.

- 1a. Leaf blade margin irregularly 3–5-lobed, stipules lanceolate, margin serrate and ciliate 12a. var. *thibetica*
 1b. Leaf blade margin distinctly lobed ca. 1/2 way to midvein, stipules ovate-lanceolate, margin repand-serrate and ciliate 12b. var. *lobata*

12a. *Neillia thibetica* var. *thibetica*

西康绣线梅(原变种) *xi kang xiu xian mei* (yuan bian zhong)

Neillia longiracemosa Hemsley; *N. velutina* Bureau.

Stipules lanceolate, margin serrate and ciliate; leaf blade margin irregularly 3–5-lobed.

• Stream sides in mixed forests; 1500–3000 m. W Sichuan, NW Yunnan.

12b. *Neillia thibetica* var. *lobata* (Rehder) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 94. 1974.

裂叶西康绣线梅 *lie ye xi kang xiu xian mei*

Neillia longiracemosa var. *lobata* Rehder, J. Arnold Arbor. 1: 257. 1920.

Stipules ovate-lanceolate, margin repand-serrate and ciliate; leaf blade margin distinctly lobed ca. 1/2 way to midvein.

• About 2900 m. SW Sichuan, NW Yunnan.

13. *Neillia breviracemosa* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 13. 1990.

短序绣线梅 *duan xu xiu xian mei*

Shrubs to 70 cm tall. Branchlets greenish, subglabrous or slightly pubescent; buds purple-red, long ovoid, with 3 or 4 subglabrous scales, apex acute. Stipules ovate, ca. 5 mm, herbaceous, subglabrous, margin remotely serrate, apex acute; petiole 6–9 mm, densely pubescent; leaf blade ovate-oblong, 4–7 × 2–3.5 cm, abaxially glabrous except on veins, adaxially sparsely pubescent, base cordate or subrounded, margin often with 1 pair of lobes at base, irregularly doubly serrate, apex long caudate. Racemes 1.5–3 cm, 5–8-flowered; peduncle subglabrous. Pedicel 3–4 mm, pubescent. Hypanthium cylindrical, ca. 6 mm, abaxially densely pubescent. Sepals triangular-lanceolate, 6–7 mm, slightly longer than hypanthium, densely pubescent on both surfaces, margin entire, apex long caudate. Petals and stamens not seen. Ovary slightly pubescent or subglabrous; ovules not seen. Follicles cylindrical, sparsely pubescent, later glabrescent. Seeds not seen. Fr. Jun.

• About 2000 m. W Yunnan (Lushui Xian).

14. *Neillia fugongensis* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 12. 1990.

福贡绣线梅 *fu gong xiu xian mei*

Shrubs to 3 m tall. Branchlets red-brown, pubescent when young, glabrescent; buds not seen. Stipules ovate, 4–5 mm, herbaceous, subglabrous, margin with remote stipitate glandular teeth, apex acuminate; petiole 5–8 mm, pubescent; leaf blade oblong or ovate-oblong, 4–5.5 × 2–4 cm, abaxially densely pubescent on veins, adaxially sparsely appressed pubescent, base subcordate, rarely truncate, margin irregularly doubly serrate and usually irregularly 5- or 6-lobed, apex long caudate-acuminate. Raceme 4–5.5 cm, 4- or 5-flowered; peduncle and pedicels densely pubescent. Hypanthium cylindrical, abaxially densely pubescent. Sepals triangular-lanceolate, slightly shorter than or equaling hypanthium, pubescent on both surfaces. Petals not seen. Stamens numerous. Ovary cylindrical, pubescent; ovules 2–4. Follicles cylindrical, pubescent. Seeds cylindrical. Fl. Jun–Jul.

• 1700–2600 m. NW Yunnan (Fugong Xian).

15. *Neillia jinggangshanensis* Z. X. Yu, Bull. Bot. Res., Harbin 3(1): 150. 1983.

井冈山绣线梅 *jing gang shan xiu xian mei*

Shrubs to 3 m tall, yellowish brown pubescent in most parts. Branchlets red-brown, angled; buds purple-red, ovoid, with 3 or 4 subglabrous scales, apex acute. Stipules oblong, 3.5–4.5 mm, herbaceous, subglabrous, margin remotely serrate, apex obtuse; petiole 4–10 mm; leaf blade ovate-oblong or triangular-oblong, 3–9.5 × 2.3–4.5 cm, abaxially pubescent,

densely so on veins, adaxially sparsely pubescent, base cuneate to cordate, rarely rounded, margin doubly serrate and usually 4- or 5-lobed, apex acuminate or caudate-acuminate. Racemes 5–6 cm, 20–40-flowered. Flowers 3–5 mm in diam.; pedicel 3–4 mm. Hypanthium cylindric, abaxially yellowish brown pubescent and stipitate glandular. Sepals triangular, shorter than hypanthium, margin entire, apex acuminate. Petals not seen. Stamens 15–20. Ovary cylindric, yellowish brown villous; ovules 4 or 5. Follicles cylindric. Seeds ovoid-globose. Fl. Jun.

• About 400 m. W Jiangxi (Jinggangshan).

7. STEPHANANDRA Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 3: 739. 1843.

野珠兰属 *ye zhu lan shu*

Gu Cuizhi (谷粹芝 *Ku Tsue-chih*); Crinan Alexander

Shrubs deciduous. Branchlets reddish brown when young, terete, slightly pubescent; buds usually 2 or 3 superposed, ovoid, small, with 2–4 scales. Leaves petiolate; stipules acuminate at apex; leaf blade simple, margin serrate, usually lobed. Inflorescence a terminal corymb or panicle, many flowered; bracts small, margin entire. Flowers small, bisexual; pedicel slender. Hypanthium cupular. Sepals 5, persistent in fruit, apex obtuse. Petals 5, white, shorter than sepals. Stamens 10–20, borne on margin of hypanthium; filaments short. Carpel 1; ovules 2, pendulous; style terminal, erect. Follicle obliquely subglobose, crustaceous, dehiscing from base. Seeds 1 or 2, lustrous, globose to ovoid.

About five species: E Asia; two species (one endemic) in China.

- 1a. Leaf blades ovate to long elliptic-ovate, 5–7 cm, margin usually shallowly lobed; pedicels and hypanthium glabrous 1. *S. chinensis*
 1b. Leaf blades triangular-ovate to ovate, 2–4 cm, margin lobed ca. 1/3 way to midvein; pedicels and hypanthium pubescent 2. *S. incisa*

1. *Stephanandra chinensis* Hance, J. Bot. 20: 210. 1882.

野珠兰 *ye zhu lan*

Stephanandra flexuosa Siebold & Zuccarini var. *chinensis* (Hance) Pampanini.

Shrubs to 1.5 m. Buds reddish brown, pubescent at scale margins. Stipules linear-lanceolate to elliptic-lanceolate, 6–8 mm, glabrous; petiole 6–8 mm, subglabrous; leaf blade ovate to long elliptic-ovate, 5–7 × 2–3 cm, glabrous or abaxially pubescent on veins, lateral veins in 7–10 pairs, base subcordate or rounded, rarely broadly cuneate, margin doubly serrate, usually shallowly lobed, apex acuminate, rarely caudate. Panicle 2–3 cm in diam.; peduncle and pedicels glabrous; bracts lanceolate to linear-lanceolate, apex obtuse. Flowers 4–5 mm in diam.; pedicel 3–6 mm. Hypanthium glabrous. Sepals erect in fruit, triangular-ovate, ca. 2 mm, margin entire. Petals ovate, rarely oblong, ca. 2 mm. Stamens ca. 10, ca. 1/2 as long as petals. Follicle ca. 2 mm in diam., pubescent, later sparsely so. Seed 1, ovoid. Fl. May, fr. Jul–Aug.

• Broad-leaved forest margins; 1000–1500 m. Anhui, Fujian, Guangdong, Henan, Hubei, Hunan, Jiangxi, Sichuan, Zhejiang.

2. *Stephanandra incisa* (Thunberg) Zabel, Gart.-Zeitung (Berlin) 4: 511. 1885.

深裂野珠兰 *shen lie ye zhu lan*

Spiraea incisa Thunberg in Murray, Syst. Veg., ed. 14, 472. 1784; *Stephanandra flexuosa* Siebold & Zuccarini.

Shrubs to 2.5 m tall. Branchlets becoming purple-gray; buds glabrous or slightly pubescent at apex. Stipules ovate-lanceolate to long elliptic, ca. 5 mm, margin sparsely toothed, ciliate; petiole 2–5 mm, pubescent; leaf blade triangular-ovate to ovate, 2–4 × 1.5–2.5 cm, abaxially sparsely pubescent, densely so on veins, adaxially pubescent, base cordate or truncate, margin doubly serrate, with 4 or 5 pairs of lobes reaching ca. 1/3 way to midvein, apex acuminate. Panicle lax, 2–6 cm in diam.; peduncle and pedicels pubescent; bracts lanceolate, apex obtuse or acute. Flowers 4–5 mm in diam.; pedicel 5–8 mm. Hypanthium sparsely pubescent. Sepals erect or spreading in fruit, triangular to oblong, ca. 2 mm, margin minutely serrate, apex obtuse. Petals obovate, 2–3 mm, apex obtuse. Stamens ca. 10, shorter than petals. Follicle 2–3 mm in diam., pilose, later glabrescent. Seed 1, ovoid. Fl. Jun–Jul, fr. Aug–Sep.

Mountain slopes, often by streams; 500–1000 m. Liaoning (Changhai, Xiuyan), E Shandong (Mouping, Qingdao), Taiwan (Hualiangam) [Japan, Korea].

8. EXOCHORDA Lindley, Gard. Chron. 1858: 925. 1858.

白鹃梅属 *bei juan mei shu*

Gu Cuizhi (谷粹芝 *Ku Tsue-chih*); Crinan Alexander

Shrubs deciduous. Branches spreading; branchlets angled, glabrous; buds ± ovoid, with several imbricate scales, glabrous or

subglabrous, apex obtuse or acute. Leaves petiolate; stipules absent or small and caducous; leaf blade simple, margin entire or serrate. Inflorescence a terminal raceme. Flowers rather large, more than 2 cm in diam. Hypanthium shallowly campanulate. Sepals 5, very short and broad. Petals 5, imbricate, white, oblong to broadly obovate, base attenuate into a claw. Stamens 15–30; filaments borne on margin of large disk, short. Carpels 5, connate; ovary superior, deeply furrowed, 5-loculed; styles free. Fruit a capsule, obconic, 5-angled, dehiscent along both sutures. Seeds 1 or 2, oblate, winged.

About four species: C and E Asia; three species (two endemic) in China.

- 1a. Leaf blades serrate above middle 3. *E. serratifolia*
 1b. Leaf blades mostly entire, occasionally serrate at apex.
 2a. Pedicels 3–5 mm; petals with short claws; stamens 15–20; petiole 5–15 mm or nearly absent 1. *E. racemosa*
 2b. Pedicels short or nearly absent; petals with long claws; stamens 25–30; petiole 15–25 mm 2. *E. giraldii*

1. *Exochorda racemosa* (Lindley) Rehder in Sargent, Pl. Wilson. 1: 456. 1913.

白鹃梅 bai jian mei

Amelanchier racemosa Lindley, Edwards's Bot. Reg. 33: t. 38. 1847; *Exochorda grandiflora* Lindley.

Shrubs to 3 m tall. Branchlets red-brown when young, later brown; buds dark purple, trigonous-ovoid, apex obtuse. Petiole 5–15 mm or nearly absent; leaf blade elliptic or narrowly so to oblong-obovate, 3.5–6.5 × 1.5–3.5 cm, glabrous on both surfaces, base cuneate or broadly so, margin entire, rarely obtusely serrate above middle, apex obtuse or acute, rarely apiculate. Raceme 2.5–3.5 cm in diam., 6–10-flowered; peduncle and pedicels glabrous; bracts broadly lanceolate, ca. 3 mm, glabrous. Flowers 2.5–3.5 cm in diam.; pedicel 3–5 mm. Hypanthium shallowly campanulate, glabrous. Sepals broadly triangular, ca. 2 mm, glabrous, apex obtuse or acute. Petals obovate, ca. 1.5 × 1 cm, base shortly clawed, apex obtuse. Stamens 15–20, 3- or 4-fascicled. Capsule glabrous; fruiting pedicel 3–8 mm. Fl. May, fr. Jun–Jul.

- Shady slopes; 200–500 m. Henan, Jiangsu, Jiangxi, Zhejiang.

2. *Exochorda giraldii* Hesse, Mitt. Deutsch. Dendrol. Ges. 17: 191, 219. 1908.

红柄白鹃梅 hong bing bai jian mei

Shrubs to 5 m tall. Branchlets green when young, red-brown when old; buds red-brown, pubescent at scale margins, apex obtuse. Petiole red or green, 1–2.5 cm, glabrous; leaf blade elliptic to narrowly so or oblong, rarely oblong-obovate, 3–4 × 1.5–3 cm, glabrous on both surfaces or abaxially pubescent, base cuneate or broadly so to rounded, rarely oblique, margin entire or serrate, apex obtuse or apiculate. Raceme 3–4.5 cm in diam., 6–10-flowered; peduncle and pedicels glabrous; bracts linear-lanceolate, ca. 3 mm, glabrous. Flowers 3–5 cm in diam.; pedicel short or nearly absent. Hypanthium shallowly campanulate, glabrous. Sepals nearly semiorbicular, ca. 2 mm, glabrous, apex obtuse. Petals obovate or oblong-obovate, 2–2.5 × ca. 1.5 cm, base attenuate into a long claw, apex rounded. Stamens 20–30, 3- or 4-fascicled. Capsule glabrous; fruiting pedicel 1–2 mm or nearly absent. Fl. May, fr. Jul–Aug.

- Scrub on slopes, rocky places in valleys; 600–2000 m. Anhui, Gansu, Hebei, Henan, Hubei, Shaanxi, Shanxi, Sichuan, Zhejiang.

- 1a. Petiole red, leaf blade elliptic or narrowly so, rarely oblong-obovate, margin entire, rarely obtusely serrate above middle; flowers

3–4.5 cm in diam.; stamens 25–30 2a. var. *giraldii*

- 1b. Petiole green, leaf blade elliptic to oblong, margin sometimes serrate; flowers ca.

5 cm in diam.; stamens 20–25 2b. var. *wilsonii*

2a. *Exochorda giraldii* var. *giraldii*

红柄白鹃梅(原变种) hong bing bai jian mei (yuan bian zhong)

Exochorda racemosa (Lindley) Rehder subsp. *giraldii* (Hesse) F. Y. Gao & Maesen; *E. racemosa* var. *giraldii* (Hesse) Rehder.

Petiole red, 1.5–2.5 cm; leaf blade elliptic or narrowly so, rarely oblong-obovate, margin entire, rarely obtusely serrate above middle. Flowers 3–4.5 cm in diam. Stamens 25–30.

- Scrub on slopes; 1000–2000 m. Anhui, Gansu, Hebei, Henan, Hubei, Shaanxi, Shanxi, Sichuan, Zhejiang.

2b. *Exochorda giraldii* var. *wilsonii* (Rehder) Rehder in L. H. Bailey, Stand. Cycl. Hort. 2: 1194. 1914.

绿柄白鹃梅 lu bing bai jian mei

Exochorda racemosa var. *wilsonii* Rehder in Sargent, Pl. Wilson. 1: 450. 1913.

Petiole green, 1–2 cm; leaf blade elliptic to oblong, margin sometimes serrate. Flowers ca. 5 cm in diam. Stamens 20–25.

- Rocky places in valleys; 600–1300 m. Anhui, Hubei, Sichuan, Zhejiang.

3. *Exochorda serratifolia* S. Moore, Hooker's Icon. Pl. 13: t. 1255. 1877.

齿叶白鹃梅 chi ye bai jian mei

Exochorda racemosa (Lindley) Rehder subsp. *serratifolia* (S. Moore) F. Y. Gao & Maesen.

Shrubs to 2 m tall. Branchlets red-purple when young, later dark purple; buds purple-red, ovoid, apex obtuse. Petiole 1–2 cm, glabrous; leaf blade elliptic to oblong-ovate, 5–9 × 3–5 cm, slightly pubescent when young, later glabrous, base cuneate or broadly so, margin entire below middle, serrate above middle, apex obtuse or acute. Raceme 3–4 cm, 4–7-flowered; peduncle and pedicels glabrous; bracts linear-lanceolate, ca. 3 mm, glabrous. Flowers 3–4 cm in diam.; pedicel 2–3 mm. Hypanthium shallowly campanulate, glabrous. Sepals triangular, ca. 2 mm, glabrous, apex acute. Petals oblong to obovate, ca. 1.5 × 1 cm, base long clawed, apex emarginate. Stamens ca.

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25, 2–4-fascicled. Capsule glabrous; fruiting pedicel 2–3 mm.
Fl. May–Jun, fr. Jul–Aug.

Scrub, slopes, river sides. NE Hebei (Wuling Shan), Liaoning
(Qian Shan) [Korea].

Exochorda serratifolia var. *polytricha* C. S. Zhu (Acta Phytotax.
Sin. 32: 432. 1994), described from N Henan (Jiyuan Xian), was said to
differ in having the current year's branchlets, petioles, leaf blades abaxially,
inflorescence rachis, and pedicels all densely white crispate pubescent.

2. Subfam. MALOIDEAE

苹果亚科 ping guo ya ke

Shrubs or trees. Leaves simple or compound, margin serrate or entire; stipules present, persistent or caducous. Carpels (1 or)2–5(–7), mostly ± connate and then united with inside of cupular receptacle, with 2, rarely 1 or several, erect anatropous ovules per carpel; ovary inferior or semi-inferior, rarely superior. Fruit usually a pome, sometimes berrylike. $x = 17$.

Between 20 and 28 genera and 940–1100 species: 16 genera (one endemic) and 275 species (167 endemic) in China.

The taxonomy of this subfamily is particularly challenging because of hybridization, polyploidy, and apomixis, especially for large genera.

This account follows the FRPS circumscription of genera; however, for an alternative treatment of genera, the reader can refer to Robertson et al. (Syst. Bot. 16: 376–394. 1991).

- 1a. Fruit with 1–5 pyrenes; carpels bony when mature.
 - 2a. Leaves pinnate, leaflets small, entire; carpels 5 13. *Osteomeles*
 - 2b. Leaves simple, entire, serrate, or lobed; carpels 1–5.
 - 3a. Leaves entire; branches unarmed.
 - 4a. Carpel 1, inserted at base of hypanthium, usually exerted from fleshy hypanthium when mature 9. *Dichotomanthes*
 - 4b. Carpels 2–5, wholly to mostly united with hypanthium 10. *Cotoneaster*
 - 3b. Leaves serrate or lobed, rarely entire; branches usually spiny.
 - 5a. Plant evergreen; carpels 5, with 2 fertile ovules per carpel 11. *Pyracantha*
 - 5b. Plant deciduous, rarely semievergreen; carpels 1–5, with 1 fertile ovule per carpel 12. *Crataegus*
- 1b. Fruit a 1–5(–7)-loculed pome, each locule with 1 to many seeds; carpels leathery or papery when mature.
 - 6a. Inflorescence compound-corymbose or paniculate, rarely umbellate, many flowered.
 - 7a. Leaves simple or compound, plant usually deciduous; pulp of fruit heterogeneous (with large prominent stone cells) to homogeneous (without stone cells) 18. *Sorbus*
 - 7b. Leaves simple, plant evergreen or deciduous; pulp of fruit homogeneous.
 - 8a. Carpels partly free; ovary semi-inferior; inflorescence a compound corymb.
 - 9a. Ovary in fruit free to middle; endocarp dehiscent when mature; leaves entire or minutely serrate 14. *Stranvaesia*
 - 9b. Ovary in fruit only free apically or to 1/3 length; endocarp not dehiscent; leaves serrate, rarely entire 15. *Photinia*
 - 8b. Carpels wholly connate; ovary inferior; inflorescence a panicle or raceme.
 - 10a. Sepals persistent in fruit; inflorescence paniculate, rarely racemose; leaves with excurrent lateral veins; carpels (2 or)3–5 16. *Eriobotrya*
 - 10b. Sepals caducous in fruit; inflorescence racemose, rarely paniculate; leaves with curved lateral veins; carpels 2(or 3) 17. *Rhaphiolepis*
 - 6b. Inflorescence umbellate or racemose, sometimes flowers fascicled or solitary.
 - 11a. Carpels 3- to many seeded.
 - 12a. Styles free; branches inermous; leaves entire 19. *Cydonia*
 - 12b. Styles connate at base; branches sometimes spiny; leaves serrate or entire.
 - 13a. Calyx densely pubescent abaxially, with persistent lobes; ovules 3–10 per locule; flowers fascicled or 2–5 in umbellate inflorescence 20. *Docynia*
 - 13b. Calyx glabrous abaxially, with caducous lobes; ovules many per locule; flowers solitary or fascicled 21. *Chaenomeles*
 - 11b. Carpels 1- or 2-seeded.
 - 14a. Ovary and fruit incompletely 6–10-loculed, with 1 ovule per locule 24. *Amelanchier*
 - 14b. Ovary and fruit 2–5-loculed, with 2 ovules per locule.
 - 15a. Plant evergreen; flowers in erect racemes or sometimes panicles; fruit black, smaller, 2-loculed, with caducous sepals 17. *Rhaphiolepis*
 - 15b. Plant deciduous; flowers in umbel-like racemes; fruit yellow, yellowish green, red, or brown, larger, 2–5-loculed, with persistent or caducous sepals.
 - 16a. Styles free; fruit usually pear-shaped, with numerous grit cells; inflorescence corymbose-racemose 22. *Pyrus*

- 16b. Styles connate basally; fruit usually apple-shaped, without or with few grit cells;
inflorescence a fascicle 23. *Malus*

9. DICHOTOMANTHES Kurz, J. Bot. 11: 194. 1873.¹²

牛筋条属 niu jin tiao shu

Lu Lingdi (陆玲娣 Lu Ling-ti); Stephen A. Spongberg

Shrubs or small trees. Leaves alternate, simple, venation camptodromous, margin entire, rarely serrate; stipules caducous, small; petiole short. Inflorescences terminal, compound-corymbose, many flowered; bracts usually caducous. Hypanthium campanulate. Calyx fleshy and enlarged in fruit, with 2 bracteoles basally; sepals 5, white, suborbicular or obovate. Stamens (15–)20; filaments alternately shorter; anthers didymous. Carpel 1, inserted at base of hypanthium; ovary superior, 1-loculed; style subterminal to lateral; stigma discoid, margin irregular; ovules 2, collateral, erect. Fruit dry, usually exserted from fleshy hypanthium, sepals persistent and erect; carpel leathery, 1-seeded; seeds compressed; cotyledons plano-convex.

- One species.

1. *Dichotomanthes tristanii* Kurz, J. Bot. 11: 195. 1873.

牛筋条 niu jin tiao

Shrubs to small trees, 2–7 m tall. Branchlets grayish brown to grayish black when old, initially densely yellowish white tomentose, glabrescent, glabrous when old; buds ovoid, small, initially tomentose, gradually glabrescent, apex obtuse or ± acute. Petiole 4–6 mm, thick, densely yellowish white tomentose; stipules caducous, filiform; leaf blade elliptic to oblong-lanceolate, sometimes obovate or oblanceolate, 3–6 × 1.5–2.5 cm, lateral veins 7–12 pairs, abaxially initially densely yellowish white tomentose, later thinly so or glabrescent, adaxially glabrous or with few hairs only along midvein, base cuneate to rounded, margin entire, rarely sparsely serrate above middle, apex acute or obtuse, usually abruptly pointed. Inflorescences 2–5 × 3–6 mm; rachis and pedicels yellowish white tomentose; bracts caducous, lanceolate, membranous. Pedicel 1–3 mm. Flowers 5–9 mm in diam. Hypanthium 2–3 mm, both sides densely tomentose. Sepals green, triangular, shorter than hypanthium, margin toothed, apex obtuse. Petals white, suborbicular or broadly ovate, 3–4 mm, base shortly clawed, apex obtuse or emarginate. Stamens (15–)20, shorter than petals; filaments glabrous, smooth. Ovary pubescent abaxially; style subterminal to lateral at anthesis, becoming subterminal at fruiting, not exceeding stamens, glabrous; stigma discoid-capitate, lobulate. Fruit red, long terete, 5–7 mm, hard, glabrous except apex slightly shortly pubescent, exserted from fleshy hypanthium, base of style forming a small apicula. Fl. Apr–May, fr. Aug–Nov.

- Mixed forests, evergreen forest margins, slopes; 1300–2500 m. Sichuan, Yunnan.

1a. Leaves abaxially initially densely

yellowish white tomentose, thinly
so when old 1a. var. *tristanii* Kurz

- 1b. Leaves abaxially initially densely
yellowish white tomentose, gradually
glabrescent, subglabrous or slightly
pubescent only along midvein
when old 1b. var. *glabrata* Sargent

1a. *Dichotomanthes tristanii* Kurz var. *tristanii* Kurz

牛筋条(原变种) niu jin tiao (yuan bian zhong)

Leaf blade initially densely yellowish white tomentose abaxially, thinly so when old.

- Mixed forests, evergreen forest margins, open slopes; 1500–2500 m. Sichuan, Yunnan.

1b. *Dichotomanthes tristanii* Kurz var. *glabrata* Sargent, Pl. Wilson. 2: 344. 1915.

光叶牛筋条 guang ye niu jin tiao

Dichotomanthes tristanii Kurz f. *glabrata* (Sargent) C. Y. Wu & Lihua Zhou.

Leaf blade initially densely yellowish white tomentose abaxially, gradually glabrescent, subglabrous or slightly pubescent only along midvein when old.

- Slopes; 1300–1500 m. S Yunnan (Simao Xian).

Wu Zhengyi (editor's note) believes this variety is merely a form occurring on the southern margin of the distribution of the species.

10. COTONEASTER Medikus, Philos. Bot. 1: 154. 1789.

栒子属 xun zi shu

Lu Lingdi (陆玲娣 Lu Ling-ti); Anthony R. Brach

Shrubs, rarely small trees, erect, decumbent, or prostrate, deciduous, semievergreen, or evergreen. Branchlets mostly terete, rarely slightly angulate, unarmed. Winter buds small; scales several, imbricate, exposed. Leaves alternate, simple, shortly petiolate; stipules caducous, usually subulate, small; margin of leaf blade entire, venation camptodromous. Inflorescences terminal or axillary,

¹²Extensive contributions were received from Kenneth R. Robertson (ILLIS), Herbarium, Illinois Natural History Survey, 607 East Peabody Drive, 172 Natural Resources Building, Champaign, Illinois 61820-6970, U.S.A.

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cymose or corymbose, sometimes flowers several fascicled or solitary. Hypanthium turbinate or campanulate, rarely cylindrical, adnate to ovary. Sepals 5, persistent, short. Petals 5, erect or spreading, imbricate in bud, white, pink, or red. Stamens 10–20(–22), inserted in mouth of hypanthium. Ovary inferior or semi-inferior, 2–5-loculed; carpels 2–5, connate abaxially, free adaxially; ovules 2 per carpel, erect; styles 2–5, free; stigmas dilated. Fruit a drupe-like pome, red, brownish red, or orange to black, with persistent, incurved, fleshy sepals, containing pyrenes; pyrenes (1 or)2–5, bony, 1-seeded; seeds compressed; cotyledons plano-convex.

About 90 species in the broad sense: widespread in temperate N Africa, Asia (except Japan), Central America (Mexico), and Europe, most abundant in SW China; 59 species (37 endemic) in China.

The shrubs are widely planted as ornamentals for their attractive fruits and flowers, and as borders, hedges, and ground cover. Further studies are necessary to clarify a taxonomy complicated by hybridization and apomixis.

- 1a. Inflorescences compact compound corymbs, more than 20-flowered; petals white, spreading; leaves large, more than 2.5 cm.
 - 2a. Leaf blade abaxially initially pilose, glabrate.
 - 3a. Leaf blade elliptic to ovate, apex obtuse or acute; fruit reddish yellow, ovoid to obovoid, 6–7 mm in diam. 8. *C. glaucophyllus*
 - 3b. Leaf blade oblong-lanceolate to oblong-oblongeolate, apex acuminate or acute; fruit red, globose, 4–5 mm in diam. 9. *C. glabratus*
 - 2b. Leaf blade abaxially persistently densely tomentose.
 - 4a. Deciduous shrub to small tree.
 - 5a. Leaf blade narrowly elliptic to ovate-lanceolate; fruit bright red, ellipsoid, 4–5 mm in diam. 6. *C. frigidus*
 - 5b. Leaf blade ovate or elliptic-ovate; fruit purplish brown to black, ovoid, 6–8 mm in diam. 7. *C. affinis*
 - 4b. Evergreen or semievergreen shrub.
 - 6a. Leaf blade abaxially persistently densely tomentose, apex obtuse or acute.
 - 7a. Inflorescences densely yellow tomentose; fruit obovoid; leaf blade obovate to elliptic 4. *C. coriaceus*
 - 7b. Inflorescences densely gray tomentose; fruit turbinate; leaf blade obovate-lanceolate to oblong-lanceolate 5. *C. turbinatus*
 - 6b. Leaf blade abaxially initially tomentose, glabrescent, apex acute to acuminate.
 - 8a. Pedicel very short or nearly absent; inflorescences 2–3.5 cm; fruit ellipsoid, pyrenes always 2 3. *C. harrovianus*
 - 8b. Pedicel 2–4 mm; inflorescences 3–5 cm; fruit subglobose or pyriform, pyrenes 2–4.
 - 9a. Leaf blade adaxially shallowly rugose, abaxially glaucous and tomentose; fruit subglobose 1. *C. salicifolius*
 - 9b. Leaf blade adaxially deeply rugose, abaxially yellow tomentose; fruit pyriform 2. *C. rhytidophyllus*
- 1b. Inflorescences lax corymbs, fewer than 20-flowered, sometimes reduced to a solitary flower; petals pink and erect, or white and spreading; leaves often smaller.
 - 10a. Corymb 3–15(–20)-flowered, sometimes reduced to a solitary flower; leaf blade longer than 2 cm, rarely slightly shorter.
 - 11a. Petals white, spreading; fruit red.
 - 12a. Leaf blade abaxially glabrous or slightly pilose.
 - 13a. Pedicel and abaxial surfaces of leaf blade and hypanthium sparsely pilose 15. *C. submultiflorus*
 - 13b. Pedicel and abaxial surfaces of leaf blade and hypanthium glabrous 16. *C. multiflorus*
 - 12b. Leaf blade abaxially tomentose, rarely tomentose-villous.
 - 14a. Hypanthium abaxially glabrous.
 - 15a. Leaf blade oblong-elliptic, abaxially gray tomentose, sometimes adaxially initially pubescent; petals 3.5–4 mm; fruit purplish red, with slightly glaucous bloom, obovoid 13. *C. mongolicus*
 - 15b. Leaf blade elliptic to broadly ovate, abaxially tomentose-villous, with glaucous bloom, always adaxially glabrous; petals 5–6 mm; fruit dark red, ovoid, rarely oblong 14. *C. hebephyllus*
 - 14b. Hypanthium abaxially tomentose or villous.
 - 16a. Semievergreen shrub; anthers purplish red; leaf blade leathery; fruit with 2 pyrenes 10. *C. pannosus*
 - 16b. Deciduous shrub; anthers yellow; leaf blade herbaceous; fruit with 1 or 2 pyrenes.
 - 17a. Leaf blade apically obtuse, abaxially white tomentose; hypanthium abaxially tomentose; petals 2.5–3.5 mm; fruit ovoid to ellipsoid 11. *C. soongoricus*
 - 17b. Leaf blade apically acute, rarely obtuse, abaxially gray tomentose; hypanthium abaxially villous; petals 4–5 mm; fruit subglobose 12. *C. silvestrii*
 - 11b. Petals pink, very rarely white, erect; fruit red, rarely black (*C. melanocarpus*, *C. tenuipes*).
 - 18a. Leaf blade abaxially tomentose; fruit red, rarely black.
 - 19a. Hypanthium abaxially glabrous or slightly puberulous.
 - 20a. Fruit black; inflorescences 3–15-flowered, rachis tomentose 29. *C. melanocarpus*
 - 20b. Fruit red; inflorescences 2–7-flowered, rachis glabrous to pilose.
 - 21a. Hypanthium abaxially puberulous; flowers 2–4 in short fascicles, nearly 1/2 as long as leaves 26. *C. oliganthus*

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- 21b. Hypanthium abaxially glabrous; flowers 2–7 in corymbs.
- 22a. Inflorescences nearly 1/2 as long as leaves; rachis and pedicels glabrous, rarely puberulous; leaf blade broadly elliptic, broadly ovate, or suborbicular; fruit subglobose, rarely ovoid, glabrous 27. *C. integerrimus*
- 22b. Inflorescences nearly as long as leaves; rachis and pedicels pilose; leaf blade ovate to oblong-ovate; fruit obovoid, puberulous 28. *C. gracilis*
- 19b. Hypanthium abaxially densely tomentose or pilose.
- 23a. Leaf blade apically obtuse, rarely acute.
- 24a. Fruit black, ovoid, with 1 or 2 pyrenes; inflorescences 2–4-flowered 19. *C. tenuipes*
- 24b. Fruit red, globose to ovoid or obovoid, with 2 or 3 pyrenes; inflorescences 3–15-flowered.
- 25a. Leaf blade elliptic to ovate; inflorescences 3- to more than 10-flowered; fruit obovoid or ovoid-globose, with 2 pyrenes 17. *C. zabelii*
- 25b. Leaf blade broadly ovate to suborbicular; inflorescences 10–15-flowered; fruit oblong, with 3 pyrenes 18. *C. fangianus*
- 23b. Leaf blade apically acute to acuminate.
- 26a. Rachis, pedicels, and hypanthium abaxially glabrous; fruit purplish black, subglobose, with 5 pyrenes 25. *C. reticulatus*
- 26b. Rachis, pedicels, and hypanthium abaxially pubescent; fruit red or orangish red, obovoid, ovoid, or subglobose, with 2–5 pyrenes.
- 27a. Rachis, pedicels, and hypanthium abaxially densely white tomentose; petals white; fruit obovoid, pyrenes 2 20. *C. wardii*
- 27b. Rachis, pedicels, and hypanthium abaxially pilose; petals usually pink, sometimes white or red; fruit subglobose to obovoid, pyrenes 3–5 or if pyrenes 2, then fruit ovoid.
- 28a. Inflorescences 5–11-flowered; fruit orangish red, with 3–5 pyrenes 24. *C. franchetii*
- 28b. Inflorescences 3–7(–11)-flowered; fruit dark or bright red, with 2–5 pyrenes.
- 29a. Fruit ovoid, dark red, with 2 or 3 pyrenes; petals red 23. *C. obscurus*
- 29b. Fruit subglobose or obovoid, bright red, with 3–5 pyrenes; petals white or pink.
- 30a. Inflorescences 2-flowered; petals pink; leaf blade elliptic to ovate, abaxially densely tomentose; fruit subglobose or obovoid, with 3–5 pyrenes 21. *C. dielsianus*
- 30b. Inflorescences 3–11-flowered; petals white; leaf blade ovate-lanceolate to oblong-ovate, abaxially sparsely tomentose; fruit subglobose, with 5 pyrenes 22. *C. glomerulatus*
- 18b. Leaf blade abaxially glabrous or pilose.
- 31a. Fruit red.
- 32a. Hypanthium abaxially glabrous when old; flowers 5–13 in corymbs; leaf blade adaxially conspicuously rugose, veins prominently raised abaxially; styles 4 or 5; fruit with 4 or 5 pyrenes 33. *C. bullatus*
- 32b. Hypanthium abaxially slightly puberulous; flowers 1–9; leaf blade adaxially not rugose, veins raised but not prominently; styles 2; fruit with 2 pyrenes.
- 33a. Flowers (1 or)2 or 3(–5); leaf blade elliptic-ovate to ovate-lanceolate, adaxially pilose; fruit ellipsoid 30. *C. acuminatus*
- 33b. Flowers 3–9; leaf blade elliptic-lanceolate, adaxially glabrous or initially pilose, glabrescent; fruit subglobose or obovoid.
- 34a. Leaf blade elliptic-lanceolate; fruit subglobose, glabrous 31. *C. nitidifolius*
- 34b. Leaf blade broadly elliptic or broadly ovate, sometimes obovate or suborbicular; fruit obovoid, pilose or subglabrous 32. *C. schantungensis*
- 31b. Fruit black.
- 35a. Hypanthium abaxially glabrous or subglabrous; inflorescences 5–10-flowered; fruit ovoid or subglobose 37. *C. ambiguus*
- 35b. Hypanthium abaxially pilose; inflorescences 2–25-flowered; fruit ellipsoid, obovoid, or subglobose.
- 36a. Leaf blade apically acute; inflorescences 2–5-flowered; fruit ellipsoid or obovoid, with 2 or 3 pyrenes 34. *C. acutifolius*
- 36b. Leaf blade apically acuminate; inflorescences 3–25-flowered; fruit subglobose or obovoid, with 3–5 pyrenes.
- 37a. Inflorescences 9–25-flowered; leaf blade adaxially rugose and conspicuously bullate; pyrenes 4 or 5, smooth 35. *C. moupinensis*
- 37b. Inflorescences 3–7-flowered; leaf blade adaxially not bullate, veins slightly impressed; pyrenes 3 or 4, furrowed and shallowly pitted on back 36. *C. foveolatus*
- 10b. Inflorescences solitary flowers, rarely 2- or 3(–7)-flowered (but 3–9(–11)-flowered in *C. sherriffii*); leaf blade often less than 2 cm, rarely slightly longer.
- 38a. Petals white, spreading; fruit red, with 2 or 3(–5) pyrenes; prostrate or low evergreen shrub.

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- 39a. Abaxial surfaces of leaf blade and hypanthium tomentose 38. *C. buxifolius*
- 39b. Abaxial surfaces of leaf blade and hypanthium pilose.
- 40a. Leaf blade ovate or oblong-ovate to elliptic, rarely obovate; fruit with 2–5 pyrenes.
- 41a. Leaf blade elliptic to oblong-elliptic, 1–2(–3) cm; fruit subglobose, with 4 or 5 pyrenes 39. *C. dammeri*
- 41b. Leaf blade ovate or oblong-ovate, rarely obovate, 0.9–1.5 cm; fruit ellipsoid-ovoid or ellipsoid, with 2 or 3 pyrenes 40. *C. morrisonensis*
- 40b. Leaf blade suborbicular, ovate, obovate, or elliptic to oblanceolate; fruit with 1 or 2 pyrenes.
- 42a. Leaf blade elliptic, oblong or obovate to oblong-obovate, rarely oblanceolate, base cuneate.
- 43a. Flowers solitary, rarely 2 or 3; shrub prostrate or suberect; leaf blade obovate to oblong-obovate, margin slightly revolute.
- 44a. Prostrate shrubs; leaf blade obovate to oblong-obovate, 4–10 mm; fruit scarlet-red, 5–7 mm in diam. 41. *C. microphyllus*
- 44b. Suberect shrubs; branches spreading to 40 cm; leaf blade elliptic to oblanceolate, rarely oblong, 6–16(–20) mm; fruit bright scarlet, 8–10 mm in diam. 42. *C. conspicuus*
- 43b. Flowers 3–9(–11); shrub erect; leaf blade oblong-obovate, rarely oblanceolate, margin not revolute 43. *C. sherriffii*
- 42b. Leaf blade suborbicular or broadly ovate, base broadly cuneate to rounded.
- 45a. Leaf blade adaxially glabrous, abaxially pilose; flowers 1–3, petals white or tinged reddish, spreading; fruit red, obovoid, with 2 or 3 pyrenes 44. *C. rotundifolius*
- 45b. Leaf blade villous on both surfaces; flowers solitary, petals pink, erect; fruit dark red, ovoid-globose, with 2 pyrenes 51. *C. langei*
- 38b. Petals red, rarely pink, erect; fruit red, rarely purplish black, with 1 (or)2 or 3(or 4) pyrenes; spreading or erect, deciduous or semievergreen shrub.
- 46a. Leaf blade abaxially densely tomentose; flowers usually solitary.
- 47a. Petals red; hypanthium abaxially pilose; leaf blade suborbicular or broadly elliptic, apex obtuse, abaxially persistently yellow tomentose 45. *C. rubens*
- 47b. Petals pink; hypanthium abaxially glabrous; leaf blade ovate, rarely ovate-elliptic, apex acute or obtuse, abaxially tomentose, gradually glabrescent, subglabrous when old 46. *C. uniflorus*
- 46b. Leaf blade abaxially glabrous or pilose; flowers 1–3(or 4).
- 48a. Hypanthium abaxially glabrous; erect shrub.
- 49a. Stems irregularly branched; fruit subglobose, sessile, erect.
- 50a. Leaf apically apiculate, rarely emarginate, blade suborbicular or orbicular-ovate, rarely broadly obovate, glabrous on both surfaces or slightly puberulous only along veins abaxially; petals pinkish 58. *C. apiculatus*
- 50b. Leaf apically acute, sometimes obtuse, blade ovate or elliptic-ovate, pilose on both surfaces; petals red 59. *C. sanguineus*
- 49b. Stems ± distichously branched; fruit obovoid or globose, shortly pedicellate, pendent.
- 51a. Branchlets conspicuously verruculose; leaf apically emarginate or partly mucronulate; flowers solitary 57. *C. verruculosus*
- 51b. Branchlets strigose, not verruculose; leaf apically acute or obtuse; flowers 1–3.
- 52a. Flowers solitary; stamens 20; leaf blade broadly ovate or broadly obovate, apex acute, rarely obtuse 55. *C. nitidus*
- 52b. Flowers 2 or 3; stamens 10; leaf blade suborbicular or broadly ovate, apex obtuse or acute 56. *C. taylorii*
- 48b. Hypanthium abaxially pubescent; prostrate or erect shrub.
- 53a. Prostrate low shrub; flowers solitary or in pairs.
- 54a. Stems horizontally spreading, regularly distichously branched 49. *C. horizontalis*
- 54b. Stems tufted on ground, irregularly branched.
- 55a. Leaf blade thinly papery, margin undulate; fruit subglobose, 7–9 mm in diam., pyrenes 2 or 3 47. *C. adpressus*
- 55b. Leaf blade leathery, margin thick, not undulate; fruit ovoid, 5–6 mm in diam., pyrenes 2 48. *C. subadpressus*
- 53b. Erect shrub; flowers 2 or 3(or 4).
- 56a. Fruit black.
- 57a. Leaf apically obtuse, rarely acute, blade ovate, rarely elliptic, adaxially glabrous, abaxially villous or subglabrous; fruit ellipsoid, pyrenes 1 or 2 53. *C. nitens*
- 57b. Leaf apically acute to acuminate, blade elliptic to ovate-elliptic, both surfaces appressed strigose-villous; fruit ovoid or subglobose, pyrenes 2 or 3 54. *C. harrismithii*
- 56b. Fruit red.
- 58a. Branchlets verruculose; leaf blade appressed pilose on both surfaces; fruit with 3 pyrenes 52. *C. chengkangensis*

58b. Branchlets not verruculose; leaf blade strigose-villous or subglabrous, fruit with 2 pyrenes.

59a. Leaf blade elliptic or broadly elliptic, rarely obovate, abaxially slightly puberulous, adaxially subglabrous, apex acute, rarely \pm obtuse; fruit ellipsoid, shortly stalked 50. *C. divaricatus*

59b. Leaf blade broadly ovate to suborbicular, both surfaces strigose-villous, apex obtuse, rarely acute; fruit ovoid-globose, subsessile 51. *C. langei*

1. *Cotoneaster salicifolius* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 8: 225. 1885.

柳叶栒子 liu ye xun zi

Shrubs evergreen, rarely semievergreen, to 5 m tall, with spreading to erect branches. Branchlets reddish brown to grayish brown, initially densely tomentose, glabrescent. Petiole often red, robust, 4–5 mm, tomentose; stipules caducous, brown, linear or linear-lanceolate, 4–7 mm, membranous, tomentulose; leaf blade elliptic-oblong to ovate-lanceolate or linear-lanceolate, 4–8.5 \times 1.5–2.5 cm, lateral veins 12–16 pairs, prominently raised abaxially and impressed adaxially, abaxially gray tomentose, with bloom, adaxially glabrous or pilose, rugose, base cuneate, margin entire, revolute or not, apex acute or acuminate. Compound corymbs 3.5–6 \times 3–4 cm, many flowered; rachis and pedicels densely gray tomentose; bracts caducous, linear, 3–5 mm, tomentulose. Pedicel 2–4 mm. Flowers 5–6 mm in diam. Hypanthium campanulate, abaxially gray tomentose. Sepals triangular, 1.5–2.5 mm, apex acute to shortly acuminate. Petals spreading, white, ovate or suborbicular, 2.5–4 \times 3–4 mm, glabrous, base shortly clawed, apex obtuse. Stamens 20, slightly longer than or nearly as long as petals; anthers purple. Ovary pilose apically; styles 2 or 3, free, somewhat not exceeding stamens. Fruit scarlet, subglobose, obovoid, or ovoid, 3–7 mm in diam.; pyrenes 2 or 3. Fl. Jun, fr. Oct. $2n = 34^*$.

• Mountain regions, mixed forests, slopes, open places; 400–3000 m. Guizhou, Hubei, Hunan, Sichuan, Yunnan.

1a. Leaf blade narrow, linear-lanceolate, adaxially glabrous, deeply rugose, margin revolute, veins deeply impressed, abaxially floccose-tomentose; fruit obovoid, 3–4 mm in diam., with 2 pyrenes 1d. var. *angustus*

1b. Leaf blade broader, elliptic-oblong or ovate-lanceolate, adaxially pilose or glabrous, margin not revolute or revolute, veins slightly to deeply impressed, abaxially gray tomentose; fruit subglobose or ovoid, 5–7 mm in diam., with 2 or 3 pyrenes.

2a. Leaf blade adaxially pilose, veins slightly impressed; fruit ovoid 1c. var. *henryanus*

2b. Leaf blade adaxially glabrous, veins deeply impressed; fruit subglobose.

3a. Leaf blade adaxially shallowly rugose, margin not revolute, veins slightly impressed 1a. var. *salicifolius*

3b. Leaf blade adaxially deeply rugose, margin revolute, veins deeply impressed 1b. var. *rugosus*

1a. *Cotoneaster salicifolius* var. *salicifolius*

柳叶栒子(原变种) liu ye xun zi (yuan bian zhong)

Cotoneaster floccosus (Rehder & E. H. Wilson) Flinck &

Hylmö; *C. salicifolius* var. *floccosus* Rehder & E. H. Wilson.

Leaf blade elliptic-oblong or ovate-lanceolate, abaxially shallowly rugose, veins slightly impressed. Fruit subglobose, 5–7 mm in diam. $2n = 34^*$.

• Mountain regions, mixed forests along river banks; 1800–3000 m. Guizhou, Hubei, Hunan, Sichuan, Yunnan.

1b. *Cotoneaster salicifolius* var. *rugosus* (E. Pritzel) Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 172. 1912.

皱叶柳叶栒子 zou ye liu ye xun zi

Cotoneaster rugosus E. Pritzel, Bot. Jahrb. Syst. 29: 385. 1900; *C. hylmoei* Flinck & J. Fryer.

Leaf blade elliptic-oblong, adaxially deeply rugose, margin revolute, veins deeply impressed. Fruit subglobose, ca. 6 mm in diam. $2n = 68^*$.

• Slopes; 400–1900 m. W Hubei, E Sichuan.

1c. *Cotoneaster salicifolius* var. *henryanus* (C. K. Schneider) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 121. 1974.

大叶柳叶栒子 da ye liu ye xun zi

Cotoneaster rugosus E. Pritzel var. *henryanus* C. K. Schneider, Ill. Handb. Laubholz. 1: 758. 1906; *C. henryanus* (C. K. Schneider) Rehder & E. H. Wilson.

Leaf blade elliptic-oblong, adaxially pilose, veins slightly impressed. Fruit ovoid, 5–7 mm in diam. $2n = 34^*$.

• Open places; 700–1900 m. W Hubei, Sichuan.

1d. *Cotoneaster salicifolius* var. *angustus* T. T. Yu, Acta Phytotax. Sin. 8: 219. 1963.

窄叶柳叶栒子 zhai ye liu ye xun zi

Cotoneaster angustus (T. T. Yu) G. Klotz.

Leaf blade linear-lanceolate, abaxially glabrous, deeply rugose, margin revolute, veins deeply impressed. Fruit obovoid, 3–4 mm in diam.

• Mixed forests; 1400–1600 m. W Sichuan.

2. *Cotoneaster rhytidophyllus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 175. 1912.

麻叶栒子 ma ye xun zi

Shrubs evergreen or semievergreen, to 2 m tall. Branchlets reddish brown, terete, stout, initially densely yellow tomentose, glabrous when old. Petiole robust, 3–5 mm, densely yellow tomentose; stipules caducous, reddish, membranous, pilose; leaf blade yellowish green adaxially, elliptic-oblong or ovate-oblong to oblong-lanceolate, 4–7 \times (1.3–)1.8–3 cm, thickly leathery, midvein conspicuously raised abaxially and deeply impressed adaxially, lateral veins 5–8 pairs, abaxially densely yellow to-

mentose, adaxially deeply rugose, initially sparsely villous, glabrescent, base cuneate, margin revolute, apex acuminate, rarely acute. Compound corymbs 3–4 cm, many flowered; rachis and pedicels densely yellow tomentose; bracts linear, pilose. Pedicel 2–4 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially densely yellow tomentose. Sepals triangular, apex acute. Petals spreading, white, broadly obovate to suborbicular, adaxially slightly pilose near base, base clawed, apex obtuse. Stamens 20, longer than or ca. as long as petals. Ovary pilose apically; styles 2(or 3), free, nearly as long as stamens. Fruit orangish red, pyriform, 5–6 × 4–5 mm; pyrenes 2–4. Fl. May–Jun, fr. Sep–Oct.

• Rocky mountains, cliffs, forests, waste places, dry places; 1200–2600 m. Guizhou, Sichuan.

3. *Cotoneaster harrovianus* E. H. Wilson, Gard. Chron., ser. 3, 51: 3. 1912.

蒙自栒子 meng zi xun zi

Shrubs evergreen, 1.5–2 m tall, much branched. Branchlets dark brown, initially yellowish gray appressed tomentose, glabrous when old. Petiole 4–5 mm, pilose; stipules lanceolate, 4–5 mm, membranous, pilose; leaf blade elliptic-oblong or ovate, rarely obovate-oblong, 2.5–5 × 1.2–2 cm, subleathery, midvein prominently raised abaxially and impressed adaxially, lateral veins 8–10 pairs, abaxially initially densely tomentose, glabrous when old, with glaucous bloom, adaxially initially puberulous, later subglabrous, slightly rugose, base cuneate, apex acute or shortly acuminate. Compound corymbs 2–3.5 × 3–5 cm, densely many flowered; rachis and pedicels densely villous; bracts linear-lanceolate or subulate, 3–5 mm, pubescent. Pedicel very short or nearly absent. Flowers 5–6 mm in diam. Hypanthium campanulate, abaxially densely tomentose. Sepals triangular, 1.5–2 mm, apex acute. Petals spreading, broadly ovate or suborbicular, 2–3 × 2–2.5 mm, puberulous near base, base nearly not clawed, apex obtuse and erose. Stamens 20, slightly shorter than petals; anthers purple, capitate. Ovary pilose apically; styles 2, free, nearly as long as stamens. Fruit dark red, ellipsoid, 7–8 mm in diam.; pyrenes usually 2. Fl. May–Jun, fr. Aug–Sep.

• Waste places or slopes; 1500–1600 m. SE Yunnan.

4. *Cotoneaster coriaceus* Franchet, Pl. Delavay. 222. 1890.

厚叶栒子 hou ye xun zi

Cotoneaster lacteus W. W. Smith; *C. oligocarpus* C. K. Schneider; *C. smithii* G. Klotz.

Shrubs evergreen, 1–3 m tall. Branchlets dark purplish brown to grayish brown, cylindrical, initially densely yellow tomentose, glabrous when old. Petiole 4–8 mm, initially densely yellow tomentose, subglabrous when old; stipules linear-lanceolate, 4–5 mm, sparsely tomentose or glabrescent at fruiting; leaf blade obovate to elliptic, 2–4.5 × 1.2–2.8 cm, thickly leathery, midvein prominently raised abaxially and deeply impressed adaxially, lateral veins 7–10 pairs, abaxially densely yellow tomentose, adaxially lustrous, glabrous, base cuneate, margin entire, apex obtuse or acute and mucronate. Compound corymbs 3–5(–6) × 4–7 cm, densely many small flowered;

rachis and pedicels densely yellow tomentose; bracts caducous, linear-lanceolate, 2–4 mm, slightly tomentose. Pedicel 1–2 mm. Flowers 4–5 mm in diam. Hypanthium campanulate, densely tomentose. Sepals triangular, 1.5–2 mm, apex acute. Petals spreading, white, broadly ovate or suborbicular, 2.5–3.5 × 2.5–3 mm, adaxially tomentulose near base, base shortly clawed, apex obtuse. Stamens 20, shorter than petals. Ovary tomentose apically; styles 2, free, nearly as long as stamens. Fruit red, obovoid, 4–6 × 4–5 mm, sparsely tomentulose; pyrenes 2. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Grassy slopes along river sides or thickets; 1800–2700 m. Guizhou, Sichuan, Xizang, Yunnan.

5. *Cotoneaster turbinatus* Craib, Bot. Mag. 140: t. 8546. 1914.

陀螺果栒子 tuo luo guo xun zi

Shrubs evergreen, 3–5 m tall, with spreading branches. Branchlets grayish brown to blackish brown, initially densely gray tomentose, glabrous when old. Petiole 4–7 mm, tomentose; stipules caducous or partly persistent, brownish, linear, 3–5 mm, tomentose; leaf blade obovate-lanceolate to oblong-lanceolate, 2.5–5 × 1–2 cm, midvein distinctly raised abaxially and impressed adaxially, lateral veins 8–10 pairs, abaxially densely gray tomentose, adaxially glabrous or with few white soft hairs along midvein, base cuneate, apex acute and abruptly mucronate. Compound corymbs 2.5–4.5 × 4–5 cm, many flowered; rachis and pedicels densely gray tomentose; bracts linear, 2–4 mm, tomentose. Pedicel 2–5 mm. Flowers 5–6 mm in diam. Hypanthium campanulate, abaxially gray tomentose. Sepals triangular, 1.5–2 mm, apex acute. Petals spreading, milky white, ovate or suborbicular, 2–3 mm in diam., adaxially puberulous near base, base shortly clawed, apex obtuse. Stamens 20, slightly shorter than petals. Ovary pilose apically; styles 2, free, ca. as long as stamens. Fruit pendent, dark red, turbinate, 4–5 mm, tomentose; pyrenes 2. Fl. Jun–Jul, fr. Sep–Oct.

• River banks, river valleys, gullies; 1800–2700 m. Guizhou, Hubei, Sichuan, Yunnan.

6. *Cotoneaster frigidus* Wallich ex Lindley, Bot. Reg. 15: t. 1229. 1829.

耐寒栒子 nai han xun zi

Cotoneaster himalaiensis Hortorum ex Zabel.

Shrubs or small trees, deciduous, to 10 m tall, with spreading branches. Branchlets purplish brown or grayish brown, angulate, initially tomentose, glabrescent. Petiole 4–7 mm, tomentose; stipules brown, linear-lanceolate, 4–6 mm, tomentulose; leaf blade narrowly elliptic to ovate-lanceolate, 3.5–8(–12) × 1.5–3(–4.5) cm, veins raised abaxially and slightly impressed adaxially, abaxially initially tomentose, gradually glabrescent, subglabrous when old, adaxially usually glabrous, base cuneate to broadly cuneate, apex acute or obtuse, sometimes mucronate with spiniform point. Compound corymbs dense, 4–6 × 3–5 cm, ca. 20–40-flowered; rachis and pedicels densely tomentose; bracts linear-lanceolate, 3–5 mm, tomentose. Pedicel 2–4 mm. Flowers 6–7 mm in diam. Hypanthium campanulate or shortly subcylindric, abaxially densely tomentose. Sepals triangular, 1–1.5 × 1.5–2 mm, apex obtuse. Petals spreading, white, broadly ovate or suborbicular, 3–3.5 mm and nearly as broad, glabrous

or puberulous adaxially near base, base shortly and broadly clawed, apex obtuse, rarely somewhat emarginate. Stamens 18–20, slightly shorter than petals. Ovary densely tomentose apically; styles 2, free, not exceeding stamens. Fruit bright red, ellipsoid, 4–5 mm in diam.; pyrenes 2. Fl. Mar–May, fr. Sep–Oct. $2n = 34$.

River valleys, broad-leaved deciduous forests on slopes; 2800–3300 m. Xizang [Bhutan, N India, Nepal, Sikkim].

7. *Cotoneaster affinis* Lindley, Trans. Linn. Soc. London 13: 101. 1822.

藏边栒子 zang bian xun zi

Cotoneaster bacillaris Lindley var. *affinis* (Lindley) J. D. Hooker; *C. frigidus* Lindley var. *affinis* (Lindley) Wenzig; *Mespilus affinis* (Lindley) D. Don.

Shrubs deciduous, to 5 m tall. Branchlets dark reddish brown, terete. Petiole 4–5 mm, densely yellow tomentose; stipules linear or lanceolate, tomentulose; leaf blade ovate or elliptic-ovate, 2.5–5 × 1.4–2 cm, midvein raised abaxially and impressed adaxially, abaxially densely yellow tomentose, gradually glabrescent, adaxially glabrous or puberulous only along midvein, base broadly cuneate, apex obtuse or acute. Compound corymbs 3–4 cm in diam., 15–30-flowered or more; rachis and pedicels densely yellow tomentose; bracts linear-lanceolate, tomentose. Pedicel 2–3 mm. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially tomentose. Sepals broadly triangular, apex acute. Petals spreading, white, suborbicular or ovate, 3–4 mm, adaxially pubescent near base, base shortly clawed, apex obtuse. Stamens 20, shorter than sepals. Ovary densely tomentose apically; styles 2, free, not exceeding stamens. Fruit purplish brown to black, ovoid, 6–8 mm in diam.; pyrenes 2. Fl. May–Jun, fr. Sep–Oct.

Slopes, mixed forests, thickets of river valleys; 1100–3900 m. SW Sichuan, S Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Sikkim].

8. *Cotoneaster glaucophyllus* Franchet, Pl. Delavay. 222. 1890.

粉叶栒子 fen ye xun zi

Shrubs semievergreen, 2–5 m tall, much branched. Branchlets robust, dark grayish brown, terete, initially densely yellow pubescent, glabrous when old. Petiole thick, 4–6 mm, initially yellow pubescent, later glabrous; stipules mostly caducous, lanceolate, 4–5 mm, puberulous; leaf blade elliptic or narrowly elliptic to ovate, (1.5–)3–6 × 1.5–2.5 cm, lateral veins 5–8 pairs, abaxially initially slightly pubescent or tomentose, glabrescent, with bloom, adaxially glabrous, base broadly cuneate to rounded, apex acute or obtuse. Compound corymbs to 3–5 cm, densely 6–12- or 40–50-flowered or more; rachis and pedicels pubescent or tomentose; bracts caducous, subulate, 2–3 mm, slightly pubescent. Pedicel 2–4 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially pilose. Sepals triangular, 1–2 × 1.5–2.5 mm, apex acute. Petals spreading, white, suborbicular or broadly obovate, 3–4 mm, adaxially puberulous near base, base shortly clawed, apex obtuse, rarely emarginate. Stamens 20, ca. as long as petals. Ovary puberulous apically; styles 2, free, nearly equaling or lower than stamens. Fruit reddish yellow, ovoid to obovoid, 6–7 mm in diam., glabrous when

mature; pyrenes usually 2. Fl. Jun–Jul, fr. Sep–Oct.

• Mixed forests, thickets, clearings, mountain regions and valleys; 1200–3000 m. Guangxi, Guizhou, Sichuan, Yunnan.

- 1a. Leaf blade 3–6 cm, abaxially white tomentose or with soft yellow hairs.
 - 2a. Inflorescences with soft yellow hairs, to 40-flowered 8a. var. *glaucophyllus*
 - 2b. Inflorescences initially white tomentose, glabrescent, to more than 50-flowered 8b. var. *serotinus*
- 1b. Leaf blade 1.5–3 cm, abaxially yellow tomentose or slightly pubescent.
 - 3a. Leaf blade abaxially initially densely yellow tomentose, glabrescent; inflorescences up to 40-flowered, larger, initially densely white tomentose 8c. var. *vestitus*
 - 3b. Leaf blade abaxially slightly pubescent or subglabrous; inflorescences 6–12-flowered, smaller, with soft hairs 8d. var. *meiophyllus*

8a. *Cotoneaster glaucophyllus* var. *glaucophyllus*

粉叶栒子(原变种) fen ye xun zi (yuan bian zhong)

Cotoneaster transens G. Klotz; *Photinia rosifoliolata* H. Léveillé.

Leaf blade 3–6 cm, abaxially initially slightly pubescent, later glabrous. Inflorescences to 40-flowered, with soft yellow hairs.

• Mixed forests on slopes, clearings; 1200–2800 m. Guangxi, Guizhou, Sichuan, Yunnan.

8b. *Cotoneaster glaucophyllus* var. *serotinus* (Hutchinson) L. T. Lu & A. R. Brach, Novon 12: 495. 2002.

多花粉叶栒子 duo hua fen ye xun zi

Cotoneaster serotinus Hutchinson, Bot. Mag. 146: t. 8854. 1920; *C. glaucophyllus* f. *serotinus* (Hutchinson) Stapf.

Leaf blade 4–6 cm, abaxially initially pubescent, gradually glabrescent. Inflorescences to more than 50-flowered, initially white tomentose, glabrescent.

• Mountain regions; 1900–3000 m. W Yunnan.

8c. *Cotoneaster glaucophyllus* var. *vestitus* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 21. 1917.

毛萼粉叶栒子 mao e fen ye xun zi

Cotoneaster vestitus (W. W. Smith) Flinck & Hylmö.

Leaf blade 2–2.5 × 1–2 cm, abaxially initially densely yellow tomentose, glabrescent. Inflorescences relatively large, to 40-flowered, initially densely white tomentose, glabrescent.

• Mixed forests, thickets, mountain regions; 2000–3000 m. W Yunnan.

8d. *Cotoneaster glaucophyllus* var. *meiophyllus* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 21. 1917.

小叶粉叶栒子 *xiao ye fen ye xun zi*

Cotoneaster arbusculus G. Klotz; *C. meiophyllus* (W. W. Smith) G. Klotz.

Leaf blade 1.5–3 × 1–2 cm, abaxially slightly pubescent or subglabrous. Inflorescences relatively small, 6–12-flowered, with soft hairs.

- Mountain valleys; 1900–2400 m. W Yunnan.

9. *Cotoneaster glabratus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 171. 1912.

光叶栒子 *guang ye xun zi*

Shrubs semievergreen, 3–5 m tall. Branchlets robust, purplish red to purplish black, terete, slightly angulate, initially sparsely appressed pubescent, gradually glabrescent. Petiole 5–7 mm, initially puberulous, later glabrous; stipules caducous, brown, lanceolate, 4–5 mm, membranous; leaf blade oblong-lanceolate to oblong-oblong-lanceolate, 4–9 × 1.5–3.3 cm, leathery, midvein slightly raised abaxially, lateral veins 7–10 pairs, abaxially with bloom, initially puberulous, glabrate, adaxially lucid, glabrous, base cuneate, apex acuminate or acute. Compound corymbs 3–6 × 3–5.5 cm, densely many flowered; rachis and pedicels sparsely pilose; peduncles 1.5–2.5 cm; bracts caducous, lanceolate, 3–5 mm, membranous, puberulous. Pedicel 2–3 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially sparsely pilose. Sepals ovate-triangular, 1–2 mm, apex acute. Petals spreading, white, ovate or suborbicular, 2.5–3 × 2–3 mm, glabrous, base shortly clawed, apex rounded. Stamens 20, unequal in length; anthers purple. Ovary puberulous apically; styles 2, free, somewhat not exceeding stamens. Fruit red, globose, 4–5 mm in diam.; pyrenes usually 2. Fl. Jun–Jul, fr. Sep–Oct.

- Rocky slopes, dense forests; 1600–2800 m. Guizhou, Hubei, Sichuan, Yunnan.

10. *Cotoneaster pannosus* Franchet, Pl. Delavay. 223. 1890.

毡毛栒子 *zhan mao xun zi*

Shrubs semievergreen, to 2 m tall. Branchlets dark grayish brown or purplish brown, thin, initially densely white tomentose, glabrescent. Petiole 2–7 mm, tomentose; stipules caducous, linear, pubescent; leaf blade narrowly elliptic, elliptic, or ovate, 2–3(–4) × 0.8–1.5 cm, leathery, midvein impressed adaxially, lateral veins 4–6 pairs, abaxially densely white tomentose, adaxially slightly pubescent or glabrous, base broadly cuneate, apex obtuse or acute. Corymbs 1–3 × 1.5–2.5 cm, to 10(–20)-flowered; rachis and pedicels densely tomentose; bracts caducous, linear, pubescent. Pedicel 2–3 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially densely tomentose. Sepals triangular, apex shortly acuminate or acute. Petals spreading, white, broadly ovate or suborbicular, 3–3.5 mm, base shortly clawed and puberulous adaxially, apex obtuse. Stamens 20, nearly as long as petals; anthers purplish red. Ovary pubescent apically; styles 2(or 3), free, ca. as long as stamens. Fruit dark red, globose or ovoid, 7–8 mm in diam.; pyrenes often 2. Fl. Jun, fr. Oct–Nov. $2n = 34^*$, 68^* .

- Thickets, rocky places, waste places in mountain regions, slopes;

1100–3200 m. Sichuan, Yunnan.

- 1a. Leaf blade elliptic or ovate, 2–3 cm 10a. var. *pannosus*
- 1b. Leaf blade narrowly elliptic, to 3–4 cm 10b. var. *robustior*

10a. *Cotoneaster pannosus* var. *pannosus*

毡毛栒子(原变种) *zhan mao xun zi (yuan bian zhong)*

Cotoneaster vernae C. K. Schneider.

Leaf blade elliptic or ovate, 2–3 cm, relatively broad. $2n = 68^*$.

- Thickets, rocky places, waste places in mountain regions; 1100–3200 m. Sichuan, Yunnan.

10b. *Cotoneaster pannosus* var. *robustior* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 24. 1917.

大叶毡毛栒子 *da ye zhan mao xun zi*

Cotoneaster robustior (W. W. Smith) Flinck & Hylmö.

Leaf blade narrowly elliptic, to 3–4 cm, relatively narrow.

- Thickets, slopes; 1800–2200 m. NW Yunnan.

11. *Cotoneaster soongoricus* (Regel & Herder) Popov, Bull. Soc. Imp. Naturalistes Moscou, n.s., 44: 128. 1935.

准噶尔栒子 *zhun ga er xun zi*

Shrubs deciduous, 1–2.5 m tall, with spreading or ascending branches. Branchlets grayish brown or reddish brown, terete, slender, initially densely gray tomentose, glabrous when old. Petiole (1.5–)2–5 mm, tomentose; leaf blade oblong to elliptic, suborbicular, or ovate, rarely obovate, (1–)1.5–5 × 1–2 cm, herbaceous, veins raised abaxially and slightly impressed adaxially, abaxially white tomentose, adaxially glabrous or slightly pilose, base rounded or broadly cuneate, apex usually obtuse and mucronate, sometimes emarginate. Corymbs 1.5–2 cm, 3–12-flowered; rachis and pedicels white tomentose. Pedicel 2–3 mm. Flowers 8–9 mm in diam. Hypanthium campanulate, abaxially tomentose. Sepals broadly triangular, 1–2 mm, subglabrous or glabrous, apex acute. Petals spreading, white, ovate to suborbicular, 2.5–3.5 × 2–3 mm, adaxially white puberulous near base, base shortly clawed, apex obtuse, rarely emarginate. Stamens 18–20, slightly shorter than petals; anthers yellow. Ovary densely white pubescent apically; styles 2, free, not exceeding stamens. Fruit red, ovoid to ellipsoid, (5–)7–10 mm; pyrenes 1 or 2. Fl. May–Jun, fr. Sep–Oct.

- Dry slopes, forests, forest margins, river and mountain valleys; 1400–2600 m. Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan.

- 1a. Leaf blade broadly elliptic, suborbicular, or ovate, 1.5–5 cm; fruit 7–10 mm 11a. var. *soongoricus*
- 1b. Leaf blade oblong to narrowly elliptic, rarely obovate, 1–1.5 cm; fruit 5–6 mm 11b. var. *microcarpus*

11a. *Cotoneaster soongoricus* var. *soongoricus*

准噶尔栒子(原变种) *zhun ga er xun zi (yuan bian zhong)*

Cotoneaster nummularia Fischer & C. A. Meyer var. *soongoricus* Regel & Herder, Bull. Soc. Imp. Naturalistes Moscou 39(2): 59. 1866; *C. fontanesii* Spach var. *soongoricus* Regel; *C. nummularia* var. *ovalifolius* Boissier; *C. racemiflorus* (Desfontaines) K. Koch var. *ovalifolius* (Boissier) Hurusawa; *C. racemiflorus* var. *soongoricus* (Regel & Herder) C. K. Schneider; *C. suavis* Pojarkova; *C. tibeticus* G. Klotz; *C. tomentellus* Pojarkova; *C. zayulensis* G. Klotz.

Leaf blade broadly elliptic, suborbicular, or ovate, 1.5–5 cm. Fruit 7–10 mm.

• Dry slopes, forests, forest margins, river valleys; 1400–2400 m. Gansu, Nei Mongol, Ningxia, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan.

Further study is necessary to determine the identity of *Cotoneaster albokermesinus* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

11b. *Cotoneaster soongoricus* var. *microcarpus* (Rehder & E. H. Wilson) G. Klotz, Wiss. Z. Martin-Luther-Univ. Halle-Wittenberg, Math.-Naturwiss. Reihe 6: 973. 1957.

小果准噶尔栒子 xiao guo zhun ga er xun zi

Cotoneaster racemiflorus (Desfontaines) K. Koch var. *microcarpus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 169. 1912; *C. microcarpus* (Rehder & E. H. Wilson) Flink & Hylmö; *C. potaninii* Pojarkova.

Leaf blade oblong to narrowly elliptic, rarely obovate, 1–1.5 cm. Fruit 5–6 mm.

• Mountain valleys; 2300–2600 m. Gansu, Hebei, Sichuan.

12. *Cotoneaster silvestrii* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 288. 1910.

华中栒子 hua zhong xun zi

Cotoneaster hupehensis Rehder & E. H. Wilson; *C. kangtinsensis* G. Klotz; *C. racemiflorus* (Desfontaines) K. Koch var. *veitchii* Rehder & E. H. Wilson; *C. veitchii* (Rehder & E. H. Wilson) G. Klotz.

Shrubs deciduous, 1–2 m tall. Branchlets reddish brown to grayish brown, slender, initially reddish brown pubescent, soon glabrescent. Petiole 3–5 mm, thin, tomentose; stipules caducous, linear, 3–5 mm, puberulous; leaf blade elliptic to ovate, 1.5–3.5 × 1–1.8 cm, herbaceous, lateral veins 4 or 5 pairs, raised abaxially and slightly impressed adaxially, abaxially thinly gray tomentose, adaxially glabrous or slightly appressed pubescent, base rounded or broadly cuneate, apex acute or obtuse, sometimes mucronate, rarely emarginate. Corymbs 3–7-flowered; rachis and pedicels thinly pubescent; peduncles 1–2 cm. Pedicel 1–3 mm. Flowers 9–10 mm in diam. Hypanthium campanulate, abaxially thinly villous. Sepals triangular, 1.5–2.5 mm, apex acute. Petals spreading, white, suborbicular, 4–5 mm in diam., adaxially white pubescent near base, base shortly clawed, apex emarginate. Stamens 20, somewhat shorter than petals; anthers yellow. Ovary white pubescent apically; styles 2, free, not exceeding stamens. Fruit red, subglobose, 7–8 mm in diam.; pyrenes 2, united into 1. Fl. May–Jun, fr. Aug–Sep. $2n =$

68*.

• Mixed forests; 500–2600 m. Anhui, Gansu, Henan, Hubei, Jiangsu, Jiangxi, Sichuan.

13. *Cotoneaster mongolicus* Pojarkova, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 17: 196. 1955.

蒙古栒子 meng gu xun zi

Cotoneaster tumeticus Pojarkova.

Shrubs deciduous, to 1.8 m tall. Branchlets spreading, dark reddish brown, terete, robust, initially white pubescent, glabrous when old. Petiole 2–3 mm, gray pubescent; stipules persistent, subulate, reddish brown, margin pubescent; leaf blade oblong-elliptic, (1.3–)2–3 × (0.5–)1–1.8 cm, veins raised abaxially, abaxially sparsely gray tomentose, adaxially lucid, glabrous or slightly pubescent, base cuneate, apex usually obtuse. Corymbs 3–6(or 7)-flowered; rachis and pedicels white pubescent; bracts subulate. Pedicel 2–3(–4) mm. Flowers 9–10 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals dark red, triangular, glabrous or sparsely pubescent only apically, apex subacute. Petals spreading, white, suborbicular, 3.5–4 mm, glabrous, margin irregularly emarginate, base not or shortly clawed. Stamens 20. Ovary densely pubescent apically; styles 2, free, not exceeding stamens. Fruit dark red or purplish red, obovoid, 8–9 mm, with slightly glaucous bloom, glabrous; pyrenes 2(or 3). Fr. Sep.

Dry stony places, thickets. Nei Mongol [E Mongolia].

14. *Cotoneaster hebeophyllus* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 273. 1912.

钝叶栒子 dun ye xun zi

Shrubs, sometimes treelike, deciduous, 1.5–3 m tall. Branchlets dark reddish brown, slender, initially pilose, soon glabrescent. Petiole 5–7 mm, sparsely tomentose-villous; stipules caducous at fruiting, linear-lanceolate, 3–4 mm, sparsely villous; leaf blade elliptic to broadly ovate, (1.5–)2–3 × (1–)1.2–2 cm, subleathery, abaxially sparsely tomentose-villous or tomentose, with glaucous bloom, adaxially glabrous, base broadly cuneate to rounded, apex obtuse or emarginate, mucronate. Corymbs (1–)1.5–3 cm, 5–15-flowered; rachis and pedicels sparsely villous; bracts linear-lanceolate, 2–3 mm, slightly villous. Pedicel 2–3 mm. Hypanthium campanulate, abaxially glabrous or slightly pilose near base. Sepals broadly triangular, abaxially glabrous or puberulous only apically, apex acute. Petals spreading, white, suborbicular, 5–6 mm in diam., adaxially puberulous near base, base very shortly clawed, apex obtuse. Stamens 20, slightly shorter than petals; anthers purple. Ovary densely pilose apically; styles 2, free, somewhat not exceeding stamens. Fruit dark red, ovoid or pyriform, rarely oblong, (5–)6–8 mm in diam.; pyrenes 2, sometimes united into 1. Fl. May–Jun, fr. Aug–Sep.

• Mountain regions, clearings at forest margins, thickets, river valleys; 1300–3400 m. Gansu, Hebei, Sichuan, SE Xizang, Yunnan.

1a. Fruit 7–8 mm in diam.; leaf blade abaxially sparsely tomentose-villous.

- 2a. Fruit usually ovoid, sometimes oblong, with 2 pyrenes usually united into 1 14a. var. *hebephyllus*
 2b. Fruit broadly pyriform, with 2 pyrenes not united 14b. var. *majusculus*
 1b. Fruit 5–7 mm in diam.; leaf blade abaxially tomentose.
 3a. Fruit pyriform; leaf blade abaxially densely gray or yellowish gray tomentose 14c. var. *incanus*
 3b. Fruit usually ovoid; leaf blade abaxially densely yellow tomentose 14d. var. *fulvidus*

14a. *Cotoneaster hebephyllus* var. *hebephyllus*

钝叶栒子(原变种) *dun ye xun zi* (*yuan bian zhong*)

Cotoneaster giraldii Flinck & Hylmö ex G. Klotz; *C. hebephyllus* var. *monopyrenus* W. W. Smith; *C. monopyrenus* (W. W. Smith) Flinck & Hylmö.

Leaf blade abaxially sparsely tomentose-villous. Fruit ovoid, sometimes oblong, 7–8 mm in diam.; pyrenes 2 usually united into 1.

- Rocky mountain regions, clearings at forest margins, thickets; 1300–3400 m. Gansu, Hebei, Sichuan, SE Xizang, Yunnan.

14b. *Cotoneaster hebephyllus* var. *majusculus* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 22. 1917.

大果钝叶栒子 *da guo dun ye xun zi*

?*Cotoneaster handel-mazzettii* G. Klotz; *C. majusculus* (W. W. Smith) G. Klotz.

Leaf blade abaxially sparsely tomentose-villous. Fruit broadly pyriform, 7–8 mm in diam.; pyrenes 2.

- Thickets on slopes; 3000–3400 m. NW Yunnan.

14c. *Cotoneaster hebephyllus* var. *incanus* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 22. 1917.

灰毛钝叶栒子 *hui mao dun ye xun zi*

Cotoneaster incanus (W. W. Smith) G. Klotz.

Leaf blade abaxially densely gray or yellowish gray tomentose. Fruit pyriform, 5–7 mm in diam.; pyrenes 2.

- Mountain regions; 2000–3300 m. NW Yunnan.

14d. *Cotoneaster hebephyllus* var. *fulvidus* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 22. 1917.

黄毛钝叶栒子 *huang mao dun ye xun zi*

Cotoneaster fulvidus (W. W. Smith) G. Klotz.

Leaf blade abaxially densely yellow tomentose. Fruit usually ovoid, 5–7 mm in diam.; pyrenes 2.

- Open thickets, river valleys; 2000–2300 m. W Yunnan.

15. *Cotoneaster submultiflorus* Popov, Bull. Soc. Imp. Naturalistes Moscou, n.s., 44: 126. 1935.

毛叶水栒子 *mao ye shui xun zi*

Cotoneaster borealichinensis (Hurusawa) Hurusawa; *C. multiflorus* Bunge var. *borealichinensis* Hurusawa.

Shrubs deciduous, erect, 2–4 m tall. Branchlets brownish or grayish brown, terete, slender, initially densely pubescent, gradually glabrescent. Petiole 4–7 mm, puberulous; stipules lanceolate, pubescent, usually glabrescent; leaf blade ovate or rhombic-ovate to elliptic, 2–4 × 1.2–2 cm, abaxially pubescent, without glaucous bloom, adaxially glabrous or initially puberulous, base broadly cuneate, apex acute or obtuse. Corymbs 1.5–2.5 cm, many flowered; rachis and pedicels villous; bracts linear, villous. Pedicel 4–6 mm. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially pilose. Sepals triangular, shorter than petals, apex acute. Petals spreading, white, ovate or suborbicular, 3–5 × 2.5–4 mm, base shortly clawed, apex obtuse or somewhat emarginate. Stamens 15–20, shorter than petals. Ovary pubescent apically; styles 2, free, not exceeding stamens. Fruit bright red, subglobose, 6–7 mm in diam.; pyrenes usually 2, united into 1. Fl. May–Jun, fr. Aug–Sep.

Rock crevices, thickets; 900–2000 m. Gansu, Hebei, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [C Asia].

16. *Cotoneaster multiflorus* Bunge in Ledebour, Fl. Altaic. 2: 220. 1830.

水栒子 *shui xun zi*

Shrubs deciduous, erect, (0.5–)4 m tall. Branchlets arching, reddish brown or brownish, terete, slender, initially pubescent, soon glabrescent. Petiole 3–8(–10) mm, initially pilose, glabrate; stipules linear, 2.5–5 mm, initially sparsely pilose, glabrate; leaf blade ovate to broadly ovate, (1.5–)2–4(–5) × (1.2–)1.5–3(–4) cm, midvein raised abaxially and impressed adaxially, abaxially pilose, glabrescent, adaxially glabrous, base broadly cuneate or rounded, apex acute or obtuse. Corymbs lax, 5–21-flowered; rachis and pedicels glabrous, rarely slightly puberulous; bracts linear, 2–4 mm, glabrous or slightly puberulous. Pedicel 4–6 mm. Flowers 1–1.2 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2 × 2–2.5 mm, apex acute. Petals spreading, white, suborbicular, 4–5 mm in diam., adaxially white puberulous near base, base shortly clawed, apex obtuse or emarginate. Stamens ca. 20, slightly shorter than petals. Ovary pilose apically; styles usually 2, free, not exceeding stamens. Fruit red or purplish red, subglobose or obovoid, (5–)7–8(–12) mm in diam.; pyrenes 2, united into 1. Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

River valleys, dense and mixed forests on slopes, forest margins, thickets, stream sides; 1200–3500 m. Gansu, Hebei, Heilongjiang, Henan, Hubei, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Russia; C and SW Asia].

- 1a. Fruit purplish red, 5–6 mm in diam. 16c. var. *atropurpureus*
 1b. Fruit red, 7–12 mm in diam.
 2a. Fruit 7–8 mm in diam. 16a. var. *multiflorus*
 2b. Fruit 10–12 mm in diam. 16b. var. *calocarpus*

16a. *Cotoneaster multiflorus* var. *multiflorus*

水栒子(原变种) shui xun zi (yuan bian zhong)

Cotoneaster magnificus J. Fryer & B. Hylmö; *C. reflexus* Carrière.

Fruit red, 7–8 mm in diam. $2n = 68$.

River valleys, mixed forests on slopes; 1200–3500 m. Gansu, Hebei, Heilongjiang, Henan, Hubei, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Russia; C and SW Asia].

16b. *Cotoneaster multiflorus* var. *calocarpus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 170. 1912.

大果水栒子 da guo shui xun zi

Cotoneaster calocarpus (Rehder & E. H. Wilson) Flinck & Hylmö; *C. przewalskii* Pojarkova.

Fruit red, 1–1.2 cm in diam. $2n = 68^*$.

• Dense forests on slopes; 1600–2600 m. Gansu, Shaanxi, Sichuan.

16c. *Cotoneaster multiflorus* var. *atropurpureus* T. T. Yu, Acta Phytotax. Sin. 8: 219. 1963.

紫果水栒子 zi guo shui xun zi

Fruit purplish black, 5–6 mm in diam.

• Forest margins, thickets, stream sides; 2500–3100 m. W Sichuan, Xizang, NW Yunnan.

17. *Cotoneaster zabelii* C. K. Schneider, Ill. Handb. Laubholz. 1: 749. 1906.

西北栒子 xi bei xun zi

Cotoneaster zabelii var. *miniatus* Rehder & E. H. Wilson.

Shrubs deciduous, to 2 m tall. Branchlets dark reddish brown, terete, initially densely yellow pubescent, glabrous when old. Petiole 2–4 mm, tomentose; stipules lanceolate, 2–4 mm, pubescent, usually glabrescent at fruiting; leaf blade elliptic to ovate, 1.5–3 × 1–2 cm, abaxially densely yellow or gray tomentose, adaxially sparsely pubescent, base rounded or broadly cuneate, apex obtuse, rarely emarginate. Corymbs pendent, 1.5–3 cm, 3–10-flowered or more; rachis and pedicels tomentose. Pedicel 2–4 mm. Hypanthium campanulate, abaxially tomentose. Sepals triangular, 1–2 × 1.5–2.5 mm, apex slightly obtuse or shortly pointed. Petals erect, pinkish, obovate or suborbicular, 2–3 mm in diam., apex obtuse. Stamens 18–20, shorter than petals. Ovary pilose apically; styles 2, free, not exceeding stamens. Fruit bright red, obovoid to ovoid-globose, 7–8 mm in diam.; pyrenes often 2. Fl. May–Jun, fr. Aug–Sep.

• Calcareous mountain regions, shaded slopes, river valleys, thickets; 800–2500 m. Gansu, Hebei, Henan, Hubei, Hunan, Jiangxi, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi.

Further study is necessary to determine the identity of *Cotoneaster shansiensis* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

18. *Cotoneaster fangianus* T. T. Yu, Acta Phytotax. Sin. 8: 219. 1963.

恩施栒子 en shi xun zi

Shrubs deciduous. Branchlets reddish brown to grayish brown, terete, thin, initially densely yellow strigose, gradually glabrescent, subglabrous when old. Petiole short and robust, 2–3 mm, yellow pubescent; stipules partly persistent, linear-lanceolate; leaf blade broadly ovate to suborbicular, 1–2 × 1–1.5 cm, midvein somewhat raised abaxially and slightly impressed adaxially, lateral veins 3–5 pairs, abaxially densely yellow tomentose, adaxially glabrous, base rounded, apex often obtuse, rarely acute. Corymbs 1.5–2.5 × 2–2.5 cm, 10–15-flowered; rachis and pedicels pubescent; bracts linear or linear-lanceolate. Pedicel 1–2 mm. Flowers 4–5 mm in diam. Hypanthium campanulate, abaxially puberulous or subglabrous. Sepals triangular, apex obtuse, sometimes acute. Petals erect, pink, suborbicular or broadly obovate, 1–2 mm in diam., base shortly clawed, apex emarginate or obtuse. Stamens 20, slightly shorter than petals. Ovary pubescent apically; styles 3, free, nearly equaling or somewhat lower than stamens. Fruit oblong; pyrenes 3. Fl. May–Jun.

• River banks; 1300–1400 m. SW Hubei.

19. *Cotoneaster tenuipes* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 171. 1912.

细枝栒子 xi zhi xun zi

Shrubs deciduous, 1–2 m tall. Branchlets brownish red, terete, slender, initially grayish yellow appressed villous, soon glabrescent, glabrous when old. Petiole 3–5 mm, villous; stipules caducous or partly persistent, lanceolate, 2.5–5 mm, slightly villous; leaf blade ovate or elliptic-ovate to narrowly elliptic-ovate, 2–2.5(–3.5) × 1.2–2 cm, veins somewhat raised abaxially and slightly impressed adaxially, abaxially gray appressed tomentose, adaxially initially sparsely pilose, subglabrous when old, base broadly cuneate, apex acute or ± obtuse. Corymbs 1.5–2.5 cm, 2–4-flowered; rachis and pedicels densely appressed villous; bracts linear or linear-lanceolate, 2–4 mm, puberulous. Pedicel 1–3 mm, slender. Flowers ca. 7 mm in diam. Hypanthium densely appressed villous abaxially. Sepals ovate-triangular, ca. 1.2 mm, apex acute. Petals erect, white, ovate or suborbicular, 3–4 mm and nearly as broad, base clawed, apex obtuse. Stamens 15, shorter than petals. Ovary puberulous apically; styles 2, free, not exceeding stamens. Fruit purplish black, ovoid, 8–9 × 5–6 mm; pyrenes 1 or 2. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Forests, rocky mountain areas; 1900–3100 m. Gansu, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

20. *Cotoneaster wardii* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 25. 1917.

白毛栒子 bai mao xun zi

Shrubs evergreen, to 3 m tall. Branchlets terete, initially white tomentose, glabrescent. Petiole robust, 2–4 mm, densely tomentose; stipules linear, 4–6 mm, sparsely pubescent; leaf blade dark green adaxially, ovate or elliptic, 2.5–4 × 1.5–2 cm, midvein distinctly raised abaxially and impressed adaxially, lateral veins 5 or 6 pairs, abaxially densely silvery tomentose, adaxially initially sparsely pilose, glabrous when old, base

rounded or broadly cuneate, apex acute. Corymbs 9–15-flowered; rachis and pedicels densely white tomentose; bracts reddish brown, linear, 4–5 mm, sparsely pubescent. Pedicel 1–3 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially densely white tomentose. Sepals triangular, apex acute. Petals erect, white, tinged reddish, suborbicular or broadly obovate, 3–4 × 2.5–3.5 mm, base shortly clawed, margin slightly incised, apex obtuse. Stamens 20, somewhat shorter than petals. Ovary white pubescent apically; styles 2(–4), free, not exceeding stamens. Fruit orangish red, obovoid, 8–9 mm in diam.; pyrenes usually 2. Fl. May–Jun, fr. Sep–Oct.

- Forest margins; 3000–4000 m. SE Xizang.

21. *Cotoneaster dielsianus* E. Pritzl, Bot. Jahrb. Syst. 29: 385. 1900.

木帚栒子 mu zhou xun zi

Shrubs deciduous, 1–2 m tall. Branchlets grayish black or brownish black, terete, thin, initially densely villous, glabrescent. Petiole 1–3 mm, tomentose; stipules partly persistent at fruiting, linear-lanceolate, nearly as long as or slightly longer than petioles, initially tomentose, glabrous when mature; leaf blade elliptic to ovate, (0.6–)1–2.5 × 0.8–1.5 cm, abaxially densely yellowish gray or gray tomentose, adaxially puberulous or subglabrous and shiny, base broadly cuneate or rounded, apex acute, rarely obtuse or emarginate. Corymbs 1.5–3 cm, 3–7-flowered; rachis and pedicels villous; bracts linear-lanceolate, 2–3 mm, pubescent. Pedicel 1–3 mm. Flowers 6–7 mm in diam. Hypanthium villous abaxially. Sepals triangular, 1–2 × 1.5–2.5 mm, apex acute, rarely obtuse or emarginate. Petals erect, pinkish, suborbicular or broadly obovate, 3–4 mm in diam., base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pilose apically; styles 3(–5), free, very short. Fruit dark red or coral-red, subglobose or obovoid, 5–8 mm in diam.; pyrenes 3–5. Fl. Jun–Jul, fr. Sep–Oct.

- Waste slopes, river valleys, grassy places, thickets, dense forests; 1000–3600 m. Gansu, Guizhou, Hubei, Sichuan, Xizang, Yunnan.

- 1a. Leaf blade 1–2.5 cm, adaxially puberulous; fruit red 21a. var. *dielsianus*
 1b. Leaf blade 0.6–1.5 cm, adaxially shiny, subglabrous; fruit coral-red 21b. var. *elegans*

21a. *Cotoneaster dielsianus* var. *dielsianus*

木帚栒子(原变种) mu zhou xun zi (yuan bian zhong)

Cotoneaster applanatus Duthie ex Veitch; *C. sikangensis* Flinck & Hylmö; *C. vilmorinianus* G. Klotz.

Leaf blade 1–2.5 cm, adaxially puberulous. Fruit red.

- Waste slopes, river valleys, grassy places, thickets; 1000–3600 m. Gansu, Guizhou, Hubei, Sichuan, Xizang, Yunnan.

Further study is necessary to determine the identities of *Cotoneaster bradyi* J. Fryer & E. C. Nelson and *C. tardiflorus* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

21b. *Cotoneaster dielsianus* var. *elegans* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 166. 1912.

小叶木帚栒子 xiao ye mu zhou xun zi

Cotoneaster dokeriensis G. Klotz; *C. elegans* (Rehder & E. H. Wilson) Flinck & Hylmö; *C. splendens* Flinck & Hylmö.

Leaf blade 0.6–1.5 cm, adaxially shiny, subglabrous. Fruit coral-red. $2n = 68^*$.

- Dense forests; 2000–3000 m. Guizhou, Sichuan.

22. *Cotoneaster glomerulatus* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 21. 1917.

球花栒子 qiu hua xun zi

Shrubs deciduous, to 3 m tall. Branchlets grayish brown or blackish brown, terete, initially densely yellow tomentose-villous, gradually glabrescent. Petiole 2–3 mm, yellow tomentose; stipules brown, lanceolate, nearly as long as petioles, sparsely villous; leaf blade ovate-lanceolate to oblong-ovate, 4–5 × 2–2.5 cm, lateral veins 4 or 5 pairs, slightly impressed adaxially, abaxially sparsely yellow tomentose, adaxially glabrous or puberulous, base broadly cuneate to rounded, apex acute, rarely acuminate or ± obtuse. Corymbs 1.5–2.5 cm, 3–11-flowered; rachis and pedicels densely yellow tomentose-villous; bracts linear or linear-lanceolate, 1–3 mm, slightly yellow villous. Pedicel very short, 1–2 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially yellow villous. Sepals triangular, 1–1.5 × 1.5–2.5 mm, apex acute. Petals erect, white, stained reddish, suborbicular, 3–3.5 mm and ca. as broad, base clawed, apex obtuse. Stamens ca. 20. Ovary yellowish pilose apically; styles 5, free, not exceeding stamens. Fruit bright red, subglobose, ca. 5 mm in diam.; pyrenes 5. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

- Slopes, river valleys, sparse forests, open scrub; 2000–2600 m. W Yunnan.

Further study is necessary to determine the identity of *Cotoneaster tengyuehensis* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

23. *Cotoneaster obscurus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 161. 1912.

暗红栒子 an hong xun zi

Shrubs deciduous, (0.5–)1.5–3 m tall, much branched. Branchlets brown or purplish brown to blackish brown, terete, initially yellowish strigose, gradually glabrescent. Petiole 2–4 mm, sparsely pilose; stipules lanceolate, 2–4 mm, membranous, pilose; leaf blade elliptic-ovate or rhombic-ovate, 2.5–4.5 × 1.5–2.5 cm, lateral veins 5–7 pairs, raised abaxially and slightly impressed adaxially, abaxially yellowish gray tomentose, adaxially sparsely pubescent, base broadly cuneate, apex acuminate, rarely acute. Corymbs 1.5–2.5 cm, 3–7-flowered; rachis and pedicels pubescent; bracts linear-lanceolate, 2–3 mm, membranous, slightly pubescent. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular, 1.5–2 mm and ca. as broad, apex shortly acuminate. Petals erect, reddish, elliptic to ovate, 3–4 × 2–3 mm, base shortly clawed, apex obtuse. Stamens 16–20, shorter than petals. Ovary white pubescent apically; styles 2 or 3, free, somewhat not exceeding stamens. Fruit dark red, ovoid, 7–8 × 5–6 mm; pyrenes usually 2–4. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Mountain valleys, thickets along river banks; 1500–3000 m. Guizhou, Hubei, Sichuan, Xizang, Yunnan.

24. *Cotoneaster franchetii* Bois, Rev. Hort. 1902: 379. 1902.

西南栒子 xi nan xun zi

Cotoneaster amoenus E. H. Wilson; *C. franchetii* var. *cinerascens* Rehder; *C. insculptus* Diels; *C. mairei* H. Léveillé; *C. mairei* var. *albiflorus* H. Léveillé.

Shrubs semievergreen, 1–3 m tall, with spreading, arching-inflexed branches. Branchlets dark grayish brown or grayish black, initially densely strigose, gradually glabrescent. Petiole 2–4 mm, tomentose; stipules linear-lanceolate, 2–4 mm, initially tomentose, glabrate; leaf blade elliptic to ovate, 2–3 × 1–1.5 cm, thick, lateral veins 4 or 5 pairs, raised abaxially and deeply impressed adaxially, abaxially densely yellow or white tomentose, adaxially initially appressed pubescent, glabrescent, base cuneate, apex acute or acuminate. Corymbs 1.5–2.5 cm, 5–11-flowered; rachis and pedicels densely tomentose; bracts linear, 2–3.5 mm, tomentose. Pedicel 2–4 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially densely pubescent. Sepals triangular, 1–2 × 1.5–2.5 mm, apex acute or shortly acuminate. Petals erect, pink, broadly obovate or elliptic, 3–4 × 2–3 mm, adaxially puberulous near base, base shortly clawed, apex obtuse. Stamens 20, shorter than petals. Ovary pubescent apically; styles 2 or 3(–5), free, not exceeding stamens. Fruit orangish red or red, ovoid-globose, 6–7 mm in diam., initially pubescent, finally glabrous; pyrenes usually 3, rarely to 5. Fl. Jun–Jul, fr. Sep–Oct. $2n = 68^*$.

Thickets in rocky sunny mountain regions, open hillsides; 1600–2900 m. Guizhou, Sichuan, Xizang, Yunnan [Thailand].

Further study is necessary to determine the identity of *Cotoneaster induratus* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

25. *Cotoneaster reticulatus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 160. 1912.

网脉栒子 wang mai xun zi

Shrubs deciduous, to 4 m tall. Branchlets brown to dark reddish brown, terete, initially yellow strigose, glabrescent. Petiole (2–)3–4 mm, pilose, glabrate; stipules lanceolate, 2–3 mm, pilose; leaf blade bright green adaxially, elliptic-ovate, rarely rhombic-ovate, (1–)2.5–3.5 × (0.8–)1–1.6 cm, subleathery, lateral veins 4 or 5 pairs, distinctly raised abaxially and impressed adaxially, abaxially yellowish gray tomentose, adaxially glabrous, rugose, base broadly cuneate to rounded, apex acuminate to acute. Corymbs 1.5–2.5 cm, 3–6-flowered; rachis and pedicels glabrous; bracts linear or linear-lanceolate. Pedicel 5–6 mm. Petals pink. Fruit purplish black, subglobose, 5–7 mm in diam., glabrous; pyrenes (2–)5. Fl. May–Jun, fr. Sep–Oct.

• Waste places, forest margins; 2600–3000 m. W Sichuan.

26. *Cotoneaster oliganthus* Pojarkova, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 8: 141. 1938.

少花栒子 shao hua xun zi

Shrubs deciduous, 1–2 m tall. Branchlets dark brown,

initially densely greenish gray appressed tomentose, glabrescent, subglabrous when old. Petiole 2–4 mm, tomentose; leaf blade bright green adaxially, elliptic or ovate-orbicular, (0.8–)1–2.5(–2.7) × (0.4–)0.7–2 cm, abaxially greenish gray tomentose, adaxially sparsely appressed pubescent or glabrous, base broadly cuneate to rounded, apex usually obtuse, rarely ± acute, sometimes emarginate, often mucronate. Fascicles or racemes ca. 1/2 as long as leaves, on very short lateral branchlets in leaf axils, 2–4-flowered; rachis 2–4 mm, tomentose. Pedicel 2–5 mm, tomentose. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially sparsely appressed pubescent or subglabrous. Sepals broadly ovate, margin purple and tomentose-ciliate, apex obtuse or ± acute. Petals erect or somewhat divaricate, pink, base floccose. Stamens 20. Styles 2(or 3), free. Fruit red, subglobose to ellipsoid, 5–8 mm in diam.; pyrenes often 2(or 3). Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

Mountain regions. Nei Mongol, Xinjiang [Kazakhstan, Kyrgyzstan].

27. *Cotoneaster integerrimus* Medikus, Gesch. Bot. 85. 1793.

全缘栒子 quan yuan xun zi

Cotoneaster vulgaris Lindley; *Mespilus cotoneaster* Linnaeus; *Ostinia cotoneaster* (Linnaeus) Clairville.

Shrubs deciduous, erect, to 2 m tall, much branched, with broad spreading crown. Branchlets brown or grayish brown, terete, initially densely gray tomentose, soon glabrescent. Petiole 2–5 mm, tomentose; stipules mostly persistent at fruiting, lanceolate, puberulous; leaf blade broadly elliptic, broadly ovate, or suborbicular, 2–5 × (0.5–)1.3–2.5(–3) cm, veins raised abaxially and impressed adaxially, abaxially densely gray tomentose, adaxially glabrous or sparsely pubescent, base rounded, apex acute or obtuse, usually mucronate. Corymbs 1.5–2.5 cm, 2–5(–7)-flowered; rachis and pedicels glabrous or puberulous; bracts lanceolate, puberulous. Pedicel 3–6 mm. Flowers ca. 8 mm in diam. Hypanthium campanulate, glabrous or puberulous abaxially. Sepals triangular-ovate, 1–1.5 × 1–2 mm, apex obtuse. Petals erect, pink, suborbicular, ca. 3 mm in diam., base clawed, apex obtuse. Stamens 15–20, nearly as long as petals. Ovary pilose apically; styles 2, rarely 3, free, not exceeding stamens. Fruit red or dark red, subglobose, rarely ovoid, 6–7(–8) mm in diam., glabrous; pyrenes usually 2, rarely 3 or 4. Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

Rocky slopes, forests; below 2500 m. Hebei, Heilongjiang, Nei Mongol, Qinghai, Xinjiang [Korea, Russia; N Asia, Europe].

28. *Cotoneaster gracilis* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 167. 1912.

细弱栒子 xi ruo xun zi

Shrubs deciduous, 1–3 m tall. First year's branches glabrous; branchlets brownish red to grayish brown, terete, slender, initially densely tomentose-villous, gradually glabrescent. Petiole 2–3 mm, white tomentose; stipules caducous, subulate, 2–4 mm, membranous, pubescent; leaf blade ovate to oblong-ovate, 2–3.5 × 1–2 cm, lateral veins 3 or 4 pairs, conspicuously raised abaxially and impressed adaxially, abaxially densely white tomentose, adaxially glabrous or puberulous, base round-

ed, apex obtuse or acute, rarely emarginate. Corymbs (1–)1.5–2.5 cm, 3–7-flowered; rachis and pedicels pilose; bracts linear, 2–3 mm, pilose. Pedicel 3–6 mm. Flowers 6–7 mm in diam. Hypanthium red, campanulate, abaxially glabrous. Sepals triangular-ovate, 1–2 mm, apex obtuse or ± acute. Petals erect, pink, suborbicular, 2.5–3.5 mm in diam., glabrous, shortly clawed. Stamens 20, slightly shorter than petals. Ovary pubescent apically; styles usually 2, free, not exceeding stamens. Fruit red, obovoid, 5–6 mm in diam., puberulous; pyrenes usually 2. Fl. May–Jun, fr. Aug–Sep.

• Mountain regions, slopes, river banks, thickets; 1000–3000 m. Gansu, Henan, Hubei, Shaanxi, Sichuan.

- 1a. Leaf blade ovate to oblong-ovate, 20–35 × 10–20 mm, densely tomentose abaxially; inflorescences 3–7-flowered 28a. var. *gracilis*
 1b. Leaf blade ovate-elliptic to broadly elliptic, 7–14 × 5.5–8 mm, tenuously tomentose abaxially; inflorescences 1–3(–6)-flowered 28b. var. *difficilis*

28a. *Cotoneaster gracilis* var. *gracilis*

细弱栒子(原变种) xi ruo xun zi (yuan bian zhong)

Leaf blade ovate to oblong-ovate, 2–3.5 × 1–2 cm, abaxially densely tomentose. Inflorescences 3–7-flowered.

• Slopes, river banks, thickets; 1000–3000 m. Gansu, Hubei, Shaanxi, Sichuan.

28b. *Cotoneaster gracilis* var. *difficilis* (G. Klotz) L. T. Lu, *Novon* 12: 496. 2002.

小叶细弱栒子 xiao ye xi ruo xun zi

Cotoneaster difficilis G. Klotz, *Wiss. Z. Friedrich-Schiller- Univ. Jena, Math.-Naturwiss. Reihe (Beitr. Phytotax. 3)* 21: 1017. 1972.

Leaf blade ovate-elliptic to broadly elliptic, 7–14 × 5.5–8 mm, abaxially tenuously tomentose. Inflorescences 1–3(–6)-flowered.

• Mountain regions; 1800–3000 m. SE Gansu, W Sichuan.

29. *Cotoneaster melanocarpus* Loddiges, *Bot. Cab.* 16: t. 1531. 1828.

黑果栒子 hei guo xun zi

Cotoneaster niger (Wahlberg) Fries; *C. orientalis* A. Kerner; *C. peduncularis* Boissier; *C. vulgaris* Lindley var. *melanocarpus* (Loddiges) Ledebour; *Mespilus cotoneaster* var. *nigra* Wahlberg.

Shrubs deciduous, 1–2(–2.5) m tall. Branchlets brown or purplish brown, terete, initially tomentose, soon glabrate, glabrous when old. Petiole (1–)2–5 mm, tomentose; stipules partly persistent, lanceolate, pubescent; leaf blade ovate-elliptic to broadly ovate, 2–4.5(–6) × 1–3 cm, abaxially white tomentose, adaxially initially slightly pubescent, glabrous when mature, base rounded or broadly cuneate, apex obtuse or ± acute, mucronate, sometimes emarginate. Corymbs nodding, 2–4 cm, 3–15-flowered; rachis and pedicels pubescent; bracts linear,

pubescent. Pedicel 3–7(–9) mm. Flowers ca. 7 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 mm, apex obtuse. Petals erect, pinkish, reddish, or reddish white, suborbicular, 3–4 mm in diam. Stamens 20, shorter than petals. Ovary pubescent apically; styles 3 or 2, free, shorter than petals. Fruit bluish black, with glaucous bloom, subglobose, 6–7(–9) mm in diam.; pyrenes 2 or 3. Fl. May–Jun, fr. Aug–Sep.

Slopes, sparse forests, thickets; 700–2600 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Shanxi, Xinjiang [Japan, N Mongolia, Russia; E Europe].

30. *Cotoneaster acuminatus* Lindley, *Trans. Linn. Soc. London* 13: 101. 1822.

尖叶栒子 jian ye xun zi

Cotoneaster bakeri G. Klotz; *C. kongboensis* G. Klotz; *C. mucronatus* Franchet; *C. nepalensis* André; *Mespilus acuminata* Loddiges.

Shrubs deciduous, erect, 2–3(–4) m tall. Branchlets grayish brown to brownish, terete, initially densely yellowish strigose, glabrous when old. Petiole 3–5 mm, villous; stipules partly caducous at fruiting, lanceolate, 3–5 mm, villous; leaf blade elliptic-ovate to ovate-lanceolate, 2–6.5 × 2–3 cm, both surfaces villous, more densely so abaxially, base broadly cuneate, apex acuminate, rarely acute. Cymes 1–2 cm, (1 or) 2 or 3(–5)-flowered; rachis and pedicels yellowish villous; bracts lanceolate or linear, 2–4 mm, margin villous. Pedicel 3–5 mm. Flowers 6–8 mm in diam. Hypanthium campanulate, abaxially appressed villous. Sepals triangular, 1.5–2.5 × 2–3 mm, apex acute. Petals erect, pink or whitish, ovate to obovate, 3–4 mm and nearly as broad, glabrous, base clawed, apex obtuse or erose. Stamens 20, shorter than petals. Ovary pilose apically; styles 2, free, not exceeding stamens. Fruit bright red, ellipsoid, 8–10 × 7–8 mm; pyrenes 2. Fl. May–Jun, fr. Sep–Oct. 2n = 34, 68.

Mixed forests, thickets, fields; 1500–3000 m. Sichuan, Xizang, Yunnan [Bhutan, N India, Nepal, Sikkim].

31. *Cotoneaster nitidifolius* Marquand, *Hooker's Icon. Pl.* 32: t. 3145. 1930.

亮叶栒子 liang ye xun zi

Shrubs deciduous, erect, 2–3 m tall. Branchlets grayish brown to reddish brown, terete, slender, initially densely yellow pubescent, gradually glabrescent. Petiole 3–5 mm, pubescent; stipules reddish, lanceolate, 3–5 mm, initially sparsely pubescent, glabrescent; leaf blade elliptic-lanceolate, 4–6.5(–8) × 1.5–2.5(–3) cm, veins raised abaxially and impressed adaxially, abaxially pubescent, more densely so along veins, adaxially glabrous, base cuneate, apex acuminate. Corymbs 1.5–2.5 cm, 3–9-flowered; rachis and pedicels pubescent; bracts reddish, linear-lanceolate, 3–4 mm, puberulous. Pedicel 1–3 mm, pubescent. Flowers nodding, 5–6 mm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular, 1.5–2 × 1.5–2 mm, apex acute. Petals erect, red basally, white apically, suborbicular or elliptic, 3–4 mm, base clawed, apex obtuse and whitish. Stamens 16–18, shorter than petals. Ovary with pubescent apex; styles 2, free, not exceeding stamens. Fruit crimson,

subglobose, 5–6 mm in diam., glabrous; pyrenes often 2. Fl. May–Jun, fr. Aug–Sep.

• Open thickets by streams, mixed forests; 2000–3000 m. Sichuan, Yunnan.

32. *Cotoneaster schantungensis* G. Klotz, Wiss. Z. Friedrich-Schiller-Univ. Jena, Math.-Naturwiss. Reihe 21: 1018. 1972.

山东栒子 shan dong xun zi

Shrubs deciduous, to 2 m tall. Branchlets reddish brown or grayish brown, terete, slender, initially densely gray villous, glabrous when old. Petiole 2–4.5 mm, slightly villous; stipules caducous or partly persistent, lanceolate, 1–2 mm, villous; leaf blade broadly elliptic or broadly ovate, sometimes obovate or suborbicular, 2–3.5 × 1.5–2.4 cm, papery, lateral veins 3–5 pairs, slightly raised abaxially, abaxially initially densely villous, glabrate, adaxially initially villous, glabrescent, base broadly cuneate to rounded, apex usually obtuse or emarginate, rarely mucronate. Corymbs suberect or spreading, 3–6-flowered; rachis and pedicels initially villous, finally subglabrous. Hypanthium campanulate, abaxially sparsely pilose. Sepals broadly triangular. Petals not seen. Fruit dark red, obovoid, 6–8 mm, sparsely pilose or subglabrous; pyrenes 2. Fl. May–Jun, fr. Aug–Sep.

• Stony slopes; 900–1900 m. Shandong.

33. *Cotoneaster bullatus* Bois in Vilmorin & Bois, Frutic. Vilm. 119. 1904.

泡叶栒子 pao ye xun zi

Shrubs deciduous, spreading, to 2 m tall. Branchlets slightly inflexed, grayish black, terete, stout, initially strigose, gradually glabrescent. Petiole (1.5–)3–6 mm, pilose; stipules caducous, brown, lanceolate, 3–5 mm, pilose; leaf blade oblong-ovate to elliptic or lanceolate-oblong, 3.5–7(–15) × 2–4(–8) cm, veins prominently raised abaxially, abaxially pilose, more densely so along veins, sometimes subglabrous, adaxially glabrous or pilose, conspicuously rugose and bullate, base cuneate or rounded, apex acuminate, rarely acute. Corymbs 2.5–5 cm in diam., (3–)5–13(–31)-flowered; rachis and pedicels pilose; bracts lanceolate, 2–3 mm, pilose. Pedicel 1–3 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially initially pilose, glabrate. Sepals triangular, 1–1.5 × 1.5–2.5 mm, apex acute. Petals erect, pinkish, obovate, 4–4.5 mm and nearly as broad, base shortly clawed, apex obtuse. Stamens 20–22, shorter than petals. Ovary pubescent apically; styles 4 or 5, free, very short. Fruit red, globose or obovoid, 6–8 × 6–8 mm; pyrenes 4 or 5. Fl. May–Jun, fr. Aug–Sep.

• Slopes, sparse forests, thickets, river banks, mountain forests and valleys; 900–3200 m. Hubei, Sichuan, Xizang, Yunnan.

- 1a. Petiole 3–6 mm; corymbs (3–)5–13-flowered.
 2a. Corymbs 5–13-flowered 33a. var. *bullatus*
 2b. Corymbs 3–5-flowered
 33b. var. *camilli-schneideri*
 1b. Petiole 1.5–2.5 mm; corymbs 9–31-flowered.
 3a. Leaf blade 5–15 × 2.5–8 cm, petiole
 ca. 2 mm; corymbs 11–31-flowered,
 5–8 cm in diam. 33c. var. *macrophyllus*

- 3b. Leaf blade usually less than 5 cm,
 petiole usually less than 2 mm;
 corymbs (9–)15–31-flowered,
 4–6 cm in diam. 33d. var. *floribundus*

33a. *Cotoneaster bullatus* var. *bullatus*

泡叶栒子(原变种) pao ye xun zi (yuan bian zhong)

Petiole 3–6 mm; leaf blade oblong-ovate or elliptic-ovate, 3.5–7 × 2–4 cm. Inflorescences 3–5 cm in diam., 5–13-flowered.

• Slopes, sparse forests, river banks, mountain valleys; 2000–3200 m. Hubei, Sichuan, Xizang, Yunnan.

33b. *Cotoneaster bullatus* var. *camilli-schneideri* (Pojarkova) L. T. Lu, **comb. et stat. nov.**

少花泡叶栒子 shao hua pao ye xun zi

Basionym: *Cotoneaster camilli-schneideri* Pojarkova, Bot. Mater. Gerb. Bot. Inst. Komarova Acad. Nauk SSSR 17: 180. 1955.

Petiole 3–6 mm; leaf blade ovate-elliptic or elliptic, rarely obovate, 3–6.5 × 2–4 cm. Inflorescences small, 3–5-flowered.

• Slopes. Hubei.

33c. *Cotoneaster bullatus* var. *macrophyllus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 164. 1912.

大叶泡叶栒子 da ye pao ye xun zi

Cotoneaster rehderi Pojarkova.

Petiole ca. 2 mm; leaf blade obovate-elliptic or elliptic, rarely elliptic-oblong or lanceolate-oblong, 5–15 × 2.5–8 cm. Inflorescences 5–8 cm in diam., 11–31-flowered. Fruit globose, 7–9 mm, with 5 pyrenes.

• Thickets; 1300–2800 m. W Sichuan.

33d. *Cotoneaster bullatus* var. *floribundus* (Stapf) L. T. Lu & A. R. Brach, Novon 12: 496. 2002.

多花泡叶栒子 duo hua pao ye xun zi

Cotoneaster moupinensis Franchet f. *floribundus* Stapf, Bot. Mag. 135: t. 8284. 1909; *C. bullatus* f. *floribundus* (Stapf) Rehder & E. H. Wilson.

Petiole 1.5–2.5 mm; leaf blade ovate or obovate to elliptic, less than 5 cm. Inflorescences 4–6 cm in diam., (9–)15–31-flowered. Fruit with 4 or 5 pyrenes.

• Mountain forests; 900–2800 m. W Sichuan.

The name *Cotoneaster boisianus* (Klotz, Wiss. Z. Friedrich-Schiller-Univ. Jena, Mat. Naturwiss. Reihe 21: 987. 1972), synonymous with this taxon, is invalid under Arts. 8.1 and 37 of the St. Louis Code because Klotz cited two specimens (from different gatherings) as types.

34. *Cotoneaster acutifolius* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 5: 190. 1832.

灰栒子 hui xun zi

Shrubs deciduous, 2–4 m tall. Branchlets brownish or red-

dish brown, terete, slender, initially villous, glabrescent. Petiole 2–5(–10) mm, villous; stipules caducous, brown, linear-lanceolate, 3–5 mm, slightly villous; leaf blade elliptic-ovate to oblong-ovate, 2–4(–5) × 1–2(–3) cm, veins raised abaxially and impressed adaxially, adaxially glabrous or both surfaces initially villous, gradually glabrescent, subglabrous when old, base broadly cuneate, apex acute, rarely acuminate. Corymbs 2–4 cm, 2–5-flowered; rachis and pedicels villous; bracts linear-lanceolate, 3–5 mm, slightly pilose. Pedicel 3–5 mm. Flowers 7–8 mm in diam. Hypanthium campanulate or shortly cylindrical, abaxially glabrous or villous. Sepals triangular, 1–2 × 1.5–2 mm, apex acute or ± obtuse. Petals erect, white, tinged reddish, broadly obovate or oblong, 3.5–4.5 × 3–4 mm, glabrous, base somewhat long clawed, apex obtuse. Stamens 10–15, shorter than petals. Ovary densely villous apically; styles often 2, free, not exceeding stamens. Fruit black, ellipsoid, obovoid, or subglobose, 6–8(–10) mm in diam., villous; pyrenes 2 or 3. Fl. May–Jun, fr. Aug–Sep.

Slopes, foothills, gullies, forests, forest margins, thickets, mountain valleys, exposed grasslands; 1000–3700 m. Anhui, Gansu, Hebei, Henan, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan [Mongolia, Russia].

- 1a. Hypanthium abaxially glabrous or only slightly villous.
 2a. Leaf blade adaxially glabrous, abaxially villous; hypanthium abaxially glabrous or slightly villous 34c. var. *lucidus*
 2b. Leaf blade villous on both surfaces; hypanthium abaxially glabrous 34d. var. *glabricalyx*
 1b. Hypanthium abaxially villous; leaf blade villous on both surfaces.
 3a. Abaxial surfaces of both leaf blade and hypanthium sparsely villous 34a. var. *acutifolius*
 3b. Abaxial surfaces of both leaf blade and hypanthium densely villous 34b. var. *villosulus*

34a. *Cotoneaster acutifolius* var. *acutifolius*

灰栒子(原变种) hui xun zi (yuan bian zhong)

Cotoneaster acutifolius Turczaninow f. *glabriusculus* Hurusawa; *C. acutifolius* var. *laetevirens* Rehder & E. H. Wilson; *C. acutifolius* Turczaninow var. *pekinensis* Koehne; *C. hurusawaianus* G. Klotz; *C. konishii* Hayata; *C. laetevirens* (Rehder & E. H. Wilson) G. Klotz; *C. niger* var. *acutifolius* Wenzig; *C. otoschwarzii* G. Klotz; *C. pekinensis* (Koehne) Zabel.

Leaf blade 2–4(–5) cm, both surfaces sparsely villous. Hypanthium sparsely villous abaxially. Fruit ellipsoid or obovoid, 6–8 mm in diam.

Slopes, foothills, gullies, forests; 1400–3700 m. Gansu, Hebei, Henan, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan [Mongolia].

34b. *Cotoneaster acutifolius* var. *villosulus* Rehder & E. H.

Wilson in Sargent, Pl. Wilson. 1: 158. 1912.

密毛灰栒子 mi mao hui xun zi

Cotoneaster dissimilis G. Klotz; *C. villosulus* (Rehder & E. H. Wilson) Flinck & Hylmö.

Leaf blade 3–5(–6) cm, both surfaces villous, more densely so abaxially. Hypanthium densely villous abaxially. Fruit ellipsoid or obovoid, 6–7 mm in diam.

• Mountain valleys, grassy slopes, thickets, forest margins; 1000–2200 m. Anhui, Gansu, Hebei, Hubei, Shaanxi, Sichuan, Taiwan, Xizang.

Further study is necessary to determine the identity of *Cotoneaster hummelii* J. Fryer & B. Hylmö, a doubtful species cultivated in the Botanic Garden in Göteborg (Sweden), which might be synonymous with this taxon.

34c. *Cotoneaster acutifolius* var. *lucidus* (Schlechtendal) L. T. Lu, Acta Phytotax. Sin. 38: 277. 2000.

甘南灰栒子 gan nan hui xun zi

Cotoneaster lucidus Schlechtendal, Linnaea 27: 541. 1854.

Leaf blade villous abaxially, glabrous adaxially. Hypanthium glabrous or only slightly villous abaxially. Fruit obovoid or subglobose, 8–10 mm in diam. $2n = 68$.

Rocky slopes, thickets; below 2900 m. S Gansu [Russia].

34d. *Cotoneaster acutifolius* var. *glabricalyx* Hurusawa, Acta Phytotax. Geobot. 13: 235. 1943.

光萼灰栒子 guang e hui xun zi

Leaf blade 2.5–3.5 cm, both surfaces villous, more densely so abaxially. Hypanthium glabrous abaxially. Fruit not seen.

• Mountain slopes; medium elevations. NC Henan (Song Shan).

35. *Cotoneaster moupinensis* Franchet, Nouv. Arch. Mus. Hist. Nat. sér. 2, 8: 224. 1885.

宝兴栒子 bao xing xun zi

Shrubs deciduous, to 5 m tall. Branchlets somewhat inflexed, grayish black, with conspicuous lenticels, terete, initially strigose, gradually glabrescent. Petiole 2–4(–8) mm, pubescent; stipules caducous; leaf blade elliptic-ovate or rhombic-ovate, 4–12 × 2–4.5 cm; veins prominently raised abaxially and impressed adaxially, abaxially pubescent along reticulate veins, adaxially slightly pilose, rugose, bullate, base broadly cuneate or subrounded, apex acuminate. Corymbs usually 9–25-flowered; rachis and pedicels pubescent; bracts lanceolate, sparsely pubescent. Pedicel 2–3 mm. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular, apex acute. Petals erect, pink, ovate or suborbicular, 3–4 × 2–3 mm, apex obtuse. Stamens ca. 20, shorter than petals. Ovary pubescent at apex; styles 4 or 5, free, not exceeding stamens. Fruit black, subglobose or obovoid, 6–8 mm in diam.; pyrenes 4 or 5. Fl. Jun–Jul, fr. Sep–Oct. $2n = 68^*$.

• Forest margins, coniferous forests, stream sides; 1300–3200 m. Gansu, Guizhou, Hubei, Ningxia, Shaanxi, Sichuan, Xizang, Yunnan.

36. *Cotoneaster foveolatus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 162. 1912.

麻核栒子 ma he xun zi

Cotoneaster cornifolius Flinck & Hylmö; *C. obscurus* Rehder & E. H. Wilson var. *cornifolius* Rehder & E. H. Wilson.

Shrubs deciduous, to 3 m tall. Branchlets dark reddish brown, terete, initially densely yellow strigose, glabrescent. Petiole 2–4 mm, pubescent; stipules partly persistent, linear or lanceolate, 3–4 mm, pubescent; leaf blade elliptic, elliptic-ovate, or elliptic-obovate, (2–)3.5–8(–10) × (1.2–)1.5–3(–4.5) cm, veins prominently raised abaxially and impressed adaxially, abaxially initially pubescent, more densely so along veins, subglabrous when old, adaxially sparsely pubescent, glabrescent, base broadly cuneate or subrounded, apex acuminate or acute. Corymbs 3–7-flowered; rachis and pedicels pubescent; bracts linear, 2–3 mm, pubescent. Pedicel 3–4 mm. Flowers 7–8 mm. Hypanthium campanulate, abaxially pilose. Sepals triangular, 1.5–2 × 2–2.5 mm, apex acute. Petals erect, pink, obovate or suborbicular, 4–5 × 3–4 mm, base shortly clawed, apex obtuse. Stamens 15–17, shorter than petals. Ovary densely pilose apically; styles often 3, rarely 2–5, free, very short. Fruit black, subglobose, 8–9 mm in diam.; pyrenes 3 or 4, furrowed and shallowly pitted on back. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Thickets, dense forests, forest margins, near water courses, waste fields; 1400–3400 m. Gansu, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Xizang, Yunnan.

Further study is necessary to determine the identity of *Cotoneaster hsingshangensis* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

37. *Cotoneaster ambiguus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 159. 1912.

川康栒子 chuan kang xun zi

Cotoneaster acutifolius Turczaninow var. *ambiguus* (Rehder & E. H. Wilson) Hurusawa; *C. pseudoambiguus* J. Fryer & B. Hylmö.

Shrubs deciduous, to 2 m tall. Branchlets reddish brown or grayish brown, slender, initially strigose, subglabrous or glabrous when old. Petiole 2–5 mm, pilose; stipules usually caducous, lanceolate or linear-lanceolate, pilose; leaf blade elliptic-ovate to rhombic-ovate, 2.5–6 × 1.5–3 cm, abaxially initially pubescent, glabrate, adaxially pilose, soon glabrescent, base broadly cuneate, apex acuminate or acute. Corymbs 1.5–3.5 cm, 5–10-flowered; rachis and pedicels pilose; bracts caducous, lanceolate or linear, 2–3 mm, pilose. Pedicel 4–6 mm. Flowers 7–8 mm in diam. Hypanthium abaxially initially pilose, finally glabrous or subglabrous. Sepals triangular, 1–1.5 × 2–2.5 mm, apex acute. Petals erect, white, stained pinkish, broadly ovate or suborbicular, 3–4 mm and ca. as broad, base shortly clawed, apex obtuse or erose. Stamens 20, slightly shorter than petals. Ovary densely pilose apically; styles 2–5, free, somewhat not exceeding stamens. Fruit black, ovoid or subglobose, 8–10 × 6–7 mm, pilose apically; pyrenes 2 or 3, rarely 4 or 5. Fl. May–Jun, fr. Sep–Oct.

• Mountain regions, semiopen slopes, sparse forests, forest mar-

gins; 1800–3000 m. Gansu, Guizhou, Hubei, Ningxia, Shaanxi, Sichuan, Yunnan.

38. *Cotoneaster buxifolius* Wallich ex Lindley, Bot. Reg. 15: sub t. 1229. 1829.

黄杨叶栒子 huang yang ye xun zi

Shrubs evergreen to semievergreen, low, to 1.5(–3) m tall. Branchlets dark grayish brown or brownish, terete, initially densely whitish tomentose, glabrate. Petiole 1–3 mm, tomentose; stipules caducous, subulate, 2–3 mm, tomentulose; leaf blade elliptic to elliptic-obovate, 5–10(–16) × (2–)4–9 mm, abaxially densely gray tomentose, adaxially initially appressed pubescent, glabrescent, base narrowly to broadly cuneate, apex acute and mucronate, rarely ± obtuse. Inflorescences (1- or)3–5(–9)-flowered; bracts lanceolate, nearly as long as pedicels, tomentose. Pedicel 3–5 mm, tomentose. Flowers 7–9 mm in diam. Hypanthium campanulate, abaxially tomentose. Sepals ovate-triangular, 1.5–2 mm, apex acute. Petals spreading, white, suborbicular or broadly ovate, 3–4 mm in diam., glabrous, base shortly clawed, apex obtuse. Stamens 20, slightly shorter than petals. Ovary pubescent apically; styles 2, free, nearly as long as stamens. Fruit red, subglobose, 5–6 mm in diam.; pyrenes usually 2. Fl. Apr–Jun, fr. Sep–Oct.

Mountain regions, rocky mountain slopes, thickets, roadsides; 1000–3900 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].

- 1a. Dwarf shrub to 0.5–1 m tall; pedicel, hypanthium and sepals abaxially initially sparsely villous-tomentose, glabrate; flowers 1 or 2(–4); leaves apically obtuse, rarely ± acute and mucronulate 38c. var. *rockii*
- 1b. Shrub 1–3 m tall; pedicel, hypanthium and sepals abaxially densely and persistently strigose-tomentose; flowers (1–)3–5(–9); leaves apically mucronate or mucronulate.
 - 2a. Shrub 1–2 m tall; leaves elliptic to elliptic-obovate, 5–10 mm or slightly longer, apex acute and mucronate, rarely ± obtuse; flowers (1–)3–5(–9) 38a. var. *buxifolius*
 - 2b. Shrub to 3 m tall; leaves elliptic, rarely obovate-elliptic, 7–16 mm, apex obtuse and mucronulate; flowers 2–5(–8) 38b. var. *marginatus*

38a. *Cotoneaster buxifolius* var. *buxifolius*

黄杨叶栒子(原变种) huang yang ye xun zi (yuan bian zhong)

Cotoneaster argenteus G. Klotz; *C. brevirameus* Rehder & E. H. Wilson; *C. buxifolius* f. *vellaeus* Franchet; *C. buxifolius* var. *vellaeus* (Franchet) G. Klotz; *C. hodjingensis* G. Klotz; *C. lidjiangensis* G. Klotz; *C. microphyllus* Wallich ex Lindley var. *buxifolius* Dippel; *C. microphyllus* var. *vellaeus* (Franchet) Rehder & E. H. Wilson.

Shrubs evergreen to semievergreen, 1–2 m tall. Leaf blade elliptic to elliptic-obovate, 5–10 mm or slightly longer, abaxially gray tomentose, apex usually acute and mucronate. Inflorescences 3–5(–9)-flowered, rarely flowers solitary. Pedicels,

hypanthium, and sepals abaxially densely and persistently strigose-tomentose.

Rocky mountain slopes, thickets, roadsides; 1000–3300 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].

Zhou and Wu (Acta Bot. Yunnan. 23: 29–36. 2001) treated *Cotoneaster buxifolius* f. *vellaeus* as a synonym of *C. poluninii* G. Klotz (from Nepal) and recognized *C. delavayanus* G. Klotz as a distinct species. Although they are sometimes aligned here, we consider both *C. astrophoros* J. Fryer & E. C. Nelson and *C. delavayanus* to be doubtful species.

38b. *Cotoneaster buxifolius* var. *marginatus* Loudon, Encycl. Trees Shrubs 411. 1842.

多花黄杨叶栒子 *duo hua hang yan ye xun zi*

Cotoneaster marginatus Lindley ex Loudon; *C. microphyllus* Wallich ex Lindley var. *buxifolius* Dippel f. *lanatus* Dippel; *C. prostratus* var. *lanatus* (Dippel) Rehder; *C. rotundifolius* Wallich ex Lindley var. *lanatus* (Dippel) C. K. Schneider.

Shrubs evergreen, to 3 m tall. Leaf blade elliptic, rarely obovate-elliptic, 7–16 mm, abaxially tomentose, apex obtuse and mucronulate. Inflorescences 2–5(–8)-flowered. Pedicels, hypanthium, and sepals abaxially densely and persistently strigose-tomentose.

Mountain regions; 2500–3300 m. SE Xizang [Bhutan, India].

Zhou & Wu (Acta Bot. Yunnan. 23: 29–36. 2001) treated this variety as a synonym of var. *buxifolius*.

38c. *Cotoneaster buxifolius* var. *rockii* (G. Klotz) L. T. Lu & A. R. Brach, **comb. et stat. nov.**

西南黄杨叶栒子 *xi nan huang yang ye xun zi*

Basionym: *Cotoneaster rockii* G. Klotz, Wiss. Z. Martin Luther Univ. Halle-Wittenberg, Math.-Naturwiss. Reihe 12: 775. 1963; *C. insolitus* G. Klotz.

Shrubs evergreen, dwarf, 0.5–1 m tall. Leaves elliptic or broadly lanceolate, rarely oblong-ob lanceolate, 6.5–12 mm, abaxially sparsely villous-tomentose or more so, apex usually obtuse, rarely ± acute and mucronulate. Flowers 1 or 2, rarely 3 or 4. Pedicels, hypanthium, and sepals abaxially sparsely villous-tomentose, gradually glabrescent.

• Rocks and boulders in high mountain regions; 3000–3900 m. SW Sichuan, SE Xizang, Yunnan.

39. *Cotoneaster dammeri* C. K. Schneider, Ill. Handb. Laubholz. 1: 761. 1906.

矮生栒子 *ai sheng xun zi*

Shrubs evergreen, low. Branches creeping, usually rooting at nodes. Branchlets dark grayish brown to grayish black, terete, initially yellowish appressed pilose, glabrous when old. Petiole 2–3(–10) mm, initially yellowish pilose, glabrous when old; stipules mostly caducous, linear-lanceolate or lanceolate, 2–4 mm, puberulent; leaf blade elliptic to oblong-elliptic or obovate, 1–2(–3) × 0.7–2.2 cm, thickly leathery, lateral veins 4–6 pairs, somewhat raised abaxially and impressed adaxially, abaxially slightly glaucous, initially appressed pilose, glabrate, adaxially

lustrous, glabrous, base broadly cuneate to rounded, apex obtuse, emarginate, or ± acute. Inflorescences ca. 1 cm in diam., usually 1-flowered, rarely 2- or 3-flowered corymbs; bracts linear-lanceolate, 2–3 mm, pilose. Pedicel 4–6 mm, rarely to 1.5 cm, pilose. Hypanthium campanulate, abaxially puberulent. Sepals triangular, 1.5–2 mm and nearly as broad, apex acute. Petals spreading, white, suborbicular or broadly ovate, 4–5 mm in diam., glabrous, base shortly clawed, apex obtuse. Stamens 20, unequal in length; anthers purple. Ovary pilose apically; styles (3 or)4 or 5, free, nearly as long as stamens. Fruit bright red, subglobose, 6–7 mm in diam., glabrous; pyrenes (3 or)4 or 5. Fl. May–Jun, fr. Sep–Oct. $2n = 34^*$.

• Mountain areas, rocks, sparse mixed forests; 1300–4100 m. Gansu, Guizhou, Hubei, Sichuan, Xizang, Yunnan.

- 1a. Petiole 2–3 mm; leaf blade elliptic or oblong-elliptic; pedicel 4–6 mm 39a. var. *dammeri*
1b. Petiole 6–10 mm; leaf blade usually obovate; pedicel 10–15 mm 39b. var. *radicans*

39a. *Cotoneaster dammeri* var. *dammeri*

矮生栒子(原变种) *ai sheng xun zi* (yuang bian zhong)

Cotoneaster dammeri subsp. *songmingensis* C. Y. Wu & Lihua Zhou; *C. humifusus* Duthie ex Veitch; *C. kweitschoviensis* G. Klotz.

Petiole 2–3 mm; leaf blade elliptic or oblong-elliptic. Pedicel 4–6 mm.

• Rocky mountain areas, sparse mixed forests; 1300–2600 m. Gansu, Guizhou, Hubei, Sichuan, Yunnan.

39b. *Cotoneaster dammeri* var. *radicans* (Dammer ex C. K. Schneider) C. K. Schneider, Ill. Handb. Laubholz. 1: 761. 1906.

长柄矮生栒子 *chang bing ai sheng xun zi*

Cotoneaster radicans Dammer ex C. K. Schneider, Ill. Handb. Laubholz. 1: 761. 1906.

Petiole 6–10 mm; leaf blade usually obovate. Pedicels 1–1.5 cm.

• Mountain areas, rocks; 2000–4100 m. Gansu, Hubei, Sichuan, Xizang.

Zhou et al. (Acta Bot. Yunnan. 22: 379–382. 2000) treated this variety as a synonym of var. *dammeri*.

40. *Cotoneaster morrisonensis* Hayata, Icon. Pl. Formosan. 5: 62. 1915.

台湾栒子 *tai wan xun zi*

Cotoneaster rokujodaisanensis Hayata.

Shrubs semievergreen, prostrate, less than 1 m tall, much branched. Branchlets grayish brown to reddish brown, terete, initially strigose, glabrous when old. Petiole 2–3(–5) mm, pilose; stipules partly persistent, linear-lanceolate, puberulent; leaf blade ovate or oblong-ovate, rarely obovate, 9–15(–20) × (5–)6–10 mm, thickly leathery, midvein raised abaxially and impressed adaxially, abaxially initially appressed pilose, later

subglabrous, adaxially glabrous, base cuneate to obtuse, margin entire and revolute, apex acute, rounded, emarginate, or mucronate. Inflorescences axillary or terminal, 1-flowered. Flower 7–8 mm in diam. Hypanthium campanulate, abaxially pilose. Sepals triangular or triangular-ovate. Petals white, broadly obovate, base shortly clawed, apex emarginate. Stamens 10–15. Carpels 2 or 3; styles 2 or 3. Fruit red, ellipsoid-ovate or ellipsoid, 7–8 × 5–6(–8) mm; pyrenes 2 or 3. Fl. May–Jul, fr. Jul–Oct.

• Sunny rocky grasslands, rocky cliffs, open sunny slopes, high mountain areas; 2200–3500 m. Taiwan.

41. *Cotoneaster microphyllus* Wallich ex Lindley, Bot. Reg. 13: t. 1114. 1827.

小叶栒子 *xiao ye xun zi*

Shrubs evergreen, low, to 1 m tall, with stiffly spreading branches. Branchlets reddish brown to blackish brown, terete, initially yellow pubescent, gradually glabrate. Petiole 1–2 mm to more than 4 mm, pubescent; stipules caducous, lanceolate or linear, nearly as long as petioles, slightly pubescent; leaf blade obovate to oblong-obovate, 4–10(–16) × 4–8 mm, thickly leathery, midvein raised abaxially and impressed adaxially, abaxially gray pubescent, rarely glabrous, adaxially glabrous or sparsely pubescent, base broadly cuneate, margin revolute, apex obtuse, rarely emarginate or ± acute. Inflorescences 1(–3)-flowered. Flowers 8–10 mm in diam. Pedicel 2–3 mm, sparsely pubescent. Hypanthium campanulate, abaxially pubescent at least initially. Sepals ovate-triangular, 1–1.5 mm and nearly as broad, apex obtuse. Petals spreading, white, suborbicular, ca. 4 mm and ca. as broad, base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pubescent apically; styles 2, free, somewhat not exceeding stamens. Fruit scarlet-red, globose, 5–6(–10) mm in diam.; pyrenes 2. Fl. May–Jun, fr. Aug–Sep. $2n = 34, 51, 68^*, 102$.

Rocks, slopes, high mountain areas, thickets, roadsides; 2000–4200 m. Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Sikkim].

Zhou & Wu (Acta Bot. Yunnan. 21: 160–166. 1999) treated the following varieties as synonyms of the species.

- 1a. Leaves pubescent on both surfaces.
 - 2a. Leaves obovate to oblong-obovate, 4–7 mm in diam.; petals white 41a. var. *microphyllus*
 - 2b. Leaves narrowly oblong or oblong-ovate to linear-lanceolate, 1.5–5(–7) mm in diam.; petals pinkish white 41b. var. *thymifolius*
- 1b. Leaves glabrous on both surfaces or only pubescent abaxially.
 - 3a. Leaves glabrous on both surfaces, rarely abaxially subglabrous, glabrescent, petioles 1–2 mm; petals pinkish; hypanthium and sepals abaxially initially sparsely pubescent, glabrescent 41c. var. *glacialis*
 - 3b. Leaves adaxially glabrous, abaxially grayish white pubescent; petioles

2–4 mm; petals white; hypanthium and sepals abaxially densely persistently long gray pubescent 41d. var. *cochleatus*

41a. *Cotoneaster microphyllus* var. *microphyllus*

小叶栒子(原变种) *xiao ye xun zi* (yuan bian zhong)

Cotoneaster buxifolius Lindley f. *melanotrichus* Franchet; *C. cochleatus* (Franchet) G. Klotz f. *melanotrichus* (Franchet) G. Klotz; *C. elatus* G. Klotz; *C. melanotrichus* (Franchet) G. Klotz; *C. microphyllus* f. *melanotrichus* (Franchet) Handel-Mazzetti; *C. microphyllus* var. *melanotrichus* (Franchet) Rehder & E. H. Wilson.

Leaves obovate to oblong-obovate, 4–10 × 4–7 mm, both surfaces pubescent. Petals white.

Rocky mountain slopes, thickets, roadsides; 2500–4200 m. Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Sikkim].

41b. *Cotoneaster microphyllus* var. *thymifolius* (Baker) Koehne, Mitt. Deutsch. Dendrol. Ges. 227. 1893.

细叶小叶栒子 *xi ye xiao ye xun zi*

Cotoneaster thymifolius Baker in Saunders, Refug. Bot. 1: t. 50. 1869; *C. integrifolius* (Roxburgh) G. Klotz; *C. linearifolius* (G. Klotz) G. Klotz; *C. microphyllus* f. *linearifolius* G. Klotz; *Crataegus integrifolia* Roxburgh.

Leaves narrowly oblong or oblong-obovate to linear-lanceolate, 4–16 × 1.5–5(–7) mm, both surfaces pubescent. Petals pinkish white. $2n = 51, 68$.

High mountain areas; 3000–4000 m. SE Xizang, NW Yunnan [India, Kashmir, Nepal, Sikkim].

41c. *Cotoneaster microphyllus* var. *glacialis* J. D. Hooker ex Wenzig, Linnaea 38: 195. 1874.

无毛小叶栒子 *wu mao xiao ye xun zi*

Cotoneaster congestus Baker; *C. glacialis* (J. D. Hooker ex Wenzig) G. Panigrahi & A. Kumar; *C. microphyllus* var. *nivalis* G. Klotz.

Petiole 1–2 mm; leaf blade usually elliptic, 6–12 × 4–7 mm, both sides glabrous or abaxially subglabrous, glabrescent. Hypanthium and sepals abaxially initially sparsely pubescent, glabrescent. Petals pinkish.

High mountain areas, rocks; 3900–4200 m. SE Xizang, NW Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Sikkim].

41d. *Cotoneaster microphyllus* var. *cochleatus* (Franchet) Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 176. 1912.

白毛小叶栒子 *bai mao xiao ye xun zi*

Cotoneaster buxifolius Lindley f. *cochleatus* Franchet, Pl. Delavay. 224. 1890; *C. cochleatus* (Franchet) G. Klotz; *C. thymifolius* var. *cochleatus* (Franchet) Franchet.

Petiole 2–4 mm; leaf blade elliptic or ovate-elliptic, 5–11 × 3–8 mm, abaxially grayish white pubescent, adaxially

glabrous, margin revolute. Hypanthium and sepals abaxially densely persistently long gray pubescent. Petals white. $2n = 68$.

Rocks, slopes; 2000–3000 m. Sichuan, Yunnan [Bhutan, Nepal].

42. *Cotoneaster conspicuus* Comber ex Marquand, Bull. Misc. Inform. Kew 1937: 119. 1937.

大果栒子 da guo xun zi

Cotoneaster microphyllus var. *conspicuus* Messel; *C. conspicuus* var. *decorus* Russel; *C. conspicuus* var. *nanus* G. Klotz; *C. nanus* (G. Klotz) G. Klotz; *C. permutatus* Klotz; *C. pluriflorus* G. Klotz.

Shrubs, evergreen, suberect, to 1.2 m tall or more, densely branched. Branchlets ascending, straight or subarcuate, to 45 cm, spreading, initially strigose-villous, gradually glabrescent. Petiole 1.5–2.5 mm; stipules subulate, rarely oblong, 6–16 (–20) × 2.5–6.5(–10) mm, midvein raised abaxially, impressed adaxially, veins inconspicuous, abaxially appressed villous, adaxially glabrous or sparsely villous, base cuneate, margin revolute, apex obtuse or rounded and callous-mucronate. Inflorescences often solitary flowers, rarely few flowered. Pedicel 1.5–2 mm, sparsely villous. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially sparsely villous. Sepals broadly triangular, ca. 1.5 mm and nearly as broad. Petals spreading, white, tipped with pink in bud, suborbicular, 3–4 × 4–5 mm. Filaments yellow, subequal; anthers purple, subglobose. Ovary glabrous; styles 2, ca. 3 mm. Fruit bright scarlet, globose or obovoid, glabrous, 8–10 mm in diam.; pyrenes 2; sepals persistent at fruiting, suberect. Fl. May–Jun, fr. Aug–Sep.

• Open sunny situations among rocks, river valleys; 2400–3300 m. Sichuan, S Xizang, Yunnan.

Comber (Gard. Chron., ser. 3, 99: 388. 1936) previously described this species (but without a Latin description or diagnosis) from plants grown from seeds collected by F. Kingdon Ward in Xizang in 1924.

43. *Cotoneaster sherriffii* G. Klotz, Wiss. Z. Martin-Luther- Univ. Halle-Wittenberg, Math.-Naturwiss. Reihe 12: 776. 1963.

康巴栒子 kang ba xun zi

Cotoneaster ludlowii G. Klotz; *C. muliensis* G. Klotz; *C. schlechtendalii* G. Klotz.

Shrubs semievergreen, erect, to 1.5 m tall, with dense, ascending branches. Branchlets grayish brown, initially sparsely accumbent strigose, glabrate, densely gray lenticellate when old. Petiole 1–3 mm, villous; stipules lanceolate or linear-lanceolate, 2–3 mm, membranous, villous; leaf blade dark green adaxially, oblong-obovate, rarely oblanceolate, 6–12 × 4–8 mm, subleathery, abaxially densely yellowish gray appressed villous, adaxially villous, base cuneate, apex obtuse and mucronate. Corymbs erect, 1–2.5 cm, 3–9(–11)-flowered; rachis and pedicels initially villous, glabrescent. Flowers 9–10 mm in diam. Hypanthium campanulate, abaxially ± villous. Sepals triangular, apex acute. Petals white or pinkish, suborbicular, 3–4 mm in diam., adaxially puberulous near base, base broadly clawed, apex obtuse. Stamens shorter than petals. Carpels 1 or 2; styles not exceeding stamens. Fruit red, globose, 5–7 mm in

diam., glabrous; pyrenes 1 or 2 united into 1. Fl. May–Jun, fr. Sep–Oct. $2n = 68$.

River valleys, forests, slopes; 2700–4100 m. W Sichuan, SE Xizang [Bhutan].

Zhou & Wu (Acta Bot. Yunnan. 21: 160–166. 1999) treated this species as a synonym of *Cotoneaster conspicuus*.

44. *Cotoneaster rotundifolius* Wallich ex Lindley, Bot. Reg. 15: sub t. 1229. 1829.

圓叶栒子 yuan ye xun zi

Cotoneaster distichus Lange var. *tongolensis* C. K. Schneider; *C. microphyllus* Wallich ex Lindley var. *rotundifolius* (Wallich ex Lindley) Wenzig; *C. microphyllus* var. *uva-ursi* Lindley; *C. prostratus* Baker; *C. rotundifolius* var. *tongolensis* (C. K. Schneider) Rehder.

Shrubs evergreen, to 4 m tall. Branchlets spreading, grayish brown to blackish brown, initially appressed villous, glabrous when old. Petiole 1–3 mm, pilose; stipules persistent or caducous, lanceolate, puberulous; leaf blade suborbicular or broadly ovate, 0.8–2 cm × 6–10 mm, abaxially pilose, adaxially glabrous, rarely puberulous, base broadly cuneate to rounded, apex obtuse or emarginate, sometimes acute and mucronate. Inflorescences 1–3-flowered; bracts caducous, linear-lanceolate. Pedicel 2–4 mm, pubescent. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially pilose. Sepals triangular, apex acute. Petals spreading, white or tinged reddish, broadly ovate or obovate, 4–5 mm and nearly as broad, base very shortly clawed, apex obtuse or emarginate. Stamens 20, ca. as long as or somewhat shorter than petals. Ovary pilose apically; styles 2 or 3, free, nearly equaling or lower than stamens. Fruit red, obovoid, 7–9 mm in diam.; pyrenes 2 or 3. Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

Grassy slopes, rocks, mountain summits; 1200–4000 m. W Sichuan, SE Xizang, NW Yunnan [Bhutan, India, Nepal].

Further study is necessary to determine the identity of *Cotoneaster subalpinus* G. Klotz, which might be synonymous with this taxon.

45. *Cotoneaster rubens* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 24. 1917.

红花栒子 hong hua xun zi

Shrubs deciduous to semievergreen, erect or prostrate, 0.5–2 m tall, usually irregularly branched. Branchlets grayish black, terete, robust, initially strigose, glabrous when old. Petiole short, 1–2 mm, stout, pubescent; stipules caducous; leaf blade suborbicular or broadly elliptic, (0.8–)1–2.3 × (0.6–)0.8–1.8 cm, veins raised abaxially and impressed adaxially, abaxially densely yellow tomentose, adaxially glabrous, base rounded, apex obtuse or mucronate, rarely acute. Inflorescences usually 1-flowered. Flowers 8–9 mm in diam., shortly pedicellate. Hypanthium campanulate, abaxially pilose. Sepals triangular, 1–2 × 1.5–2.5 mm, apex ± obtuse. Petals erect, dark red, orbicular to broadly obovate, 4–5 mm in diam., apex obtuse. Stamens 20, shorter than petals. Ovary pilose apically; styles 2 or 3, free, somewhat not exceeding stamens. Fruit red, obovoid, 8–9 mm in diam.; pyrenes 2 or 3. Fl. Jun–Jul, fr. Sep–Oct.

Dense forests on slopes, forest margins, grasslands, rocky places;

3000–4100 m. W Sichuan, SE Xizang, NW Yunnan [Bhutan, N Myanmar].

- 1a. Leaf blade 10–23 × 8–18 mm, apex obtuse or mucronate, sometimes acute; fruit usually with 2 or 3 pyrenes 45a. var. *rubens*
 1b. Leaf blade 8–10 × 6–8 mm, apex obtuse or slightly mucronate; fruit usually with 3 pyrenes 45b. var. *minimus*

45a. *Cotoneaster rubens* var. *rubens*

红花栒子(原变种) hong hua xun zi (yuan bian zhong)

Cotoneaster notabilis G. Klotz.

Leaf blade 1–2.3 × 0.8–1.8 cm, apex obtuse and mucronate, sometimes acute. Fruit usually with 2 or 3 pyrenes.

Dense forests on slopes, forest margins, grasslands; 3000–4100 m. SE Xizang, NW Yunnan [Bhutan, N Myanmar].

45b. *Cotoneaster rubens* var. *minimus* T. T. Yu, Acta Phytotax. Sin. 8: 220. 1963.

小叶红花栒子 xiao ye hong hua xun zi

Leaf blade 8–10 × 6–8 mm, apex obtuse or slightly mucronate. Fruit usually with 3 pyrenes.

- Rocky places. W Sichuan.

Zhou & Wu (Acta Bot. Yunnan. 23: 29–36. 2001) treated this variety as a synonym of *Cotoneaster buxifolius*.

46. *Cotoneaster uniflorus* Bunge in Ledebour, Fl. Altaic. 2: 220. 1830.

单花栒子 dan hua xun zi

Cotoneaster integerrimus Medikus var. *uniflorus* (Bunge) C. K. Schneider; *C. vulgaris* Lindley var. *uniflorus* (Bunge) Regel.

Shrubs deciduous, sometimes prostrate, 30–40(–100) cm tall, spreading. Branchlets grayish brown to grayish black, terete, slender, initially densely yellow pubescent, gradually glabrescent. Petiole (2.5–)3–5 mm, puberulous; stipules purplish red, lanceolate, pilose; leaf blade usually ovate, rarely ovate-elliptic, 1.8–3.5 × 1.3–2.5 cm, abaxially initially tomentose, subglabrous when old, adaxially glabrous, base broadly cuneate to rounded, apex acute, rarely ± obtuse or emarginate. Inflorescences axillary, 1(or 2)-flowered. Pedicel very short, pilose. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, longer than or nearly as long as petals, margin sometimes with few shallow teeth, apex ± obtuse or acute. Petals erect, pink, suborbicular, 3–3.5 mm and ca. as broad, base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pubescent apically; styles 2 or 3(or 4), free, not exceeding stamens. Fruit red, globose, 6–7(–10) mm in diam.; pyrenes (2 or)3(or 4). Fl. May–Jun, fr. Aug–Sep. $2n = 34$.

Forests; 1000–2100 m. Qinghai, Xinjiang [NW Mongolia, Russia].

47. *Cotoneaster adpressus* Bois in Vilmorin & Bois, Frutic. Vilm. 116. 1904.

匍匐栒子 pu fu xun zi

Cotoneaster horizontalis Decaisne var. *adpressus* (Bois) C. K. Schneider; *C. taoensis* G. Klotz.

Shrubs deciduous, prostrate, irregularly branched. Branchlets reddish brown or grayish brown to grayish black, terete, slender, initially strigose, glabrous when old. Petiole 1–2 mm, glabrous or pilose; stipules caducous, subulate, nearly as long as petioles; leaf blade broadly ovate or obovate, rarely elliptic, 5–15 × 4–10 mm, thinly papery, midvein raised abaxially and impressed adaxially, abaxially sparsely pubescent or glabrous, adaxially glabrous, base cuneate, margin entire and undulate, apex obtuse or ± acute. Inflorescences 1- or 2-flowered. Flowers subsessile, 7–8 mm in diam. Hypanthium campanulate, abaxially sparsely pubescent. Sepals ovate-triangular, apex acute, shorter than petals. Petals erect, pink, obovate, 4–5 mm and nearly as broad, apex emarginate or obtuse. Stamens ca. 10–15, shorter than petals. Ovary pubescent apically; styles 2, free, not exceeding stamens. Fruit bright red, subglobose, 7–9 mm in diam., glabrous; pyrenes 2, rarely 3. Fl. May–Jun, fr. Aug–Sep. $2n = 68$.

Mixed forests on slopes, rocky places; 1900–4000 m. Gansu, Guizhou, Hubei, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan [India, Myanmar, Nepal].

48. *Cotoneaster subadpressus* T. T. Yu, Acta Phytotax. Sin. 8: 219. 1963.

高山栒子 gao shan xun zi

Shrubs deciduous or semievergreen, prostrate, low. Branchlets grayish black when old, stout, initially densely pilose, glabrous when old. Petiole 1–2 mm, pilose; stipules caducous, linear or subulate; leaf blade suborbicular or broadly ovate, 4–8(–12) mm and ca. as broad, thickly leathery, midvein raised abaxially and impressed adaxially, lateral veins inconspicuous, both surfaces and margin initially pubescent, glabrous when old, base broadly cuneate to rounded, margin thick, apex obtuse or acute. Inflorescences 1-flowered. Flowers 4–6 mm in diam., subsessile or shortly pedicellate. Hypanthium campanulate, abaxially pubescent. Sepals triangular, apex acute or obtuse. Petals erect, pink, obovate or suborbicular, 3–4 × 2–3 mm, base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pubescent apically; styles 2, free, somewhat not exceeding stamens. Fruit ovoid, 5–6 mm in diam.; pyrenes 2. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

- Rocky slopes of high mountains, coniferous forests, forest margins; 3000–3600 m. Sichuan, W Yunnan.

49. *Cotoneaster horizontalis* Decaisne, Fl. Serres Jard. Eur. 22: 168. 1877.

平枝栒子 ping zhi xun zi

Shrubs deciduous or semievergreen, procumbent, usually to 50 cm tall, sometimes taller, with horizontally spreading, distichously much branched stems. Branchlets blackish brown, terete, initially strigose, glabrous when old. Petiole 1–3 mm, pubescent; stipules caducous, brown, subulate or lanceolate, 2–4 mm, puberulous; leaf blade suborbicular or broadly elliptic,

rarely obovate, 6–14 × 4–9 mm, midvein raised abaxially and ± impressed adaxially, abaxially sparsely accumbent pubescent, adaxially glabrous, base cuneate, apex usually acute. Inflorescences 1- or 2-flowered. Pedicel short to nearly absent. Flowers 5–7 mm in diam. Hypanthium campanulate, abaxially sparsely pubescent. Sepals triangular, 1–1.5 × 1–2 mm, apex acute. Petals erect, pink, reddish, or whitish, 3–4 × 2–3 mm, base shortly clawed, apex obtuse. Stamens ca. 12, shorter than petals. Ovary pilose apically; styles (2 or)3, free, not exceeding stamens. Fruit bright red, subglobose or ellipsoid, (3–)5–7 mm in diam.; pyrenes 3, rarely 2. Fl. May–Jun, fr. Sep–Oct.

Thickets, rocks, rocky slopes, dry mountain areas; 1500–3500 m. Gansu, Guizhou, Hubei, Hunan, Jiangsu, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Nepal].

Plants with somewhat larger leaves, clearly and very strikingly variegated with white, have been described as *Cotoneaster horizontalis* var. *variegatus* Osborn (Gard. Chron., ser. 3, 72: 351. 1922). They are grown as ornamentals, particularly in rock gardens.

- 1a. Fruit subglobose, 5–7 mm in diam.,
with 3 pyrenes, rarely only 2 49a. var. *horizontalis*
1b. Fruit ellipsoid, 3–4 mm in diam.,
usually with 2 pyrenes 49b. var. *perpusillus*

49a. *Cotoneaster horizontalis* var. *horizontalis*

平枝栒子(原变种) ping zhi xun zi (yuan bian zhong)

Cotoneaster acuminatus Lindley var. *prostratus* Hooker ex Decaisne; *C. symonsii* Loudon ex Koehne; *Diospyros chaffanjonii* H. Léveillé.

Leaf blade 6–14 mm, not variegated with white. Fruit subglobose, 5–7 mm in diam.; pyrenes 3, rarely 2.

Thickets, rocky slopes, dry mountain areas; 2000–3500 m. Gansu, Guizhou, Hubei, Hunan, Jiangsu, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Nepal].

Further study is necessary to determine the identities of *Cotoneaster atropurpureus* Flinck & B. Hylmö and *C. flinckii* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

49b. *Cotoneaster horizontalis* var. *perpusillus* C. K. Schneider, Ill. Handb. Laubholz. 1: 745. 1906.

小叶平枝栒子 xiao ye ping zhi xun zi

Cotoneaster distichus Lange var. *perpusillus* (C. K. Schneider) C. K. Schneider; *C. perpusillus* (C. K. Schneider) Flinck & Hylmö.

Leaf blade 6–8 mm, not variegated with white. Fruit ellipsoid, 5–6 × 3–4 mm; pyrenes usually 2. $2n = 68^*$.

• Rocks, rocky slopes; 1500–2500 m. Guizhou, Hubei, Shaanxi, Sichuan.

50. *Cotoneaster divaricatus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 157. 1912.

散生栒子 san sheng xun zi

Shrubs deciduous, erect, 1–2 m tall, sparsely branched. Branchlets spreading, dark reddish brown or dark grayish

brown, terete, slender, initially strigose, glabrous when old. Petiole 1–2(–3) mm, pubescent; stipules caducous, linear-lanceolate, 2–5 mm, slightly pubescent; leaf blade elliptic or broadly elliptic, rarely obovate, 0.7–2 cm × 5–10 mm, midvein raised abaxially and ± impressed adaxially, both surfaces initially pubescent, adaxially subglabrous when old, base broadly cuneate, apex acute, rarely ± obtuse, sometimes mucronate. Inflorescences 5–6 mm in diam., 2–4-flowered; bracts caducous, linear-lanceolate, slightly pubescent. Pedicel 1–2 mm, sparsely pubescent. Flowers 3–4 mm. Hypanthium sparsely pubescent abaxially. Sepals triangular, 1–2 mm, apex acute. Petals erect, pink, ovate or oblong, 3–4 × 2–3 mm, base shortly clawed, apex obtuse. Stamens 10–15, shorter than petals. Ovary pubescent apically; styles 2, free, not exceeding stamens. Fruit red, ellipsoid, 5–7 mm in diam., sparsely pubescent; pyrenes (1 or)2(or 3). Fl. Apr–Jun, fr. Sep–Oct.

• Rocky slopes, gullies, forests, shrubwoods, thickets; 1600–3400 m. Anhui, Gansu, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang.

51. *Cotoneaster langei* G. Klotz, Wiss. Z. Friedrich-Schiller- Univ. Jena, Math.-Naturwiss. Reihe 21: 1000. 1972.

中甸栒子 zhong dian xun zi

Shrubs deciduous or semievergreen, erect or partly prostrate, to 1 m tall. Branchlets brown or purplish brown to blackish brown, terete, initially yellow strigose, glabrous when old. Petiole 1–2 mm, densely strigose-villous; stipules partly persistent, subulate, 1–2 mm, membranous; leaf blade dark green adaxially, broadly ovate or suborbicular, 7–14 × 6–13 mm, subleathery, abaxially initially densely strigose-villous, glabrate, adaxially shiny, initially yellowish villous, glabrescent, lateral veins 3–5 pairs, slightly impressed adaxially, base rounded or broadly cuneate, apex obtuse and mucronate, rarely emarginate or acute. Inflorescences 1-flowered. Pedicel very short or indistinct, strigose-villous. Flower 5–7 mm in diam. Hypanthium campanulate, abaxially strigose-villous. Sepals broadly triangular, 1–2 × 1.5–2.5 mm, apex acute or ± obtuse. Petals erect, pink, suborbicular, base shortly clawed, apex obtuse. Stamens 10–12. Styles 2, free. Fruit dark red, ovoid-globose, 8–9 mm in diam., sparsely strigose-villous; pyrenes 2, ovoid. Fl. May–Jun, fr. Aug–Sep.

• Thickets, coniferous forests, rocky slopes; 3000–3500 m. SW Sichuan, NW Yunnan.

Further study is necessary to determine the identity of *Cotoneaster ganghobaensis* J. Fryer & B. Hylmö, which might be synonymous with this taxon.

52. *Cotoneaster chengkangensis* T. T. Yu, Acta Phytotax. Sin. 8: 220. 1963.

镇康栒子 zhen kang xun zi

Cotoneaster strigosus G. Klotz.

Shrubs deciduous, to 2 m tall. Branchlets grayish brown to grayish black, terete, initially densely yellow strigose, glabrous when old, inconspicuously verruculose. Petiole 1–3 mm, pubescent; stipules linear-lanceolate, nearly as long as or slightly

longer than petioles, membranous, puberulous; leaf blade ovate or broadly elliptic to suborbicular, (0.8–)1–2 × 0.7–1.5 cm, both surfaces appressed pilose, more densely so adaxially, base broadly cuneate to subrounded, apex acute, sometimes mucronate. Inflorescences 2- or 3-flowered; bracts linear or lanceolate, nearly as long as or slightly longer than pedicels. Flowers 6–7 mm in diam. Pedicel 3–4 mm, pilose. Hypanthium campanulate, abaxially puberulous. Sepals triangular, 1–1.5 × 1.5–2 mm, apex acute. Petals erect, pinkish, ovate or obovate, 3–4 × 2–3 mm, base shortly clawed, apex obtuse. Stamens 15–20, shorter than petals. Ovary pilose apically; styles 4 or 5, free, somewhat not exceeding stamens. Fruit usually nodding, red, ellipsoid, 8–9 × 5–7 mm, shortly puberulous, glabrous when old; pyrenes usually 3. Fl. May–Jun, fr. Sep–Oct.

- Rocky places, alongside ditches; 2300–3400 m. W Yunnan.

53. *Cotoneaster nitens* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 156. 1912.

光泽栒子 *guang ze xun zi*

Shrubs deciduous, 2–4 m tall, much branched. Branchlets grayish brown to grayish black, terete, initially strigose, glabrous when old. Petiole 2–3 mm, villous, sometimes subglabrous; stipules partly persistent, linear, pubescent; leaf blade ovate or elliptic, 1–2 × 0.7–1.5 cm, abaxially initially villous, subglabrous when old, adaxially lustrous, glabrous, base rounded or broadly cuneate, apex obtuse, rarely acute, sometimes mucronate or emarginate. Corymbs 1–2 cm, 2- or 3(–8)-flowered; rachis and pedicels villous; bracts linear, pubescent. Pedicel 2–4 mm. Flowers 7–8 mm in diam. Hypanthium sparsely villous abaxially. Sepals triangular, 1–2 × 1.5–2.5 mm, shorter than petals, apex acute or ± obtuse. Petals pinkish, suborbicular or broadly obovate, 4–4.5 × 3–4 mm, apex obtuse. Stamens 10–12, shorter than petals. Ovary pubescent apically; styles often 2, rarely 3, free, not exceeding stamens. Fruit purplish black, ellipsoid, 6–8 mm in diam., shiny, glabrous; pyrenes 1 or 2. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

- Slopes, river banks, mixed forests; 1900–3000 m. W Sichuan.

54. *Cotoneaster harrismithii* Flinck & Hylmö, Bot. Not. 115: 29. 1962.

丹巴栒子 *dan ba xun zi*

Shrubs deciduous, 1–2 m tall. Branchlets sometimes nodding, reddish brown when old, terete, initially grayish yellow strigose-villous, glabrous when old. Petiole 2–3 mm, strigose-villous; stipules subulate, 2–5 mm, pilose; leaf blade elliptic to ovate-elliptic, (0.7–)1.5–2 cm × 4–11 mm, lateral veins 3 or 4 pairs, slightly raised abaxially, both surfaces appressed strigose-villous, more densely so abaxially, glabrescent, base cuneate or somewhat rounded, apex acute to acuminate. Corymbs (2 or)3 (or 4)-flowered; rachis and pedicels villous; bracts subulate, sparsely villous. Pedicel 1–3 mm. Flowers 4–5 mm in diam. Hypanthium campanulate, abaxially villous. Sepals triangular, apex acute. Petals erect, pink or brownish red with white margin, suborbicular, 2–3 × 1.5–2 mm, base cuneate, apex incurved. Stamens (10–)12(–14), 1.5–2 mm; filaments equal in length; anthers yellowish white or pink. Styles 2 or 3, free, 1–2 mm. Fruit brownish black or black, ovoid or subglobose, 6–7 ×

4–5 mm; pyrenes 2 or 3. Fl. Apr–May, fr. Aug–Sep.

- Slopes, thickets; 2300–2900 m. W Sichuan, SE Xizang.

55. *Cotoneaster nitidus* Jacques, J. Soc. Imp. Centr. Hort. 5: 516. 1859.

两列栒子 *liang lie xun zi*

Shrubs deciduous or semievergreen, erect, to 2.5 m tall. Branchlets ± dichotomously arranged, grayish brown when old, terete, initially densely yellow strigose, gradually glabrescent. Petiole 1–3 mm, villous; stipules persistent, lanceolate, 2–4 mm, pilose; leaf blade broadly ovate or broadly obovate, (0.4–)0.8–1.5(–2.5) × (0.5–)0.7–1.3(–1.8) cm, midvein raised abaxially and impressed adaxially, both surfaces appressed villous, more densely so adaxially, base rounded or broadly cuneate, apex acute and mucronate, rarely obtuse. Inflorescences 1-flowered. Pedicel 1–2 mm. Flower 5–7 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals broadly triangular, 1–2 × 2–3 mm, apex ± acute or obtuse. Petals erect, white or stained reddish, ovate or suborbicular, 3–4 mm in diam., apex obtuse. Stamens 20, shorter than petals. Ovary pubescent apically; styles (2 or)3(or 4), free, somewhat not exceeding stamens. Fruit nodding, red, broadly obovoid, 7–8 mm in diam., shortly puberulous; pyrenes (2 or)3(or 4). Fl. Jun–Jul, fr. Sep–Oct.

Thickets, forests, grassy slopes, mountain regions and valleys; 1600–4000 m. Sichuan, Xizang, Yunnan [Bhutan, NE India, N Myanmar, Nepal, Sikkim].

- 1a. Leaf blade 4–7 × 5–6 mm, apex obtuse or emarginate 55c. var. *parvifolius*
- 1b. Leaf blade 8–15(–25) × 7–13(–18) mm, apex acute.
 - 2a. Leaf blade 8–15(–20) × 7–13(–15) mm, apex acute and abruptly mucronate, rarely obtuse 55a. var. *nitidus*
 - 2b. Leaf blade 12–25 × 12–18 mm, apex acute and shortly mucronate 55b. var. *duthieanus*

55a. *Cotoneaster nitidus* var. *nitidus*

两列栒子(原变种) *liang lie xun zi* (yuan bian zhong)

Cotoneaster distichus Lange; *C. rupestris* Charlton.

Leaf blade 0.8–1.5(–2) × 0.7–1.3(–1.5) cm, apex acute and abruptly mucronate, rarely obtuse.

Thickets, forests, grassy slopes, mountain valleys; 1600–4000 m. Sichuan, Xizang, Yunnan [Bhutan, NE India, N Myanmar, Nepal, Sikkim].

55b. *Cotoneaster nitidus* var. *duthieanus* (C. K. Schneider) T. Yu, Fl. Reipubl. Popularis Sin. 36: 167. 1974.

大叶两列栒子 *da ye liang lie xun zi*

Cotoneaster distichus Lange var. *duthieanus* C. K. Schneider, Ill. Handb. Laubholz. 1: 745. 1906; *C. duthieanus* (C. K. Schneider) G. Klotz; *C. forrestii* G. Klotz.

Leaf blade 1.2–2.5 × 1.2–1.8 cm, apex acute and shortly mucronate.

Mountain regions; 2500–4000 m. NW Yunnan [N Myanmar].

Further study is necessary to determine the identities of *Cotoneaster cuspidatus* Marquand ex J. Fryer & B. Hylmø and *C. marquandii* G. Klotz, which might be synonymous with this taxon.

55c. *Cotoneaster nitidus* var. *parvifolius* (T. T. Yu) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 167. 1974.

小叶两列栒子 xiao ye liang lie xun zi

Cotoneaster distichus Lange var. *parvifolius* T. T. Yu, Bull. Brit. Mus. (Nat. Hist.) Bot. 1: 129. 1954; *C. cavei* G. Klotz; *C. cordifolius* G. Klotz; *C. nitidus* subsp. *cavei* (G. Klotz) H. Ohashi.

Leaf blade 4–7 × 5–6 mm, apex obtuse or emarginate.

High mountain regions; 2700–3200 m. NW Yunnan [N Myanmar].

Further study is necessary to determine the identity of *Cotoneaster salwinensis* G. Klotz, which might be synonymous with this taxon.

56. *Cotoneaster taylorii* T. T. Yu, Bull. Brit. Mus. (Nat. Hist.) Bot. 1: 129. 1954.

藏南栒子 zang nan xun zi

Cotoneaster nitidus Jacquin subsp. *taylorii* (T. T. Yu) H. Ohashi.

Shrubs or small trees, deciduous, 2–3 m tall. Branchlets grayish brown when old, terete, initially densely brownish yellow strigose, glabrous when old. Petiole 2–3 mm, brownish yellow pilose; stipules lanceolate, 1–2 mm, membranous, brownish yellow pilose; leaf blade suborbicular or broadly ovate, 1–1.2 cm × 9–10 mm, adaxially shiny, veins inconspicuously raised abaxially and slightly impressed adaxially, both surfaces initially hirtellous, glabrous when old, base rounded, rarely broadly cuneate, apex obtuse or acute. Inflorescences 2- or 3-flowered; bracts lanceolate, 1–2 mm, membranous. Pedicel 3–5 mm, hirsute. Hypanthium campanulate, abaxially usually glabrous. Sepals broadly triangular, puberulous only along margin, apex obtuse. Petals erect, dark red with white margin, suborbicular, 3–3.5 mm in diam., base shortly clawed, apex obtuse. Stamens ca. 10, shorter than petals, glabrous. Ovary with dense, white hairs at apex; styles 2, free, not exceeding stamens. Fruit red, obovoid; pyrenes 1 or 2. Fl. May–Jun, fr. Jul–Aug.

• Stream sides, gully forests, thickets, river valleys; 3300–4200 m. E Xizang.

57. *Cotoneaster verruculosus* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 272. 1912.

疣枝栒子 you zhi xun zi

Cotoneaster distichus Lange var. *verruculosus* (Diels) T. T. Yu; *C. improvisus* G. Klotz.

Shrubs deciduous or semievergreen, erect, 0.6–2 m tall. Branchlets initially dark reddish brown to grayish brown, dark gray when old, terete, initially densely yellow strigose, glabrate, conspicuously verruculose when old. Petiole 2–5 mm, pubescent; stipules persistent, lanceolate, 2–6 mm, pubescent; leaf blade suborbicular or broadly ovate to broadly obovate, 0.7–1.4

cm × 6–12 mm, both surfaces appressed pilose, glabrescent, abaxially subglabrous, base broadly cuneate or rounded, apex emarginate or partly mucronulate. Inflorescences usually 1-flowered. Flowers 7–8 mm in diam., nearly sessile. Hypanthium glabrous abaxially. Sepals ovate-triangular, 1.5–2.5 mm and ca. as broad, apex ± obtuse. Petals erect, pink, suborbicular, 4–4.5 mm in diam. Stamens 20, shorter than petals. Ovary pubescent apically; styles 2, free, not exceeding stamens. Fruit red, globose, 7–8 mm in diam.; pyrenes often 2. Fl. May–Jun, fr. Sep–Oct.

Mixed forests on dry slopes, grasslands, fields, roadsides; 2800–3600 m. Sichuan, Xizang, Yunnan [Bhutan, N India, Myanmar, Nepal, Sikkim].

58. *Cotoneaster apiculatus* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 156. 1912.

细尖栒子 xi jian xun zi

Shrubs deciduous, erect, 1.5–2 m tall, irregularly branched. Branchlets dark grayish red to grayish brown, terete, initially strigose, glabrescent. Petiole 1–3 mm, initially pubescent, later glabrous; stipules caducous or partly persistent, linear-lanceolate, 2–3 mm, membranous; leaf blade suborbicular or orbicular-ovate, rarely broadly obovate, 6–15 × 5–13 mm, midvein and 2 pairs of lateral veins somewhat raised abaxially and slightly impressed adaxially, abaxially initially appressed strigose-pilose along veins, glabrate, adaxially lustrous, glabrous, base broadly cuneate or rounded, apex apiculate, rarely emarginate. Inflorescences 1-flowered. Pedicel short. Hypanthium glabrous or subglabrous abaxially. Sepals triangular, 1.5–2 mm and ca. as broad, apex shortly acuminate. Petals erect, pinkish, suborbicular, base shortly clawed, apex obtuse. Fruit solitary, erect, red, subglobose, 7–8 mm in diam.; pyrenes (2 or)3. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Roadsides on slopes, forests, upland thickets, forest margins, open places, ditch sides, rocky cliffs; 1500–3300 m. Gansu, Hubei, Shaanxi, Sichuan, Yunnan.

Further study is necessary to determine the identity of *Cotoneaster sichuanensis* G. Klotz, which might be synonymous with this taxon.

59. *Cotoneaster sanguineus* T. T. Yu, Bull. Brit. Mus. (Nat. Hist.) Bot. 1: 130. 1954.

血色栒子 xue se xun zi

Shrubs deciduous, 2–3 m tall, much branched. Branchlets grayish brown or grayish black when old, terete, initially yellowish strigose, gradually glabrescent. Petiole 3–6 mm, pilose; stipules lanceolate, 2–4 mm, membranous, puberulous; leaf blade ovate or elliptic-ovate, 1–2 cm × 7–12 mm, lateral veins 4 or 5 pairs, somewhat raised abaxially and slightly impressed adaxially, abaxially pilose, adaxially shiny, yellowish pilose, glabrous when old, base broadly cuneate or rounded, apex acute, rarely obtuse. Inflorescences usually 1-flowered; bracts lanceolate, somewhat longer than pedicels. Flower subsessile, to 1 cm in diam. Hypanthium red, campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 × 2–3 mm, apex acute or obtuse. Petals erect or spreading, red, broadly obovate, 4–5 mm and ca. as broad, glabrous, base shortly broadly clawed, apex obtuse. Stamens 10, somewhat shorter than petals. Ovary yellow pubescent apically; styles 2, free, not exceeding stamens. Fruit red, subglobose; pyrenes 2. Fl. Jun–Jul.

Slopes, gullies, thickets, rocks, forests; 3200–4100 m. SE Xizang, NW Yunnan [Bhutan, NE India, Nepal].

11. PYRACANTHA M. Roemer, Fam. Nat. Syn. Monogr. 3: 104, 219. 1847.

火棘属 huojishu

Gu Cui zhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Sportella Hance.

Shrubs or small trees, evergreen, usually with thorny branches; buds small, pubescent. Leaves simple, alternate or fascicled, shortly petiolate or sessile, venation camptodromous, margin crenulate, serrulate, or entire; stipules caducous, minute. Inflorescences compound corymbs; hypanthium short. Sepals 5. Petals 5, spreading, white, usually suborbicular, base shortly clawed. Stamens 15–20; anthers yellow. Carpels 5, basally ca. 1/2 adnate to hypanthium, apically free; ovary 5-loculed, semi-inferior, with 2 ovules per locule; styles 5, free. Pome red or orange, globose, with persistent incurved sepals at apex; pyrenes (nutlets) 5.

About ten species: E Asia to SE Europe; seven species (five endemic) in China.

Further study is necessary to determine the placement of the recently described species, *P. heterophylla* T. B. Chao & Zhi X. Chen (Bull. Bot. Res., Harbin 17: 302. 1997) and *P. stoloniformis* T. B. Chao & Zhi X. Chen (loc. cit.: 301).

- 1a. Corymbs dense; pedicel 1–2 mm; hypanthium abaxially densely tomentose.
 - 2a. Leaf apically acute, blade oblong to oblong-obovate; petiole 4–6(–9) mm; branches usually unarmed 6. *P. inermis*
 - 2b. Leaf apically obtuse or truncate, blade obovate to obovate-elliptic; petiole to 2 mm; branches with short thorns 7. *P. densiflora*
- 1b. Corymbs loose; pedicel 4–10 mm; hypanthium glabrous or abaxially slightly pubescent.
 - 3a. Leaves abaxially densely tomentose 5. *P. angustifolia*
 - 3b. Leaves abaxially glabrous or pubescent.
 - 4a. Leaf margin crenulate, apex acute, apiculate, or obtuse, blade oblong or oblanceolate, rarely ovate-lanceolate 4. *P. crenulata*
 - 4b. Leaf margin crenate-serrate, serrulate, or entire, apex obtuse, emarginate, or slightly apiculate, blade usually obovate to obovate-oblong.
 - 5a. Leaf blade crenate-serrate at margin, broadest in apical part 1. *P. fortuneana*
 - 5b. Leaf blade usually entire at margin, sometimes serrulate, broadest at or near middle.
 - 6a. Leaf apically usually slightly apiculate or obtuse, abaxially glaucescent, blade usually elliptic or oblong 2. *P. atalantioides*

- 6b. Leaf apically emarginate or truncate, abaxially pubescent, blade usually narrowly elliptic to narrowly obovate 3. *P. koidzumii*

1. *Pyracantha fortuneana* (Maximowicz) H. L. Li, J. Arnold Arbor. 25: 420. 1944.

火棘 huojī

Photinia fortuneana Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, sér. 3, 19: 179. 1874; *P. crenatoserrata* Hance; *Pyracantha crenatoserrata* (Hance) Rehder; *P. yunnanensis* Chittenden.

Shrubs to 3 m tall. Lateral branches short, thornlike; young branchlets rusty pubescent, dark brown and glabrescent when old. Petiole glabrous or initially slightly pubescent; stipules not seen; leaf blade obovate or obovate-oblong, 1.5–6 × 0.5–2 cm, both surfaces glabrous, base cuneate, margin serrate with teeth incurved, apex obtuse or emarginate, sometimes shortly apiculate. Compound corymb rather loose, 3–4 cm in diam.; peduncle subglabrous; bracts caducous, lanceolate. Pedicel ca. 1 cm, subglabrous. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1–1.5 mm, glabrous, margin entire, apex obtuse. Petals suborbicular, ca. 4 × 3 mm, apex rounded or obtuse. Stamens 20; filaments 3–4 mm. Ovary densely white pubescent apically; styles ca. as long as stamens. Pome orangish red or dark red, subglobose, ca. 5 mm; fruiting pedicel 2–5 mm; sepals persistent, erect. Fl. Mar–May, fr. Aug–Nov. $2n = 34^*$.

• Thickets, stream sides, roadsides; 500–2800 m. Fujian, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang.

2. *Pyracantha atalantioides* (Hance) Stapf, Bot. Mag. 151: t. 9099. 1926.

全缘火棘 quan yuan huojī

Sportella atalantioides Hance, J. Bot. 15: 207. 1877; *Crataegus pyracantha* Hemsley; *Mespilus loureiroi* Kosteletzky; *Pyracantha discolor* Rehder; *P. gibbsii* A. B. Jackson; *P. loureiroi* (Kosteletzky) Merrill.

Shrubs or small trees, to 6 m tall, with thorny branches, rarely unarmed. Branchlets initially yellowish brown or gray pubescent, glabrous when old. Petiole ca. 2.5 mm, usually glabrous, sometimes pubescent; leaf blade elliptic or oblong, rarely oblong-obovate, 1.5–4 × 1–1.6 cm, both surfaces initially yellowish brown pubescent, glabrescent, abaxially becoming slightly glaucescent, lateral veins dense, base broadly cuneate or rounded, margin usually entire, sometimes inconspicuously serrulate, apex apiculate or obtuse, sometimes slightly aristate. Compound corymb loose, 3–4 in diam., many flowered; peduncle yellowish brown pubescent; bracts caducous, lanceolate. Pedicel 5–10 mm, yellowish brown pubescent. Flowers 8–10 mm in diam. Hypanthium campanulate, pubescent. Sepals triangular or broadly elliptic, 1–1.5 mm, abaxially sparsely pubescent, apex obtuse. Petals ovate, 4–5 × 3–4 mm, apex slightly apiculate. Stamens 20; filaments ca. 3 mm. Ovary densely white tomentose apically; styles nearly as long as stamens. Pome bright red, depressed-globose, 4–5 mm in diam.; fruiting pedicel 5–10 mm, glabrous; sepals persistent, erect. Fl. Apr–

May, fr. Sep–Nov.

• Slopes, valleys, among shrubs, open forests; 500–1700 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan.

3. *Pyracantha koidzumii* (Hayata) Rehder, J. Arnold Arbor. 1: 261. 1920.

台湾火棘 tai wan huojī

Cotoneaster koidzumii Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 101. 1911; *C. formosanus* Hayata; *C. taiwoensis* Hayata; *Pyracantha formosana* Kanehira; *P. koidzumii* var. *taiwoensis* (Hayata) Masamune.

Shrubs caespitose. Branchlets dark gray, often thornlike, initially pubescent, glabrous when old. Leaves usually 3–5-fascicled; petioles ca. 3 mm, puberulous; leaf blade narrowly elliptic to narrowly obovate, 3–4.5 × 0.7–1.2 cm, abaxially glaucescent, densely pubescent when young, glabrescent, adaxially glabrous, base cuneate, margin entire, apex slightly emarginate or truncate. Corymb 3–4 cm in diam., many flowered; peduncle sparsely pubescent; bracts caducous, lanceolate. Pedicel 5–11 mm, sparsely pubescent. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially densely pubescent. Sepals triangular, 1–1.2 mm, abaxially densely pubescent when young, apex acute. Petals suborbicular or broadly elliptic, 3.5–4 × 3–4 mm, apex slightly emarginate. Stamens 20; filaments 2–3 mm. Ovary pubescent; styles nearly as long as stamens. Pome orangish red, depressed-globose, 4–5 mm. Fr. Aug–Nov.

• Rocky valley areas, seashores, thickets, among shrubs. Taiwan.

4. *Pyracantha crenulata* (D. Don) M. Roemer, Fam. Nat. Syn. Monogr. 3: 220. 1847.

细圆齿火棘 xi yuan chi huojī

Shrubs or small trees, to 5 m tall, with thorny branches. Branches dark brown when old, initially rusty pubescent, glabrous when old. Petiole 3–6 mm, glabrous; leaf blade oblong or oblanceolate, rarely ovate-lanceolate, 2–7 × 0.8–1.8 cm, both surfaces glabrous, base broadly cuneate or slightly rounded, margin crenulate or sparsely so, apex acute or obtuse. Compound corymb 3–5 cm in diam., many flowered; peduncle initially brown pubescent basally, glabrescent; bracts caducous, lanceolate. Pedicel 4–10 mm, glabrous. Flowers 6–9 mm in diam. Hypanthium campanulate, glabrous. Sepals triangular, 1–1.2 mm, abaxially glabrous, apex acute. Petals orbicular, 4–5 × 3–4 mm, apex rounded. Stamens 20; filaments 2–3 mm. Ovary densely white pubescent apically; styles nearly as long as stamens. Pome orangish yellow or orangish red when mature, nearly globose, 3–8 mm in diam.; sepals persistent, erect. Fl. Mar–May, fr. Aug–Nov.

Slopes, roadsides, stream sides, among shrubs, grassy places, valleys; 700–2500 m. Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal].

- 1a. Plant to 5 m tall, with few thorny branches; leaf blade 2–7 × 0.8–1.8 cm; pome orangish yellow or orangish red 4a. var. *crenulata*
- 1b. Plant to 2 m tall, with several thorny branches; leaf blade 1–2.5 × 0.4–0.8 cm; pome red 4b. var. *kansuensis*

4a. *Pyracantha crenulata* var. *crenulata*

细圆齿火棘(原变种) xi yuan chi huo ji (yuan bian zhong)

Mespilus crenulata D. Don, Prodr. Fl. Nepal. 238. 1825; *Cotoneaster crenulatus* (D. Don) K. Koch; *Crataegus crenulata* (D. Don) Roxburgh; *Crataegus pyracantha* var. *crenulata* (D. Don) Loudon; *Pyracantha chinensis* M. Roemer.

Shrubs or small trees, to 5 m tall, with few thorny branches. Leaf blade oblong or oblanceolate, rarely ovate-lanceolate, 2–7 × 0.8–1.8 cm. Pome orangish yellow or orangish red, subglobose, 3–8 mm in diam.

Slopes, roadsides, stream sides, among shrubs, grassy places; 700–2400 m. Guangdong, Guangxi, Guizhou, Hubei, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal].

4b. *Pyracantha crenulata* var. *kansuensis* Rehder, J. Arnold Arbor. 4: 114. 1923.

细叶细圆齿火棘 xi ye xi yuan chi huo ji

Shrubs to 2 m tall, with several thorny branches. Leaf blade oblong to obovate-lanceolate, 1–2.5 cm × 4–8 mm. Pome red, globose, ca. 5 mm in diam.

• Valleys, roadsides, stream sides; 1500–2500 m. Gansu, Guizhou, S Shaanxi (Qin Ling), Sichuan, Yunnan.

5. *Pyracantha angustifolia* (Franchet) C. K. Schneider, Ill. Handb. Laubholz. 1: 761. 1906.

窄叶火棘 zhai ye huo ji

Cotoneaster angustifolius Franchet, Pl. Delavay. 221. 1890.

Shrubs or small trees, to 4 m tall, often with thorny branches. Branchlets purplish brown when old, densely grayish yellow tomentose when young, glabrous when old. Petiole 1–2.5 mm or leaves sessile; leaf blade narrowly oblong to oblanceolate-oblong, 1.5–5 cm × 4–8 mm, abaxially densely gray tomentose, adaxially initially gray tomentose, soon glabrescent, base cuneate, margin entire, apex obtuse, apiculate, or emarginate. Compound corymb 2–4 cm diam., several flowered; peduncle densely gray tomentose; bracts caducous, lanceolate. Pedicel 1–2 mm, densely gray tomentose. Flowers ca. 2.5 mm in diam. Hypanthium campanulate, densely gray tomentose. Sepals triangular, 1–1.1 mm, abaxially densely gray tomentose, apex acute. Petals suborbicular, ca. 4 mm, apex rounded or emarginate. Stamens 20; filaments 1.5–2 mm. Ovary white tomentose; styles nearly as long as stamens. Pome reddish, depressed-globose, 5–6 mm in diam.; sepals persistent, erect. Fl. May–Jun, fr. Oct–Dec.

• Thickets on slopes, at roadsides; 1600–3000 m. Guizhou, Hubei, Sichuan, Xizang, Yunnan, Zhejiang.

6. *Pyracantha inermis* Vidal, Notul. Syst. (Paris) 13: 301. 1948.

澜沧火棘 lan cang huo ji

Pyracantha mekongensis T. T. Yu.

Shrubs to 1 m tall, usually unarmed, with dense, short branches. Branches grayish brown, rusty tomentose distally when young, soon glabrescent. Leaves fasciculate on short branches; petioles 4–9 mm, glabrous; leaf blade oblong to oblong-obovate, 3–4.5 × 1–1.3 cm, both surfaces glabrous, midvein prominent abaxially, impressed adaxially, base cuneate, margin crenate, teeth incurved apically, apex acute. Corymb dense, terminal on short shoots, 2–3 cm diam., many flowered; peduncle rusty tomentose; bracts caducous, lanceolate. Pedicel 1–3 mm, stout, rusty tomentose. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially densely rusty tomentose. Sepals triangular. 1–1.2 mm, abaxially densely rusty tomentose, apex acute to acuminate. Petals ovate, apex rounded or emarginate. Stamens 20; filaments 2–3 mm. Ovary densely white tomentose; styles nearly as long as stamens. Pome purplish brown, subglobose, ca. 5 mm in diam.; fruiting pedicels densely shortly tomentose. Fl. May.

Sandy river banks; ca. 800 m. Yunnan [Laos].

7. *Pyracantha densiflora* T. T. Yu, Acta Phytotax. Sin. 8: 220. 1963.

密花火棘 mi hua huo ji

Shrubs. Branches with short thorns 1–2 cm; branchlets

purplish brown when old, densely rusty tomentose when young, glabrous when old. Leaves dense, fasciculate on short branchlets; petiole short, not more than 2 mm, subglabrous; leaf blade obovate to obovate-elliptic, 1–1.8 cm × 6–9 mm, abaxially brown tomentose, glabrescent, adaxially lustrous, base cuneate, margin crenulate, apex obtuse or truncate. Inflorescences 1.5–2.5 cm; 6–10-flowered; peduncle absent; bracts caducous, lanceolate. Pedicel densely rusty tomentose. Flowers 0.8–1.2

cm in diam. Hypanthium campanulate, abaxially densely rusty tomentose. Sepals triangular, 1.5–2 mm, abaxially rusty tomentose, apex obtuse. Petals ovate, 4–6 × 3–4 mm, apex rounded or obtuse. Stamens 20; filaments shorter than petals, 1.5–2 mm. Ovary densely white tomentose; styles nearly as long as stamens. Pome not seen. Fl. Jun–Jul.

- Thickets; ca. 1000 m. NW Guangxi (Longlin Xian).

12. CRATAEGUS Linnaeus, Sp. Pl. 1: 475. 1753.

山楂属 shan zha shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Shrubs, subshrubs, or small trees, deciduous, rarely evergreen, armed, rarely unarmed; buds ovoid or subglobose. Leaves simple, stipulate, venation craspedodromous, margin serrate and lobed or partite, rarely entire. Inflorescences corymbose, sometimes flowers solitary. Hypanthium campanulate. Sepals 5. Petals 5, white, rarely pinkish. Stamens 5–25; carpels 1–5, connate, but free apically. Ovary inferior or semi-inferior, with 2 ovules per locule, but one rudimentary. Fruit a pome, with persistent sepals at apex; carpels bony when mature, each locule with 1 seed; seed erect, cotyledons plano-convex.

At least 1000 species: N temperate regions, especially abundant in North America; 18 species (ten endemic) in China.

Crataegus biloba H. Léveillé, described from Guizhou, is *Symplocos paniculata* (Thunberg) Miquel in the Symplocaceae (see Fl. China 15: 252. 1996), under which it has been recognized as f. *biloba* (H. Léveillé) Rehder. *Crataegus lvi* H. Léveillé (Fl. Kouy-Tcheou, 347. 1915), also described from Guizhou, is the same species.

- 1a. Leaves deeply pinnatifid to more than 1/2 width of blade, some lateral veins extending to apices of lobes, some to sinus between lobes.
 - 2a. Fruit yellow or red, pyrenes (nutlets) with concave scars on 2 inner sides.
 - 3a. Fruit golden-yellow, 8–10 mm in diam., pyrenes 4 or 5; leaves glabrous or slightly pubescent 15. *C. altaica*
 - 3b. Fruit red, 4–8 mm in diam., pyrenes 3–5; leaves glabrous 16. *C. remotilobata*
 - 2b. Fruit red or black, pyrenes smooth on 2 inner sides.
 - 4a. Leaves cuneate, rarely broadly cuneate, with 2 or 3 pairs of lobes, subglabrous on both surfaces; fruit black, pyrenes 2 or 3 18. *C. songarica*
 - 4b. Leaves truncate or broadly cuneate, with 3–5 pairs of lobes, pubescent along midvein and lateral veins; fruit red, pyrenes 3–5 1. *C. pinnatifida*
- 1b. Leaves lobed or not divided, lateral veins extending to apices of lobes or teeth only.
 - 5a. Fruit black; inflorescence glabrous or nearly so.
 - 6a. Pulp green; pyrenes 4 or 5, with concave scars on 2 inner sides; leaf blade triangular-ovate to broadly ovate, base broadly cuneate to subrounded, with 3–5 pairs of lobes, pubescent on both surfaces 17. *C. chlorosarca*
 - 6b. Pulp yellow; pyrenes 2 or 3, smooth on 2 inner sides; leaf blade rhomboidal to broadly ovate, base cuneate, sometimes broadly cuneate, with 2 or 3 pairs of lobes, subglabrous on both surfaces 18. *C. songarica*
 - 5b. Fruit red, rarely yellow; inflorescence pubescent or glabrous.
 - 7a. Branches usually unarmed; leaf margin crenate-serrate or obtusely serrate, often not lobed, rarely 3–5-lobed on sterile branches 2. *C. scabrifolia*
 - 7b. Branches armed, leaf blade lobed.
 - 8a. Leaf margin crenate-serrate, with 2–4 pairs of lobes in apical part.
 - 9a. Hypanthium and sepals abaxially glabrous; sepals entire 3. *C. hupehensis*
 - 9b. Hypanthium and sepals abaxially densely pubescent; sepals 2–4-crenulate-serrate 4. *C. shensiensis*
 - 8b. Leaf margin sharply serrate, often with 2–4 pairs of lobes in apical part, rarely only 3-lobed near apex.
 - 10a. Pedicel and peduncle pubescent or tomentose.
 - 11a. Leaf basally cuneate, margin apically incised or 3(–7)-lobed; pyrenes smooth on both inner sides.
 - 12a. Simple corymb 2–2.5 cm in diam., 5–7-flowered; petiole 4–5 mm 5. *C. cuneata*
 - 12b. Compound corymb ca. 8 cm in diam.; 7–18-flowered; petiole 1.5–4 cm 6. *C. shandongensis*
 - 11b. Leaf basally broadly cuneate to rounded, margin with 3–7 pairs of lobes; pyrenes with concave scars on both inner sides.
 - 13a. Leaves adaxially subglabrous, abaxially sparsely pubescent.
 - 14a. Thorns 6–10 mm; leaf petiole pilose or subglabrous, blade margin sharply serrate; fruit ellipsoid, glabrous 7. *C. wilsonii*
 - 14b. Thorns 10–25 mm; leaf petiole glabrescent, blade margin doubly serrate; fruit

- subglobose, sparsely pubescent 8. *C. oresbia*
- 13b. Leaves pubescent on both surfaces.
 - 15a. Leaf basally cuneate or broadly cuneate, occasionally truncate; fruit globose, red or purplish brown 9. *C. maximowiczii*
 - 15b. Leaf basally rounded, truncate, or broadly cuneate; fruit subglobose, orangish red 10. *C. aurantia*
- 10b. Pedicel and peduncle glabrous.
 - 16a. Leaf basally cuneate; fruit red, ca. 1 cm in diam. 11. *C. sanguinea*
 - 16b. Leaf basally truncate or broadly cuneate; fruit yellow, orange, red, or black, not more than 1 cm in diam.
 - 17a. Ovary apically glabrous.
 - 18a. Leaf blade rhombic-ovate or elliptic-ovate, with 3–5 pairs of lobes, apex acuminate; fruit subglobose or oblong, orangish red 12. *C. dahurica*
 - 18b. Leaf blade broadly ovate, with 2–4 pairs of lobes, apex obtuse; fruit ellipsoid, red 13. *C. chungtienensis*
 - 17b. Ovary apically pubescent.
 - 19a. Leaf blade with 5–7 pairs of lobes, margin densely serrate 14. *C. kansuensis*
 - 19b. Leaf blade with 2–4 pairs of lobes, margin remotely serrate.
 - 20a. Thorns usually absent; corymbs 3–4 cm in diam.; fruit yellow, 8–10 mm in diam. 15. *C. altaica*
 - 20b. Thorns usually present; corymbs 6–7 cm in diam.; fruit red, 4–8 mm in diam. 16. *C. remotilobata*

1. *Crataegus pinnatifida* Bunge, Mem. Acad. Imp. Sci. St.-Petersbourg Divers Savans 2: 11. 1835.

山楂 shan zha

Trees deciduous, to 6 m tall, with thorns 1–2 cm or sometimes unarmed. Branchlets purplish brown when young, grayish brown when old, terete, subglabrous or glabrous when young; buds purplish red, triangular-ovoid, glabrous. Stipules falcate, ca. 8 mm, herbaceous, margin serrate, apex acuminate; petiole 2–6 cm, glabrous; leaf blade dark green adaxially, broadly ovate or triangular-ovate, rarely rhomboidal-ovate, 5–10 × 4–7.5 cm, lateral veins 6–10 pairs, usually extending to apices of lobes and to sinuses between lobes, abaxially sparsely pubescent along veins, adaxially lustrous, base truncate or broadly cuneate, with 3–5 pairs of lobes, margin sharply irregularly doubly serrate, apex shortly acuminate. Corymb 4–6 cm in diam., many flowered; peduncle initially pubescent, glabrate, bracts caducous, linear-lanceolate, membranous, apex acuminate. Pedicel 4–7 mm, initially pubescent, glabrescent. Flowers ca. 1.5 cm in diam. Hypanthium campanulate, abaxially grayish white pubescent. Sepals triangular-ovate to lanceolate, 4–5 mm, both surfaces glabrous, apex shortly acuminate. Petals white, obovate or suborbicular, 7–8 × 5–6 mm. Stamens 20. Ovary 5-loculed, with 2 ovules per locule; styles 3–5, pubescent basally. Pome dark red, subglobose or pyriform, 1–2.5 cm in diam., glabrous; sepals persistent; pyrenes 3–5. Fl. May–Jun, fr. Aug–Sep. $2n = 34^*$, 102^* .

Among shrubs, slopes, also cultivated; 100–2000 m. Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xinjiang, Zhejiang [Korea].

- 1a. Pedicel and peduncle glabrous 1c. var. *psilosa*
- 1b. Pedicel and peduncle pubescent.
 - 2a. Fruit small, 1–1.5 cm in diam. 1a. var. *pinnatifida*
 - 2b. Fruit larger, ca. 2.5 cm in diam. 1b. var. *major*

1a. *Crataegus pinnatifida* var. *pinnatifida*

山楂(原变种) shan zha (yuan bian zhong)

Crataegus oxyacantha Linnaeus var. *pinnatifida* Regel; ?*C. pinnatifida* f. *geholensis* (C. K. Schneider) M. Kitagawa; ?*C. pinnatifida* var. *geholensis* C. K. Schneider; *C. pinnatifida* var. *songarica* Dippel; *Mespilus pinnatifida* K. Koch; *M. pinnatifida* var. *songarica* (Dippel) Ascherson & Graebner.

Pedicel and peduncle pubescent. Fruit small, 1–1.5 cm.

Among shrubs, slopes; 100–1500 m. Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Zhejiang [Korea].

1b. *Crataegus pinnatifida* var. *major* N. E. Brown, Gard. Chron., n.s., 26: 621. 1886.

山里红 shan li hong

Crataegus pinnatifida var. *korolkowii* (Ascherson & Graebner) Yabe; *Mespilus korolkowii* Ascherson & Graebner.

Pedicel and peduncle pubescent, glabrate. Fruit relatively large, ca. 2.5 cm in diam.

Cultivated in N, NE, and NW China [of cultivated origin].

This taxon has been long cultivated as an important fruit tree.

1c. *Crataegus pinnatifida* var. *psilosa* C. K. Schneider, Ill. Handb. Laubholz. 1: 769. 1906.

无毛山楂 wu mao shan zha

Crataegus coreana H. Léveillé; *C. pinnatifida* f. *psilosa* (C. K. Schneider) M. Kitagawa.

Pedicel and peduncle glabrous. $2n = 34^*$.

Heilongjiang, Jilin, Liaoning [Korea].

2. *Crataegus scabrifolia* (Franchet) Rehder, J. Arnold Arbor.

12: 71. 1931.

云南山楂 yun nan shan zha

Pyrus scabrifolia Franchet, Pl. Delavay. 229. 1890; *Crataegus bodinieri* H. Léveillé; *C. henryi* Dunn.

Trees deciduous, to 10 m tall; branches usually unarmed. Branchlets purplish brown when young, grayish brown when old, terete, initially glabrous or subglabrous; buds purplish red, triangular-ovoid, glabrous. Stipules caducous, linear-lanceolate, ca. 8 mm, membranous, glabrous, margin glandular serrate, apex acuminate; petiole 1.5–4 cm, glabrous; leaf blade ovate-lanceolate to ovate-elliptic or rhombic-ovate, 4–3 × 2.5–4.5 cm, abaxially villous only along midvein and lateral veins, pilose or subglabrous, adaxially slightly pubescent when young, glabrescent, base cuneate, margin sparsely irregularly and doubly obtusely serrate, usually not lobed or those of sterile shoots sparsely irregularly 3–5-lobed apically, apex acute. Corymb or compound corymb, 4–5 cm in diam., many flowered; peduncle glabrous; bracts caducous, linear-lanceolate, membranous. Pedicel 5–10 mm, glabrous. Flowers ca. 1.5 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular-ovate or triangular-lanceolate, 3–4 mm, abaxially glabrous. Petals white, suborbicular or obovate, ca. 8 × 6 mm. Stamens 20. Ovary grayish white tomentose apically; styles 3–5. Pome yellow or reddish, depressed-globose, 1.5–2.5 cm in diam., glabrous; sepals persistent; pyrenes 5, smooth on both inner sides. Fl. Apr–Jun, fr. Aug–Oct. $2n = 34^*$.

• Margins of *Pinus* forests, among shrubs, mixed river side forests; 1500–3000 m. Guangxi, Guizhou, Sichuan, Yunnan.

3. *Crataegus hupehensis* Sargent, Pl. Wilson. 1: 178. 1912.

湖北山楂 hu bei shan zha

Crataegus hupehensis var. *flavida* S. Y. Wang.

Trees or shrubs, 3–5 m tall; branches sparsely thorny, sometimes unarmed. Branchlets purplish brown when young, grayish brown when old, terete, glabrous; buds purple, triangular-ovoid to ovoid, glabrous. Stipules caducous, lanceolate or falcate, 5–8 mm, herbaceous, margin glandular serrate, apex acuminate; petiole 3.5–5 cm, glabrous; leaf blade ovate or ovate-oblong, 4–9 × 4–7 cm, glabrous or only abaxially barbate in axils, base broadly cuneate or subrounded, margin crenate-serrate, with 2–4 pairs of shallow lobes at apical part; lobes ovate, apex shortly acuminate. Corymb 3–4 cm in diam., 7–9-flowered; peduncle glabrous; bracts caducous, linear-lanceolate, membranous. Pedicel 4–5 mm, glabrous. Flowers ca. 1 cm in diam. Hypanthium campanulate, glabrous. Sepals triangular-ovate, 3–4 mm, margin entire, glabrous. Petals white, ovate, ca. 8 × 6 mm. Stamens 20. Ovary 5-loculed, with 2 ovules per locule; styles 5, white tomentose basally. Pome red, subglobose, ca. 2.5 cm in diam., punctate, glabrous; sepals persistent, reflexed; pyrenes 5, smooth on both inner sides. Fl. May–Jun, fr. Aug–Sep. $2n = 34^*$.

• Thickets on slopes; 500–2000 m. Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Zhejiang.

4. *Crataegus shensiensis* Pojarkova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 13: 78. 1950.

陕西山楂 shaan xi shan zha

Shrubs. Branchlets reddish brown when young, dark brown when old, terete, glabrous; buds and stipules not seen. Petiole 1.5–2.5 cm, glabrous; leaves proximally on branches obovate or suborbicular, distal ones broadly ovate or oblong-ovate, 6–9 × 2.5–7.7 cm, abaxially barbate in axils, adaxially only with few hairs along veins, base cuneate or subrounded, margin irregularly crenate-serrate, with 1 pair of lobes broadly ovate or oblong-ovate, apex acute or acuminate. Compound corymb ca. 4 cm in diam., several flowered; peduncle glabrous; bracts not seen. Pedicel 4.5–11 mm, glabrous. Flowers not seen. Hypanthium campanulate, glabrous. Sepals triangular or lanceolate, adaxially pubescent, after anthesis revolute, margin entire or 2–4-crenulate at apical part, apex acuminate. Petals orbicular or broadly ovate, 5–7 mm. Stamens 20. Ovary pubescent apically, 5-loculed, with 2 ovules per locule; styles 5, pubescent basally. Pome not seen. $2n = 34^*$.

• Shaanxi.

Further study is necessary to document the characters of flowers and fruit.

5. *Crataegus cuneata* Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(2): 130. 1843.

野山楂 ye shan zha

Shrubs deciduous, to 15 m tall, usually with slender thorns 5–8 mm. Branchlets purplish brown when young, grayish brown when old, terete, initially pubescent, glabrous when old; buds purplish brown, triangular-ovoid, glabrous, apex obtuse. Stipules falcate, large, 5–8 mm, herbaceous, glabrous, margin serrate, apex acute; petiole 4–5 mm, narrowly winged or not, glabrous; leaf blade broadly obovate to obovate-oblong or obovate-elliptic, 2–6 × 1–4.5 cm, abaxially sparsely pubescent, densely so along veins, glabrescent, with conspicuous veins, adaxially glabrous, base cuneate or attenuate, margin irregularly doubly serrate or serrate, 3-lobed, rarely 5-lobed in apical part or not lobed, apex acute. Corymb 2–2.5 cm in diam., 5–7-flowered, peduncle pubescent; bracts caducous, lanceolate, herbaceous. Pedicel ca. 1 cm, pubescent. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular-ovate, ca. 4 mm, both surfaces villous. Petals white, suborbicular or obovate, 6–7 mm. Stamens 20. Ovary pubescent apically, 5-loculed, with 2 ovules per locule; styles 4 or 5, tomentose basally. Pome red or yellow, subglobose or depressed-globose, 1–2 cm in diam., glabrous; sepals often persistent, reflexed; pyrenes 4 or 5, smooth on both inner sides. Fl. May–Jun, fr. Sep–Nov. $2n = 34^*$.

Valleys, thickets; 200–2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Yunnan, Zhejiang [Japan].

- 1a. Leaf blade broadly obovate to obovate-oblong, larger, 2–6 × 1–1.4 cm, abaxially sparsely pubescent, densely so along veins, base cuneate, margin irregularly doubly serrate, 3-lobed, rarely 5-lobed in apical part 5a. var. *cuneata*
- 1b. Leaf blade obovate-elliptic, smaller,

2–3(–4) × 1.5(–2) cm, both surfaces
glabrous, base attenuate, margin
serrate in apical part, not
lobed 5b. var. *tangchungchangii*

5a. *Crataegus cuneata* var. *cuneata*

野山楂(原变种) ye shan zha (yuan bian zhong)

Crataegus argyi H. Léveillé & Vaniot; *C. chantcha* H. Léveillé; *C. cuneata* f. *pleniflora* S. X. Qian; *C. cuneata* var. *shangnanensis* L. Mao & T. C. Cui; *C. kulingensis* Sargent; *C. stephanostyla* H. Léveillé & Vaniot.

Leaf blade broadly obovate to obovate-oblong, 2–6 × 1–1.4 cm, abaxially sparsely pubescent, densely so along veins, base cuneate, margin irregularly doubly serrate, 3-lobed, rarely 5-lobed in apical part.

Valleys, thickets; 200–2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi (Qin Ling), Yunnan, Zhejiang [Japan].

5b. *Crataegus cuneata* var. *tangchungchangii* (F. P. Metcalf) T. C. Ku & Spongberg, **comb. et stat. nov.**

小叶野山楂 xiao ye ye shan zha

Basionym: *Crataegus tangchungchangii* F. P. Metcalf, Lingnan Sci. J. 11(1): 13. 1932; *C. cuneata* f. *tangchungchangii* (F. P. Metcalf) Y. T. Chang.

Leaf blade obovate-elliptic, 2–3(–4) × 1–1.5(–2) cm, both surfaces glabrous, base attenuate, margin serrate in apical part, not lobed.

• Thickets; 200–1500 m. Fujian (Changluo, Fuqing Xian, Fuzhou Shi).

6. *Crataegus shandongensis* F. Z. Li & W. D. Peng, Bull. Bot. Res., Harbin 6(4): 149. 1986.

山东山楂 shan dong shan zha

Shrubs deciduous, to 5 m tall, usually thorny; thorns robust, 5–10 cm. Branchlets reddish brown when young, grayish brown when old, terete, initially sparsely pubescent, glabrous when old, with sparse lenticels; buds not seen. Stipules caducous, falcate, herbaceous, subglabrous, glandular serrate at margin, apex acute to acuminate; petiole 1.5–4 cm, glabrous; leaf blade obovate or narrowly elliptic 4–8 × 2–4 cm, abaxially sparsely pubescent, densely so along veins, adaxially sparsely white pilose only along midvein, base cuneate, margin irregularly serrate, usually 3–5-lobed, sometimes not divided in apical part, apex acuminate. Compound corymb ca. 8 cm in diam., 7- or 8(–18)-flowered; peduncle white pubescent; bracts caducous, linear-lanceolate, membranous. Pedicel 1–1.5 cm, white pubescent. Flowers ca. 2 cm in diam. Hypanthium campanulate, abaxially white pubescent. Sepals triangular, 4–6 mm, adaxially white pubescent. Petals white, suborbicular or obovate-orbicular, ca. 5 × 4 mm. Ovary 5-loculed, with 2 ovules per locule; styles 5, white pubescent basally. Pome red, globose, 1–1.5 cm in diam., glabrous; sepals persistent; pyrenes 5, smooth on both inner sides. Fl. May–Jun, fr. Sep–Nov.

• Slopes; 500–800 m. C Shandong (Tai Shan).

7. *Crataegus wilsonii* Sargent, Pl. Wilson. 1: 180. 1912.

少毛山楂 shao mao shan zha

Shrubs deciduous, to 7 m tall; usually thorny; thorns 1–2.5 cm, stout. Branchlets dark yellowish brown when young, grayish brown or dark brown when old, terete, initially white pubescent, glabrous or subglabrous when old; buds purplish brown, triangular-ovoid, glabrous. Stipules falcate or oblong, 8–10 mm, herbaceous, subglabrous; petiole 2–2.5 cm, sparsely pilose or subglabrous; leaf blade ovate or obovate, rarely triangular-ovate, 4–6.5 × 3.5–5.5 cm, abaxially slightly pubescent along midvein and veins, adaxially sparsely pubescent when young, base cuneate, rounded, or cordate, margin sharply serrate (teeth aristate toward apex) and usually with (2 or) 3–5 pairs of shallow lobes in apical part, apex acute or obtuse. Corymb 3–4 cm in diam., many flowered; peduncle white tomentose; bracts caducous, lanceolate, herbaceous to membranous. Pedicel 4–7 mm, white tomentose. Flowers 3–4 cm in diam. Hypanthium campanulate, abaxially white tomentose or glabrous. Sepals ovate or triangular-ovate, 3–4 mm, abaxially pubescent. Petals white, suborbicular, 6–7 × 5–6. Stamens 20. Ovary 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3, white tomentose basally. Pome red or purplish red, ellipsoid, 6–7 mm in diam., glabrous; sepals persistent, reflexed; pyrenes 1–3, with deep concave scars on both inner sides. Fl. May, fr. Aug–Sep. $2n = 34^*$.

• Shaded dense forests on slopes, thickets; 1000–2500 m. Gansu, Henan, Hubei, Shaanxi, Sichuan, Yunnan, Zhejiang.

8. *Crataegus oresbia* W. W. Smith, Notes. Roy. Bot. Gard. Edinburgh 10: 26. 1917.

滇西山楂 dian xi shan zha

Shrubs ca. 6 m tall, thorny; thorns 6–10 mm. Branchlets grayish brown, terete, white tomentose when young, soon glabrescent; buds purplish brown, ovate-triangular, glabrous. Stipules caducous, ovate-lanceolate or falcate, 6–10 mm, membranous, subglabrous, margin glandular serrate, apex acute-acuminate; petiole 1.8–2.8 cm, initially pubescent, soon glabrescent; leaf blade broadly ovate, 4.5–6 × 3–5.5 cm, abaxially sparsely pubescent, densely so along veins, adaxially sparsely pubescent, base cuneate or broadly cuneate, margin remotely doubly serrate and with (2 or) 3–5 pairs of lobes, apex obtuse or acute. Corymb 3.6–6 cm in diam., many flowered; peduncle white tomentose; bracts caducous, linear-lanceolate, membranous. Pedicel 4–12 mm, white villous. Flowers ca. 1 cm in diam. Hypanthium campanulate, adaxially white villous. Sepals triangular-ovate, slightly shorter than hypanthium, 2–3 mm, both surfaces white pubescent. Petals white, suborbicular, ca. 8 × 6 mm. Stamens 20. Styles 2, rarely 3, pubescent basally. Pome reddish yellow, subglobose, ca. 6 mm in diam., white pubescent, rarely subglabrous; sepals persistent, reflexed; pyrenes 2 or 3, with concave scars on both inner sides. Fl. May, fr. Aug–Sep.

• On shrub-covered slopes; 2500–3300 m. NW Yunnan.

9. *Crataegus maximowiczii* C. K. Schneider, Ill. Handb. Laub-

holz. 1: 771. 1906.

毛山楂 mao shan zha

Crataegus altaica (Loudon) Lange var. *villosa* (Ruprecht) Lange; *C. beipiaogensis* S. L. Tung & X. J. Tian; *C. maximowiczii* var. *ninganensis* S. Q. Nie & B. J. Jen; *C. sanguinea* Pallas var. *villosa* Ruprecht.

Shrubs or small trees, to 7 m tall, unarmed or armed; thorns 1.5–3.5 cm. Branchlets purplish brown, terete, initially densely white pubescent, glabrescent; buds purplish brown, ovoid, glabrous. Stipules caducous, falcate, 5–8 mm, membranous, subglabrous, margin glandular serrate, apex acute or acuminate; petiole 1.5–2.5 cm, sparsely villous; leaf blade broadly ovate or rhombic-ovate, 4–6 × 3.5 cm, abaxially densely whitish villous, adaxially sparsely pubescent, base cuneate or broadly cuneate, occasionally truncate, margin remotely doubly serrate and with 3–5 pairs of lobes, apex acute. Compound corymb 4–5 cm in diam., many flowered; peduncle whitish villous; bracts caducous, linear-lanceolate, membranous. Pedicel 3–8 mm, whitish villous. Flowers ca. 1.2 cm in diam. Hypanthium campanulate, abaxially white pubescent. Sepals triangular-ovate or triangular-lanceolate, 3–4 mm, abaxially white pubescent. Petals white, suborbicular, ca. 5 mm. Stamens 20. Styles (2 or)3–5, pubescent basally. Pome purplish brown or red, globose, ca. 8 mm in diam., initially pubescent, later glabrous; fruiting pedicel 4–9 mm, initially densely white villous, glabrate when mature; sepals persistent, reflexed; pyrenes 3–5, with concave scars on both inner sides. Fl. May–Jun, fr. Aug–Sep. $2n = 32, 34^*, 51^*$.

Near or in mixed forests, roadsides, river sides; 200–1000 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia (E Siberia)].

10. *Crataegus aurantia* Pojarkova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 13: 82. 1950.

橘红山楂 ju hong shan zha

Shrubs or small trees, deciduous, 3–5 m tall, unarmed or armed; thorns 1–2 cm. Branchlets dark purple when young, grayish brown when old, initially pubescent; buds not seen. Stipules not seen; petiole 1.5–2.5 cm, densely pubescent; leaf blade dark green adaxially, broadly ovate, 4–7 × 3–7 cm, abaxially pubescent, densely so along midvein and veins, adaxially sparsely pubescent, base rounded, truncate, or broadly cuneate, margin sharply and irregularly serrate, with 2 or 3 pairs of shallow lobes; lobes broadly ovate to suborbicular, apex acute. Compound corymb 3–4 cm in diam., many flowered; peduncle densely pubescent; bracts not seen. Pedicel 5–8 mm, densely pubescent. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially pubescent. Sepals broadly triangular, 4–6 mm, abaxially pubescent. Petals white, suborbicular, ca. 5–6 mm. Stamens 18–20. Ovary 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3 rarely 4, pubescent basally. Pome orangish red when dried, oblong-ovoid when young, subglobose when mature, ca. 1 cm in diam., glabrous; sepals persistent, reflexed; pyrenes 2 or 3, abaxially convex, adaxially with concave scars. Fl. May–Jun, fr. Aug–Sep.

• Mixed forests on slopes; 1000–1800 m. Gansu, Hebei, Shaanxi,

Shanxi.

11. *Crataegus sanguinea* Pallas, Fl. Ross. 1(1): 25. 1784.

辽宁山楂 liao ling shan zha

Mespilus purpurea Poiret; *M. sanguinea* Spach.

Shrubs or rarely small trees, deciduous, 2–4 m tall, usually thorny; thorns ca. 1 cm, sometimes absent. Branchlets purplish brown when young, grayish brown when old, terete, sparsely pubescent when young, soon glabrous; buds purplish brown, triangular-ovoid, glabrous. Stipules falcate or irregularly cordate, 5–7 mm, herbaceous, glabrous, margin serrate, apex acute; petiole 1.5–2 cm, subglabrous; leaf blade broadly ovate or rhombic-ovate, 5–6 × 3.5–4.5 cm, abaxially sparsely pubescent along veins, adaxially pubescent, base cuneate, margin doubly serrate, with (2 or)3–5 pairs of shallow lobes, apex acute. Corymb 2–3 cm in diam., many flowered; peduncle glabrous, subglabrous; bracts caducous, linear, membranous. Pedicel 5–6 mm, glabrous or subglabrous. Flowers ca. 8 mm in diam. Hypanthium campanulate, glabrous. Sepals triangular-ovate, ca. 4 mm, abaxially sparsely pubescent. Petals white, oblong, 5–6 mm. Stamens 20. Ovary pubescent apically, 3–5-loculed, with 2 ovules per locule; styles 3(–5). Pome red, subglobose, ca. 1 cm in diam., glabrous; sepals persistent, reflexed; pyrenes 3, rarely 5, with concave scars on both inner sides. Fl. May–Jun, fr. Jul–Aug. $2n = 51^*, 68^*$.

Slopes, mixed river side forests; 900–3000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Xinjiang [N Mongolia, Russia (Siberia)].

12. *Crataegus dahurica* Koehne ex C. K. Schneider, Ill. Handb. Laubholz. 1: 773. 1906.

光叶山楂 guang ye shan zha

Shrubs or small trees, deciduous, 2–6 m tall; thorns 1–2.5 cm, slender, sometimes absent. Branchlets purplish brown when young, dark brown when old, wilted, glabrous, with sparse, oblong lenticels; buds purple, suborbicular or triangular, glabrous. Stipules lanceolate or ovate-lanceolate, 6–8 mm, herbaceous, glabrous, margin serrate, apex acuminate; petiole 7–10 mm, glabrous; leaf blade rhombic-ovate, rarely elliptic-ovate to obovate, 3–5 × 2.5–4 cm, both surfaces glabrous, base cuneate or broadly cuneate, margin sharply doubly serrate, entire near base, with (2 or)3–5 pairs of lobes at apical 2/3 of margin; lobes ovate, apex acuminate. Compound corymb 3–5 cm in diam., many flowered; peduncle glabrous; bracts caducous, linear-lanceolate, membranous. Pedicel 8–10 mm, glabrous. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals linear-lanceolate, ca. 3 mm, margin entire or with 1 or 2 pairs of teeth, both surfaces glabrous. Petals white, suborbicular or obovate, 4–5 × 3–4 mm. Stamens 20. Styles 2–4, glabrous. Pome orangish red or orangish yellow, subglobose or oblong, 6–8 mm in diam., glabrous; sepals persistent, reflexed; pyrenes 2–4, with concave scars on both inner sides. Fl. May, fr. Aug. $2n = 34^*$.

Grassy places on river banks in forests, sandy slopes, thickets; 500–1500 m. N Hebei, Heilongjiang, Nei Mongol [N Mongolia, Russia (E Siberia)].

- 1a. Petiole and leaf blade abaxially glabrous
..... 12a. var. *dahurica*
1b. Petiole and leaf blade abaxially
pubescent 12b. var. *laevicalyx*

12a. *Crataegus dahurica* var. *dahurica*

光叶山楂(原变种) *guang ye shan zha* (*yuan bian zhong*)

Crataegus chitaensis Sargent; *C. purpurea* J. A. Bosc ex Candolle; *C. sanguinea* Pallas var. *glabra* Maximowicz.

Petiole and leaf blade abaxially glabrous.

Grassy places on river banks in forests, sandy slopes; 500–1000 m. Heilongjiang, Nei Mongol [N Mongolia, Russia (E Siberia)].

12b. *Crataegus dahurica* var. *laevicalyx* (J. X. Huang et al.) T. C. Ku & Spongberg, **comb. et stat. nov.**

光萼山楂 *guang e shan zha*

Basionym: *Crataegus laevicalyx* J. X. Huang et al., Bull. Bot. Res., Harbin 11(1): 25. 1991.

Petiole and leaf blade abaxially densely pubescent.

- Sandy slopes, thickets; ca. 1500 m. N Hebei (Weichang Xian).

13. *Crataegus chungtienensis* W. W. Smith, Notes Roy Bot. Gard. Edinburgh 10: 26. 1917.

中甸山楂 *zhong dian shan zha*

Shrubs to 6 m tall. Branchlets grayish brown, terete, glabrous or subglabrous, with sparse, oblong lenticels; buds purplish brown, ovoid, glabrous. Stipules ovate-lanceolate, ca. 8 mm, membranous, glabrous, margin glandular serrate, apex acuminate; petiole 1–1.2, rarely to 3 cm, glabrous; leaf blade broadly ovate, 4–7 × 3.5–5 cm, abaxially sparsely pubescent, densely so along veins, adaxially subglabrous, base rounded to broadly cuneate, margin sharply doubly serrate, with 2 or 3 (or 4) pairs of lobes, rarely parted near base, apex obtuse. Corymb 3–4 cm in diam., many flowered; peduncle glabrous or subglabrous; bracts caducous, linear-lanceolate, membranous. Pedicel 4–6 mm, glabrous or subglabrous. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular-ovate, ca. 1 mm, both surfaces glabrous. Petals white, broadly obovate, ca. 6 × 5 mm. Stamens 20, slightly longer than petals. Styles (1 or) 2 or 3, glabrous. Pome red, ellipsoid, ca. 6 mm in diam., glabrous; sepals persistent, reflexed; pyrenes 1–3, with concave scars on both inner sides. Fl. May, fr. Sep.

- Mixed stream side forests, among shrubs; 2500–3500 m. NW Yunnan (Zhongdian Xian).

14. *Crataegus kansuensis* E. H. Wilson, J. Arnold Arbor. 9: 58. 1928.

甘肃山楂 *gan su shan zha*

Shrubs or small trees, 2.5–8 m tall, usually thorny; thorns many, ca. 0.7–1.5 cm. Branchlets greenish red, terete, slender, glabrous; buds purplish brown, suborbicular, glabrous. Stipules caducous, ovate-lanceolate, ca. 8 mm, membranous, subglabrous, margin glandular serrate, apex acute-acuminate; petiole 1.8–2.5 cm, glabrous; leaf blade broadly ovate, 4–6 × 3–4 cm,

abaxially pubescent along veins and barbate in vein axils, later subglabrescent, adaxially sparsely pubescent, base truncate or broadly cuneate, margin sharply and doubly serrate, with 5–7 pairs of shallow lobes; lobes triangular-ovate, apex acute. Corymb 3–4 cm in diam., 8–18-flowered; peduncle glabrous; bracts caducous, lanceolate, membranous. Pedicel 5–6 mm, glabrous. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 2–3 mm, both surfaces glabrous. Petals white, suborbicular, 5–6 × 3–4 mm. Stamens 15–20. Ovary tomentose apically, 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3. Pome red or orangish yellow, subglobose, 8–10 mm in diam., glabrous; sepals persistent; pyrenes 2 or 3, with concave scars on both inner lateral sides. Fl. May, fr. Jul–Sep. $2n = 34^*$.

- Mixed forests, shaded slopes, stream sides; 1000–3000 m. Gansu, Guizhou, Hebei, Shaanxi, Shanxi, Sichuan.

15. *Crataegus altaica* (Loudon) Lange, Rev. Sp. Gen. Crataeg. 42. 1897.

阿尔泰山楂 *a er tai shan zha*

Crataegus purpurea var. *altaica* Loudon, Arb. Brit. 2: 825. 1838; *C. sanguinea* Pallas var. *incisa* Regel; *C. sanguinea* var. *inermis* Karelina & Kirilov; *C. wattiana* Hemsley & Lace var. *incisa* (Regel) C. K. Schneider.

Trees medium-sized, 3–6 m tall, unarmed, rarely with few 2–4 cm thorns. Branchlets purplish brown or reddish brown when young, grayish brown when old, terete, stout, glabrous; buds purplish brown, suborbicular, glabrous, apex acute. Stipules falcate or cordate, ca. 1 cm, herbaceous, glabrous, margin glandular serrate, apex acute; petiole 2–3.4 cm, glabrous; leaf blade broadly ovate or triangular-ovate, 5–9 × 4–7 cm, veins conspicuous, lateral veins extending to apices of lobes, abaxially barbate in vein axils, adaxially sparsely pubescent, base truncate or broadly cuneate, rarely subcordate, margin irregularly and sharply serrate, usually with 2–4 pairs of lobes, often parted near base, apex acute or obtuse. Compound corymb 3–4 cm in diam., many flowered; peduncle glabrous; bracts caducous, lanceolate, membranous. Pedicel 5–7 mm, glabrous. Flowers 1.2–1.5 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular-ovate, or triangular-lanceolate, 2–4 mm, both surfaces glabrous, apex caudate-acuminate. Petals white, suborbicular, ca. 5 mm in diam. Stamens 20. Ovary sparsely pubescent apically, 4- or 5-loculed, with 2 ovules per locule; styles 4 or 5. Pome yellow, subglobose, 8–10 mm in diam., glabrous; sepals persistent, reflexed; pyrenes 4 or 5, with concave scars on both inner sides. Fl. May–Jun, fr. Aug–Sep. $2n = 68^*$.

- Slopes, forest understories, stream sides; 400–1900 m. C and N Xinjiang [Russia (SE European part, Siberia)].

16. *Crataegus remotilobata* Raikova ex Popov, Bull. Appl. Bot., Leningrad 22: 438. 1929.

裂叶山楂 *lie ye shan zha*

Trees small, 5–6 m tall, usually thorny; thorns 0.6–2.5 cm, slender. Branchlets purplish brown when young, dark purple

when old, terete, stout, glabrous or slightly glaucous; buds purplish brown, suborbicular, glabrous. Stipules caducous, falcate or cordate, ca. 8 mm, herbaceous, glabrous, margin thickened serrate, apex acute-acuminate; petiole 1.5–2.5 cm, glabrous; leaf blade broadly ovate, 4–6 × 3–4.5 cm, both surfaces glabrous or only abaxially pubescent in vein axils, base cuneate or broadly cuneate, margin remotely and sharply serrate, and with 2–4 pairs of lobes near base, often nearly divided to midvein; lobes ovate or ovate-lanceolate, apex acute or shortly acuminate. Corymb 6–7 cm in diam., many flowered; peduncle glabrous, slightly glaucous; bracts caducous, linear, membranous. Pedicel 5–6 mm, glabrous, glaucous. Flowers ca. 1.2 cm in diam. Hypanthium campanulate, abaxially glabrous, glaucous. Sepals triangular, 2–3 mm, both surfaces glabrous. Petals white, broadly obovate, ca. 5–6 × 3–4 mm. Stamens 20. Ovary densely pubescent apically, 4- or 5-loculed, with 2 ovules per locule; styles 4 or 5. Pome red, globose, 4–8 mm in diam., glabrous; sepals persistent, reflexed; pyrenes 3–5, with deep concave scars on both inner sides. Fl. May–Jun, fr. Jul–Aug.

- Slopes, stream sides, roadsides. C and W Xinjiang.

17. *Crataegus chlorosarca* Maximowicz, Bull. Soc. Imp. Naturalistes Moscou 54(1): 20. 1879.

绿肉山楂 lu rou shan zha

Trees small, to 6 m tall; usually with few 1–1.5 cm thorns. Branchlets purplish brown when young, yellowish brown when old, terete, glabrous; buds purplish brown, triangular-ovoid, glabrous. Stipules falcate, 5–8 mm, membranous, glabrous, margin glandular serrate, apex acute; petiole 1.5–2 cm, pubescent; leaf blade triangular-ovate to broadly ovate, 5–9 × 3–5 cm, both surfaces sparsely pubescent, sometimes abaxially barbate in vein axils, base broadly cuneate or subrounded, margin sharply serrate, usually with 3–5 pairs of irregular lobes, apex acute or shortly acuminate. Corymb 2–3.5 cm in diam., several flowered; peduncle glabrous; bracts caducous, lanceolate, membranous. Pedicel 2–6 mm, glabrous. Flowers 1–1.2 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular-lanceolate, 2–3 mm, both surfaces glabrous. Petals white, suborbicular, 5–7 × 4–5 mm. Stamens 20. Ovary pubescent apically; styles 5. Pome red when immature, black when mature

with green pulp, subglobose, glabrous; sepals persistent; pyrenes 4 or 5, with concave scars on both inner sides. Fl. Jun–Jul, fr. Aug–Sep.

Cultivated. Liaoning [native to Japan and Russia (Kamchatka, Sakhalin)].

18. *Crataegus songarica* K. Koch, Verh. Vereins Beförd. Gartenbaues Königl. Preuss. Staaten, n.s., 1(2): 287. 1853.

准噶尔山楂 zhun ge er shan zha

Crataegus fischeri C. K. Schneider.

Shrubs or small trees, 4–5 m tall, armed or unarmed; thorns 0.8–1.5 cm, stout. Branchlets purplish brown when young, grayish brown when old, initially sparsely pubescent, soon glabrate, terete; buds reddish brown, ovoid, glabrous. Stipules falcate or lanceolate, ca. 8 mm, herbaceous, glabrous, margin serrate, apex acuminate; petiole 2–2.5 cm, glabrous or subglabrous; leaf blade rhomboidal-ovate to broadly ovate, 3.5–6.5 × 2.5–5.5 cm, both surfaces pubescent when young, glabrescent, base cuneate, rarely broadly cuneate, margin remotely serrate and with 2 or 3 pairs of deep lobes, or apically shallowly lobed; lobes oblong, apex acute. Corymb 3–5 cm in diam., many flowered; peduncle glabrous or slightly pubescent when young; bracts caducous, linear, membranous. Pedicel 0.5–1.5 cm, slightly pubescent when young. Hypanthium campanulate, initially pubescent, soon glabrous. Sepals triangular-ovate or broadly lanceolate, ca. 3 mm, abaxially initially pubescent, glabrescent. Petals not seen. Stamens 15–20. Ovary pubescent apically, 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3. Pome reddish black with yellow pulp, sparsely punctate, globose, rarely ellipsoid, 1.2–1.6 cm in diam., glabrous; sepals persistent, reflexed; pyrenes 2 or 3, smooth on both inner sides. Fl. May, fr. Jul. $2n = 68^*$.

Valleys, thickets; 500–2000 m. Xinjiang (Huocheng Xian, Ili Xian) [Afghanistan, Kazakhstan; SW Asia (Iran)].

Crataegus dsungarica Zabel ex Lange (Rev. Spec. Gen. Crataegi, 43. 1897), described from Shandong, may be a hybrid between *C. altaica* and *C. songarica*, but no specimens were seen by the present authors.

13. *OSTEOMELES* Lindley, Trans. Linn. Soc. London 13: 96, 98. 1821.

小石积属 xiao shi ji shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Shrubs deciduous or evergreen; buds small, with several narrow scales. Leaves imparipinnate; stipules linear to lanceolate; rachis narrowly winged; leaflets opposite, sessile or shortly petiolulate, small, margin entire. Corymb terminal, numerous flowered; bracts caducous. Hypanthium campanulate. Sepals 5. Petals 5, white. Stamens 20. Ovary inferior; 5-loculed, with 1 ovule per locule; styles 5, free. Fruit a small pome, with persistent erect sepals; seeds erect; cotyledons plano-convex.

About five species: E Asia; three species (one endemic) in China.

- 1a. Styles basally glabrous; leaflet blade suborbicular, rarely obovate-oblong 3. *O. subrotunda*
- 1b. Styles basally pubescent; leaf blade obovate to elliptic.
 - 2a. Leaflet blade obovate or obovate-oblong, 10–15 × 3–5 mm; hypanthium and sepals densely pubescent 1. *O. anthyllidifolia*
 - 2b. Leaflet blade elliptic, elliptic-oblong or obovate-oblong, 5–10 × 2–4 mm; hypanthium and sepals

slightly pubescent or subglabrous 2. *O. schwerinae*

1. *Osteomeles anthyllidifolia* (Smith) Lindley, Trans. Linn. Soc. London 13: 99. 1821.

小石积 xiao shi ji

Pyrus anthyllidifolia Smith in Rees, Cycl. 29: *Pyrus* no. 29. 1819.

Shrubs 1–3 m tall. Branchlets reddish brown or purplish brown, terete, slender, initially pubescent, glabrescent; buds not seen. Leaves with 7–15 pairs of leaflets; stipules caducous, lanceolate, membranous; petiole 1–1.5 cm, pubescent; petiolule very short or absent; leaflet blade obovate or obovate-oblong, 1–1.5 cm × 3–5 mm, both surfaces pubescent, abaxially densely so, base broadly cuneate to subrounded, margin entire, apex obtuse, emarginate or mucronulate. Corymb 2–3 cm in diam., numerous flowered; peduncle pubescent; bracts caducous, lanceolate, membranous, pubescent. Pedicel 5–8 mm, pubescent. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular-lanceolate, abaxially densely pubescent, adaxially sparsely pubescent, margin entire, apex acuminate. Petals spatulate, 5–7 × 3–4 mm. Stamens 20. Styles nearly as long as stamens, villous basally. Pome blackish brown, ellipsoid or oblong, ca. 1 cm; fruiting pedicel ca. 8 mm, pubescent; sepals persistent, erect. Fl. Apr–May, fr. Aug.

Coral rocks near sea; near sea level. Taiwan (Hongtuo Yu, Lan Yu) [Japan (Ryukyu Islands)].

2. *Osteomeles schwerinae* C. K. Schneider, Ill. Handb. Laubholz. 1: 763. 1906.

华西小石积 hua xi xiao shi ji

Shrubs or semishrubs, deciduous or evergreen, dense, spreading, 1–4 m tall. Branchlets reddish brown or purple, terete, slender, initially densely grayish white pubescent, glabrescent; buds depressed-triangular-ovoid, small, subglabrous. Leaves with 7–15 pairs of leaflets; stipules caducous, lanceolate, membranous; petiole 3–5 mm, pubescent to subglabrous, petiolules very short or nearly absent; leaflet blade elliptic or elliptic-oblong, rarely obovate-oblong, (3–)5–10 × 2–4 mm, both surfaces sparsely pubescent, abaxially densely so, base broadly cuneate or subrounded, margin entire, apex acute or mucronulate. Corymb 2–3 cm in diam., 3–5-flowered; peduncle grayish white pubescent; bracts caducous, linear-lanceolate, membranous, pubescent. Pedicel 3–5 mm, grayish white pubescent. Flowers ca. 1 cm in diam. Hypanthium campanulate, ca. 3 mm, abaxially subglabrous or sparsely pubescent. Sepals ovate-lanceolate, abaxially pubescent, margin entire, apex acute. Petals oblong, 5–7 × 3–4 mm. Stamens 20. Styles nearly as long as stamens, villous basally. Pome bluish black, ovoid or subglobose, 6–8 mm; fruiting pedicel 5–8 mm, slightly pubescent; sepals persistent, erect. Fl. Apr–May, fr. May–Jul.

• Scrub, slopes, fields, roadsides, mixed forests; 1000–3000 m. Gansu, Guizhou, Shaanxi, Sichuan, ?Taiwan, Xizang, Yunnan.

1a. Leaflet blade 5–10 mm; petiole pubescent 2a. var. *schwerinae*

1b. Leaflet blade 3–5 mm; petiole subglabrous 2b. var. *microphylla*

2a. *Osteomeles schwerinae* var. *schwerinae*

华西小石积(原变种) hua xi xiao shi ji (yuan bian zhong)

Osteomeles chinensis Lingelsheim & Borza.

Petiole pubescent; leaflet blade 5–10 mm.

• Scrub on slopes, roadsides; 1000–3000 m. Gansu, Guizhou, Sichuan, ?Taiwan, Yunnan.

2b. *Osteomeles schwerinae* var. *microphylla* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 3: 431. 1917.

小叶华西小石积 xiao ye hua xi xiao shi ji

Osteomeles schwerinae var. *multijuga* Koidzumi.

Petiole subglabrous; leaflet blade 3–5 mm.

• Slopes, roadsides, mixed forests; 1500–2700 m. Gansu, Shaanxi, Sichuan, Yunnan.

3. *Osteomeles subrotunda* K. Koch, Ann. Mus. Bot. Lugduno-Batavum 1: 250. 1864.

圆叶小石积 yuan ye xiao shi ji

Shrubs evergreen, dense, ca. 2 m tall. Branchlets grayish brown, terete, slender, densely grayish white villous when young, glabrescent; buds ovoid, small, subglabrous, apex obtuse. Leaves with 7–15 pairs of leaflets; stipules caducous, lanceolate, membranous, apex acuminate; petiole 3–7 mm, pubescent to glabrous, petiolule very short; leaflet blade suborbicular or obovate-oblong, (3–)4–6 × (1.5–)2–3 mm, abaxially densely grayish white villous, adaxially sparsely villous, or both surfaces glabrous to subglabrous, base rounded or subrounded, margin entire, apex obtuse, mucronulate or apiculate. Corymb 2–3.5 cm in diam., many flowered; peduncle villous; bracts caducous, linear-lanceolate, membranous, pubescent. Pedicel 3–5 mm, villous. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular-lanceolate, abaxially pubescent, adaxially subglabrous, margin entire, apex acute. Petals oblong, 5–8 × 3–5 mm. Stamens 20. Styles glabrous, nearly as long as stamens. Pome bluish black, subglobose, 6–12 mm in diam.; fruiting pedicel 5–8 mm, slightly pubescent; sepals persistent. Fl. Apr–Jun, fr. Jul–Sep.

Mixed forests, scrub on mountain summits, roadsides; 200–500 m. N Guangdong (Renhua Xian) [Japan (Ryukyu Islands)].

1a. Leaf blade and petiole hairy; leaflets 4–6 × 2–3 mm, apex obtuse or mucronulate 3a. var. *subrotunda*

1b. Leaf blade and petiole glabrous or subglabrous; leaflets 3–4 × 1.5–2 mm, apex obtuse and apiculate 3b. var. *glabrata*

3a. *Osteomeles subrotunda* var. *subrotunda*

圆叶小石积(原变种) yuan ye xiao shi ji (yuan bian zhong)

Osteomeles anthyllidifolia Lindley f. *subrotunda* (K. Koch) Koidzumi; *O. anthyllidifolia* var. *subrotunda* (K. Koch) Masamune.

Leaf blade and petiole hairy; leaflets 4–6 × 2–3 mm, apex obtuse or mucronulate.

Mixed forests, roadsides; 200–500 m. N Guangdong (Renhua Xian) [Japan (Ryukyu Islands)].

3b. *Osteomeles subrotunda* var. *glabrata* T. T. Yu, Acta Phytotax. Sin. 13(1): 101. 1975.

无毛圆叶小石积 wu mao yuan ye xiao shi ji

Leaf blade and petiole glabrous or subglabrous; leaflets 3–4 × 1.5–2 mm, apex obtuse and apiculate.

• Shrub on mountain summits. N Guangdong.

14. STRANVAESIA Lindley, Edwards's Bot. Reg. 23: t. 1956. 1837.¹³

红果树属 hong guo shu shu

Lu Lingdi (陆玲娣 Lu Ling-ti); Stephen A. Spongberg

Trees or shrubs, evergreen. Winter buds ovoid, small; scales few, exposed. Leaves petiolate, stipulate, simple, leathery, venation camptodromous, margin entire, undulate, or serrate. Corymbs or subumbels, terminal or axillary, few to numerous flowered; bracts early caducous. Hypanthium campanulate, 1/2 adnate to base of ovary. Sepals 5, erect, short. Petals 5, spreading, white, base shortly clawed. Stamens 20; filaments filiform. Ovary semi-inferior, pubescent, 4- or 5-loculed, free to middle from hypanthium in fruit; styles 4 or 5, connate high above middle; stigmas capitate; ovules 2 per locule, basal, collateral, ascending. Fruit a pome, ovoid to subglobose, fleshy, with persistent sepals; carpel crustaceous; locules abaxially loculicidally dehiscent; seeds oblong, compressed, testa leathery; cotyledons nearly flat.

About six species: China, NE India, N Laos, Malaysia, N Myanmar, Nepal, Philippines, Thailand, N Vietnam; five species (two endemic) in China.

This treatment follows that of the FRPS. Alternatively, there is considerable evidence that *Stranvaesia* should be included within *Photinia* (Kalkman, Blumea 21: 413–442.1973; Iketani & Ohashi, J. Jap. Bot. 66: 319–351. 1991; Ohashi & Iketani, J. Jap. Bot. 69: 22–23. 1994; Phipps et al., Syst. Bot. 16: 303–332. 1991; Robertson et al., Syst. Bot. 16: 376–394. 1991; Rohrer et al., Amer. J. Bot. 78: 1617–1635. 1991; Rohrer et al., Amer. J. Bot. 81: 574–581. 1994; Wu Zhengyi, pers. comm.). Basically, all of these point out that the primary character often used to differentiate the two genera, i.e., whether the carpels dehisce or not, is “artificial.” Kalkman (loc. cit.) was the first recent author to note that the supposedly dehiscent carpels of *Stranvaesia* are an artifact of pressing herbarium specimens. Also, Rohrer et al. (loc. cit.) found that *Photinia* and *Stranvaesia* do not differ in connation of the carpels or in the adnation of the carpels to the hypanthium.

- 1a. Bracts ovate-lanceolate; lenticels on branchlets inconspicuous; with large warts above each leaf scar and above some bract scars of inflorescence; fruit subglobose 1. *S. davidiana*
- 1b. Bracts subulate or linear to lanceolate; lenticels on branchlets conspicuous; fruit globose or ovoid-globose.
 - 2a. Petiole more than 1 cm, slender; leaf blade oblanceolate to obovate-oblong; fruit globose.
 - 3a. Rachis, pedicels, and hypanthium pilose; petiole ca. 1 cm, pilose 2. *S. nussia*
 - 3b. Rachis, pedicels, and hypanthium glabrous; petiole 1.5–4 cm, glabrous 3. *S. oblanceolata*
 - 2b. Petiole shorter, not over 1 cm, broader; leaf blade elliptic or oblong to oblong-obovate; fruit ovoid or ovoid-globose.
 - 4a. Petiole, abaxial surface of leaf blade, and inflorescence brownish yellow tomentose-villous; fruit ovoid, reddish yellow, 10–14 mm in diam., slightly tomentose-villous 4. *S. amphidoxa*
 - 4b. Petiole, abaxial surface of leaf blade, and inflorescence densely yellow tomentose; fruit ovoid-globose, 8–10 mm in diam., densely tomentose 5. *S. tomentosa*

1. *Stranvaesia davidiana* Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 179. 1874.

红果树 hong guo shu

Shrubs or small trees, 1–10 m tall, densely branched. Branchlets grayish brown when old, terete, initially densely villous, gradually glabrescent, with sparse, inconspicuous lenticels; buds reddish brown, narrowly ovoid, apex shortly acuminate; scales subglabrous or pubescent at margin. Petiole 1.2–

2 cm, pilose, gradually glabrescent; stipules caducous, subulate, 5–6 mm, membranous, slightly pilose; leaf blade oblong, oblong-lanceolate, or oblanceolate, (3–)5–12 × 2–4.5 cm, midvein raised abaxially and impressed adaxially, lateral veins 8–16 pairs and inconspicuous, both surfaces grayish brown villous along midvein, base cuneate to broadly cuneate, margin entire or undulate, apex acute or abruptly pointed. Compound corymbs terminal, 5–8 × (1.5–)5–10 cm, few or numerous flowered; rachis and pedicels villous; bracts caducous, ovate-

¹³ Extensive contributions were received from Kenneth R. Robertson (ILLIS), Herbarium, Illinois Natural History Survey, 607 East Peabody Drive, 172 Natural Resources Building, Champaign, Illinois 61820-6970, U.S.A.

lanceolate, membranous. Pedicel 2–4 mm. Flowers 5–10 mm in diam. Hypanthium cupular, 5–7 mm, abaxially sparsely villous. Sepals triangular-ovate, 2–3 mm, margin entire, apex acute. Petals suborbicular, 4–5 mm in diam., base shortly clawed. Stamens 20; anthers purplish red. Styles 5, mostly connate, not exceeding stamens; stigma capitate; ovary tomentose apically. Fruit orangish red, subglobose, 7–8 mm in diam.; sepals erect; seeds narrowly ellipsoid. Fl. May–Jun, fr. Sep–Oct.

Slopes, mountain summits, roadsides, thickets, river valleys, damp gullies; 900–3000 m. Fujian, Gansu, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Malaysia, N Vietnam].

One of us (Spongberg) notes that, because of variability, further study is necessary to determine whether these taxa are really distinct.

- 1a. Leaf margin entire; inflorescence 5–10 cm in diam., densely flowered; rachis and pedicels densely villous 1a. var. *davidiana*
 1b. Leaf margin undulate; inflorescence 1.5–5 cm in diam., few flowered; rachis and pedicels ± villous 1b. var. *undulata*

1a. *Stranvaesia davidiana* var. *davidiana*

红果树(原变种) hong guo shu (yuan bian zhong)

Photinia davidiana (Decaisne) Cardot; *P. nitakayamensis* Hayata; *P. undulata* (Decaisne) Cardot var. *formosana* Cardot; *Pyrus cavaleriei* H. Léveillé; *P. davidiana* var. *formosana* (Cardot) H. Ohashi & Iketani; *Stranvaesia davidiana* var. *salicifolia* (Hutchinson) Rehder; *S. henryi* Diels; *S. nitakayamensis* (Hayata) Hayata; *S. salicifolia* Hutchinson.

Leaf blade 5–12 cm. Inflorescences 5–10 cm in diam., densely flowered; rachis and pedicels densely villous.

Slopes, mountain summits, roadsides, thickets; 1000–3000 m. Gansu, Guangxi, Guizhou, Hubei, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan [Malaysia, N Vietnam].

1b. *Stranvaesia davidiana* var. *undulata* (Decaisne) Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1:192. 1912.

波叶红果树 bo ye hong guo shu

Stranvaesia undulata Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 179. 1874; *Eriobotrya undulata* (Decaisne) Franchet; *Photinia undulata* (Decaisne) Cardot; *S. davidiana* Decaisne var. *suoxiyuensis* C. J. Qi & C. L. Peng.

Leaf blade 3–8(–10) cm, margin undulate. Inflorescences 1.5–5 cm in diam., few flowered; rachis and pedicels ± villous.

• Slopes, river valleys, damp gullies, thickets; 900–3000 m. Fujian, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

2. *Stranvaesia nussia* (Buchanan-Hamilton ex D. Don) Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 178. 1874.

印緬红果树 yin mian hong guo shu

Pyrus nussia Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 237. 1825; *Crataegus glauca* Wallich ex G. Don; *Eriobotrya ambigua* Merrill; *Stranvaesia glaucescens* Lindley.

Trees to 5–9 m tall. Branchlets purplish brown when old,

terete, densely pilose when young, gradually glabrescent, subglabrous when old. Petiole ca. 1 cm, pilose; stipules caducous, lanceolate, membranous; leaf blade oblanceolate or obovate-lanceolate, 6–8 × 2–3.5 cm, veins 10–12 pairs, abaxially pilose along veins, adaxially initially pilose, glabrescent, base cuneate, margin irregularly obtusely dentate, apex acute. Compound corymbs terminal, 6–9 × 8–12 cm, many flowered; rachis and pedicels densely pilose; bracts 4–6 mm, pubescent. Pedicel 5–10 mm. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially pilose. Sepals triangular-lanceolate, 2.5–4 × 2.5–3 mm, margin entire, apex acute. Petals oblong or elliptic, 4–6 × 3–5 mm, base shortly clawed and barbate, apex emarginate. Stamens 20; filaments unequal in length, slightly shorter than sepals. Ovary semi-inferior, (4- or)5-loculed; styles (4 or)5, connate for ca. 1/2 length, base densely pubescent. Fruit orangish red, compressed-globose, ca. 8 mm in diam., pubescent when young, glabrate; sepals incurved; seeds 1 or 2 per locule.

Mixed forests; 500–2800 m. SE Xizang, Yunnan [NE India, N Laos, N Myanmar, Nepal, Philippines, N Thailand].

3. *Stranvaesia oblanceolata* (Rehder & E. H. Wilson) Stapf, Bot. Mag. 149: t. 9008. 1924.

滇南红果树 dian nan hong guo shu

Stranvaesia nussia Buchanan-Hamilton ex D. Don var. *oblanceolata* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 193. 1912.

Shrubs 5–9 m tall. Branchlets purplish red when young, dark purplish brown when old, terete, glabrous, with scattered orbicular lenticels; buds purplish brown, narrowly ovoid, glabrous. Petiole 1.5–4 cm, glabrous; leaf blade oblanceolate or obovate-oblong, 8–13 × 3.5–5 cm, lucid, midvein prominently raised abaxially and slightly impressed adaxially, both surfaces glabrous, base cuneate, rarely subrounded, margin obscurely obtusely dentate, apex acute. Compound corymbs terminal, 7–9(–11) × 5–10(–14) cm, compact, many flowered; rachis and pedicels glabrous; bracts linear, 2–3 mm. Pedicel 3–5 mm. Flowers ca. 1 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular-ovate, 2–3 mm, much shorter than hypanthium, margin entire, apex acute. Petals suborbicular or broadly ovate, 5–6 × 3–5 mm. Stamens 20, shorter than petals. Ovary pubescent; styles 5, not exceeding stamens, connate for more than 1/2 length; stigma capitate. Fruit ovoid, 6–8 mm in diam.; sepals erect. Fl. Apr–May, fr. Jun–Jul.

Mixed evergreen forests of mountain valleys, slopes; 1400–2000 m. S Yunnan [N Laos, N Myanmar, Thailand].

4. *Stranvaesia amphidoxa* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 319. 1906.

毛萼红果树 mao e hong guo shu

Shrubs or small trees, 2–4 m tall. Branchlets purplish brown when young, blackish brown when old, angulate, yellowish brown tomentose-villous when young, glabrous when old, with sparse, brownish lenticels; buds reddish brown, ovoid, apex acute, scale villous at margin. Petiole 2–4 mm, villous; stipules caducous, small; leaf blade dark green adaxially, elliptic, oblong, or oblong-obovate, 4–10 × 2–4 cm, midvein and 6–

8 pairs of lateral veins distinctly raised abaxially and impressed adaxially, abaxially brownish yellow, tomentose-villous along midvein, adaxially glabrous or subglabrous, base cuneate or broadly cuneate, rarely subrounded, margin minutely sharply aristate-serrate, apex acuminate or caudate. Inflorescences terminal, corymbose or subumbellate, 3–4 × 2.5–5 cm, several to more than 10-flowered; rachis and pedicels densely brownish yellow tomentose-villous or glabrous; bracts caducous, brown, subulate, 4–6 mm, membranous. Pedicel 4–10 mm. Flowers 8–9 mm in diam. Hypanthium campanulate, abaxially densely yellow tomentose-villous. Sepals triangular-ovate, 2–3 × 2–2.5 mm, nearly 1/2 as long as hypanthium, margin entire, apex acute. Petals suborbicular, 5–7 mm in diam., glabrous, base shortly clawed, apex obtuse or somewhat emarginate. Stamens 20, shorter than petals; anthers yellowish brown. Styles 5, mostly united, not exceeding stamens, yellowish white tomentose-villous; stigma capitate. Fruit reddish yellow, ovoid, 1–1.4 cm in diam., initially slightly tomentose-villous, glabrate, with small pale lenticels; sepals erect or incurved, abaxially tomentose-villous. Fl. May–Jun, fr. Sep–Oct.

• Slopes, roadsides, stream sides, dense forests, thickets, mountain valleys; 500–1500 m. Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang.

- 1a. Inflorescence corymbose; pedicel, hypanthium, and fruit tomentose-villous 4a. var. *amphidoxa*
 1b. Inflorescence subumbellate; pedicel, hypanthium, and fruit glabrous 4b. var. *amphileia*

4a. *Stranvaesia amphidoxa* var. *amphidoxa*

毛萼红果树(原变种) mao e hong guo shu (yuan bian zhong)

Photinia amphidoxa (C. K. Schneider) Rehder & E. H. Wilson; *P. amphidoxa* var. *kwangsiensis* F. P. Metcalf; *P. amphidoxa* var. *stylosa* Cardot; *Pourthiaea amphidoxa* (C. K. Schneider) Stapf; *Pyrus feddei* H. Léveillé.

Inflorescences corymbose. Pedicels, hypanthium abaxially, and fruit tomentose-villous.

• Slopes, roadsides, stream sides, thickets, mountain valleys; 500–

1500 m. Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang.

4b. *Stranvaesia amphidoxa* var. *amphileia* (Handel-Mazzetti)
 T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 214. 1974.

湖南红果树 hu nan hong guo shu

Photinia amphidoxa (C. K. Schneider) Rehder & E. H. Wilson var. *amphileia* Handel-Mazzetti, Symb. Sin. 7: 481. 1933.

Inflorescences subumbellate. Pedicels, hypanthium abaxially, and fruit glabrous.

• Dense forests in mountain valleys; 1000–1500 m. Guangxi, Guizhou, Hunan.

5. *Stranvaesia tomentosa* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 13(1): 102. 1975.

绒毛红果树 rong mao hong guo shu

Shrubs or small trees, ca. 2 m tall. Branchlets blackish brown when old, terete, densely yellow tomentose when young, with scattered gray lenticels; buds ovoid, densely tomentose. Petiole short, less than 4 mm, broad, densely yellow tomentose; stipules early caducous, smaller; leaf blade dark green adaxially, oblong or oblong-obovate, 3–6.5 × 1–3 cm, veins 6 or 7 pairs, raised abaxially and impressed adaxially, abaxially densely yellow tomentose, adaxially glabrous or subglabrous, base cuneate or broadly cuneate, rarely subrounded, margin sharply shortly aristate-serrate, apex caudate-acuminate or acuminate. Corymbs crowded, 2–4 cm in diam., 3–7-flowered, rarely to 12-flowered; rachis and pedicels densely yellow tomentose; bracts caducous, lanceolate, membranous. Pedicel 5–12 mm. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially densely yellow tomentose. Sepals triangular-ovate, nearly 1/3 length of hypanthium, apex acute. Stamens 20. Styles 5, mostly connate, not exceeding stamens. Fruit dark red, ovoid-globose, 8–10 mm in diam., densely tomentose; sepals erect. Fl. May–Jun, fr. Jul–Sep.

• Slope forests, roadsides, water courses; 600–1400 m. Chongqing (Beipei, Nanchuan Xian).

15. PHOTINIA Lindley, Trans. Linn. Soc. London 13: 96, 103. 1821.¹⁴

石楠属 shi nan shu

Lu Lingdi (陆玲娣 Lu Ling-ti); Stephen A. Spongberg

Pourthiaea Decaisne.

Trees or shrubs, deciduous or evergreen. Winter buds small; scales imbricate, few. Leaves alternate, simple, papery or leathery, venation camptodromous, margin serrate, rarely entire, shortly petiolate; stipules present, usually subulate. Inflorescences terminal, umbellate or corymbose, rarely shortly paniculate, many flowered, sometimes flowers 2- or 3-clustered or solitary. Hypanthium cupular or campanulate to cylindrical, adnate to ovary or free near apex. Sepals 5, persistent, short. Petals 5, contorted or imbricate in bud, base clawed. Stamens usually ca. 20. Carpels 2–5, rarely 1; ovary semi-inferior, (1 or)2–5-loculed, in fruit free apically or to 1/3 length; styles (1 or)2–5, free or ± connate, short, dilated apically; stigmas truncate; ovules 2 per locule, erect. Fruit a pome, globose, ovoid, or ellipsoid, somewhat fleshy, (1- or)2–5-loculed, free from calyx only near apex or to 1/3 length, with persistent, incurved sepals; carpel crustaceous or membranous, each locule 1- or 2-seeded; seeds erect, testa leathery; cotyledons plano-convex.

About 60 species: E, S, and SE Asia, also in Mexico; 43 species (32 endemic) in China.

¹⁴Extensive contributions were received from Kenneth R. Robertson (ILLS), Herbarium, Illinois Natural History Survey, 607 East Peabody Drive, 172 Natural Resources Building, Champaign, Illinois 61820-6970, U.S.A.

ROSACEAE

Wu Zhengyi (editor's note) believes that *Pourthiaea* is morphologically distinct from *Photinia* and should be treated as a separate genus.

Many species of *Photinia* are ornamental trees and shrubs with large lustrous leaves and attractive white flowers in the spring followed by red fruits in the autumn. The wood is hard and heavy, suitable for making furniture and other small articles.

- 1a. Plant evergreen; inflorescence compound-corymbose; rachis and pedicels without lenticels in fruit.
 - 2a. Leaves entire, rarely with few inconspicuous teeth.
 - 3a. Inflorescences glabrous, rarely slightly pilose; leaves leathery, not revolute, both surfaces glabrous 1. *P. integrifolia*
 - 3b. Inflorescences densely tomentose; leaves thickly leathery, slightly revolute, adaxially glabrous, abaxially densely tomentose.
 - 4a. Petiole 20–30 mm; lateral veins 20–25 pairs 4. *P. megaphylla*
 - 4b. Petiole 1.5–5 mm; lateral veins 13–17 pairs.
 - 5a. Hypanthium campanulate, abaxially glabrous 2. *P. crassifolia*
 - 5b. Hypanthium cylindric, abaxially tomentose 3. *P. tushanensis*
 - 2b. Leaves wholly or partly serrate.
 - 6a. Leaf blade abaxially with black glands.
 - 7a. Inflorescence branches and hypanthium abaxially villous; petiole 10–25(–30) mm, glandular and toothed 21. *P. prunifolia*
 - 7b. Inflorescence branches and hypanthium abaxially gray tomentose; petiole 8–15 mm, without glands and teeth 22. *P. raupingensis*
 - 6b. Leaf blade abaxially without black glands.
 - 8a. Inflorescence branches glabrous or pilose.
 - 9a. Inflorescences pilose 9. *P. bodinieri*
 - 9b. Inflorescences glabrous.
 - 10a. Petiole usually 2–4 cm 5. *P. serratifolia*
 - 10b. Petiole usually 0.4–1.5 cm.
 - 11a. Petiole 10–15 mm; leaf blade elliptic, oblong, or oblong-obovate, apex acuminate 6. *P. glabra*
 - 11b. Petiole 4–10 mm; leaf blade oblong-lanceolate, lorate-lanceolate, or oblanceolate, apex acute or obtuse.
 - 12a. Leaf blade oblong-lanceolate or lorate-lanceolate, margin crenate, veins 18–20 pairs 7. *P. stenophylla*
 - 12b. Leaf blade oblanceolate, margin sharply serrate, veins 9–13 pairs 8. *P. lochengensis*
 - 8b. Inflorescence branches usually tomentose.
 - 13a. Leaf margin spiny-serrate.
 - 14a. Branchlets, petioles, and inflorescences tomentose; leaf blade 4.5–7 × 4–5 cm 19. *P. prionophylla*
 - 14b. Branchlets, petioles, and inflorescences villous; leaf blade 2–5 × 1–2 cm 20. *P. berberidifolia*
 - 13b. Leaf margin sharply serrate or obtusely serrate.
 - 15a. Leaf blade abaxially glabrous.
 - 16a. Leaf blade oblong, elliptic, or oblong-obovate, apex acute, veins 12–14 pairs 10. *P. beckii*
 - 16b. Leaf blade obovate or oblanceolate, apex obtuse, veins 9–11 pairs 11. *P. lasiogyne*
 - 15b. Leaf blade abaxially pubescent or tomentose.
 - 17a. Leaf blade abaxially pilose.
 - 18a. Inflorescences gray lanuginose; leaf veins 18–20 pairs; petiole 2.5–4 cm 14. *P. lanuginosa*
 - 18b. Inflorescences villous; leaf veins 12–15 or 20 pairs; petiole 0.6–2(–2.5) cm.
 - 19a. Leaf margin serrate at least in part, leaf blade oblong-elliptic to obovate-oblong, veins ca. 20 pairs, petiole 0.6–1.2 cm 12. *P. chingiana*
 - 19b. Leaf margin wholly serrate, leaf blade oblong-ovate, oblong-obovate, or oblong-lanceolate, veins 12–15 pairs, petiole 1–2(–2.5) cm 13. *P. kwangsiensis*
 - 17b. Leaf blade abaxially tomentose.
 - 20a. Petiole 2–4 cm; hypanthium abaxially tomentose 15. *P. glomerata*
 - 20b. Petiole usually less than 2 cm; hypanthium abaxially glabrous or tomentose.
 - 21a. Hypanthium glabrous abaxially; leaf veins 30–40 pairs 16. *P. anlungensis*
 - 21b. Hypanthium tomentose abaxially; leaf veins 10–20 pairs.
 - 22a. Leaf blade oblong-lanceolate or oblanceolate, abaxially gray tomentose when young, glabrescent, apex acute or shortly acuminate, margin sparsely minutely sharply serrate, veins 12–15 pairs 17. *P. chihsiniiana*
 - 22b. Leaf blade lorate-oblong or narrowly lanceolate, abaxially densely and persistently yellow tomentose, apex obtuse or acute, margin with sparse, sharp or spiny teeth, veins 10–20 pairs 18. *P. loriformis*
 - 1b. Plant deciduous, very rarely evergreen; inflorescence umbellate, corymbose, or compound-corymbose; rachis and pedicels with prominent lenticels in fruit.

ROSACEAE

- 23a. Inflorescence an umbel or corymb, 2–9-flowered, sometimes flowers solitary, rarely more than 9.
- 24a. Branchlet, petiole, pedicel, and hypanthium abaxially densely pubescent.
- 25a. Deciduous shrub; flowers 3–8 in umbels or corymbs; pedicel 3–10 mm; leaf apically acuminate to caudate 42. *P. hirsuta*
- 25b. Evergreen shrub; flowers 1 or 2, or 3–6 in umbels or corymbs; pedicel 10–20 mm; leaf apically acute to shortly acuminate 43. *P. zhejiangensis*
- 24b. Branchlet, petiole, pedicel, and hypanthium abaxially glabrous.
- 26a. Flowers several to more than 10 in umbels or corymbs; pedicel 1–2.5(–3.2) cm; petals villous adaxially 39. *P. parvifolia*
- 26b. Flowers solitary or 2- or 3(–5)-fascicled; pedicel 2–5 cm; petals glabrous.
- 27a. Shrub 2(–5) m tall, erect; pedicel often 3–5 cm, glabrous; sepals not toothed; petals white or stained yellow 40. *P. komarovii*
- 27b. Shrub smaller, decumbent; pedicel 0.5–1.8 cm, sparsely villous when young, glabrous when old; sepals irregularly minutely toothed; petals white 41. *P. chingshuiensis*
- 23b. Inflorescence a corymb or compound corymb, usually more than 10-flowered.
- 28a. Inflorescence pubescent or tomentose.
- 29a. Peduncle and pedicels verticillate 32. *P. benthamiana*
- 29b. Peduncle and pedicels alternate.
- 30a. Leaf blade glabrous or pilose abaxially.
- 31a. Leaf blade abaxially glabrous, apex acuminate, margin sharply serrate, veins 9 or 10 pairs 33. *P. pilosicalyx*
- 31b. Leaf blade abaxially pilose, apex caudate or acute to shortly acuminate, margin sharply or shallowly serrate, veins 5–10(–12) pairs.
- 32a. Leaf apically caudate, margin densely sharply serrate apically, veins 5–7 pairs 34. *P. villosa*
- 32b. Leaf apically acute to shortly acuminate, margin sparsely shallowly serrate, veins 8–10(–12) pairs 35. *P. calleryana*
- 30b. Leaf blade abaxially tomentose.
- 33a. Leaf margin sparsely serrate or subentire, leaf blade lanceolate or lorate-lanceolate, abaxially densely gray tomentose when young, subglabrous when old 38. *P. podocarpifolia*
- 33b. Leaf margin sharply serrate along entire length, leaf blade oblong to oblong-lanceolate or lanceolate, abaxially yellowish gray or long gray tomentose at least initially.
- 34a. Leaf blade oblong or oblong-elliptic to oblong-lanceolate, abaxially persistently yellowish gray tomentose, lateral veins 10–15 pairs; rachis, pedicels, and hypanthium abaxially sparsely villous, usually glabrate 36. *P. schneideriana*
- 34b. Leaf blade lanceolate, abaxially initially long gray tomentose, glabrescent, lateral veins 8–10 pairs; rachis, pedicels, and hypanthium abaxially densely long gray tomentose 37. *P. arguta*
- 28b. Inflorescence glabrous.
- 35a. Leaf blade abaxially tomentose.
- 36a. Leaf blade 4–8.5 × 1–2 cm, abaxially floccose-tomentose, margin densely minutely serrate, apex acuminate, veins conspicuous, 8–11 pairs 30. *P. tsaii*
- 36b. Leaf blade 3–4 × 0.8–1 cm, abaxially densely yellow tomentose, margin entire or inconspicuously crenulate, apex ± obtuse or ± acute, veins inconspicuous 31. *P. blinii*
- 35b. Leaf blade abaxially glabrous, rarely puberulous only along veins.
- 37a. Leaf veins adaxially deeply impressed 29. *P. impressivena*
- 37b. Leaf veins adaxially slightly impressed.
- 38a. Leaf apically acute, rarely shortly acuminate.
- 39a. Leaf basally symmetrical, leaf blade broadly lanceolate, both surfaces glabrous, veins not oblique, petiole 5–7 mm; fruit obovoid, 6–7 mm in diam. 27. *P. bergerae*
- 39b. Leaf basally asymmetric, leaf blade oblong or oblanceolate, abaxially villous along midvein, veins very oblique, petiole 7–10 mm; fruit ovoid to ellipsoid, 3–4 mm in diam. 28. *P. obliqua*
- 38b. Leaf apically acuminate to caudate.
- 40a. Leaf margin densely minutely sharply serrate, veins 7–9 pairs 26. *P. fokiensis*
- 40b. Leaf margin sparsely serrate, veins 6–16 pairs.
- 41a. Leaf blade lanceolate or oblong-lanceolate, margin revolute, shallowly sharply serrate, sometimes subentire, lateral veins 12–16 pairs; fruiting pedicel 5–9 mm 25. *P. callosa*
- 41b. Leaf blade elliptic, oblong, obovate-oblong, ovate-lanceolate, or obovate-lanceolate, margin not revolute, sharply serrate, lateral veins 6–14 pairs; fruiting pedicel 1–2.5 cm.
- 42a. Leaf blade adaxially glabrous, sparsely pilose along veins abaxially, veins 9–14 pairs; fruit ovoid or subglobose; fruiting pedicel 1–2 cm 23. *P. beauverdiana*

- 42b. Leaf blade glabrous on both surfaces, veins 6–8 pairs; fruit obovoid or obovoid-ellipsoid; fruiting pedicel 1.5–2.5 cm 24. *P. lucida*

1. *Photinia integrifolia* Lindley, Trans. Linn. Soc. London 13: 103. 1822.

全缘石楠 *quan yuan shi nan*

Trees evergreen, 5–7 m tall. Branchlets brown, terete, glabrous, blackish gray when old, with scattered suborbicular or oblong lenticels. Petiole (1–)2–4 cm, glabrous; leaf blade oblong, lanceolate, or oblanceolate, 6–12 × 3–5 cm, leathery, veins 12–17 pairs, both surfaces glabrous, base cuneate, rarely rounded, margin entire, apex acute or shortly acuminate. Compound corymbs terminal, much branched, 7–12 × 8–15 cm, many flowered; rachis and pedicels glabrous, rarely puberulous. Pedicel 3–5 mm. Flowers 4–5(–8) mm in diam. Hypanthium cupular, 1–1.5 mm, abaxially glabrous. Sepals broadly triangular, 1–1.5 mm, apex obtuse. Petals white or yellowish, orbicular, 1–2 mm in diam., glabrous, base shortly clawed. Stamens 20, nearly as long as or slightly longer than petals. Ovary pilose apically; styles 2, shorter than or nearly as long as stamens. Fruit purplish red, subglobose, 5–6 mm in diam., glabrous. Fl. May–Jun, fr. Sep–Oct. $2n = 34$.

Evergreen forests; 1200–2700 m. W Guangxi, Guizhou, SE Xizang, W Yunnan [Bhutan, India, Laos, Myanmar, Nepal, Sikkim, Thailand, Vietnam].

1a. Flowers 4–5 mm in diam., white 1a. var. *integrifolia*
1b. Flowers 7–8 mm in diam., yellowish

..... 1b. var. *flavidiflora*

1a. *Photinia integrifolia* var. *integrifolia*

全缘石楠(原变种) *quan yuan shi nan (yuan bian zhong)*

Eriobotrya integrifolia (Lindley) Kurz; *Photinia integrifolia* var. *notoniana* (Wight & Arnott) Vidal; *P. integrifolia* var. *yunnanensis* T. T. Yu; *P. notoniana* Wight & Arnott; *P. sambuciflora* W. W. Smith; *P. scandens* Stapf; *Stranvaesia scandens* (Stapf) Handel-Mazzetti.

Flowers 4–5 mm in diam. Petals white.

Evergreen forests; 1500–2500 m. W Guangxi, Guizhou, SE Xizang, W Yunnan [Bhutan, India, Laos, Myanmar, Nepal, Sikkim, Thailand, Vietnam].

1b. *Photinia integrifolia* var. *flavidiflora* (W. W. Smith) J. E. Vidal, *Adansonia*, n.s., 5: 227. 1965.

黄花全缘石楠 *huang hua quan yuan shi nan*

Photinia flavidiflora W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 59. 1917.

Flowers 7–8 mm in diam. Petals yellowish.

Evergreen forests on slopes; 1200–2700 m. W Yunnan [Myanmar].

2. *Photinia crassifolia* H. Lévillé, Fl. Kouy-Tchéou, 349. 1915.

厚叶石楠 *hou ye shi nan*

Photinia crassifolia var. *denticulata* Cardot.

Shrubs evergreen, 4–5 m tall. Branches brown cinereous, rusty tomentose when young, glabrous when old, with inconspicuous lenticels. Petiole 1.5–4 mm, tomentose; leaf blade oblong, 6–15 × 1.5–4.5 cm, thickly leathery, veins 15–17 pairs, reticulate veins prominent, abaxially somewhat purple when dry, tomentose along veins, adaxially shiny, glabrous, base rounded, margin slightly revolute, entire or inconspicuously dentate, apex acute or obtuse and shortly pointed. Compound corymbs terminal, 9–14 cm in diam., numerous flowered; rachis and pedicels densely tomentose. Pedicel 2–3 mm. Flowers 5–6 mm in diam. Hypanthium campanulate, ca. 1 mm, abaxially glabrous. Sepals triangular, 0.5–1 mm, apex acute. Petals white, obovate, 2–3 mm, glabrous, base shortly clawed, apex obtuse. Stamens 20, slightly longer than or nearly as long as petals. Ovary white tomentose apically; styles 2, free, not exceeding stamens. Fruit brownish red, ovoid, 6–7 × 5–6 mm. Fl. May–Jun, fr. Sep–Nov.

• Sunny slopes, slope thickets; 500–1700 m. Guangxi, Guizhou, Yunnan.

3. *Photinia tushanensis* T. T. Yu, Acta Phytotax. Sin. 8: 229. 1963.

独山石楠 *du shan shi nan*

Shrubs evergreen, to 5 m tall. Branchlets grayish brown or grayish black when old, densely gray tomentose when young, gradually glabrescent. Petiole nearly absent or short, 3–5 mm, thick, initially densely tomentose, glabrate; leaf blade oblong-elliptic, 11–17 × 3–5 cm, thickly leathery, veins 13–15 pairs, robust midvein prominently raised abaxially and deeply impressed adaxially, abaxially densely yellowish brown tomentose, glabrate, adaxially initially tomentose, gradually glabrescent or subglabrous, base rounded, margin slightly revolute, entire, undulate, or inconspicuously shallowly serrate, apex acute or obtuse and shortly pointed. Compound corymbs terminal, compact, 9–10 cm in diam., numerous flowered; rachis and pedicels densely gray tomentose. Pedicel 2–3 mm or nearly absent. Flowers 5–6 mm in diam. Hypanthium cylindrical, 3–5 mm, abaxially tomentose. Sepals ovate, ca. 1 mm, apex obtuse. Petals obovate or broadly elliptic, 2–2.5 mm, glabrous, base shortly clawed. Stamens 20, shorter than petals. Ovary tomentose; styles 2, free. Fruit not seen. Fl. Jun–Jul.

• Thickets at mountain summits; 800–900 m. S Guizhou (Dushan Xian).

4. *Photinia megaphylla* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 493. 1980.

大叶石楠 *da ye shi nan*

Shrubs evergreen, ca. 3 m tall. Branchlets angulate, densely brownish yellow tomentose. Petiole 2–3 mm, densely brownish yellow tomentose; stipules caducous; leaf blade elliptic or elliptic-obovate, 16–27 × 10–12 cm, veins 20–25 pairs, raised abaxially and impressed adaxially, abaxially densely brownish yellow tomentose, adaxially glabrous, base broadly cuneate or subrounded, margin obscurely crenate, apex acuminate to caudate. Compound corymbs terminal, many flowered; rachis and

pedicels densely brownish yellow tomentose. Pedicel 2–5 mm. Hypanthium campanulate, abaxially puberulous or subglabrous. Sepals triangulate-ovate, shorter than tube, apex acute. Ovary with 2 ovules per locule; styles 2, basally connate. Fruit not seen. Fl. May–Jun.

- Broad-leaved forests on slopes; ca. 1800 m. SE Xizang.

5. *Photinia serratifolia* (Desfontaines) Kalkman, *Blumea* 21: 424. 1973.

石楠 shi nan

Shrubs or trees, evergreen, 4–6(–12) m tall. Branchlets brown or reddish brown when young, brownish gray when old, glabrous; buds ovoid, 4–7 mm, apex acute to shortly acuminate; scales several, brown. Petiole 2–4 cm, pubescent when young, glabrescent; leaf blade narrowly elliptic, narrowly obovate, or obovate-elliptic, (6–)9–22 × 3–6.5 cm, leathery, veins 20–30 pairs, midvein raised abaxially and impressed adaxially, abaxially long pubescent along veins when young, both surfaces glabrous when mature, adaxially lustrous, base rounded or broadly cuneate, margin sparsely or inconspicuously toothed or entire, apex acuminate. Compound corymbs terminal, 8–12 × 10–16 cm; rachis and pedicels glabrous, villous, or tomentose. Pedicel 3–5 mm. Flowers 6–8 mm in diam. Hypanthium cupular, 1–1.5 mm, usually glabrous, sometimes abaxially tomentose or basally villous. Sepals broadly triangular, 1–1.5 mm, apex acute or obtuse. Petals white, suborbicular, 3–4 mm in diam., glabrous or villous. Stamens 20, outer ones longer than inner ones. Ovary pilose apically; styles 2, sometimes 3, connate at base, not exceeding stamens; stigma capitate. Fruit red when immature, brownish purple when mature, globose, 5–6 mm in diam., with 1 seed; seeds brownish, ovoid, 2–2.5 mm, smooth. Fl. Apr–May, fr. Sep–Oct.

Mixed forests, roadsides, slopes, fields, mountain areas, sea shores; sea level to 2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [S India, Indonesia, Japan, Philippines].

- 1a. Leaf margin prominently serrate, entire only near base.
 - 2a. Rachis, pedicels, hypanthium, and petals glabrous; leaf blade narrowly elliptic, narrowly obovate, or obovate-elliptic 5a. var. *serratifolia*
 - 2b. Rachis, pedicels, hypanthium, and petals basally villous; leaf blade obovate-elliptic 5b. var. *lasiopetala*
- 1b. Leaf margin entire or very inconspicuously shallowly minutely toothed.
 - 3a. Leaf blade elliptic or obovate-elliptic, 8–16 cm; rachis and pedicels tomentose; hypanthium and petals glabrous 5c. var. *daphniphyloides*
 - 3b. Leaf blade obovate-lanceolate or spatulate-lanceolate, 6–10 cm; rachis and pedicels tomentose; hypanthium abaxially tomentose; petals glabrous 5d. var. *ardisiifolia*

5a. *Photinia serratifolia* var. *serratifolia*

石楠(原变种) shi nan (yuan bian zhong)

Crataegus serratifolia Desfontaines, *Tabl. École Bot.*, ed. 3, 288. 1829; *Photinia glabra* (Thunberg) Maximowicz var. *chinensis* Maximowicz; *P. pustulata* Lindley; *P. serrulata* Lindley.

Leaf blade narrowly elliptic, narrowly obovate, or obovate-elliptic, 9–22 cm, margin prominently serrate, entire only near base. Rachis, pedicels, hypanthium and petals glabrous.

Mixed forests, roadsides, slopes, fields; 700–2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [S India, Indonesia, Japan, Philippines].

5b. *Photinia serratifolia* var. *lasiopetala* (Hayata) H. Ohashi, *J. Jap. Bot.* 63: 234. 1988.

毛瓣石楠 mao ban shi nan

Photinia lasiopetala Hayata, *Icon. Pl. Formosan.* 6: 17. 1916; *P. serrulata* Lindley f. *lasiopetala* (Hayata) T. Shimizu; *P. serrulata* var. *lasiopetala* (Hayata) K. C. Kuan.

Leaf blade obovate-lanceolate, 8–15 cm, margin distinctly serrate, entire only near base. Rachis, pedicels, hypanthium, and petals basally villous.

- Low mountain areas; ca. 900 m. C Taiwan.

5c. *Photinia serratifolia* var. *daphniphyloides* (Hayata) L. T. Lu, *Acta Phytotax. Sin.* 38: 277. 2000.

宽叶石楠 kuan ye shi nan

Photinia daphniphyloides Hayata, *Icon. Pl. Formosan.* 7: 30. 1918; *P. serrulata* Lindley f. *daphniphyloides* (Hayata) H. L. Li; *P. serrulata* var. *daphniphyloides* (Hayata) K. C. Kuan.

Leaves elliptic or obovate-elliptic, 8–16 cm, margin entire or very inconspicuously minutely dentate. Rachis and pedicels tomentose; hypanthium and petals glabrous.

- Sea shores; sea level. E Taiwan.

5d. *Photinia serratifolia* var. *ardisiifolia* (Hayata) H. Ohashi, *J. Jap. Bot.* 63: 234. 1988.

紫金牛叶石楠 zi jin niu ye shi nan

Photinia ardisiifolia Hayata, *Icon. Pl. Formosan.* 5: 65. 1915; *P. serrulata* Lindley f. *ardisiifolia* (Hayata) H. L. Li; *P. serrulata* var. *ardisiifolia* (Hayata) K. C. Kuan.

Leaves obovate-lanceolate or spatulate-lanceolate, 6–11 cm, margin entire or inconspicuously shallowly minutely dentate. Rachis, pedicels, and hypanthium abaxially tomentose; petals glabrous.

- Mountain areas; medium elevations. E Taiwan.

6. *Photinia glabra* (Thunberg) Maximowicz, *Bull. Acad. Imp. Sci. Saint-Petersbourg*, sér. 3, 19: 178. 1874.

光叶石楠 guang ye shi nan

Crataegus glabra Thunberg in Murray, *Syst. Veg.*, ed. 14, 465. 1784.

Trees evergreen, 3–5 m tall, rarely to 7 m tall. Branchlets brown to grayish brown when young, grayish black when old, glabrous, with scattered brownish black orbicular lenticels; buds narrowly ovate, 3–5 mm, apex acuminate, rarely acute; scales dark brown, glabrous. Petiole 1–1.5 cm, glabrous; leaf blade initially reddish, elliptic, oblong, or oblong-obovate, 5–9 × 2–4 cm, thickly leathery, veins 10–18 pairs, both surfaces glabrous, base cuneate, margin with sparse, shallowly crenulate teeth, apex acuminate. Compound corymbs terminal, 6–11 × 7–12 cm, numerous flowered; rachis and pedicels glabrous. Pedicel 5–8 mm. Flowers 7–8 mm in diam. Hypanthium cupular, abaxially glabrous. Sepals triangular, 1–1.5 mm, apex acute. Petals white, obovate, 2–3 mm, adaxially white tomentose near base, base shortly clawed, margin revolute, apex obtuse. Stamens 20, nearly as long as or slightly shorter than petals. Ovary pilose apically; styles 2, rarely 3, basally free or connate; stigma capitate. Fruit red, obovate or ovoid, ca. 5 mm, glabrous. Fl. Apr–May, fr. Sep–Oct.

Slopes, mixed forests; 500–800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Japan, Myanmar, Thailand].

7. *Photinia stenophylla* Handel-Mazzetti, Symb. Sin. 7: 480. 1933.

窄叶石楠 *zhai ye shi nan*

Shrubs evergreen, 1–2 m tall. Branchlets brownish to reddish brown when young, grayish brown when old, initially slightly pilose, glabrate, with sparse, orbicular lenticels; buds small; scales ± subulate, glabrous. Petiole 4–10 mm, broad, grooved, initially pilose, glabrescent; stipules caducous, brownish, subulate or linear-subulate, 4–7 mm, glabrous; leaf blade lorate-lanceolate or oblong-lanceolate, 3.5–9 × 1–3 cm, leathery, veins 18–20 pairs, midvein raised abaxially, both surfaces glabrous, basally gradually attenuate, margin slightly revolute, crenate, apex acute or obtuse and mucronate. Compound corymbs terminal, 3–4 cm in diam., 15–25-flowered; rachis and pedicels glabrous. Pedicel 5–10 mm. Hypanthium cupular, 1.5–2 mm, abaxially glabrous. Sepals triangular, 1–2 mm, apex acute. Petals white, 2–3 mm, adaxially white pilose, apex emarginate. Stamens 20, ca. as long as petals. Ovary pilose apically; styles 2, connate, only free near apex, not exceeding stamens. Fruit red, ovoid, 5–7 × 3–5 mm, fleshy, glabrous, smooth, 4-seeded; sepals incurved. Fl. Apr–May, fr. Jul–Aug.

Near water courses in mountain valleys, thickets alongside rivers; 200–400 m. Guangxi, Guizhou [Thailand].

8. *Photinia lochengensis* T. T. Yu, Acta Phytotax. Sin. 8: 226. 1963.

罗城石楠 *luo cheng shi nan*

Trees or shrubs, evergreen. Branchlets purple brown or blackish brown, sparsely pubescent when young; buds ovoid, small, glabrous, apex acute. Petiole 5–8 mm, initially pubescent, glabrescent; leaf blade yellowish brown abaxially when dried, dark green adaxially, oblanceolate, 3.5–5 × 1–2 cm, leathery, veins 9–13 slender pairs, somewhat raised abaxially, both surfaces glabrous except slightly pubescent along midvein when young, base cuneate, margin slightly revolute and some-

what undulate, with minute sharp incurved teeth, apex acute, usually shortly pointed. Compound corymbs terminal, 5–7 cm in diam.; rachis and pedicels glabrous. Flowers 3–4 mm in diam. Hypanthium campanulate, ca. 1.5 mm × 1.5 mm, abaxially glabrous. Sepals erect, broadly triangular, ca. 1 cm. Petals white, obovate, ca. 2 mm, base shortly clawed, apex obtuse. Stamens 20, shorter than petals. Ovary white pilose apically; styles 2, rarely 3, free. Fruit subglobose to ovoid-globose, ca. 3 mm in diam., glabrous; sepals incurved.

• Rocks, stream sides; 100–300 m. NC Guangxi (Luocheng Xian), Zhejiang.

9. *Photinia bodinieri* H. Léveillé, Repert. Spec. Nov. Regni Veg. 4: 334. 1907.

贵州石楠 *gui zhou shi nan*

Trees evergreen, 6–15 m tall. Branchlets yellowish brown when young, gray when old, sparsely appressed pubescent when young, glabrous when old. Petiole (0.8–)1–1.5 cm, glabrous; leaf blade oblong, elliptic or obovate to oblanceolate or narrowly lanceolate, 5–10(–15) × (1.5–)2–5 cm, veins 10–16(–20) pairs, both surfaces glabrous or initially slightly pubescent along veins, glabrescent, base cuneate, margin serrate, apex acute to acuminate. Compound corymbs terminal, compact, 5–8 × 5–10 cm, many flowered; rachis and pedicels appressed pubescent; bracts caducous, lanceolate or linear, 2–4 mm, pubescent. Pedicel 5–7 mm. Flowers 1–1.2 cm in diam. Hypanthium cupular, abaxially sparsely appressed pubescent. Sepals broadly triangular, 1–2 mm, apex acute or obtuse. Petals white, suborbicular, 3–4 mm in diam., glabrous, shortly clawed, apex obtuse or emarginate. Stamens 20, shorter than petals. Styles 2 or 3, connate from base to middle, white villous basally. Fruit yellowish red, globose or ovoid, 7–10 mm in diam., glabrous; seeds 2–4, brown, ovoid, 4–5 mm. Fl. Apr–May, fr. Sep–Oct.

Forest margins, thickets, valleys, slopes, roadsides, forests; 300–1300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Shaanxi, Sichuan, Yunnan, Zhejiang [Indonesia, N Vietnam].

- 1a. Leaf blade oblong, elliptic, or obovate to oblanceolate, 2–5 cm wide, margin sharply serrate 9a. var. *bodinieri*
- 1b. Leaf blade narrowly lanceolate, 1.5–3 cm wide, margin obtusely serrate 9b. var. *longifolia*

9a. *Photinia bodinieri* var. *bodinieri*

贵州石楠(原变种) *gui zhou shi nan* (yuan bian zhong)

Hiptage esquirolii H. Léveillé; *Photinia davidsoniae* Rehder & E. H. Wilson.

Leaf blade oblong, elliptic, or obovate to oblanceolate, 5–10(–15) × 2–5 cm, margin sharply serrate.

Forest margins, thickets, valleys, rocky slopes; 300–1000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Shaanxi, Sichuan, Yunnan, Zhejiang [Indonesia, N Vietnam].

9b. *Photinia bodinieri* var. *longifolia* Cardot, Notul. Syst. (Paris) 3: 374. 1918.

长叶贵州石楠 *chang ye gui zhou shi nan*

Leaf blade narrowly lanceolate, 6.5–13 × 1.5–3 cm, margin obtusely serrate.

- Roadsides, slopes, forests; 600–1300 m. Guizhou.

10. *Photinia beckii* C. K. Schneider, Ill. Handb. Laubholz. 1: 707. 1906.

椭圆叶石楠 tuo yuan ye shi nan

Trees evergreen, 4–5 m tall. Branchlets grayish brown when old, gray pubescent when young, gradually glabrescent, glabrous when old; buds ovoid, 3–5 mm, apex acute; scales tomentose. Petiole 0.8–1.5 cm, pubescent when young, glabrescent; stipules lanceolate, 3–5 mm, tomentose; leaf blade oblong, elliptic, or oblong-obovate, 5–8 × 2–3.5 cm, leathery, shiny adaxially, veins 12–14 slender inconspicuous pairs, both surfaces glabrous or abaxially puberulous only along midvein when young, glabrous when old, base rounded or broadly cuneate, margin slightly revolute, shallowly obtusely dentate, entire near base, apex acute and abruptly pointed. Compound corymbs terminal, 6–8 × 7–9 cm, compact, numerous flowered; rachis and pedicels densely yellow tomentose; bracts dark brown, lanceolate, 2.5–4 mm, tomentose. Pedicel 1–2 mm. Flowers 5–7 mm. Hypanthium glabrous abaxially. Sepals triangular-ovate, 1–2 mm, glabrous, margin minutely glandular serrate, apex obtuse. Petals orbicular, 2–3 mm in diam., adaxially pilose, base shortly clawed. Stamens 20, shorter than or nearly as long as petals. Ovary pilose apically; styles 2, connate basally. Fruit ellipsoid, 6–7 × 4–5 mm. Fl. Apr–May, fr. Sep–Oct.

- Thickets, forest margins, stream sides; 1500–1800 m. SE Yunnan.

11. *Photinia lasiogyna* (Franchet) C. K. Schneider, Repert. Spec. Nov. Regni Veg. 3: 153. 1906.

倒卵叶石楠 dao luan ye shi nan

Shrubs or small trees, evergreen, 1–2 m tall. Branchlets purplish brown when old, pilose when young, glabrous when old, with yellowish brown lenticels. Petiole 1.5–1.8 cm, initially slightly puberulous, glabrous when old; leaf blade obovate or oblanceolate, 5–10 × 2.5–3.5 cm, leathery, veins 9–11 pairs and inconspicuous, both surfaces glabrous or abaxially tomentose-pilose along veins when young, glabrescent, adaxially lustrous, base cuneate or gradually attenuate, margin obscurely dentate, apex obtuse or abruptly shortly pointed. Compound corymbs terminal, 3–5 cm in diam.; rachis and pedicels tomentose, sometimes glabrescent; bracts subulate, 1–2 cm. Pedicel 3–4 mm. Flowers 6–12 mm in diam. Hypanthium cupular, abaxially tomentose or glabrous. Sepals broadly triangular. Petals white, obovate, 4–6 × 3–4 mm, glabrous, base shortly clawed. Stamens 20, shorter than petals. Ovary pubescent apically; styles 2–4, connate basally. Fruit red, obovoid, 4–5 mm in diam., with prominent lenticels. Fl. May–Jun, fr. Sep–Nov.

- Thickets, forests, grassy and calcareous slopes, fields, foothills; 200–2600 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang.

- 1a. Rachis, pedicels, and hypanthium abaxially densely tomentose 11a. var. *lasiogyna*
- 1b. Rachis and pedicels sparsely tomentose-pilose when young, soon glabrescent,

glabrous when old; hypanthium

glabrous abaxially 11b. var. *glabrescens*

11a. *Photinia lasiogyna* var. *lasiogyna*

倒卵叶石楠(原变种) dao luan ye shi nan (yuan bian zhong)

Eriobotrya lasiogyna Franchet, Pl. Delavay. 225. 1890; *Photinia mairei* H. Lévillé; *Stranvaesia glaucescens* Lindley var. *yunnanensis* Franchet.

Rachis, pedicels, and hypanthium abaxially densely tomentose.

- Thickets, forests, grassy slopes, fields; 1900–2600 m. Sichuan, Yunnan.

11b. *Photinia lasiogyna* var. *glabrescens* L. T. Lu & C. L. Li, Acta Phytotax. Sin. 38: 278. 2000.

脱毛石楠 tuo mao shi nan

Rachis and pedicels sparsely tomentose-pilose when young, soon glabrescent, glabrous when old; hypanthium glabrous abaxially.

- Mixed forests, foothills, calcareous slopes; 200–1500 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang.

12. *Photinia chingiana* Handel-Mazzetti, Sinensia 2: 125. 1932.

宜山石楠 yi shan shi nan

Shrubs or small trees, evergreen, to 5 m tall. Branchlets gray when old, tomentose-villous when young, subglabrous when old, with inconspicuous lenticels. Petiole robust, 6–12 mm, villous; leaf blade oblong-elliptic to obovate-oblong or elliptic-lanceolate, 10–15 × 3–6 cm, leathery, veins ca. 20 pairs, raised abaxially and impressed adaxially, abaxially tomentose-villous, glabrescent, or densely floccosely tomentose, adaxially glabrous, base rounded, margin revolute, serrate at least in part, apex acuminate to long caudate. Compound corymbs terminal, 5–9 × 6–10 cm; peduncles and pedicels densely tomentose-villous. Pedicel 2–5 mm. Hypanthium cupular, 1–1.5 mm, abaxially densely gray villous. Sepals triangular, 1–1.5 mm, apex acute. Young fruit green, obovoid, 5–6 mm, densely villous, apex with erect triangular sepals and 2 styles. Fr. Aug–Sep.

- Forests, valley thickets, river banks; below 1200 m. Guangxi, Guizhou.

- 1a. Leaf blade oblong-elliptic to obovate-oblong, abaxially tomentose-villous, margin sparsely minutely incurved-serrate apically, subentire or with few inconspicuous teeth basally 12a. var. *chingiana*
- 1b. Leaf blade elliptic-lanceolate, abaxially densely floccosely tomentose, margin prominently sharply serrate 12b. var. *lipingensis*

12a. *Photinia chingiana* var. *chingiana*

宜山石楠(原变种) yi shan shi nan (yuan bian zhong)

Photinia austroguizhouensis Y. K. Li; *P. simplex* Y. K. Li & X. M. Wang.

Leaf blade oblong-elliptic to obovate-oblong, abaxially

tomentose-villous, margin sparsely minutely incurved-serrate apically, subtire or with few inconspicuous teeth basally.

• Evergreen broad-leaved forests, open forests, valley thickets, river banks; below 1200 m. Guangxi, Guizhou.

12b. *Photinia chingiana* var. *lipingensis* (Y. K. Li & M. Z. Yang) L. T. Lu & C. L. Li, *Acta Phytotax. Sin.* 38: 277. 2000.

黎平石楠 li ping shi nan

Photinia lipingensis Y. K. Li & M. Z. Yang, *Bull. Bot. Res.*, Harbin 8(3): 134. 1988.

Leaf blade elliptic-lanceolate, abaxially densely floccosely tomentose, margin prominently sharply serrate.

• Forests; ca. 400 m. SE Guizhou (Liping Xian).

13. *Photinia kwangsiensis* H. L. Li, *J. Arnold Arbor.* 26: 62. 1945.

广西石楠 guang xi shi nan

Trees evergreen, to 15 m tall. Branchlets dark brown or grayish brown when young, grayish black when old, terete, initially densely appressed brownish villous, subglabrous when old, with inconspicuous lenticels. Petiole 1–2(–2.5) cm, densely villous; leaf blade oblong-ovate, oblong-obovate, or oblong-lanceolate, 7–12 × 3–4.5 cm, thinly leathery, veins 12–15 pairs, reticulate veins prominent, abaxially densely brownish villous, adaxially glabrous except villous along midvein, base subrounded or broadly cuneate, margin slightly revolute, unevenly serrate to doubly serrate, apex acuminate or caudate. Compound corymbs, terminal, 8–9 × 12–13 cm, many flowered; rachis and pedicels densely brownish villous. Pedicel 3–5 mm. Hypanthium cupular, 1–2 mm, abaxially brownish villous. Sepals triangular, 1–1.5 mm, apex acute. Petals slightly longer than sepals. Stamens ca. 20. Fruit orange, subglobose, 5–6 mm in diam., villous or subglabrous; sepals incurved. Fr. Sep–Oct.

• Mixed forests, river banks; below 3000 m. E Guangxi.

14. *Photinia lanuginosa* T. T. Yu, *Acta Phytotax. Sin.* 8: 227. 1963.

绵毛石楠 mian mao shi nan

Trees or shrubs, evergreen. Branchlets blackish brown when old, terete, gray lanuginose when young, gradually glabrescent, subglabrous when old; buds ovoid, 3–4 mm, apex acute; scales blackish brown, glabrous. Petiole 2.5–4 cm, initially densely gray lanuginose, glabrate; leaf blade dark green adaxially, narrowly elliptic, rarely elongated and elliptic-obovate, 8–15 × 4–5 cm, leathery, lateral veins 18–20 pairs, abaxially pale, villous only along midvein, adaxially lustrous, glabrous, base broadly cuneate or subrounded, margin sharply serrate, entire near base, apex sharply acuminate. Compound corymbs terminal, 7–8 × 9–12 cm, compact, many flowered; rachis and pedicels densely gray lanuginose, glabrescent. Pedicel 2–5 cm. Flowers 5–6 mm in diam. Hypanthium cupular, 1–1.5 mm, glabrous or slightly villous. Sepals ovate, 1–1.5 mm, apex obtuse. Petals white, suborbicular, ca. 2 mm in diam., glabrous, base shortly clawed. Stamens 20, shorter than petals. Ovary 2-loculed, apex densely villous; styles 2, nearly free.

Fruit not seen. Fl. Apr.

• Mountain areas. Hunan (Xuefeng Shan), Zhejiang.

15. *Photinia glomerata* Rehder & E. H. Wilson in Sargent, *Pl. Wilson.* 1: 190. 1912.

球花石楠 qiu hua shi nan

Eriobotrya griffithii (Decaisne) Franchet; *Photinia franchetiana* Diels; *P. glomerata* Rehder & E. H. Wilson var. *cuneata* T. T. Yu; *P. glomerata* var. *microphylla* T. T. Yu; *P. griffithii* Decaisne; *P. serrulata* Lindley var. *congestiflora* Car-dot.

Shrubs or small trees, evergreen, 6–10 m tall. Branchlets purplish brown or grayish brown when old, terete, densely yellow tomentose when young, glabrous when old, with many scattered lenticels; buds ovoid, 3–4 mm, pubescent, apex obtuse; scales dark brown. Petiole 2–4 cm, initially densely tomentose, later subglabrous; leaf blade oblong or lanceolate to oblanceolate, leathery, (5–)6–18 × 2.5–6 cm, lateral veins 12–20 pairs, abaxially densely yellow tomentose, later partly or wholly glabrescent, adaxially initially tomentose along midvein, glabrate, base obliquely cuneate to rounded, margin somewhat revolute, serrate, apex shortly acuminate. Compound corymbs terminal, densely glomerate, 5–10 × 6–12 cm, many flowered; rachis and pedicels densely yellow tomentose. Pedicel nearly absent or very short. Flowers fragrant, 4–5 mm in diam. Hypanthium cupular, 1–1.5 mm, abaxially densely yellow tomentose. Sepals erect, ovate, 1–1.5 mm, apex acute. Petals white, suborbicular, 2–2.5 mm in diam., adaxially pilose near base, base shortly clawed, apex obtuse. Stamens 20, nearly as long as petals. Styles 2, connate nearly to middle, not exceeding stamens. Fruit red, ovoid, 5–7 × 2.5–4 mm, glabrous. Fl. May–Jun, fr. Aug–Sep.

• Mixed forests, thickets, roadsides, slopes; 1500–2600 m. Hubei, Sichuan, Yunnan.

16. *Photinia anlungensis* T. T. Yu, *Acta Phytotax. Sin.* 8: 228. 1963.

安龙石楠 an long shi nan

Shrubs evergreen, to 2 m tall. Branchlets dark brown when old, initially densely gray tomentose, glabrous when old, with scattered lenticels; buds oblong, 6–8 mm; scales brown, glabrous. Petiole 0.8–1.5 cm, initially densely tomentose, subglabrous when old; leaf blade oblong, oblong-lanceolate, or oblong-oblanceolate, 10–15 × 3–4.5 cm, leathery, midvein robust, lateral veins ca. 30–34 pairs, raised, slender, abaxially sparsely gray tomentose along veins, adaxially initially pilose, glabrescent, base broadly cuneate to subrounded, margin sharply serrate, apex acute or shortly acuminate. Compound corymbs terminal, ca. 15 cm in diam., many flowered; rachis and branches densely tomentose. Pedicel 2–3 mm, glabrous. Hypanthium cupular, abaxially glabrous. Sepals ovate-triangular, shorter. Ovary 2-loculed, apex villous; styles 2. Immature fruit obovoid, 3–4 mm, glabrous. Fl. May–Jun, fr. Aug–Oct.

• Slopes, forest margins; ca. 1300 m. SW Guizhou (Anlong Xian).

17. Photinia chihsiniana K. C. Kuan, Acta Phytotax. Sin 8: 227. 1963.

临桂石楠 lin gui shi nan

Trees evergreen, small, to 4 m tall. Branchlets grayish black when old, densely gray tomentose when young, subglabrous when old, with few lenticels; buds brownish, ovoid, 2–3 mm, gray tomentose, apex acute. Petiole 0.5–2 cm, initially gray tomentose, glabrate; stipules caducous, subulate, 3–4 mm, gray tomentose; leaf blade greenish abaxially, dark green adaxially, oblong-lanceolate or oblanceolate, 5–11 × 1.5–3 cm, leathery, lateral veins 12–15 pairs, both surfaces initially gray tomentose, glabrate, adaxially shiny, base gradually attenuate, margin somewhat revolute, sparsely minutely sharply serrate, apex acute or shortly acuminate. Compound corymbs terminal, 6–7 cm in diam.; rachis and pedicels densely gray tomentose. Pedicel 3–7 mm. Flowers ca. 5 mm in diam. Hypanthium cupular, 1–1.5 mm, abaxially gray tomentose. Sepals ovate-triangular, 1–1.5 mm, apex obtuse. Petals suborbicular, 3–4 mm in diam., glabrous. Stamens 20, nearly as long as or slightly longer than petals. Ovary pilose apically; styles 2, free, not much exceeding stamens. Fruit dark red, ovoid, 3–4 × 2–3 mm; sepals gray tomentose; seeds black, 2 or 3, ellipsoid, 2–3 mm, Fl. Apr–May, fr. Oct–Nov.

• Sparse forests in mountain valleys, slopes; 300–1000 m. NE Guangxi (Guilin Shi, Lingui Xian), Hunan.

18. Photinia loriformis W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 60. 1917.

带叶石楠 dai ye shi nan

Shrubs or small trees, evergreen, to 3 m tall. Branchlets grayish brown when old, initially densely appressed yellow tomentose, subglabrous when old, with scattered lenticels; buds ellipsoid, yellow tomentose, apex acute. Petiole 3–12 mm, densely yellow tomentose; leaf blade lorate-oblong or narrowly lanceolate, 4–9 × 1–2 cm, leathery, veins 10–20 pairs, raised abaxially and impressed adaxially, abaxially densely yellow tomentose, adaxially lustrous, glabrous when old, base broadly cuneate, margin revolute when dry, with sparse, sharp or spiny teeth, apex obtuse and mucronate, or acute and spiny pointed. Compound corymbs terminal, 4–7 cm in diam., numerous flowered, glomerate; rachis and pedicels yellow tomentose, glabrate in fruit; bracts caducous, linear. Pedicel 2–5 mm. Flowers 3–5 mm. Hypanthium cupular, ca. 2 mm, abaxially tomentose. Sepals ovate, 1–1.5 cm, apex obtuse. Petals white, orbicular, ca. 3 mm in diam., glabrous. Stamens 20, much shorter than petals; styles 2, free, long tomentose basally. Fruit red, ovoid, 4–6 × 3–5 mm; sepals erect, sparsely pubescent; seeds 2–4. Fl. Apr–May, fr. Aug–Sep.

• Forests on dry slopes, fields, mountain valleys; 2100–2700 m. Sichuan, Yunnan.

19. Photinia prionophylla (Franchet) C. K. Schneider, Repert. Spec. Nov. Regni Veg. 3: 153. 1906.

刺叶石楠 ci ye shi nan

Shrubs or small trees, evergreen, 1–3 m tall, tomentose throughout or glabrescent. Branchlets brownish to reddish

brown when young, grayish brown to grayish black when old, terete, initially short tomentose, glabrous when old; buds ovoid, apex acute; scales brownish, shortly gray tomentose. Petiole 6–15 mm, stout, gray tomentose; stipules subulate or acicular-linear, sparsely tomentose, margin with red glands; leaf blade obovate or elliptic-obovate, 4.5–7 × 4–5 cm, leathery, veins 10–14 pairs, midvein raised abaxially and impressed adaxially, abaxially densely gray tomentose, adaxially initially sparsely tomentose, glabrescent, base narrowly cuneate, margin spiny-serrate, apex obtuse or acute to acuminate. Compound corymbs terminal, 4–8 × 6–10 cm, many flowered; rachis and pedicels densely tomentose; bracts subulate, 2–2.5 mm. Pedicel 2–4 mm. Flowers 7–9 mm in diam. Hypanthium cupular, 2–3 mm, abaxially densely tomentose. Sepals triangular, 1–2 mm, margin with black glands, apex acute or obtuse. Petals white, suborbicular, 3–4 mm in diam., adaxially tomentose. Stamens 20, slightly shorter than or nearly as long as petals. Ovary densely long tomentose; styles 2, connate toward base, somewhat not exceeding stamens. Fruit red, ovoid or obovoid, 6–8 mm in diam., initially tomentose, glabrescent. Fl. May, fr. Sep–Nov.

• Sunny rocky slopes, near water courses, thickets, roadsides, mixed forests; 1800–3000 m. Yunnan.

1a. Plant tomentose throughout 19a. var. *prionophylla*
1b. Plant glabrous when mature 19b. var. *nudifolia*

19a. Photinia prionophylla var. *prionophylla*

刺叶石楠(原变种) ci ye shi nan (yuan bian zhong)

Eriobotrya prionophylla Franchet, Pl. Delavay. 225. 1890.

Plants tomentose throughout.

• Sunny rocky slopes, near water courses, thickets by roadsides; 2500–3000 m. NW Yunnan.

19b. Photinia prionophylla var. *nudifolia* Handel-Mazzetti, Symb. Sin. 7: 480. 1933.

无毛刺叶石楠 wu mao ci ye shi nan

Plants glabrous when mature.

• Mixed forests, roadsides; ca. 1800 m. Yunnan.

20. Photinia berberidifolia Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 191. 1912.

小檗叶石楠 xiao bo ye shi nan

Shrubs evergreen, to 60 cm tall. Branchlets purplish brown when old, densely appressed villous when young, glabrous when old. Petiole 2.5–6 mm, initially villous, glabrate; stipules linear-lanceolate, nearly as long as petiole, with 2–4 teeth per side; leaf blade obovate or oblong-obovate, 2–5 × 1–2 cm, leathery, midvein prominent, raised abaxially and impressed adaxially, veins 6–10 pairs, abaxially appressed villous, later subglabrous, adaxially lucid, glabrous, base cuneate, margin somewhat incurved, spiny-serrate, apex acute or obtuse. Compound corymbs terminal, 2.5–3 cm; rachis angulate, villous; bracts persistent, linear-lanceolate, subglabrous, with few teeth. Pedicel 2–5 mm, villous. Flowers 9–10 mm in diam. Hypanthium cupular, ca. 3 mm in diam., abaxially sparsely villous. Sepals broadly ovate, apex obtuse. Petals white, suborbicular,

3.5–4 mm in diam., apex usually emarginate. Stamens 20, ca. 1/2 length of petals. Ovary 2-loculed, densely pilose apically; styles 2, connate to middle, villous, not exceeding stamens. Fruit not seen. Fl. May, fr. Aug–Oct.

- Mountain valleys; 2200–2400 m. W Sichuan.

21. *Photinia prunifolia* (Hooker & Arnott) Lindley, Bot. Reg., n.s., 10: sub t. 1956. 1837.

桃叶石楠 tao ye shi nan

Trees evergreen, 10–20 m tall. Branchlets dark purplish brown to grayish black, glabrous, with yellowish brown sub-orbicular lenticels; buds ovoid, 2.5–4 mm, apex shortly acuminate or acute; scales several, dark brown, puberulous when young, glabrous when old. Petiole 1–2.5(–3) cm, glabrous, with many glands, sometimes with teeth; leaf blade oblong or oblong-lanceolate, 7–13 × 3–5 cm, leathery, veins 13–15 pairs, both surfaces glabrous, rarely slightly pilose when young, soon glabrescent, abaxially with black glands, adaxially lustrous, base rounded to cuneate, margin densely minutely sharply serrate or doubly serrate, apex acuminate or acute. Compound corymbs terminal, 8–11 × 12–16 cm, compact, many flowered; rachis and pedicels slightly villous; bracts caducous, lanceolate or linear, 2–4 mm, somewhat villous, later glabrous. Pedicel 4–8 mm. Flowers 7–8 mm in diam. Hypanthium cupular, 2–2.5 mm, abaxially glabrous or initially villous, glabrescent. Sepals triangular, 1–2 mm, apex acuminate or acute. Petals white, obovate, 3–4.5 mm, base tomentose, apex obtuse. Stamens 20, slightly shorter than or nearly as long as petals. Ovary pubescent apically; styles 2(or 3), connate basally, somewhat not exceeding stamens. Fruit red, ellipsoid, 7–11 × 4–7 mm, glabrous, with 2(or 3) seeds. Fl. Mar–Apr, fr. Oct–Nov.

Hills, slopes, stream sides, forests, bamboo forests by roadsides; 200–1700 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Yunnan, Zhejiang [Indonesia, Japan, Malaysia, Vietnam].

- 1a. Leaf margin minutely sharply serrate, apex acuminate, blade oblong or oblong-lanceolate, base broadly cuneate to rounded; hypanthium villous 21a. var. *prunifolia*
 1b. Leaf margin prominently doubly serrate, apex acute, blade oblong-lanceolate, base cuneate; hypanthium glabrous 21b. var. *denticulata*

21a. *Photinia prunifolia* var. *prunifolia*

桃叶石楠(原变种) tao ye shi nan (yuan bian zhong)

Photinia serrulata Lindley var. *prunifolia* Hooker & Arnott, Bot. Beechey Voy. 185. 1833; *P. consimilis* Handel-Mazzetti; *P. melanostigma* Hance.

Leaf blade oblong or oblong-lanceolate, base broadly cuneate to rounded, margin minutely sharply serrate, apex acuminate. Hypanthium villous.

Hills, grassy slopes, stream sides, forests; 200–1700 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Yunnan, Zhejiang [Indonesia, Japan, Malaysia, Vietnam].

21b. *Photinia prunifolia* var. *denticulata* T. T. Yu, Acta Phytotax. Sin. 8: 228. 1963.

重齿桃叶石楠 chong chi tao ye shi nan

Leaf blade oblong-lanceolate, base cuneate, margin prominently doubly serrate, apex acute. Hypanthium glabrous.

- Slopes, bamboo forests by roadsides. Fujian, Guangxi, Zhejiang.

22. *Photinia raupingensis* K. C. Kuan, Acta Phytotax. Sin. 8: 228. 1963.

饶平石楠 rao ping shi nan

Trees evergreen, 4–5 m tall. Branchlets densely villous, gradually glabrescent, purplish black and glabrous when old, lenticels smaller. Petiole 0.8–1.5 cm, usually glabrous, without glands and teeth; leaf blade oblong, obovate, or oblong-elliptic, 4–8 × 2–3 cm, leathery, midvein initially sparsely villous, later glabrous, prominently raised abaxially, impressed adaxially, lateral veins 12–17 pairs, abaxially with black glands, adaxially glabrous, base cuneate, margin minutely serrate, entire near base, apex acute or obtuse. Compound corymbs terminal, 3–7 cm in diam., dense, numerous flowered; rachis and pedicels densely gray tomentose; bracts subulate or linear, 3–4 mm, gray tomentose. Flowers 7–8 mm in diam. Hypanthium cupular, 1–2 mm, abaxially densely gray tomentose. Sepals triangular, 1–1.5 mm, apex acute. Petals white, obovate, 2–3 mm, basally tomentose, apex obtuse. Stamens 20, shorter than petals. Ovary 2-loculed, apex pilose; styles 2, connate basally. Fruit red, ovoid, 5–6 × 3–4 mm; seeds brownish, ovoid, ca. 2 mm. Fl. May–Jun, fr. Oct–Nov.

- Mixed forests on slopes, mountain valleys, rocky areas; 500–1000 m. Guangdong, Guangxi.

23. *Photinia beauverdiana* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 319. 1906.

中华石楠 zhong hua shi nan

Shrubs or small trees, deciduous, 3–10 m tall. Branchlets purplish brown to blackish brown, terete, usually glabrous, with scattered gray lenticels; buds ovoid, puberulous, apex acute; scales several, dark brown. Petiole 5–10 mm, puberulous; leaf blade oblong, ovate, or elliptic to obovate, (3–)5–13 × 2–5 cm, papery, veins (6–)9–14 pairs, abaxially pilose along veins, adaxially lustrous, glabrous, base cuneate to rounded, margin serrate, apex acute or shortly acuminate to caudate. Compound corymbs terminal, 4–7 × 5–10 cm, many flowered; rachis and pedicels glabrous, with numerous oblong lenticels; bracts brown, linear, 3–5 mm, glabrous. Pedicel 0.7–1.5 cm, to 2 cm in fruit. Flowers 5–7 mm in diam. Hypanthium cupular, 1–1.5 mm, abaxially usually glabrous. Sepals broadly triangular or triangular-ovate, 1–2 mm, apex acute or ± obtuse. Petals white, ovate or obovate, 2–4 × 2.5–3.5 mm, glabrous, apex obtuse. Stamens 20, slightly shorter than or nearly as long as petals. Styles (2 or)3, somewhat not exceeding stamens, basally connate. Fruit purplish red, ovoid or subglobose, 7–8 × 5–6 mm, glabrous, slightly lenticellate. Fl. Apr–May, fr. Jul–Aug.

Slopes, rocks, mountain sides, valleys, river sides, thickets, forests; 200–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, N Vietnam].

- 1a. Leaf blade 5–13 cm, apex acute to shortly acuminate, lateral veins 9–14 pairs 23a. var. *beauverdiana*
 1b. Leaf blade 3–6 cm, apex shortly acuminate to caudate, lateral veins 6–8 pairs 23b. var. *brevifolia*

23a. Photinia beauverdiana var. **beauverdiana**

中华石楠(原变种) zhong hua shi nan (yuan bian zhong)

Photinia beauverdiana var. *notabilis* (C. K. Schneider) Rehder & E. H. Wilson; *P. cavaleriei* H. Léveillé; *P. kudoi* Masamune; *P. notabilis* C. K. Schneider; *Pourthiaea beauverdiana* (C. K. Schneider) Hatusima; *P. beauverdiana* var. *notabilis* (C. K. Schneider) Hatusima.

Leaf blade oblong, elliptic, oblong-elliptic, or obovate-oblong, 5–13 cm, lateral veins 9–14 pairs, apex acute to shortly acuminate.

Slopes, mountain sides, valleys, thickets, forests; 200–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, N Vietnam].

23b. Photinia beauverdiana var. **brevifolia** Cardot, Notul. Syst. (Paris) 3: 378. 1918.

短叶中华石楠 duan ye zhong hua shi nan

Pourthiaea beauverdiana var. *brevifolia* (Cardot) Iketani & H. Ohashi.

Leaf blade ovate or elliptic to obovate, 3–6 cm, lateral veins 6–8 pairs, apex shortly acuminate to caudate.

• Slopes, rocks in valleys, river sides, forests; 400–1400 m. ?Guizhou, Hubei, Hunan, Jiangsu, Shaanxi, Sichuan, Zhejiang.

24. Photinia lucida (Decaisne) C. K. Schneider, Ill. Handb. Laubholz. 1: 710. 1906.

台湾石楠 tai wan shi nan

Pourthiaea lucida Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 148. 1874; *Photinia taiwanensis* Hayata; *P. villosa* (Thunberg) Candolle var. *formosana* Hance; *Pourthiaea formosana* (Hance) Koidzumi.

Trees deciduous, small, 4–5(–6) m tall. Branchlets reddish brown when young, grayish brown or purplish brown when old, terete, gray pubescent when young, glabrous when old, with oblong lenticels; buds ovoid, 2–4 mm, puberulous, apex acute or ± obtuse; scales several, dark brown. Petiole 3–7 mm, glabrous; leaf blade obovate-oblong or obovate-lanceolate, 5–9 × 2–3 cm, papery, veins 6–8 pairs, both surfaces glabrous, base gradually attenuate, margin sparsely minutely serrate, entire toward base, apex caudate. Compound corymbs terminal, 3–6 × 4–6 cm, many flowered; rachis and pedicels glabrous or slightly pubescent when young, glabrate. Pedicel 5–10 mm, to 2.5 cm in fruit, with a pair of subulate bracts 2–3 mm at base. Flowers 7–10 mm. Hypanthium cupular, 2–2.5 mm, abaxially glabrous. Sepals triangular, 1–1.5 mm, apex acute. Petals white, orbicular or broadly obovate, 3–3.5 mm in diam., base shortly clawed and pilose, apex obtuse, sometimes emarginate. Stamens 15–

20, unequal in length. Styles 2 or 3, connate, only free apically, pilose basally, not exceeding stamens. Fruit dark red, obovoid or obovoid-ellipsoid, 5–8 × 3–6 mm, glabrous, with dense, suborbicular lenticels. Fl. Apr–May, fr. Aug–Sep.

• Broad-leaved forests, thickets; 300–400 m. Taiwan.

25. Photinia callosa Chun ex T. T. Yu & K. C. Kuan, Acta Phytotax. Sin. 8: 229. 1963.

厚齿石楠 hou chi shi nan

Pourthiaea callosa (Chun ex T. T. Yu & K. C. Kuan) Iketani & H. Ohashi.

Shrubs or trees, deciduous, to 12 m tall. Branchlets grayish brown to blackish brown, glabrous, with few yellow lenticels; buds ovoid, 2–3 mm; scales brown, glabrous. Petiole 0.5–1.5 cm, glabrous; leaf blade lanceolate or oblong-lanceolate, 5.5–13 × 1.5–3.5 cm, papery, veins 12–16 pairs, midvein prominently raised abaxially and impressed adaxially, both surfaces glabrous, base cuneate, margin slightly revolute, shallowly sharply serrate, sometimes subentire, apex caudate or acuminate. Compound corymbs terminal, 4–6 cm in diam., many flowered; rachis and pedicels glabrous, lenticellate. Pedicel 3–7 mm. Flowers 6–9 mm in diam. Hypanthium campanulate, 1–2 mm, abaxially glabrous. Sepals ovate, ca. 1/2 as long as hypanthium, apex obtuse. Petals white, obovate-oblong, 2–3 mm, glabrous, base shortly clawed, apex obtuse. Stamens 20, slightly shorter than petals. Styles 2 or 3, mostly connate, glabrous. Fruit ovoid-globose, 4–6 × 3–4 mm, glabrous; fruiting pedicels 5–9 mm, with distinct lenticels; seeds black, ovoid, ca. 4 mm. Fl. Apr–May, fr. Aug–Sep.

• Sparse forests in mountain valleys, slopes; 400–800 m. Guangdong, Guangxi.

26. Photinia fokiensis (Finet & Franchet) Franchet ex Cardot, Bull. Mus. Natl. Hist. Nat. 26: 570. 1920.

福建石楠 fu jian shi nan

Photinia glabra Hemsley var. *fokiensis* Finet & Franchet, Bull. Soc. Bot. France 46: 207. 1899; *Pourthiaea fokiensis* (Finet & Franchet) Iketani & H. Ohashi.

Shrubs or small trees, deciduous, 3–5 m tall. Branchlets brownish to brownish black, slender, with scattered lenticels; buds ovoid, 3–5 mm, glabrous. Petiole 5–10 mm, glabrous; leaf blade lanceolate or oblong-lanceolate, 7–11 × 1.5–4 cm, thinly papery, veins 7–9 pairs, midvein raised abaxially and impressed adaxially, both surfaces glabrous or puberulous along midvein abaxially, base cuneate, margin densely minutely sharply serrate, apex long acuminate. Compound corymbs terminal, 3–7 × 3–5 cm, loose, few flowered; rachis and pedicels glabrous, lenticellate. Pedicel 0.8–1.2 cm, slender. Flowers 1–1.2 cm in diam. Hypanthium cupular, 2–3 mm, abaxially glabrous. Sepals triangular-ovate, 1–2 mm and nearly as broad, apex acute. Petals white, broadly obovate or suborbicular, 4–6 mm in diam., base clawed, apex emarginate. Stamens ca. 20, shorter than petals. Ovary pilose apically; styles 3, connate nearly to apex, equaling or lower than stamens. Fruit reddish brown, obovoid or subglobose, 6–8 mm in diam., glabrous. Fl. Apr–May, fr. July–Sep.

- Mountain valley forests; 500–700 m. Fujian, Zhejiang.

27. *Photinia bergerae* C. K. Schneider, Ill. Handb. Laubholz. 1: 709. 1906.

湖北石楠 hu bei shi nan

Pourthiaea bergerae (C. K. Schneider) Iketani & H. Ohashi.

Shrubs deciduous, to 1.5 m tall. Branchlets reddish brown or purplish brown, lucid, glabrous, with sparse lenticels; buds ovoid; scales several, brown, glabrous. Petiole 5–7 mm, glabrous; leaf blade broadly lanceolate, 4–6 × 1–2 cm, papery, lateral veins 4–7 pairs, both surfaces glabrous, adaxially lustrous, base cuneate, margin sharply serrate, apex acute. Compound corymbs terminal, 3–4 × 4–6 cm; rachis and pedicels sparsely lenticellate, glabrous. Pedicel 6–8(–10) mm. Flowers ca. 1 cm in diam. Hypanthium campanulate, 3–4 mm in diam., glabrous. Sepals broadly ovate, slightly shorter than hypanthium, ciliate, apex obtuse. Petals broadly elliptic, adaxially slightly pilose, base shortly clawed. Stamens 20–25, slightly longer than petals. Ovary villous apically; styles 3, mostly connate, only free apically. Fruit purplish red, obovoid, 7–8 × 6–7 mm. Fl. Apr–May, fr. Sep–Oct.

- Slopes; ca. 1000 m. W Hubei.

28. *Photinia obliqua* Stapf, Bot. Mag. 149: t. 9008. 1924.

斜脉石楠 xie mai shi nan

Pourthiaea obliqua (Stapf) Iketani & H. Ohashi.

Shrubs deciduous. Branchlets blackish purple, glabrous, sparsely lenticellate; buds narrowly ovoid, 3–5 mm; scales several, blackish purple. Petiole 7–10 mm, slightly pubescent or glabrous; leaf blade oblong or oblanceolate, 5–9 × 2.5–3 cm, veins very oblique, 5–7 pairs, prominent abaxially, glabrous except abaxially villous along midvein, base very obliquely cuneate, margin minutely sharply serrate, apex acute or shortly acuminate. Inflorescences and flowers not seen. Infructescences compound corymbs, 6–8 × 8–10 cm; rachis and pedicels glabrous, lenticellate. Fruit ovoid to ellipsoid, 5–6 × 3–4 mm; fruiting pedicels 1–1.5 cm.

- E Fujian (Fuzhou Shi).

29. *Photinia impressivena* Hayata, Icon. Pl. Formosan. 5: 67. 1915.

陷脉石楠 xian mai shi nan

Shrubs or small trees, deciduous, 2–6 m tall. Branchlets purplish brown, terete, villous when young, glabrescent, with suborbicular lenticels; buds reddish brown, ovoid, apex acute. Petiole reddish, very short, 1–2(–8) mm, glabrous; leaf blade oblong-obovate or oblong-oblanceolate, 5–10 × 1.5–3 cm, thinly leathery, veins 6–9 pairs, raised abaxially and deeply impressed adaxially, anastomosing at leaf margin, both surfaces glabrous, adaxially shiny, base cuneate or attenuate into petioles, margin sparsely minutely serrate, apex acuminate. Compound corymbs terminal, 3–4(–10) mm in diam., few to many flowered; rachis and pedicels glabrous or tomentose, lenticellate. Pedicel (2–)4–10 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, 4–5 mm in diam., abaxially glabrous. Se-

pals triangular-ovate, slightly shorter than hypanthium, apex acute. Petals white, ovate, 3–4 mm, glabrous, apex obtuse. Stamens 20, longer than petals, glabrous. Styles 2, connate nearly to middle. Fruit red, ovoid-ellipsoid, 8–10 × 6–8 mm, glabrous, few lenticellate; sepals urceolate; fruiting pedicels 1–1.8 cm, with dense lenticels. Fl. Apr–May, fr. Sep–Oct.

Forests, thickets, mountain valleys, stream sides; 400–3000 m. Fujian, Guangdong, Guangxi, Hainan [Vietnam].

- 1a. Petiole 1–2 mm; compound corymb 3–4 cm in diam., few flowered; rachis, pedicels, and hypanthium abaxially glabrous; pedicel 4–10 mm 29a. var. *impressivena*
- 1b. Petiole 5–8 mm; compound corymb 5–10 cm in diam., many flowered; rachis, pedicels, and hypanthium abaxially white tomentose; pedicel 2–3 mm 29b. var. *urceolocarpa*

29a. *Photinia impressivena* var. *impressivena*

陷脉石楠(原变种) xian mai shi nan (yuan bian zhong)

Photinia euphlebica Merrill & Chun; *Pourthiaea impressivena* (Hayata) Iketani & H. Ohashi; *Stranvaesia impressivena* (Hayata) Masamune.

Petiole 1–2 mm. Compound corymbs 3–4 mm in diam., few flowered; rachis, pedicels, and hypanthium abaxially glabrous. Pedicel 4–10 mm.

- Mixed forests, mountain valleys, stream sides; 400–3000 m. Fujian, Guangdong, Guangxi, Hainan.

29b. *Photinia impressivena* var. *urceolocarpa* (J. E. Vidal) J. E. Vidal, Fl. Cambodge, Laos & Vietnam 6: 51. 1968.

毛序陷脉石楠 mao xu xian mai shi nan

Photinia lancilimba J. E. Vidal var. *urceolocarpa* J. E. Vidal, Notul. Syst. 13: 299. 1948; *Pourthiaea impressivena* var. *urceolocarpa* (J. E. Vidal) Iketani & H. Ohashi.

Petiole 5–8 mm. Compound corymbs 5–10 cm in diam., many flowered; rachis, pedicels, and hypanthium abaxially white tomentose. Pedicel 2–3 mm.

Forests, thickets; ca. 500 m. Guangxi [Vietnam].

30. *Photinia tsaii* Rehder, J. Arnold Arbor. 19: 274. 1938.

福贡石楠 fu gong shi nan

Pourthiaea tsaii (Rehder) Iketani & H. Ohashi.

Shrubs deciduous, 0.5–1.5 m tall, or trees to 7 m tall. Branchlets purplish brown when old, initially densely gray floccose-tomentose, subglabrous when old, lenticellate. Petiole 3–10 mm, gray floccose-tomentose when young, gradually glabrescent; leaf blade lanceolate or oblong, 4–8.5 × 1–2 cm, papery, veins 8–11 pairs, midvein raised abaxially and impressed adaxially, abaxially initially floccose-tomentose, glabrescent, adaxially slightly rugulose, glabrous, base gradually attenuate, margin densely minutely serrate, apex acuminate. Inflorescences and flowers not seen. Infructescences terminal, 4–5 cm in diam.; rachis and pedicels glabrous, with dense, prominent

lenticels; fruiting pedicels 2–5 mm. Fruit red, ovoid, 8–10 × 6–8 mm, glabrous; sepals persistent, erect, triangular, slightly pilose; ovary 2- or 3-loculed; seeds 2–6, yellowish brown, 4–4.5 mm. Fr. Sep–Oct.

- Slopes, forest margins; 1500–2000 m. NW Yunnan.

31. *Photinia blinii* (H. Léveillé) Rehder, J. Arnold Arbor. 17: 335. 1936.

短叶石楠 *duan ye shi nan*

Cotoneaster blinii H. Léveillé, Cat. Pl. Yunnan 229. 1917; *Pourthiaea blinii* (H. Léveillé) Iketani & H. Ohashi.

Shrubs deciduous. Branchlets purplish red when young, purplish brown when old, densely tomentose when young, glabrous when old, with scattered small lenticels. Petiole very short or nearly absent, densely yellow tomentose; leaf blade lanceolate, 3–4 × 0.8–1 cm, veins inconspicuous, midvein somewhat raised abaxially and slightly impressed adaxially, abaxially densely yellow tomentose, adaxially initially tomentose, gradually glabrescent, base cuneate and gradually attenuate, margin entire or rarely inconspicuously crenulate, apex ± obtuse or ± acute. Inflorescences and flowers not seen. Infructescences terminal, corymbose, 1.8–2 cm, compact; rachis and pedicels purplish brown, short, glabrous, with distinct lenticels. Stamens ca. 20. Styles 3. Fruit ovoid-globose, 6–7 mm, ovary 3-loculed; sepals incurved, triangular, 1–1.5 mm. Fl. Aug–Sep, fr. Oct.

- River beds; ca. 600 m. Guizhou.

32. *Photinia benthamiana* Hance, Ann. Sci. Nat., Bot., sér. 5, 5: 213. 1866.

闽粤石楠 *min yue shi nan*

Shrubs or small trees, deciduous, 3–10 m tall. Branchlets dark reddish brown or purplish brown when young, grayish black when old, initially densely gray villous, glabrous when old, with elliptic lenticels; buds narrowly ovoid, 3–5 × 2–3 mm, apex acute; scales several, brown, villous. Petiole 3–10 mm, gray villous; leaf blade obovate-oblong or oblong-lanceolate to narrowly lanceolate, 5–11 × 2–5 cm, papery, veins 5–8 pairs, both surfaces sparsely gray villous when young, later glabrous or only with few long hairs along veins abaxially, base attenuate or broadly cuneate, margin sparsely serrate, apex acute or obtuse. Compound corymbs terminal, 4–6(–7) × 5–7 cm, numerous flowered; peduncles and pedicels gray villous; bracts subulate, 2–4 mm, villous. Pedicel 3–5 mm. Flowers 7–8 mm in diam. Hypanthium cupular, 3–4 mm, abaxially villous. Sepals triangular, 1–1.5 mm. Petals white, obovate or orbicular, 3–4 mm, adaxially glabrous or puberulous, apex obtuse or emarginate. Stamens 20, nearly as long as or slightly shorter than petals. Styles 2 or 3, somewhat not exceeding stamens, glabrous, connate basally. Fruit ovoid or subglobose, 4–6 × 3–5 mm, sparsely yellow pubescent. Fl. Mar–May, fr. Jul–Aug.

Slopes, mountain valleys, forests, thickets, roadsides, river banks; 200–2500 m. Fujian, Guangdong, Guangxi, Hainan, Hubei, Hunan, Yunnan, Zhejiang [Laos, Thailand, Vietnam].

1a. Leaf blade obovate-oblong or oblong-

- lanceolate, base attenuate 32a. var. *benthamiana*
 1b. Leaf blade oblong-obovate or narrowly lanceolate to ovate-lanceolate, base broadly cuneate or attenuate.
 2a. Leaf blade oblong-obovate, 3–4 cm wide, base broadly cuneate 32b. var. *obovata*
 2b. Leaf blade narrowly lanceolate to ovate-lanceolate, 1–2.5 cm wide, base attenuate 32c. var. *salicifolia*

32a. *Photinia benthamiana* var. *benthamiana*

闽粤石楠(原变种) *min yue shi nan* (*yuan bian zhong*)

Pourthiaea benthamiana (Hance) Nakai; *Stranvaesia benthamiana* (Hance) Merrill.

Leaf blade obovate-oblong or oblong-lanceolate, 2–5 cm wide, base attenuate.

Slopes, mountain valleys, forests, thickets, roadsides; 200–2500 m. Fujian, Guangdong, Hubei, Hunan, Yunnan, Zhejiang [Vietnam].

32b. *Photinia benthamiana* var. *obovata* H. L. Li, J. Arnold Arbor. 25: 208. 1944.

倒卵叶闽粤石楠 *dao luan ye min yue shi nan*

Pourthiaea benthamiana var. *obovata* (H. L. Li) Iketani & H. Ohashi.

Leaf blade oblong-obovate, 3–4 cm wide, base broadly cuneate.

- Dense forests on slopes; ca. 1000 m. Hainan.

32c. *Photinia benthamiana* var. *salicifolia* Cardot, Notul. Syst. (Paris) 3: 376. 1918.

柳叶闽粤石楠 *liu ye min yue shi nan*

Pourthiaea benthamiana var. *salicifolia* (Cardot) Iketani & H. Ohashi.

Leaf blade narrowly lanceolate to ovate-lanceolate, 1–2.5 cm wide, base attenuate.

Mountain forests, thickets, river banks; 900–1700 m. Guangxi, Hainan, Yunnan [Laos, Thailand, Vietnam].

33. *Photinia pilosicalyx* T. T. Yu, Acta Phytotax. Sin. 8: 231. 1963.

毛果石楠 *mao guo shi nan*

Pourthiaea pilosicalyx (T. T. Yu) Iketani & H. Ohashi.

Shrubs deciduous, ca. 4 m tall. Branchlets purplish brown, glabrous, lenticellate; buds dark brown, ovoid, sparsely pilose, apex acute. Petiole 5–7 mm, glabrous; leaf blade yellowish brown abaxially, dark green adaxially, lanceolate or oblong-lanceolate, 5–11 × 1.5–4.5 cm, membranous, midvein prominent abaxially and impressed adaxially, veins 9 or 10 pairs, adaxially somewhat lustrous, both surfaces glabrous, base cuneate, margin sharply serrate, apex acuminate. Compound corymbs terminal, 4–8 cm in diam., many flowered; rachis and pedicels yellow pilose; hypanthium yellow pilose abaxially. Flowers not seen. Young fruit ovoid, 5–6 × 3–4 mm, pilose, with suberect incurved sepals, and 2 free styles.

• Mixed forests, forests on foothills; 1000–1200 m. SW Guizhou (Anlong Xian, Xingyi Xian).

34. *Photinia villosa* (Thunberg) Candel, Prodr. 2: 631. 1825.

鸡丁子 *ji ding zi*

Shrubs or trees, deciduous, 2–5 m tall. Branchlets dark brown to reddish brown when young, grayish brown when old, initially white villous, glabrous when old, with scattered oblong or elliptic lenticels; buds ovoid, 2–4 mm, apex acute to shortly acuminate; scales brown, glabrous. Petiole 2–6 mm, villous; leaf blade obovate, oblong-obovate, or elliptic, 3–8 × 2–4 cm, herbaceous, veins 5–7 pairs, both surfaces initially white villous, glabrescent or subglabrous adaxially and villous only along veins abaxially, base cuneate, margin densely sharply serrate apically, apex caudate. Inflorescences terminal, corymbose, rarely umbellate, 2–5 × 3–6 cm, (5–)10–20- or more flowered; rachis and pedicels villous, with dense, oblong or elliptic small lenticels in fruit; bracts caducous, subulate or linear, 2–4 mm. Pedicel 1.5–2.5 cm. Flowers 7–12 mm. Hypanthium cupular, 2–3 mm, abaxially white villous or glabrous. Sepals triangular-ovate, 2–3 mm, apex obtuse. Petals white, suborbicular, 4–5 mm in diam., adaxially pilose near base, shortly clawed. Stamens 20, shorter than petals. Ovary densely white villous apically; styles 3, free from middle, glabrous. Fruit red or yellowish red, ellipsoid or ovoid, 8–10(–16) × 6–8(–11) mm, slightly pilose; sepals erect. Fl. Apr–May, fr. Aug–Sep.

Slopes, forests, thickets, stream sides, roadsides, waste places; 100–1600 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Yunnan, Zhejiang [Japan, Korea].

- 1a. Petiole, leaf blade, pedicel, and hypanthium white villous; inflorescence compound-corymbose, 10–20-flowered or more; fruit 6–8 mm in diam. 34a. var. *villosa*
- 1b. Petiole, leaf blade, and pedicel sparsely white villous; inflorescence simple corymbose, rarely umbellate, 5–8(–15)-flowered; fruit 9–11 mm in diam.
 - 2a. Hypanthium sparsely villous; leaf blade elliptic or oblong-elliptic, rarely oblong-obovate 34b. var. *sinica*
 - 2b. Hypanthium glabrous; leaf blade usually obovate or oblong-obovate 34c. var. *glabricalycina*

34a. *Photinia villosa* var. *villosa*

毛叶石楠(原变种) *mao ye shi nan (yuan bian zhong)*

Crataegus villosa Thunberg in Murray, Syst. Veg., ed. 14, 465. 1784; *Photinia variabilis* Hemsley, nom. illeg. (included *C. villosa*); *Pourthiaea variabilis* Palibin; *P. villosa* (Thunberg) Decaisne.

Petioles, leaf blade, pedicels, and hypanthium white villous. Leaf blade obovate or oblong-obovate. Compound corymbs 10- to more than 20-flowered. Fruit 8–10 × 6–8 mm.

Slopes, thickets; 800–1200 m. Anhui, Hubei, Jiangsu, Shandong, Zhejiang [Japan, Korea].

34b. *Photinia villosa* var. *sinica* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 186. 1912.

庐山石楠 *lu shan shi nan*

Photinia cardotii F. P. Metcalf; *P. parvifolia* (E. Pritzl) C. K. Schneider var. *kankaoensis* (Hatusima) T. T. Yu & K. C. Kuan; *P. subumbellata* Rehder & E. H. Wilson var. *villosa* Cardot; *Pourthiaea kankaoensis* Hatusima; *P. villosa* var. *sinica* (Rehder & E. H. Wilson) Migo.

Petioles, leaf blade, and pedicels sparsely white villous. Leaf blade elliptic or oblong-elliptic, rarely oblong-obovate. Inflorescences usually simple corymbose, 5–8(–15)-flowered. Hypanthium sparsely villous. Fruit 0.8–1.6 × 0.9–1.1 cm.

• Forests, thickets, grassy slopes, stream sides, waste places; 1000–1600 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Zhejiang.

34c. *Photinia villosa* var. *glabricalycina* L. T. Lu & C. L. Li, Acta Phytotax. Sin. 38: 279. 2000.

光萼石楠 *guang e shi nan*

Petioles, leaf blade, and pedicels sparsely white villous. Leaf blade obovate or oblong-obovate. Inflorescences simple corymbose or umbellate, 5–8-flowered or slightly more. Hypanthium glabrous abaxially. Fruit 0.8–1.4 cm × 9–10 mm.

• Sunny slopes, roadsides, mixed forests, thickets; 100–1100 m. Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Zhejiang.

35. *Photinia calleryana* (Decaisne) Cardot, Notul. Syst. (Paris) 3: 377. 1918.

城口石楠 *cheng kou shi nan*

Pourthiaea calleryana Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 147. 1874; *Cotoneaster esquirolii* H. Léveillé; *Photinia brevipedunculata* Cardot; *P. esquirolii* (H. Léveillé) Rehder; *Stranvaesia calleryana* (Decaisne) Decaisne.

Shrubs or small trees, deciduous. Branchlets brown, pubescent when young, glabrous when old, lenticellate. Petiole 3–10 mm, initially pubescent, glabrescent; leaf blade oblong or oblong-elliptic, 7–10 × 3–5 cm, veins 8–10(–12) pairs, both surfaces flocculose-pubescent when young, glabrescent or only with few soft hairs along veins abaxially, base broadly cuneate, margin sparsely shallowly serrate, apex acute to shortly acuminate. Inflorescences terminal, corymbose, few flowered; rachis and pedicels villous; bracts lanceolate or linear, 3–5 mm, villous. Flowers 0.8–1.2 cm in diam. Hypanthium cupular or campanulate, abaxially villous. Sepals triangular, 1–1.5 mm, apex acute. Petals suborbicular, 4–5 × 3–4 mm, abaxially slightly pilose when young, glabrate, base clawed, apex emarginate. Stamens 20, somewhat shorter than petals; filaments glabrous, base dilated. Ovary densely villous apically; styles 3, connate to above middle. Fruit ovoid, 5–7 × 3–5 mm, glabrous; fruiting pedicels prominently minutely lenticellate. Fl. May–Jun, fr. Jul–Aug.

• Mountain regions; ca. 2000 m. Chongqing, Guizhou, ?E Sichuan, Yunnan.

36. *Photinia schneideriana* Rehder & E. H. Wilson in Sargent, Pl. Wilson 1: 188. 1912.

绒毛石楠 rong mao shi nan

Shrubs or small trees, deciduous, to 7 m tall. Branchlets purplish brown when young, grayish brown when old, initially sparsely villous, subglabrous when old, with prominent brownish fusiform lenticels; buds broadly ovoid, 2–4 mm, apex acute; scales dark brown, glabrous or margin puberulous. Petiole 6–10 mm, initially villous, glabrescent; leaf blade oblong or oblong-elliptic to oblong-lanceolate, 6–11 × 2–5.5 cm, veins 10–15 pairs, slightly raised abaxially, abaxially yellowish gray tomentose, adaxially initially sparsely villous, glabrescent, base broadly cuneate, margin sharply serrate, apex acuminate. Compound corymbs terminal, (3–)5–8 × 5–11 cm, many flowered; rachis and pedicels glabrous or sparsely villous, glabrescent, with brownish lenticels in fruit; bracts linear or lanceolate, 2–4 mm, puberulous. Pedicel 3–8 mm. Hypanthium cupular, 3–4 mm, abaxially sparsely villous, later subglabrous or glabrous. Sepals spreading, suborbicular, 1–1.5 mm, apex abruptly pointed. Petals white, suborbicular, 4–5 mm in diam., glabrous or adaxially villous at base, base shortly clawed, apex obtuse. Stamens 20, nearly as long as petals. Ovary pilose apically; styles 2 or 3, not exceeding stamens, basally connate. Fruit reddish, obovoid or obovoid-ellipsoid, 7–10 × 6–8 mm, glabrous, minutely lenticellate; seeds blackish brown, ovoid, 5–6 mm, apex acute. Fl. Apr–May, fr. Sep–Oct.

• Forests, river valleys, near water courses, fields; 400–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang.

- 1a. Rachis, pedicels, and hypanthium abaxially sparsely villous, glabrescent; petals glabrous 36a. var. *schneideriana*
 1b. Rachis, pedicels, and hypanthium abaxially glabrous; petals adaxially villous near base 36b. var. *parviflora*

36a. *Photinia schneideriana* var. *schneideriana*

绒毛石楠(原变种) rong mao shi nan (yuan bian zhong)

Photinia beauverdiana C. K. Schneider var. *lohfaensis* F. P. Metcalf; *P. dabeishanensis* M. P. Deng & K. Yao; *P. fauriei* Cardot; *P. zhijiangensis* T. C. Ku; *Pourthiaea schneideriana* (Rehder & E. H. Wilson) Iketani & H. Ohashi.

Rachis, pedicels, and hypanthium abaxially sparsely villous, glabrescent; petals glabrous.

• Forests, river valleys, near water courses; 400–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang.

36b. *Photinia schneideriana* var. *parviflora* (Cardot) L. T. Lu & C. L. Li, Acta Phytotax. Sin. 38: 277. 2000.

小花石楠 xiao hua shi nan

Photinia parviflora Cardot, Notul. Syst. (Paris) 3: 378. 1918, not L. O. Williams (1972); *Pourthiaea parviflora* (Cardot) Iketani & H. Ohashi.

Rachis, pedicels, and hypanthium abaxially glabrous; petals adaxially villous near base.

• Fields; low elevations. Guizhou.

One of us (Spongberg) prefers to treat this variety as a synonym of the species because of the slight differences.

37. *Photinia arguta* Lindley, Bot. Reg. 23: sub t. 1956. 1837.

锐齿石楠 rui chi shi nan

Shrubs or small trees. Branchlets purplish brown when young, brownish gray when old, angulate, initially tomentose, glabrous when old; buds narrowly ovoid or oblong, 3–5 mm, apex acute; scales several, purplish brown. Petiole 4–6 mm, tomentose when young; leaf blade lanceolate, oblong-lanceolate, or oblong-oblong-lanceolate, 4.5–8 × 2–3 cm, veins 8–10 pairs, both surfaces long gray tomentose when young, glabrate or with hairs only along veins when old, base cuneate, margin minutely sharply serrate, apex acuminate. Compound corymbs terminal, 2–5(–8) × 1.5–3 cm, several to many flowered; rachis and pedicels long gray tomentose; bracts linear or linear-lanceolate, 3–4 mm, initially slightly long tomentose, glabrescent. Pedicel 3–6 mm. Hypanthium cupular, 1.5–2 × 2–3 mm, abaxially densely long gray tomentose. Sepals triangular, 1–2.5 × ca. 2 mm, apex ± acute or obtuse. Petals obovate, 3–4 × 2–3 mm, adaxially usually tomentose near base, base shortly clawed, apex obtuse. Stamens 20. Ovary densely long tomentose; styles 3, connate basally. Fruit subglobose, 6–7 mm in diam., glabrous or pubescent.

Thickets, gullies, near water courses; 300–1300 m. Guangxi, Guizhou, S Yunnan [India, Laos, Myanmar, Thailand, Vietnam].

Two varieties occur in China; var. *arguta* occurs in India and has leaf blade lanceolate, compound corymb 2–5 cm, several flowered, and fruit glabrous.

- 1a. Compound corymb 5–8 cm, more numerous flowered; fruit pubescent 37a. var. *hookeri*
 1b. Compound corymb 2–5 cm, relatively less flowered, fruit glabrous 37b. var. *salicifolia*

37a. *Photinia arguta* var. *hookeri* (Decaisne) J. E. Vidal, Adansonia, n.s., 5: 229. 1965.

锐齿石楠 rui chi shi nan

Pourthiaea hookeri Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 148. 1874; *Photinia hookeri* (Decaisne) Merrill; *P. mollis* J. D. Hooker; *Pourthiaea arguta* (Lindley) Decaisne var. *hookeri* (Decaisne) J. D. Hooker.

Leaf blade lanceolate or oblong-lanceolate. Compound corymbs 5–8 cm, many flowered. Fruit pubescent.

Thickets along river sides; 300–900 m. S Yunnan (Xishuangbanna) [India, Thailand].

37b. *Photinia arguta* var. *salicifolia* (Decaisne) J. E. Vidal, Adansonia, n.s., 5: 229. 1965.

柳叶锐齿石楠 liu ye rui chi shi nan

Pourthiaea salicifolia Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 148. 1874; *Photinia lancifolia* Rehder & E. H. Wilson; *P. lancilimba* J. E. Vidal; *P. mollis* J. D. Hooker var. *angustifolia* Fischer; *P. salicifolia* (Decaisne) C. K. Schneider; *Pourthiaea arguta* var. *salicifolia* (Decaisne) Iketani & H. Ohashi.

Leaf blade narrowly lanceolate, oblong-lanceolate, or oblong-obovate. Compound corymbs 2–5 cm. Fruit glabrous.

Mountain thickets, gullies, near water courses; 1100–1300 m. Guangxi, Guizhou, S Yunnan [India, Laos, Myanmar, Thailand, Vietnam].

38. *Photinia podocarpifolia* T. T. Yu, Acta Phytotax. Sin. 8: 230. 1963.

罗汉松叶石楠 *luo han song ye shi nan*

Pourthiaea podocarpifolia (T. T. Yu) Iketani & H. Ohashi.

Shrubs 1–2 m tall. Branchlets purplish brown when old, terete, gray tomentose when young, glabrous when old, with small orbicular lenticels. Petiole 2–5 mm, initially densely gray tomentose, glabrescent; leaf blade greenish abaxially, dark green adaxially, lanceolate or lorate-lanceolate, 4–6 × 0.8–1.5 cm, leathery, veins 7–10 pairs, abaxially densely gray tomentose when young, subglabrous when old, adaxially glabrous, base attenuate into short petiole, margin sparsely serrate or subentire, apex acuminate, rarely acute. Compound corymbs terminal, 4–6 × 3–5 cm, densely 10–20-flowered; rachis and pedicels densely gray tomentose, glabrous in fruit, with brown lenticels; bracts caducous, linear, membranous. Pedicel 1–3 mm. Flowers 5–8 mm in diam. Hypanthium campanulate, 3.5–4.5 mm in diam., abaxially densely gray tomentose. Sepals ovate, 1–1.5 mm, apex acute. Petals white, obovate, 5–6 × 3–4 mm, glabrous, base very shortly clawed, apex obtuse or emarginate. Stamens 20, much shorter than petals. Ovary 3-loculed, apex densely pilose; styles 3, connate at base, 4–5 mm; stigma subcapitate. Fruit ovoid-globose or subglobose, 5–7 × 5–6 mm, glabrous, with puberulous sepals; seeds 4–5 mm. Fl. Apr–May, fr. Sep–Oct.

• Thickets on sunny slopes, forests by river sides; 200–1000 m. Guangxi, Guizhou.

39. *Photinia parvifolia* (E. Pritzell) C. K. Schneider, Ill. Handb. Laubholz. 1: 711. 1906.

小叶石楠 *xiao ye shi nan*

Shrubs deciduous, 1–3 m tall. Branchlets reddish brown, blackish brown when old, slender, glabrous, with scattered oblong or elliptic yellow lenticels; buds ovoid, 3–4 mm, apex acute. Petiole 1–2 mm, glabrous; leaf blade ovate, elliptic, or elliptic-ovate to rhombic-ovate, 4–8 × 1–3.5 cm, veins 6–9 pairs, somewhat raised abaxially, both surfaces glabrous or slightly puberulous when young, base cuneate to subrounded, margin sharply serrate, apex acuminate or caudate. Inflorescences umbellate or simple corymbose, terminating lateral branchlets, several to slightly more than 10-flowered, nearly without peduncle; bracts caducous, subulate. Pedicel 1–2.5(–3.2) cm, slender, glabrous or sparsely villous, lenticellate. Flowers 0.5–1.5 cm in diam. Hypanthium cupular, 2–3 mm in diam., abaxially glabrous or sparsely villous. Sepals ovate, 1–1.5 mm, apex acute. Petals white, orbicular, 4–5 mm in diam., adaxially sparsely villous basally, base very shortly clawed, apex obtuse. Stamens 20, shorter than petals. Ovary densely villous apically; styles 2 or 3, connate nearly to middle. Fruit orangish red or purple, ellipsoid or ovoid, 9–12 × 5–7 mm, glabrous; sepals erect; seeds ovoid; fruiting pedicels 1–2.5 cm, with dense lenticels. Fl. Apr–May, fr. Jul–Aug.

• Hills, mountain valleys, rocky slopes, fields, forests, thickets; 300–2500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Zhejiang.

1a. Pedicels and hypanthium abaxially glabrous 39a. var. *parvifolia*

1b. Pedicels and hypanthium abaxially sparsely villous 39b. var. *subparvifolia*

39a. *Photinia parvifolia* var. *parvifolia*

小叶石楠(原变种) *xiao ye shi nan* (yuan bian zhong)

Pourthiaea parvifolia E. Pritzell, Bot. Jahrb. Syst. 29: 389. 1900; *Photinia subumbellata* Rehder & E. H. Wilson; *P. villosa* (Thunberg) Candolle var. *parvifolia* (E. Pritzell) P. S. Hsu & L. C. Li; *Pourthiaea laevis* (Thunberg) Koidzumi var. *parvifolia* (E. Pritzell) Migo; *P. villosa* (Thunberg) Decaisne var. *parvifolia* (E. Pritzell) Iketani & H. Ohashi.

Pedicels and hypanthium abaxially glabrous.

• Hills, mountain valleys, rocky slopes, fields, forests, thickets; 300–2500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Zhejiang.

39b. *Photinia parvifolia* var. *subparvifolia* (Y. K. Li & X. M. Wang) L. T. Lu & C. L. Li, Acta Phytotax. Sin. 38: 278. 2000.

假小叶石楠 *jia xiao ye shi nan*

Photinia subparvifolia Y. K. Li & X. M. Wang, Bull. Bot. Res., Harbin 6(4): 108. 1986.

Pedicels and hypanthium abaxially sparsely villous.

• Forests in mountain valleys; 500–600 m. S Guizhou (Libo Xian).

One of us (Spongberg) prefers to treat this variety as a synonym of the species because of the slight differences.

40. *Photinia komarovii* (H. Léveillé & Vaniot) L. T. Lu & C. L. Li, Acta Phytotax. Sin. 38: 278. 2000.

垂丝石楠 *chui si shi nan*

Viburnum komarovii H. Léveillé & Vaniot, Repert. Spec. Nov. Regni Veg. 9: 78. 1910; *Crataegus cavaleriei* H. Léveillé (1915), not H. Léveillé & Vaniot (1908); *Photinia parvifolia* (E. Pritzell) C. K. Schneider var. *tenuipes* (P. S. Hsu & L. C. Li) P. L. Chiu; *P. villosa* (Thunberg) Candolle var. *tenuipes* P. S. Hsu & L. C. Li; *P. wuyishanensis* Z. X. Yu; *Pourthiaea villosa* (Thunberg) Decaisne var. *tenuipes* (P. S. Hsu & L. C. Li) Iketani & H. Ohashi.

Shrubs deciduous, to 3 m tall. Branchlets reddish brown or dark brown, gray villous when young, glabrous when old; buds reddish brown, narrowly ovoid, glabrous. Petiole 1–2 mm, initially slightly villous, later glabrous; leaf blade elliptic or rhomboidal-ovate to ovate-lanceolate, 2–5 × 1–2.2 cm, veins 4–6 pairs, raised abaxially and impressed adaxially, both surfaces glabrous or slightly gray villous along veins when young, glabrescent, base broadly cuneate or ± rounded, margin sharply serrate, apex acuminate to caudate. Inflorescences 2- or 3-fascicled or flowers solitary, without peduncle. Pedicel (2–)3–5 cm, slender, glabrous, sparsely minutely lenticellate. Flowers 6–8 mm in diam. Hypanthium glabrous abaxially. Sepals tri-

angular-ovate, 1–1.5 mm. Petals white, suborbicular, 3–3.5 mm in diam., glabrous, apex obtuse. Stamens 15–20, shorter than or nearly as long as petals. Ovary densely gray villous apically; styles 2, connate from base nearly to middle or apex, glabrous. Fruit red, ellipsoid or oblong-ovate, 6–7 × 5–6 mm, glabrous; sepals incurved; fruiting pedicels 3–5 mm, lenticellate. Fl. Jun.

• Slopes, roadsides, sparse woods, forests; 400–1500 m. Fujian, Guizhou, Hubei, Jiangxi, Sichuan, Zhejiang.

41. *Photinia chingshuiensis* (T. Shimizu) T. S. Liu & H. J. Su, Fl. Taiwan 3: 74. 1977.

清水石楠 qing shui shi nan

Pourthiaea chingshuiensis T. Shimizu, J. Fac. Text. Sci. & Technol., Shinshu Univ., no. 36, ser. A (Biol.): 36. 1963; *Photinia parvifolia* C. K. Schneider var. *chingshuiensis* (T. Shimizu) S. S. Ying; *Pourthiaea villosa* (Thunberg) Decaisne var. *chingshuiensis* (T. Shimizu) Iketani & H. Ohashi.

Shrubs deciduous, decumbent, much branched. Branches brown or purplish brown to grayish brown, sparsely lenticellate; buds ovoid, small, 2–3 mm, apex ± obtuse or ± acute; scales several, brown, glabrous. Petiole blackish purple, 1–2 mm, villous; leaves usually 3–5-fascicled on short shoots, alternate on flowering branches; leaf blade pale green abaxially, dark green adaxially, elliptic to obovate-lanceolate, 1–4 × 0.5–1.5 cm, papery, lateral veins 6–8 pairs, somewhat raised abaxially, both surfaces glabrous or abaxially slightly villous along midvein when young, base cuneate, margin minutely sharply serrate, apex acute to shortly acuminate. Umbels terminal, 3–5-flowered, without peduncle, sometimes flowers solitary; bracts caducous, subulate, 1–2 mm, glabrous, apex acute. Pedicel 0.5–1.8 cm, slender, glabrous or sparsely villous when young, lenticellate. Flowers 5–7 mm in diam. Hypanthium cupular, 2–3 × 3–4 mm, abaxially glabrous. Sepals triangular or ovate-triangular, 1.5–2 × 2–2.5 mm, margin irregularly minutely serrate, apex acute. Petals white, suborbicular, 5–6 × 6–7 mm, glabrous, base shortly clawed, apex obtuse. Stamens ca. 20. Ovary densely villous apically; styles not exceeding stamens, connate basally. Infructescences and fruit not seen.

• Sunny gravel ridges of Chingshui Shan; 600–2100 m. Taiwan.

42. *Photinia hirsuta* Handel-Mazzetti, Symb. Sin. 7: 481. 1933.

褐毛石楠 he mao shi nan

Shrubs or small trees, deciduous, 1–2 m tall. Branchlets reddish brown to purplish brown when young, blackish brown when old, terete, densely brown hirsute, with orbicular lenticels; buds ovoid, apex acute; scales dark reddish brown, brown hirsute. Petiole 2–4 mm, thick, densely brown hirsute; leaf blade elliptic, elliptic-lanceolate, or subovate, 3–7.5 × 1.5–3 cm, papery, lateral veins 5 or 6 pairs, abaxially brown hirsute, gradually glabrate, adaxially sparsely pilose when young, glabrescent, base broadly cuneate or subrounded, margin sparsely sharply serrate, apex acuminate to caudate, sometimes 3-lobed. Inflorescences umbellate or simple corymbose, 0.8–1.5 × 0.8–2 cm, nearly without peduncle, 3–8-flowered; bracts subulate, 4–5 mm, slightly pubescent. Pedicel 3–10 mm, densely brown

hirsute. Flowers 5–7 mm in diam. Hypanthium campanulate, abaxially densely brown hirsute. Sepals triangular, 2–2.5 mm. Petals white or pinkish, obovate, 2.5–3.5 mm, adaxially puberulous. Stamens 20, somewhat shorter than petals. Styles 2, connate basally, not exceeding stamens, base pubescent. Fruit red, ellipsoid, 7–9 mm, subglabrous, lenticellate; seeds blackish brown, ellipsoid, 2–3 mm, smooth. Fl. Apr–May, fr. Aug–Sep.

• Forests, river valleys, waste places; 100–800 m. Anhui, Fujian, ?Guangdong, Hubei, Hunan, Jiangxi, Zhejiang.

1a. Leaf blade apically not divided 42a. var. *hirsuta*

1b. Leaf blade apically 3-lobed 42b. var. *lobulata*

42a. *Photinia hirsuta* var. *hirsuta*

褐毛石楠(原变种) he mao shi nan (yuan bian zhong)

Pourthiaea hirsuta (Handel-Mazzetti) Iketani & H. Ohashi.

Leaf blade not divided apically.

• Forests on slopes, river valleys, waste places; 100–800 m. Anhui, Fujian, ?Guangdong, Hubei, Hunan, Jiangxi, Zhejiang.

42b. *Photinia hirsuta* var. *lobulata* T. T. Yu, Acta Phytotax. Sin. 8: 231. 1963.

裂叶褐毛石楠 lie ye he mao shi nan

Pourthiaea hirsuta var. *lobulata* (T. T. Yu) Iketani & H. Ohashi.

Leaf blade 3-lobed apically.

• Mixed forests. W Fujian (Liancheng Xian).

One of us (Spongberg) prefers to treat this variety as a synonym of the species because of the slight differences.

43. *Photinia zhejiangensis* P. L. Chiu, Acta Phytotax. Sin. 18: 97. 1980.

浙江石楠 zhe jiang shi nan

Pourthiaea zhejiangensis (P. L. Chiu) Iketani & H. Ohashi.

Shrubs evergreen, 1–1.5 m tall. Branchlets blackish brown to nearly black when old, initially densely brown pubescent, glabrous when old, with brown lenticels; buds conical, ± with soft yellowish brown hairs, apex acute. Petiole 1–2 mm, yellowish brown hairy; leaf blade green adaxially, elliptic to obovate-elliptic, 2–5 × 1.5–2.8 cm, leathery, veins 6–8 pairs, inconspicuous, abaxially pale initially, yellowish brown villous along midvein, glabrate, sometimes villous only basally when old, adaxially initially sparsely yellowish brown villous, glabrescent, base cuneate, margin sharply serrate, apex acute or abruptly shortly apiculate. Inflorescences 1- or 2-flowered, or in terminal 3–6-flowered corymb; bracts subulate, 1.5–2 mm. Pedicel 1–2 cm, sparsely yellowish brown villous. Hypanthium campanulate, abaxially sparsely yellowish brown villous. Sepals triangular, 1.5–2 mm. Stamens 20. Styles 2 or 3, connate basally. Fruit red, ovoid-ellipsoid or urceolate, glabrous, with sparse, small lenticels; fruiting pedicels 1–2 cm, slender, minutely lenticellate, sparsely villous or subglabrous; sepals persistent, erect, 8–10 mm. Fl. Apr–May, fr. Oct–Nov.

• Thickets; 100–700 m. Zhejiang.

16. ERIOBOTRYA Lindley, Trans. Linn. Soc. London 13: 96, 102. 1821.

枇杷属 pi ba shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Trees or shrubs, evergreen. Leaves simple, stipulate, usually petiolate, venation craspedodromous or camptodromous, margin serrate or entire. Inflorescences terminal panicles, numerous flowered. Hypanthium cupular or obconical. Sepals 5, persistent. Petals 5, white or yellow, obovate or orbicular, base clawed. Stamens 20. Ovary inferior, 2–5-loculed, with 2 ovules per locule; styles 2–5, connate at base and often pubescent. Fruit a pome with persistent incurved sepals, fleshy or dry, endocarp (core) membranous, with 1 or 2 large seeds.

About 30 species: E Asia; 14 species (three endemic) in China.

- 1a. Leaves including petiole glabrous 14. *E. elliptica*
 1b. Leaves pubescent, petiole pubescent or glabrous.
 2a. Leaves abaxially sparsely pubescent or rusty or gray tomentose.
 3a. Leaf margin remotely 4–10-serrate apically, entire basally.
 4a. Leaves abaxially initially rusty pubescent, glabrescent; flowers large, stalked, petals 6–8 mm, entire at apex 4. *E. tengyuehensis*
 4b. Leaves abaxially yellow villous; flowers small, stalked or sessile, petals ca. 5 mm, truncate, slightly emarginate, or 2-lobed at apex 5. *E. salwinensis*
 3b. Leaf margin remotely serrate or undulate, entire basally.
 5a. Leaf margin undulate, blade 7–15 cm; styles 2, rarely 3 3. *E. prinoides*
 5b. Leaf margin remotely serrate, blade 12–40 cm; styles 3–5.
 6a. Leaf blade lanceolate, oblanceolate, obovate, or elliptic-oblong, 12–30 × 3–9 cm, adaxially rugose, abaxially densely grayish brown tomentose; styles 5 1. *E. japonica*
 6b. Leaf blade oblong to oblong-obovate, 30–40 × 10–15 cm, adaxially not rugose, abaxially densely rusty tomentose; styles 3–5 2. *E. malipoensis*
 2b. Leaves brown or brownish yellow tomentose when young, glabrescent.
 7a. Leaf margin remotely inconspicuously serrate apically, entire basally 6. *E. fragrans*
 7b. Leaf margin serrate along entire length.
 8a. Petiole ca. 1.5 cm or less.
 9a. Stamens 10; styles 2; leaf blade lanceolate or oblanceolate, very rarely ovate-oblong, apex acute, margin remotely sharply serrate 12. *E. henryi*
 9b. Stamens 15; styles 3 or 4; leaf blade oblong or obovate-oblong, apex obtuse or acute, margin incurved-serrate 13. *E. seguinii*
 8b. Petiole 1.5 cm or longer.
 10a. Leaf blade obovate or oblanceolate.
 11a. Flowers sessile; styles 3 or 4; leaf blade 9–23 × 3.5–13 cm 7. *E. serrata*
 11b. Flowers pedicellate, pedicel 2–4 mm; styles 2 or 3; leaf blade 5–15 × 2–6 cm 8. *E. obovata*
 10b. Leaf blade oblong, elliptic, oblong-lanceolate, oblong-oblanceolate, or lanceolate.
 12a. Leaf margin incised-serrate; peduncle and pedicels tomentose 9. *E. bengalensis*
 12b. Leaf margin serrate or crenate; peduncle and pedicels subglabrous or rusty tomentose.
 13a. Leaf margin shallowly but sharply serrate, not revolute; peduncle and pedicels sparsely pubescent or subglabrous 10. *E. cavaleriei*
 13b. Leaf margin coarsely obtusely serrate and revolute; peduncle and pedicels densely rusty tomentose 11. *E. deflexa*

1. Eriobotrya japonica (Thunberg) Lindley, Trans. Linn. Soc. London 13: 102. 1822.

枇杷 pi ba

Mespilus japonica Thunberg, Nova Acta Regiae Soc. Sci. Upsal. 3: 208. 1780; *Crataegus bibas* Loureiro.

Trees small, to 10 m tall. Branchlets yellowish brown, densely rusty or grayish rusty tomentose. Stipule subulate, 1–1.5 cm, pubescent, apex acuminate; petiole nearly absent or short, 6–10 mm, grayish brown tomentose; leaf blade lanceolate, oblanceolate, obovate, or elliptic-oblong, 12–30 × 3–9 cm, leathery, lateral veins 11 or 12 pairs, abaxially densely gray

rusty tomentose, adaxially lustrous, rugose, base cuneate, margin entire basally, remotely serrate apically, apex acute or acuminate. Panicle 10–19 cm, many flowered; peduncle densely rusty tomentose; bracts subulate, 2–5 mm, densely rusty tomentose. Pedicel 2–8 mm, rusty tomentose. Flowers fragrant, 1.2–2 cm in diam. Hypanthium shallowly cupular, abaxially rusty tomentose. Sepals triangular-ovate, 2–3 mm, abaxially densely rusty tomentose, apex obtuse. Petals white, oblong or ovate, 5–9 × 4–6 mm, apex obtuse or emarginate. Stamens 20. Ovary rusty pubescent apically, 5-loculed, with 2 ovules per locule; styles 5, free. Pome yellow or orangish yellow, globose or obovate, 1–1.5 cm in diam., rusty tomentose, soon gla-

brescent; fruiting pedicel 3–8 mm, initially rusty tomentose, glabrescent. Fl. Jun, fr. Jul–Aug. $2n = 34^*$.

Native in Chongqing (Nanchuan Xian), Hubei (Yichang); cultivated in Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Taiwan, Yunnan, Zhejiang [cultivated throughout SE Asia].

2. *Eriobotrya malipoensis* K. C. Kuan, Acta Phytotax. Sin. 8: 231. 1963.

麻栗坡枇杷 ma li po pi ba

Trees 10–15 m tall. Branchlets purplish brown, stout, rusty tomentose. Stipules caducous, lanceolate, 8–9 mm, pubescent, apex acuminate; petiole ca. 1 cm, densely rusty tomentose; leaf blade oblong or oblong-obovate, 30–40 × 10–15 cm, leathery, midvein stout, prominent on both surfaces, lateral veins 20–25 pairs, abaxially densely rusty tomentose, adaxially lustrous, glabrous, base attenuate, margin remotely obtusely serrate, apex acute. Panicle 8–10 cm in diam., many flowered; peduncle densely rusty tomentose; bracts and bracteoles lanceolate, 3–5 mm, densely rusty tomentose. Pedicel 2–4 mm, densely rusty tomentose. Flowers fragrant, ca. 1 cm in diam. Hypanthium cupular, rusty tomentose. Sepals ovate, 2–3 mm, abaxially glabrous, adaxially rusty tomentose, margin entire. Petals white, obovate, 5–6 × 4–5 mm. Stamens 20. Ovary pubescent apically, 2-loculed, with 2 ovules per locule; styles 3–5. Pome brown, globose or subglobose, ca. 1.8 cm in diam., initially rusty tomentose, glabrescent; fruiting pedicel 3–5 mm, densely pubescent. Fl. Jun, fr. Jul.

• Dense forests in valleys; 1200–1500 m. SE Yunnan.

3. *Eriobotrya prinoides* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 194. 1912.

栎叶枇杷 li ye pi ba

Trees small, 4–10 m tall. Branchlets purplish brown or grayish brown, stout, tomentose when young, glabrescent, with pale lenticels. Stipules ovate, herbaceous, apex acuminate to shortly acuminate; petiole 1.5–3 cm, brownish gray tomentose; leaf blade oblong or elliptic, rarely ovate, 7–15 × 3.5–7.5 cm, leathery, midvein stout, prominent abaxially, lateral veins 9–11 pairs, abaxially densely gray tomentose, adaxially lustrous, initially pubescent, glabrescent, base cuneate, margin remotely undulate or obtusely serrate, or nearly entire at base, apex acute, rarely obtuse. Panicle 6–10 cm, many flowered; peduncle brownish gray tomentose; bracts and bracteoles ovate, 3–4 mm, pubescent. Pedicel 2–4 mm, brownish gray tomentose. Flowers 1–1.5 cm in diam. Hypanthium cupular, pubescent. Sepals oblong-ovate, 2–3 mm, abaxially pubescent, apex obtuse. Petals white, ovate, 4–5 × 3–4 mm. Stamens 20. Ovary pubescent apically, 2(or 3)-loculed, with 2 ovules per locule; styles 2, rarely 3, free or connate basally. Pome dark brown, ovoid to ovoid-globose, 6–7 mm in diam., initially pubescent, glabrescent. Fl. Jun, fr. Jul–Aug.

River banks, dense moist forest understories; 800–1700 m. W Sichuan, SE Yunnan [Laos].

4. *Eriobotrya tengyuehensis* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 30. 1917.

腾越枇杷 teng yue pi ba

Trees to 20 m tall. Branchlets dark gray, stout, densely rusty tomentose when young, glabrescent. Stipules caducous, not seen; petiole 2–3.5 cm, glabrous or nearly so; leaf blade oblong, elliptic, or subobovate, 10–17 × 4–7 cm, leathery, midvein prominent abaxially, lateral veins 9–18 pairs, reticulate veins conspicuous, abaxially initially rusty pubescent, glabrescent, adaxially lustrous, glabrous, base broadly cuneate or subrounded, margin entire basally, remotely serrate apically, apex acuminate. Panicle ca. 15 cm in diam., many flowered; peduncle brownish yellow tomentose; bracts caducous, not seen. Pedicel short or nearly absent. Flowers ca. 2 cm in diam. Hypanthium cupular, abaxially brown tomentose. Sepals ovate, ca. 2 mm, abaxially densely brownish yellow tomentose. Petals yellow, obovate, 6–8 × 5–6 mm. Stamens 20. Ovary densely pubescent apically, 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3, connate basally or throughout. Pome dark brown, globose, ca. 7 mm in diam., densely brownish yellow tomentose; fruiting pedicel 2–3 mm, densely brownish pubescent. Fl. Apr–May, fr. Sep–Oct.

Mixed forests on slopes; 1700–2500 m. NW Yunnan [Myanmar].

5. *Eriobotrya salwinensis* Handel-Mazzetti, Symb. Sin. 7: 475. 1933.

怒江枇杷 nu jiang pi ba

Trees small. Branchlets blackish gray, short, stout, initially densely brown tomentose, glabrescent, much branched. Stipules caducous, not seen; petiole 2–3 mm, robust, tomentose; leaf blade obovate-lanceolate, rarely elliptic or narrowly elliptic, 10–20 × 2.5–6.5 cm, thickly leathery, lateral veins 14–20 pairs abaxially, reticulate veins conspicuous, abaxially yellow villous, adaxially lustrous, glabrous, base cuneate, sometimes subrounded, margin with 4–10 pairs of shallow teeth in apical 1/4, apex acuminate. Panicle pyramidal, ca. 15 cm in diam., many flowered; peduncle robust, densely rusty tomentose; bracteoles 2, ovate, ca. 2 mm, pubescent. Pedicel short, 2–3 mm, robust, densely rusty tomentose. Hypanthium cupular, abaxially rusty tomentose. Sepals ovate, ca. 5 mm, abaxially rusty tomentose, apex obtuse. Petals pale yellow, obovate, ca. 5 mm. Stamens 20. Ovary brown villous, 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3, free. Pome brown, granular-punctate, globose, ca. 1.5 cm in diam., base and apex rusty pubescent. Fl. Apr–May, fr. Jun–Aug.

Broad-leaved forests; 1600–2400 m. NW Yunnan [India, Myanmar].

6. *Eriobotrya fragrans* Champion ex Bentham, Hooker's J. Bot. Kew Gard. Misc. 4: 80. 1852.

香花枇杷 xiang hua pi ba

Trees small, to 10 m tall. Branchlets gray, stout, densely brown tomentose, soon glabrate. Stipules caducous, not seen; petiole 1.5–3 cm, initially brown tomentose, glabrous when old; leaf blade oblong-elliptic, 7–15 × 2.5–5 cm, leathery, both surfaces densely tomentose when young, glabrescent when old, midvein prominent on both surfaces, lateral veins 9–11 pairs, base cuneate or attenuate, margin entire basally, remotely in-

conspicuously serrate apically, apex acute or shortly acuminate. Panicle 7–9 cm in diam., many flowered; peduncle densely brown tomentose; bracts not seen. Pedicel 2–3 mm, densely brown tomentose. Flowers ca. 1.5 cm in diam. Hypanthium cupular, abaxially brown tomentose. Sepals triangular-ovate, 3–4 mm, densely brown tomentose. Petals white, elliptic, ca. 5 × 3 mm. Stamens 20. Ovary pubescent, 4- or 5-loculed, with 2 ovules per locule; styles 4 or 5, white villous basally. Pome brown, globose, 1.5–2.5 cm in diam., tomentose and granular-punctate. Fl. Apr–May, fr. Aug–Sep.

Thickets on slopes; 800–900 m. Guangdong, Guangxi, Xizang [Vietnam].

7. *Eriobotrya serrata* J. E. Vidal, *Adansonia*, n.s., 5: 558. 1965.

齿叶枇杷 chi ye pi ba

Trees 10–20 m tall. Branchlets yellowish brown, stout, densely tomentose when young, glabrescent. Stipules caducous, not seen; petiole 1.5–3 cm, glabrous; leaf blade obovate or oblanceolate, 9–23 × 3.5–13 cm, leathery, adaxially lustrous, midvein prominent on both surfaces, lateral veins 10–16 pairs, glabrous or abaxially sparsely brown pubescent along veins, base attenuate, margin incurved-serrate, apex obtuse or acute. Panicle ca. 8 cm in diam., many flowered; peduncle densely yellow tomentose; bracts not seen. Pedicel 2–3 mm, densely yellow tomentose. Flowers 8–10 mm in diam. Hypanthium cupular, 3–4 mm, abaxially densely yellow tomentose. Sepals ovate, 2–2.5 cm, abaxially yellow tomentose, apex obtuse or acute. Petals white, obovate, 3–3.5 mm. Stamens 20. Ovary pubescent apically, (2 or)3- or 4(or 5)-loculed, with 2 ovules per locule; styles (2 or)3 or 4(or 5), base pubescent. Pome green, globose or pyriform, 1.5–1.8 cm in diam., subglabrous; sepals reflexed. Fl. Nov, fr. May.

Thickets on slopes; 1100–1900 m. Guangxi, Yunnan [Laos].

8. *Eriobotrya obovata* W. W. Smith, *Notes Roy. Bot. Gard. Edinburgh* 10: 29. 1917.

倒卵叶枇杷 dao luan ye pi ba

Trees ca. 10 m tall. Branchlets dark gray, stout, initially rusty tomentose, glabrescent, much branched. Stipules caducous, not seen; petiole 1.5–3 cm, glabrous; leaf blade obovate or oblanceolate, 5–15 × 2–6 cm, leathery, midvein prominent on both surfaces, lateral veins 10–14 pairs, glabrous, base cuneate or broadly cuneate, margin sharply incurved-serrate, entire near base, apex rounded or shortly acuminate. Panicle spreading, 6–7 cm in diam., many flowered; peduncle densely brown tomentose; bracts caducous, not seen. Pedicel short, 2–4 mm, densely brown tomentose. Flowers 1–1.5 cm in diam. Hypanthium cupular, densely brown tomentose. Sepals triangular, 3–4 mm, abaxially densely brown tomentose, apex obtuse. Petals white, obovate, 5–7 mm, brown tomentose, apex rounded-obtuse. Stamens 20. Ovary densely pubescent, 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3, white villous basally. Pome brown, subglobose, 7–9 mm in diam., subglabrous; fruiting pedicel 3–5 mm, brown tomentose. Fl. May, fr. Jun–Jul.

• Thickets on slopes. C Yunnan.

9. *Eriobotrya bengalensis* (Roxburgh) J. D. Hooker var. ***angustifolia*** Cardot, *Notul. Syst. (Paris)* 3: 371. 1918.

窄叶南亚枇杷 zhai ye nan ya pi ba

Eriobotrya bengalensis f. *angustifolia* (Cardot) J. E. Vidal.

Trees to 10 m tall. Branchlets gray-brown, stout, glabrous or subglabrous. Petiole 2–4 cm, glabrous; stipules not seen; leaf blade lanceolate, oblong, or elliptic, 7–12(–20) × 2–3.5(–8) cm, adaxially lustrous, midvein prominent abaxially, lateral veins (7–)10(–12) pairs, both surfaces glabrous, base cuneate, margin remotely shortly incised-serrate, entire near base, apex acuminate. Panicle spreading, 8–12 × 8–12 cm, tomentose, densely flowered; peduncle short, densely brown tomentose; bractlets lanceolate, both surfaces brown tomentose. Pedicel 3–5 mm. Hypanthium 2–3 mm, abaxially tomentose. Sepals triangular-ovate, ca. 1 mm, abaxially densely brown tomentose, margin entire, apex obtuse or acute. Petals white, obovate or suborbicular, 4–5 mm, glabrous or adaxially pubescent at base, apex rounded or emarginate. Stamens 20. Ovary pubescent apically, 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3(or 4), pubescent basally. Pome ovoid-globose, 1–1.5 cm in diam.; fruiting pedicel brown tomentose; sepals reflexed. Fl. Nov–Feb.

• Mixed forests on slopes; 1200–1800 m. NE Guizhou (Fanjing Shan), SE Yunnan.

Eriobotrya bengalensis var. *bengalensis* (including f. *intermedia* J. E. Vidal) occurs in Cambodia, India, Indonesia, Laos, Myanmar, Thailand, and Vietnam.

10. *Eriobotrya cavaleriei* (H. Léveillé) Rehder, *J. Arnold Arbor.* 13: 307. 1932.

大花枇杷 da hua pi ba

Hiptage cavaleriei H. Léveillé, *Repert. Spec. Nov. Regni Veg.* 10: 372. 1912; *Eriobotrya brackloii* Handel-Mazzetti; *E. brackloii* var. *atrachophylla* Handel-Mazzetti; *E. cavaleriei* var. *brackloii* (Handel-Mazzetti) Rehder; *E. deflexa* (Hemsley) Nakai var. *grandiflora* (Rehder & E. H. Wilson) Nakai; *E. grandiflora* Rehder & E. H. Wilson.

Trees 4–5 cm tall. Branchlets brownish yellow, stout, glabrous. Leaves in clusters at apices of branches; stipules caducous, not seen; petiole 1.5–4 cm, glabrous; leaf blade oblong, oblong-lanceolate, or oblong-oblanceolate, 7–18 × 2.5–7 cm, leathery, midvein prominent on both surfaces, lateral veins 7–14 pairs, reticulate veins conspicuous abaxially, abaxially subglabrous, adaxially lustrous, glabrous, base attenuate, margin remotely sharply serrate, entire near base, apex acuminate. Panicle 9–12 cm in diam., many flowered; peduncle sparsely brown pubescent; bracts caducous, not seen. Pedicel 3–10 mm, sparsely brown pubescent. Flowers 1.5–2.5 cm in diam. Hypanthium cupular, abaxially sparsely brown pubescent. Sepals triangular-ovate, 2–3 mm, tomentose along margin, apex obtuse. Petals white, obovate, 8–10 mm. Stamens 20. Ovary glabrous, 2- or 3-loculed; styles 2 or 3, connate at base, ca. 4 mm, white villous basally. Pome yellowish red, elliptic or subglobose, 1–1.5 cm in diam., glabrous; fruiting pedicel 3–10 mm, hairy; sepals reflexed. Fl. Apr–May, fr. Jul–Aug.

Slopes, mixed river side forests; 500–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan [N Vietnam].

11. Eriobotrya deflexa (Hemsley) Nakai, Bot. Mag. (Tokyo) 30: 18. 1916.

台湾枇杷 tai wan pi ba

Photinia deflexa Hemsley, Ann. Bot. (Oxford) 9: 153. 1895; *Eriobotrya buisanensis* (Hayata) Makino & Nemoto; *E. deflexa* f. *buisanensis* (Hayata) Nakai; *E. deflexa* var. *buisanensis* (Hayata) Hayata; *E. deflexa* f. *koshunensis* (Kanehira & Sasaki) H. L. Li; *E. deflexa* var. *koshunensis* Kanehira & Sasaki; *P. buisanensis* Hayata.

Trees 5–12 m tall. Branchlets brownish gray, stout, densely brown tomentose when young, glabrescent. Leaves in clusters at apices of branchlets; stipules caducous, not seen; petiole 2–4 cm, glabrous; leaf blade oblong or oblong-lanceolate to obovate-oblong, (9–)10–19 × (1.5–)3–7 cm, leathery, adaxially lustrous, midvein prominent on both surfaces, lateral veins 10–12 pairs, both surfaces initially shortly tomentose, soon glabrescent, base cuneate, margin remotely irregularly incurved-crenate, revolute, apex shortly caudate or acuminate. Panicle 6–8 cm in diam., many flowered; peduncle densely brown tomentose; bracts and bractlets lanceolate, 4–6 mm, abaxially tomentose. Pedicel 6–12 mm, densely brown tomentose. Flowers 1.5–1.8 cm in diam. Hypanthium cupular, abaxially brown tomentose. Sepals triangular-ovate, slightly shorter than hypanthium, ca. 1.2 cm, abaxially brown tomentose, adaxially glabrous, apex obtuse or acute. Petals white, orbicular or obovate, ca. 8 × 7 mm. Stamens 20. Ovary glabrous, 3–5-loculed, with 2 ovules per locule; styles 3–5, connate at base, pubescent. Pome yellowish red, subglobose, 1.2–2 cm in diam., glabrous; fruiting pedicel 7–12 mm, brown pubescent; sepals reflexed. Fl. May–Jun, fr. Jun–Aug.

Slopes, broad-leaved valley forests; 1000–2100 m. Guangdong, Hainan, Taiwan [S Vietnam].

12. Eriobotrya henryi Nakai, J. Arnold Arbor. 5: 70. 1924.

窄叶枇杷 zhai ye pi ba

Shrubs or small trees, to 7 m tall. Branchlets gray, slender, initially tomentose, soon glabrescent. Stipules caducous, not seen; petioles 5–13 mm, subglabrous; leaf blade lanceolate or oblanceolate, rarely ovate-oblong, 5–11 × 0.8–2.7 cm, leathery, midvein prominent on both surfaces, lateral veins 16–20 pairs, adaxially lustrous, rusty tomentose when young, soon glabrescent, base cuneate or attenuate, margin remotely and sharply serrate, apex acuminate. Panicle 2.5–4.5(–7) cm in diam., many flowered; peduncle short, densely rusty tomentose; bracts caducous; bracteoles caducous, linear, both surfaces rusty tomentose, densely so at margin, soon glabrescent. Pedicel 2–4 mm, densely rusty tomentose. Flowers ca. 1 cm in diam. Hypanthium cupular, abaxially rusty tomentose. Sepals ovate or ovate-lanceolate, ca. 2.5 mm, both surfaces tomentose, apex obtuse or shortly caudate. Petals white, obovate, 7–8 mm, apex rounded. Stamens 15–20. Ovary pubescent, 2-loculed, with 2

ovules per locule; styles 2 or 3, free. Pome dark purplish brown, ovoid, 7–9 mm in diam., rusty tomentose; fruiting pedicel 2–5 mm, initially densely brown tomentose, soon glabrescent. Fl. May–Jun, fr. Jun–Aug.

Thickets on slopes; 1800–2000 m. Guizhou, Yunnan [Myanmar].

13. Eriobotrya seguinii (H. Léveillé) Cardot ex Guillaumin, Bull. Soc. Bot. France 71: 287. 1924.

小叶枇杷 xiao ye pi ba

Symplocos seguinii H. Léveillé, Repert. Spec. Nov. Regni Veg. 10: 431. 1912; *Eriobotrya pseudoraphiolepis* Cardot.

Shrubs 2–4 m tall. Branchlets brownish gray, slender, glabrous. Stipules caducous, lanceolate, 2–3 mm, glabrous, apex acuminate; petiole 1–1.5 cm, glabrous; leaf blade oblong or oblanceolate, 3–6 × 1.2 cm, leathery, midvein prominent on both surfaces, lateral veins ca. 10 pairs and inconspicuous, abaxially villous when young, glabrescent, adaxially lustrous, glabrous, base attenuate into short petiole, margin incurved-crenate, apex obtuse or acute. Panicle, rarely a raceme, 1–4 cm in diam., several to many flowered; peduncle densely rusty tomentose; bracts caducous, lanceolate, 1.8–3 mm, rusty tomentose. Pedicel absent or densely shortly rusty tomentose. Flowers ca. 5 mm in diam. Hypanthium shortly campanulate, abaxially rusty tomentose. Sepals broadly ovate, short, ca. 2 mm, abaxially rusty tomentose, apex obtuse. Petals white, suborbicular or obcordate, ca. 4 mm. Stamens 15. Ovary villous apically, 3- or 4-loculed, with 2 ovules per locule; styles 3 or 4, villous basally. Pome dark purplish brown, ovoid, ca. 1 cm in diam., slightly pubescent; fruiting pedicel 2–3 mm, densely brown pubescent; sepals reflexed. Fl. Mar–Apr, fr. Jun–Jul.

• Thickets on slopes; 500–1500 m. SW Guizhou, SE Yunnan.

14. Eriobotrya elliptica Lindley, Trans. Linn. Soc. London 13: 102. 1822.

椭圆枇杷 tuo yuan pi ba

Mespilus cuila Buchanan-Hamilton.

Trees evergreen, 5–10 m tall. Branchlets grayish brown, stout, glabrous. Stipules caducous, not seen; petiole 2–4 cm, glabrous. Leaf blade oblong to oblong-lanceolate, rarely oblong-oblanceolate, 18–25 × 6–9 cm, leathery, lateral veins 15–20 pairs, abaxially prominent, adaxially impressed, both surfaces glabrous, base cuneate, rarely subrounded, margin obtusely serrate, apex acuminate or shortly caudate. Panicle terminal, many flowered; peduncle densely tomentose; bracts caducous, not seen. Pedicel subsessile. Hypanthium shallowly campanulate. Sepals triangular, abaxially tomentose, apex obtuse. Petals orbicular or elliptic, base pilose. Stamens 20. Styles 5; ovary pubescent. Pome obovoid or subglobose, 8–12 mm in diam.

Evergreen broad-leaved forests; 500–1800 m. SE Xizang (Mêdog Xian) [Nepal].

17. RHAPHIOLEPIS Lindley, Bot. Reg. 6: t. 468. 1820, nom. et orth. cons.

石斑木属 shi ban mu shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Shrubs or small trees, evergreen. Leaves simple, shortly petiolate, leathery, venation camptodromous, margin serrate or entire;

stipules caducous, subulate. Inflorescences in terminal racemes or panicles. Hypanthium campanulate to tubular. Sepals 5, erect or reflexed. Petals 5, white or pink, base shortly clawed. Stamens 15–20. Ovary inferior, 2-loculed, with 2 erect ovules per locule; styles 2 or 3, connate at base. Pome drupe-like, purplish black or bluish, subglobose, succulent, with early caducous sepals leaving an annular ring; seeds 1 or 2, subglobose, large, seed coat thin, cotyledons thickened, plano-convex or semiglobose.

About 15 species: E Asia; seven species (three endemic) in China.

Rhaphiolepis jiulongjiangensis P. C. Huang & K. M. Li (J. Nanjing Inst. Forest. 13(4): 85. 1989), described from Fujian (Hua'an Xian), requires further study. We are unable to treat it in this account because we have seen no specimens.

- 1a. Leaves abaxially, petiole, and pedicel densely rusty tomentose 7. *R. ferruginea*
- 1b. Leaves glabrous or only abaxially slightly tomentose or pubescent; inflorescence glabrous or pubescent.
 - 2a. Leaf blade narrowly lanceolate, lanceolate, or oblong-lanceolate, rarely obovate-oblong.
 - 3a. Leaf blade lanceolate or oblong-lanceolate, rarely obovate-oblong, apex acuminate or acute 5. *R. salicifolia*
 - 3b. Leaf blade narrowly lanceolate, apex obtuse or shortly acuminate 6. *R. lanceolata*
 - 2b. Leaf blade ovate, obovate, elliptic, oblong, or oblong-lanceolate.
 - 4a. Leaf margin remotely serrate.
 - 5a. Leaf blade ovate or oblong, rarely obovate or oblong-lanceolate, 2–8 cm; inflorescence tomentose or glabrous; fruit 5–8 mm in diam. 1. *R. indica*
 - 5b. Leaf blade narrowly elliptic to obovate-oblong, 7–15 cm; inflorescence tomentose; fruit 7–10 mm in diam. 2. *R. major*
 - 4b. Leaf margin entire or remotely crenate.
 - 6a. Branches spreading; leaf blade narrowly elliptic, ovate, or obovate; petiole 5–10 mm 3. *R. umbellata*
 - 6b. Branches erect or ascending; leaf blade oblong or oblong-obovate; petiole very short or nearly absent 4. *R. integerrima*

1. *Rhaphiolepis indica* (Linnaeus) Lindley, Bot. Reg. 6: t. 468. 1820.

石斑木 shi ban mu

Shrubs, rarely small trees, to 4 m tall. Branchlets purplish brown when young, grayish brown when old, terete, initially brown tomentose, glabrous when old. Petiole 0.5–1.8 cm or nearly absent, slightly brown tomentose or subglabrous; stipules caducous, lanceolate, sparsely brown tomentose, apex acuminate; leaf blade ovate, oblong, rarely obovate, oblong-lanceolate, narrowly elliptic or lanceolate-elliptic, (2–)4–8 × 1.5–4 cm, leathery, veins prominent abaxially, reticulate veins conspicuous abaxially and conspicuous or not adaxially, abaxially pale, glabrous or sparsely tomentose, adaxially lustrous, glabrous, base attenuate, margin crenulate, serrate, or obtusely serrate, apex obtuse, acute, acuminate, or long caudate. Panicle or racemes terminal, many or few flowered; peduncle and pedicels rusty tomentose; bracts and bractlets caducous, lanceolate or narrowly lanceolate, 2–7 mm, both surfaces initially brown tomentose, densely so at margin, soon glabrescent, apex acuminate. Pedicel 0.5–1.5 cm, initially brown tomentose, soon glabrescent. Flowers 1–1.3(–1.5) cm in diam. Hypanthium tubular, brown tomentose at margin and on both surfaces or glabrous. Sepals triangular-lanceolate or linear, 4.5–6 mm, both surfaces slightly brown tomentose or glabrous, apex acute. Petals white or pinkish, obovate or lanceolate, 5–7 × 4–5 mm, pubescent basally, apex obtuse. Stamens 15, ca. as long as or shorter than petals. Ovary glabrous, 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3, connate at base, subglabrous. Pome purplish black, globose, 5–8 mm in diam., glabrous; fruiting pedicel 5–10 mm, glabrous; sepals caducous, leaving an annular ring. Fl. Apr, fr. Jul–Aug.

Slopes, roadsides, thickets at stream sides; 700–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Taiwan, Yunnan, Zhejiang [Cambodia, Japan, Laos, Thailand, Vietnam].

- 1a. Inflorescence sparsely pubescent, few flowered; leaf margin serrate apically 1b. var. *shilanensis*
- 1b. Inflorescence densely rusty tomentose, usually numerous flowered; leaf margin crenulate or obtusely serrate.
 - 2a. Leaf blade ovate, oblong, rarely obovate, or oblong-lanceolate, crenulate; bracts narrowly lanceolate, 2–7 mm 1a. var. *indica*
 - 2b. Leaf blade narrowly elliptic or lanceolate-elliptic, obtusely serrate; bracts lanceolate, ca. 7 mm 1c. var. *tashiroi*

1a. *Rhaphiolepis indica* var. *indica*

石斑木(原变种) shi ban mu (yuan bian zhong)

Crataegus indica Linnaeus, Sp. Pl. 1: 477. 1753; *C. rubra* Loureiro; *Mespilus sinensis* Poirlet; *Rhaphiolepis gracilis* Nakai; *R. parvibracteolata* Merrill; *R. rubra* (Loureiro) Lindley; *R. rugosa* Nakai; *R. sinensis* M. Roemer.

Leaf blade ovate or oblong, rarely obovate or oblong-lanceolate, (2–)4–8 × 1.5–4 cm, margin crenulate. Inflorescences rusty tomentose, numerous flowered; bracts narrowly lanceolate, 2–7 mm. Pedicel 0.5–1.5 cm.

Slopes, roadsides, thickets at stream sides; 1500–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Taiwan, Yunnan, Zhejiang [Cambodia, Japan, Laos, Thailand, Vietnam].

Rhaphiolepis impressivena Masamune (*R. indica* f. *impressivena* (Masamune) S. S. Ying) might be an allied species or ecotype of *R. indica*.

1b. *Rhaphiolepis indica* var. *shilanensis* Y. P. Yang & H. Y. Liu, Taiwania 47: 176. 2002.

恒春石斑木 heng chun shi ban mu

Leaf blade oblong to oblanceolate, 4–5 × 1.5–2 cm, margin serrate apically. Inflorescences sparsely pubescent, few flowered; bracts lanceolate, ca. 4 mm. Pedicel 0.7–1.5 cm.

- S Taiwan (Pingdong Xian).

The names *Rhaphiolepis hiiranensis* (Kanehira, Formos. Trees, rev. ed., 276. 1936) and *R. indica* var. *hiiranensis* (Li, Lloydia 4: 235. 1951), synonymous with this taxon, are invalid under Art. 36.1 of the St. Louis Code because Kanehira did not provide a Latin description.

1c. *Rhaphiolepis indica* var. *tashiroi* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 22: 129. 1906.

毛序石斑木 mao xu shi ban mu

Leaf blade narrowly elliptic or lanceolate-elliptic, 5–7 × 1.5–2 cm, obtusely serrate. Inflorescences densely rusty tomentose, numerous flowered; bracts lanceolate, ca. 7 mm. Pedicel 3–10 mm.

- 700–1000 m. C and N Taiwan.

2. *Rhaphiolepis major* Cardot, Notul. Syst. (Paris) 3: 380. 1918.

大叶石斑木 da ye shi ban mu

Rhaphiolepis indica (Linnaeus) Lindley var. *grandifolia* Franchet.

Shrubs to 4 m tall. Branchlets initially green, grayish brown when old, terete, initially glabrous, rarely pubescent, glabrous or subglabrous when old. Stipules caducous, lanceolate, 1.5–2 cm, membranous, initially sparsely pubescent, soon glabrescent; petiole 1.5–2.5 cm, subglabrous or glabrous; leaf blade narrowly elliptic or obovate-oblong, 7–15 × 4–6 cm, leathery, midvein prominent on both surfaces, lateral veins 8–14 pairs, abaxially glabrescent, adaxially glabrous or with sparse hairs in vein axils when young, base cuneate-attenuate, margin shallowly crenulate, entire near base, apex acute or shortly acuminate. Panicle terminal, many flowered; peduncle glabrescent; bracts not seen; bractlets lanceolate, 5–7 mm, membranous, initially sparsely brown pubescent, soon glabrescent, apex acuminate. Pedicel 0.7–1.5 cm, initially sparsely brown pubescent, soon glabrescent. Flowers 1.3–1.5 cm in diam. Hypanthium campanulate, abaxially rusty tomentose, adaxially glabrous. Sepals triangular-lanceolate, rarely ovate-lanceolate, slightly longer than hypanthium, 5–6 mm, abaxially slightly pubescent, adaxially densely so, apex acuminate. Petals white, ovate, 5–7 × 4.5–5.5 cm, pubescent basally, apex acute or obtuse. Stamens 15, ca. as long as or shorter than petals. Ovary 2-loculed, with 2 ovules per locule; styles 2, connate at base, subglabrous. Pome black, globose, 7–10 mm in diam., pubescent or subglabrous; fruiting pedicel 8–10 mm, brown tomentose; sepals caducous, leaving an annular ring. Fl. Apr, fr. Aug.

- Dense shady forests, among shrubs by streams; 200–300 m. Fujian, S Jiangsu, Jiangxi, Zhejiang.

3. *Rhaphiolepis umbellata* (Thunberg) Makino, Bot. Mag. (Tokyo) 16: 13. 1902.

厚叶石斑木 hou ye shi ban mu

Laurus umbellata Thunberg in Murray, Syst. Veg., ed. 14, 384. 1784; *Mespilus sieboldii* Blume; *Opa japonica* Seemann;

Rhaphiolepis indica (Linnaeus) Lindley f. *umbellata* (Thunberg) S. Hatusima; *R. indica* var. *umbellata* (Thunberg) H. Ohashi; *Rhaphiolepis japonica* Siebold & Zuccarini var. *integerrima* J. D. Hooker; *R. ovata* Briot; *R. umbellata* f. *integerrima* (J. D. Hooker) Rehder; *R. umbellata* f. *ovata* (Briot) C. K. Schneider.

Shrubs or small trees, 2–4 m tall. Branchlets blackish brown, terete, initially brown pubescent, glabrescent. Stipules not seen; petiole 5–10 mm, subglabrous; leaf blade greenish abaxially, dark green adaxially, narrowly elliptic, ovate, or obovate (2–)4–10 × (1.2–)2–4 cm, thickly leathery, reticulate veins conspicuous abaxially, adaxially slightly lustrous, base cuneate, margin entire or remotely crenate, slightly revolute, apex obtuse to slightly acute. Panicle terminal, many flowered; peduncle densely brown pubescent; bracts not seen. Pedicel absent or 1–2 mm, densely brown pubescent. Hypanthium obconical, densely brown pubescent. Sepals lanceolate or triangular-lanceolate, longer than hypanthium, 3–4.5 mm, abaxially sparsely brown pubescent, adaxially densely so, margin entire, apex acuminate. Petals white, obovate, 1–1.2 cm, glabrous, apex obtuse. Stamens 20, shorter than petals. Ovary 2-loculed, with 2 ovules per locule; styles 2, connate at base. Pome blackish purple, globose, 7–10 mm in diam., glaucescent; fruiting pedicel 2–5 mm, glabrous; sepals caducous, leaving an annular ring. Fl. Apr–Jun, fr. Sep–Nov.

Taiwan, E Zhejiang (Putuo Xian, Tiantai Xian) [Japan].

4. *Rhaphiolepis integerrima* Hooker & Arnott, Bot. Beechey Voy. 263. 1838.

全缘石斑木 quan yuan shi ban mu

Rhaphiolepis integerrima var. *mertensii* (Siebold & Zuccarini) Makino ex Koidzumi; *R. mertensii* Siebold & Zuccarini; *R. umbellata* (Thunberg) Makino var. *mertensii* (Siebold & Zuccarini) Makino; *R. umbellata* var. *integerrima* (Hooker & Arnott) Masamune.

Shrubs or small trees. Branches erect or ascending. Leaves clustered at apices of branches; stipules not seen; petiole short or nearly absent; leaf blade oblong or oblong-obovate, 4–7 × 2–3.5 cm, leathery, base cuneate, margin entire, revolute, apex obtuse. Panicle terminal; peduncle and pedicels brown tomentose, bracts caducous. Hypanthium campanulate, abaxially tomentose. Sepals narrowly elliptic, 2.5–3 mm, abaxially pubescent. Petals obovate, ca. 1 cm × 5 mm. Stamens 20; filaments irregular. Ovary 2-loculed, with 2 ovules per locule; styles 2, slender, connate at base, glabrous, not exceeding stamens. Fruit globose, ca. 8 mm, fruiting pedicel thick. Fl. Apr–May, fr. Nov.

Taiwan (Hong Yu, Huoshao Dao, Jilong Shi) [Japan (Ryukyu Islands)].

5. *Rhaphiolepis salicifolia* Lindley, Coll. Bot. 1: t. 3. 1821.

柳叶石斑木 liu ye shi ban mu

Rhaphiolepis cheniana F. P. Metcalf; *R. kwangsiensis* H. H. Hu.

Shrubs or small trees, 2.5–6 m tall. Branchlets red when young, grayish brown or brownish black when old, terete, slender, pubescent. Stipules not seen; petiole 5–10 mm, glabrous;

leaf blade deep green adaxially, pale green abaxially, lanceolate or oblong-lanceolate, rarely obovate-oblong, 6–9 × 1.5–2.5 cm, midvein prominent on both surfaces, adaxially lustrous, base attenuate, margin remotely irregularly crenulate, sometimes entire basally, apex acuminate or acute. Panicle terminal, few to several flowered; peduncle and pedicels pubescent; bracts not seen. Pedicel 2–5 mm. Flowers ca. 1 cm in diam. Hypanthium tubular, abaxially pubescent, adaxially subglabrous. Sepals triangular-lanceolate or elliptic-lanceolate, 2–2.5 mm, abaxially nearly glabrous, adaxially pubescent, apex emarginate. Petals white, elliptic or obovate-elliptic, ca. 6 × 2 mm, glabrous, apex obtuse. Stamens 20, shorter than petals. Ovary 2-loculed, with 2 ovules per locule; styles 2, pubescent. Pome blackish brown, globose, 6–9 mm, subglabrous, apex with a pale scar; fruiting pedicel 6–10 mm, subglabrous. Fl. Apr, fr. Oct.

Slopes, forest margins, open forests at mountain summits. Fujian, Guangdong, Guangxi [Vietnam].

6. *Rhaphiolepis lanceolata* H. H. Hu, J. Arnold Arbor. 13: 335. 1932.

细叶石斑木 *xi ye shi ban mu*

Rhaphiolepis hainanensis F. P. Metcalf; *R. indica* (Linnaeus) Lindley var. *angustifolia* Cardot.

Shrubs, rarely trees, to 1–1.5 m tall. Branchlets blackish purple, terete, stout, brown pubescent when young, soon glabrescent. Stipules not seen; petiole 2–4 mm, glabrous; leaf blade narrowly lanceolate, 3–7.5 cm × 5–14 mm, leathery, midvein and lateral veins prominent abaxially, midvein impressed adaxially, abaxially glabrous or nearly so, adaxially lustrous, glabrous, base narrowly cuneate, margin sparsely crenate, apex obtuse or shortly acuminate. Panicle terminal, many flowered; peduncle and pedicels brown pubescent; bracts lanceolate or subulate, 2–4 mm, both surfaces pubescent, apex acute. Pedicel ca. 2 mm. Hypanthium tubular, abaxially brown pubescent. Sepals lanceolate, longer than hypanthium, 4.5–6 mm, both surfaces pubescent, apex acute or acuminate. Petals white or pinkish, elliptic-lanceolate, 6–7 × 1.5–4 mm, glabrous, apex obtuse. Stamens 15, longer than or ca. as long as petals. Ovary 3-loculed, with 2 ovules per locule; styles 3, connate at base, glabrous. Pome black, globose, 4–7 mm in diam., pubescent; fruiting pedicel 4–5 mm, pubescent; sepals deciduous, leaving an annular ring. Fl. Jun, fr. Oct–Nov.

• Open forests on slopes, open thickets in valleys; 400–1500 m. ?Guangdong, Guangxi, Hainan.

7. *Rhaphiolepis ferruginea* F. P. Metcalf, Lingnan Sci. J. 18: 509. 1939.

绣毛石斑木 *xiu mao shi ban mu*

Trees or shrubs, more than 10 m tall. Branchlets blackish brown when young, grayish black when old, terete, densely rusty tomentose. Stipules caducous, lanceolate, ca. 5 mm, both surfaces tomentose, apex acuminate; petiole 1–2.5 cm, densely rusty tomentose; leaf blade elliptic or broadly lanceolate, 6–15 × 2.5–5.5 cm, leathery, midvein impressed adaxially, veins slightly prominent abaxially, abaxially densely rusty tomentose or pubescent, adaxially tomentose when young, glabrescent, base cuneate, margin entire or serrate, revolute or not, apex acute or shortly acuminate. Panicles terminal, many flowered; peduncle and pedicels densely rusty pubescent; bracts lanceolate, ca. 6 mm, rusty tomentose, margin entire, apex acuminate. Pedicel 2–4 mm. Flowers 8–10 mm. Hypanthium campanulate, abaxially densely rusty tomentose. Sepals ovate, slightly longer than hypanthium, ca. 3 mm, abaxially densely rusty pubescent, margin entire, apex acute. Petals white, ovate-oblong, ca. 4 mm, glabrous, apex obtuse. Stamens unequal, ca. as long as or shorter than petals. Ovary 2-loculed, with 2 ovules per locule; styles 2, connate at base, glabrous. Pome black, globose, 5–8 mm in diam., yellow tomentose when young, later subglabrous or sparsely rusty tomentose apically; fruiting pedicel short, 4–7 mm, densely rusty tomentose; sepals deciduous, leaving an annular ring. Fl. Apr–Jun, fr. Oct.

• Slopes, valleys, open forests at roadsides and on slopes, stream sides; 300–600 m. Fujian, Guangdong, Guangxi, Hainan.

- 1a. Leaf margin entire and revolute, blade abaxially densely rusty pubescent 7a. var. *ferruginea*
- 1b. Leaf margin conspicuously serrate apically, blade abaxially sparsely rusty pubescent 7b. var. *serrata*

7a. *Rhaphiolepis ferruginea* var. *ferruginea*

绣毛石斑木(原变种) *xiu mao shi ban mu* (yuan bian zhong)

Leaf blade entire and revolute at margin, abaxially densely rusty pubescent.

• Slopes, valleys, open forests at roadsides; 300–600 m. Fujian, Guangdong, Guangxi, Hainan.

7b. *Rhaphiolepis ferruginea* var. *serrata* F. P. Metcalf, Lingnan Sci. J. 18: 511. 1939.

齿叶绣毛石斑木 *chi ye xiu mao shi ban mu*

Leaf blade conspicuously serrate apically, not revolute, abaxially sparsely rusty pubescent.

• Stream sides, open forests on slopes. Fujian, Guangdong, Guangxi.

18. *SORBUS* Linnaeus, Sp. Pl. 1: 477. 1753.¹⁵

花楸属 *hua qiu shu*

Lu Lingdi (陆玲娣 Lu Ling-ti); Stephen A. Spongberg

Aria (Persoon) Host; *Micromeles* Decaisne; *Pleiosorbus* Lihua Zhou & C. Y. Wu; *Sorbus* subgen. *Aria* Persoon.

Trees or shrubs, usually deciduous. Winter buds usually rather large, ovoid, conical, or spindle-shaped, sometimes viscid; scales

¹⁵Extensive contributions on compound-leaved taxa were received from Hugh McAllister, Ness Botanic Gardens, The University of Liverpool, Environmental and Horticultural Research Station, Ness, Neston, South Wirral, Cheshire L64 4AY, United Kingdom.

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imbricate, several, glabrous or pubescent. Leaves alternate, membranous or herbaceous; stipules caducous, simple or pinnately compound, plicate or rarely convolute in bud; leaf blade usually serrate, sometimes nearly entire, venation craspedodromous or camptodromous, glabrous or pubescent. Inflorescences compound, rarely simple corymbs or panicles. Hypanthium campanulate, rarely obconical or urceolate. Sepals 5, ovate or triangular, glabrous, pubescent, or tomentose, sometimes glandular along margin. Petals 5, glabrous or pubescent, base clawed or not. Stamens 15–25(–44) in 2 or 3 whorls, unequal in length; anthers ovoid or subglobose. Carpels 2–5, partly or wholly adnate to hypanthium; ovary semi-inferior to inferior, 2–5(–7)-loculed, with 2 or 3(or 4) ovules per locule, one usually abortive; styles 2–5, free or partially connate, glabrous or pubescent. Fruit a pome, white, yellow, pink, or brown to orange or red, ovoid or globose to ellipsoid or oblong, usually small, glabrous or pubescent, laevigate or with small lenticels, apically with sepals persistent or caducous leaving an annular scar, with 2–5(–7) locules, each with 1 or 2 exendospermous seeds; seeds several, with thin perisperm and endosperm enclosing embryo with compressed cotyledons.

About 100 species: widely distributed throughout temperate regions of Asia, Europe, and North America; 67 species (43 endemic) in China.

This account follows the FRPS generic concept; however, the reader should note the alternative of treating simple-leaved species within the genus *Aria* (see Ohashi & Itetani, J. Jap. Bot. 68: 355–361. 1993).

Sorbus forrestii McAllister & Gillham (Bot. Mag. 183: n.s., t. 792. 1980), described from NW Yunnan, requires further study. We are unable to treat it in this account because we have seen no specimens.

Kai Larsen (pers. comm.) noted that *Sorbus verrucosa* (Decaisne) Rehder (in Sargent, Pl. Wilson. 2: 278. 1915; *Micromeles verrucosa* Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 169. 1874) might occur in China since it is present in NE India, N Thailand, and N Vietnam.

Sorbus species are ornamental plants with attractive, large clusters of white flowers, and most bear colorful fruits. The fruits can be used for making jam, marmalade, various drinks, wine, vinegar, etc. The wood is hard, heavy, and fine-grained, suitable for making furniture or small, carved articles.

1a. Leaves pinnately compound.

2a. Leaflets 3–7(–9) pairs.

3a. Dwarf shrub, less than 1 m tall.

4a. Leaflets adaxially sparsely villous, abaxially glabrous; inflorescence white villous, intermixed with rust-brown hairs; flowers and fruit white 14. *S. reducta*

4b. Leaflets glabrous on both surfaces; inflorescence rust-brown pubescent; flowers and fruit pink 15. *S. poteriifolia*

3b. Erect tree or shrub, more than (4–)5 m tall.

5a. Leaflets more than 10 cm, rarely shorter, apex obtuse, margin shallowly obtusely dentate and slightly revolute 1. *S. insignis*

5b. Leaflets less than 10 cm, rarely longer, apex acute or shortly acuminate, rarely obtuse, margin sharply or obtusely serrate, not revolute.

6a. Stipules herbaceous, late caducous; fruit red, yellow, or orange, rarely white.

7a. Buds densely white tomentose; fruit red.

8a. Leaflets 5–9 cm, abaxially densely grayish white tomentose; styles tomentose basally 6. *S. esserteauana*

8b. Leaflets 3–5 cm, abaxially tomentose when young but glabrescent; styles pubescent basally 7. *S. pohuashanensis*

7b. Buds apically glabrous or puberulous; fruit white, yellow, red, or orangish red.

9a. Fruit white or yellow 5. *S. discolor*

9b. Fruit red or orangish red.

10a. Leaflet abaxially densely tomentose when young, with sparse hairs only along midvein when mature, blade 7–13 cm 2. *S. sargentiana*

10b. Leaflet abaxially glabrous or pubescent along midvein, glabrescent, blade 4–8.5 cm.

11a. Rachis of leaves and leaflets abaxially glabrous or puberulous along midvein; leaflet margin shallowly minutely serrate 3. *S. wilsoniana*

11b. Rachis of leaves and leaflets abaxially rust-brown pubescent; leaflet margin coarsely and sharply serrate 4. *S. amabilis*

6b. Stipules membranous, caducous; fruit red, pink, or white.

12a. Leaflets 3 or 4 pairs, margin obtusely serrate or doubly serrate; fruit white 8. *S. helena*

12b. Leaflets 4–8 pairs, margin sharply serrate; fruit red or white tinged red.

13a. Buds white pubescent; leaflets mostly with distinct teeth along margin; flowers 1.5–2 cm in diam.; fruit red.

14a. Leaflets glabrous on both surfaces; inflorescence glabrous 9. *S. tianschanica*

14b. Leaflets abaxially white pubescent along midvein; inflorescence white tomentose 10. *S. tapashana*

13b. Buds glabrous; leaflets with few teeth above the middle or at apex; flowers less than 1.5 cm in diam.; fruit white or white tinged red.

15a. Leaflet apically acute or shortly acuminate, rarely obtuse, abaxially white tomentose along midvein 11. *S. hupehensis*

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- 15b. Leaflet apically obtuse or subacute, both surfaces usually glabrous or abaxially puberulous along midvein.
- 16a. Leaflet basally broadly cuneate to rounded, apically with few teeth; petals glabrous adaxially; flowers 6–7 mm in diam. 12. *S. oligodonta*
- 16b. Leaflet basally truncate or subrounded-truncate, coarsely sharply serrate above base; petals pilose adaxially; flowers to 15 mm in diam. 13. *S. macrantha*
- 2b. Leaflets (4–)8–21 pairs.
- 17a. Leaflets (4–)8–14(–17) pairs, usually more than 2 cm, rarely shorter.
- 18a. Leaflet margin with few apical teeth.
- 19a. Fruit white 22. *S. glomerulata*
- 19b. Fruit red.
- 20a. Inflorescence grayish white tomentose; hypanthium glabrous 21. *S. scalaris*
- 20b. Inflorescence rust-brown pubescent; hypanthium glabrous or pubescent.
- 21a. Hypanthium brown pubescent 20. *S. obsoletidentata*
- 21b. Hypanthium glabrous.
- 22a. Stipules membranous, lanceolate 19. *S. kiukiangensis*
- 22b. Stipules herbaceous, lanceolate or ovate to suborbicular.
- 23a. Leaflets (4–)6–9-paired; styles 2 or 3(or 4), basally glabrous 16. *S. foliolosa*
- 23b. Leaflets 9–14(–15)-paired; styles 3–5, basally puberulous.
- 24a. Leaflets ovate-linear or linear-oblong, 15–30 × 6–8 mm, at intervals of 6–8 mm, abaxially densely papillose, apex with few sharp teeth; stipules lanceolate to ovate, 4–6 mm; styles 3–5 17. *S. pteridophylla*
- 24b. Leaflets linear or narrowly lanceolate, 25–50(–60) × 10–15 mm, at intervals of 10–20 mm, abaxially not papillose, densely sharply serrate from base or above middle; stipules broadly ovate or suborbicular, 10–12 mm, rarely narrower; styles 5 18. *S. ursina*
- 18b. Leaflet margin serrate except base sparsely few toothed.
- 25a. Hypanthium pubescent.
- 26a. Leaflets 6–8(–10)-paired, with 15–20 teeth on each margin; stipules herbaceous, large, dentate or entire; styles 4 28. *S. monbeigii*
- 26b. Leaflets 9–13-paired, with 4–8 sharp minute teeth on each margin; stipules membranous, subulate; styles 5 29. *S. vilmorinii*
- 25b. Hypanthium glabrous.
- 27a. Leaflets abaxially and inflorescence glabrous; leaflets 5–8-paired 23. *S. zayuensis*
- 27b. Leaflets abaxially and inflorescence pubescent; leaflets 7–13(–17)-paired.
- 28a. Fruit reddish to scarlet; branchlets with numerous lenticels.
- 29a. Leaflet apically acute or obtuse, with 10–20 teeth on each margin; rachis and pedicels rust-brown pubescent 24. *S. rehderiana*
- 29b. Leaflet apically acuminate, with 20–30 teeth on each margin; rachis and pedicels sparsely pubescent or subglabrous 25. *S. randaiensis*
- 28b. Fruit white; branchlets with few lenticels.
- 30a. Leaflet margin wholly serrate except at base, abaxially not papillose; styles 5, ± free at base 26. *S. koehneana*
- 30b. Leaflet margin sharply minutely serrate apically, abaxially densely papillose; styles 4 or 5, connate basally or from base to 1/3 length 27. *S. prattii*
- 17b. Leaflets (8–)14–21 pairs, usually less than 2 cm, rarely longer.
- 31a. Leaflets with few teeth (3–5 per side), rarely more; leaflets abaxially and inflorescence glabrous.
- 32a. Leaflet margin with 3–5 coarse teeth per side apically; fruit scarlet 30. *S. filipes*
- 32b. Leaflet margin with few sharp teeth; fruit white or white tinged bluish 31. *S. microphylla*
- 31b. Leaflets with more teeth (4 or)5–16 per side; leaflets abaxially and inflorescence glabrous or pubescent.
- 33a. Small shrub, less than 1.5 m tall; leaflets 13–18-paired, 6–11 mm, with 4–7 incised sharp teeth on each margin 32. *S. lanpingensis*
- 33b. Shrub or small tree, more than 2.5 m tall; leaflets 8–21-paired, usually 10–25 mm, with (4 or)5–16 teeth on each margin.
- 34a. Fruit red; petals pink to purple; leaflets abaxially and inflorescence pubescent.
- 35a. Leaflets abaxially and inflorescence rust-red pubescent; hypanthium glabrous; stipules coarsely sharply serrate; leaflets with 6–10 incurved sharp teeth per side 33. *S. rufopilosa*
- 35b. Leaflets abaxially and inflorescence white pubescent; hypanthium pubescent; stipules entire; leaflets with 5–10 sharp teeth per side 34. *S. albopilosa*
- 34b. Fruit white; petals white; leaflets abaxially and inflorescence glabrous or pubescent.

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- 36a. Leaflets abaxially and inflorescence glabrous; leaflets 12–17 pairs, narrowly oblong, 5–11-crenate per side 35. *S. setschwanensis*
- 36b. Leaflets abaxially and inflorescence pilose, glabrescent, leaflets 17–21 pairs, oblong or oblong-lanceolate, with 6–16 sharp teeth per side 36. *S. multijuga*
- 1b. Leaves simple.
- 37a. Fruit apically with persistent sepals; carpels mostly adnate to hypanthium, only separate at apex.
- 38a. Leaves abaxially glabrous or tomentose only in vein axils.
- 39a. Fruit ovoid, ovoid-globose, oblong, or obovate-oblong, 1–2 cm in diam.; leaf margin obtusely crenate or shallowly lobed.
- 40a. Leaf basally cuneate to subrounded, blade with 14–20 pairs of lateral veins; fruit ovoid, ovoid-globose, or subglobose, (1.5–)2–3 × 1.5–2 cm 37. *S. megalocarpa*
- 40b. Leaf basally cuneate, blade with 12–14 pairs of lateral veins; fruit oblong or obovoid-oblong, 1.5–2 × 1–1.5 cm 38. *S. guanxianensis*
- 39b. Fruit subglobose, (0.8–)1–1.2 cm in diam.; leaf margin sharply serrate.
- 41a. Fruit 4-loculed; leaves oblong-ovate or ovate-lanceolate, margin sharply incised doubly serrate or lobed, with 13–18 pairs of lateral veins 39. *S. arguta*
- 41b. Fruit 2-loculed; leaves elliptic or oblong-elliptic, margin irregularly sharply serrate, with 7–11 pairs of lateral veins 40. *S. yunnanensis*
- 38b. Leaves abaxially densely tomentose over entire surface.
- 42a. Fruit narrowly ovoid to oblong, 2-loculed; tree to 15 m tall.
- 43a. Fruit 6–10 × 4–7 mm; leaves narrowly elliptic or oblong-ovate, 9–14 × 5–9 cm, margin irregularly serrate or shallowly doubly serrate 41. *S. zahlbruckneri*
- 43b. Fruit 10–16 × 6–13 mm; leaves elliptic to obovate-elliptic, 6–13 × 3.5–9.5 cm, margin regularly deeply doubly serrate or lobed 42. *S. yuana*
- 42b. Fruit subglobose to ovoid or obovoid, 2–5-loculed; shrub to ca. 7 m tall.
- 44a. Petiole 3–12 mm; leaves cuneate to subrounded basally.
- 45a. Inflorescence 3–6 × 4–8 cm, 20–30-flowered or more; styles glabrous basally; fruit scarlet, ovoid or obovoid, 9–12(–15) × 7–11(–13) mm, with few small lenticels 43. *S. thibetica*
- 45b. Inflorescence 1.5–3.5 × 4–4.5 cm, 10–25-flowered; styles yellowish white tomentose basally; fruit white, stained red, subglobose, 6–8(–10) mm in diam., with or without few small lenticels 44. *S. pallescens*
- 44b. Petiole 10–25 mm; leaves rounded or broadly cuneate at base.
- 46a. Inflorescence 5–8 × (5–)7–10 cm, 30–45-flowered; styles tomentose basally; fruit 15–20 mm in diam.; shrub 45. *S. cuspidata*
- 46b. Inflorescence 3–4 × 3.5–5 cm, (15–)20–30-flowered or more; styles glabrous or pubescent basally; fruit 5–10 mm in diam.; tree or shrub.
- 47a. Leaf margin serrulate; styles grayish white tomentose basally; pedicel 5–12 mm 46. *S. hemsleyi*
- 47b. Leaf margin irregularly minutely serrate or doubly serrate; styles glabrous or puberulous basally; pedicel 3–5 mm 47. *S. coronata*
- 37b. Fruit without persistent sepals apically; carpels 2 or 3, rarely 4 or 5, wholly adnate to hypanthium.
- 48a. Leaves abaxially glabrous or puberulous.
- 49a. Lateral veins (6–)10–18(–24) pairs, veins terminating in teeth on leaf margin.
- 50a. Fruit 2-loculed, without or with few inconspicuous small lenticels; leaf margin sharply doubly serrate, petiole 1.5–3 cm 48. *S. alnifolia*
- 50b. Fruit 2–5-loculed, lenticellate; leaf margin crenate, serrate, or doubly serrate, petiole 0.3–2 cm.
- 51a. Leaf margin doubly serrate, lateral veins 16–24 pairs 52. *S. meliosmifolia*
- 51b. Leaf margin serrate, lateral veins 10–18 pairs.
- 52a. Leaf margin crenate; fruit conspicuously lenticellate, 4- or 5-loculed 49. *S. caloneura*
- 52b. Leaf margin sharply serrate; fruit without or with few small lenticels, 2- or 3-loculed.
- 53a. Leaves ovate-elliptic or oblong-elliptic, rarely oblong-obovate; petiole 1–2 cm; fruit 6–9 mm in diam., without or with few small lenticels, 2- or 3-loculed 50. *S. rhamnoides*
- 53b. Leaves oblong-lanceolate to obovate-lanceolate; petiole 3–8 mm; fruit 5–7 mm in diam., without lenticels, 2-loculed 51. *S. salwinensis*
- 49b. Lateral veins 7–11 pairs, usually anastomosing toward leaf margin.
- 54a. Fruit more than 1 cm in diam., conspicuously lenticellate; petiole more than 1 cm, rarely shorter.
- 55a. Leaf margin sharply serrate apically, base cuneate, rarely rounded 56. *S. globosa*
- 55b. Leaf margin obtusely crenate, base narrowly cuneate or rounded.
- 56a. Fruit larger, 3–5 cm in diam., 5–7-loculed; styles 5–7; leaves elliptic to obovate-elliptic, base narrowly cuneate, margin sparsely minutely shallowly crenulate; petiole 0.3–0.5 cm 53. *S. medogensis*

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- 56b. Fruit smaller, 1–2 cm in diam., 2–4-loculed; styles 2–4; petiole 1–3 cm.
 57a. Leaves ovate or elliptic-ovate, rounded basally, shallowly crenate; petiole 2.5–3 cm 54. *S. corymbifera*
 57b. Leaves rhombic, cuneate basally, minutely obtusely crenulate apically; petiole 1–2 cm 55. *S. rhombifolia*
- 54b. Fruit less than 1 cm in diam., rarely larger, without or with few inconspicuous lenticels; petiole usually less than 1 cm.
 58a. Inflorescences gray tomentose; leaves obovate or oblong-obovate 59. *S. keissleri*
 58b. Inflorescences glabrous; leaves elliptic, oblong-elliptic, elliptic-lanceolate, or elliptic-obovate.
 59a. Leaves glabrous on both surfaces, margin shallowly obtusely minutely serrate apically; fruit globose, with few small lenticels 57. *S. thomsonii*
 59b. Leaves abaxially sparsely tomentose along veins when young, glabrescent, margin sharply serrate but entire near base; fruit ovoid, without lenticels 58. *S. aronioides*
- 48b. Leaves tomentose abaxially.
 60a. Leaves abaxially densely gray or yellowish white tomentose.
 61a. Leaves abaxially yellowish white tomentose; inflorescence rust-brown tomentose; fruit subglobose 62. *S. dunnii*
 61b. Leaves abaxially and inflorescence densely gray tomentose; fruit oblong, oblong-ellipsoid, or obovoid-oblong.
 62a. Leaf basally broadly cuneate to rounded, lateral veins nearly parallel; petiole 0.5–1(–1.5) cm; styles 2 or 3, connate and white tomentose basally 60. *S. folgneri*
 62b. Leaf basally rounded to subcordate, lateral veins curved; petiole 1.2–2 cm; styles 2, connate basally, glabrous 61. *S. tsinlingensis*
- 60b. Leaves abaxially densely rusty or rust-brown tomentose.
 63a. Lateral veins nearly parallel, terminating in marginal teeth.
 64a. Leaves ovate, elliptic, or obovate, both surfaces densely rusty tomentose when young, glabrescent, lateral veins 6–8(–11) pairs, petiole 1–1.5 cm 63. *S. ferruginea*
 64b. Leaves narrowly elliptic or elliptic-ovate to elliptic-obovate, abaxially persistently rust-brown tomentose, lateral veins 12–15 pairs, petiole 0.5–1 cm 64. *S. epidendron*
- 63b. Lateral veins anastomosing near leaf margin.
 65a. Leaves 4–7(–9) cm, lateral veins 6–8 pairs, petiole 5–7(–10) mm; fruit ovoid, 5–10 mm in diam., usually not lenticellate 67. *S. astataria*
 65b. Leaves 9–15 cm, lateral veins 10–15 pairs, petiole 10–30 mm; fruit subglobose, 10–15 mm in diam., with conspicuous lenticels.
 66a. Leaves ovate or elliptic-ovate, rarely elliptic-obovate, shortly acuminate, rarely acute, margin shallowly crenate-serrate above base, petiole 20–30 mm; fruit ca. 10 mm in diam. 65. *S. ochracea*
 66b. Leaves elliptic-lanceolate, acuminate to caudate, margin usually entire or apically sparsely serrate, petiole ca. 10 mm; fruit 10–15 mm in diam. 66. *S. subochracea*

1. *Sorbus insignis* (J. D. Hooker) Hedlund, Kongl. Svenska Vetenskapsakad. Handl. 35(1): 32. 1901.

卷边花楸 *juan bian hua qiu*

Pyrus insignis J. D. Hooker, Fl. Brit. India 2: 377. 1878; *P. harrowiana* I. B. Balfour & W. W. Smith; *Sorbus harrowiana* (I. B. Balfour & W. W. Smith) Rehder.

Trees, rarely shrubs, to 10–15 m tall. Branchlets reddish brown when young, grayish brown when old, terete, rust-brown tomentose when young, glabrous when old, with elliptic lenticels 2–4 mm; buds narrowly ovoid, 1–1.8 cm × 7–12 mm, apex shortly acuminate or acute; scales several, brownish, initially puberulent, glabrate. Leaves imparipinnate, together with rachis 20–30 cm; petiole 1.7–4 cm; stipules persistent, suborbicular, 1–2 cm, sometimes lobed; rachis slightly winged, sulcate, sparsely tomentose, glabrous when old; leaflet blades 3–5(or 6) pairs, at intervals of 1–2(–3) cm, dark green adaxially, oblong or oblong-lanceolate, (6–)10–15(–20) × 2–4(–5) cm, abaxially glaucous, lateral veins 24–30 pairs, arching and anastomosing at margin, both surfaces tomentose when young, glabrescent, base rounded or obliquely cordate, margin slightly revolute and shallowly crenate, apex obtuse. Inflorescences 10–15 cm in diam., densely flowered; rachis and pedicels sparsely

pubescent, with large lenticels; bracts linear-subulate. Flowers 6–8 mm in diam. Hypanthium campanulate, 1–1.3 mm, abaxially ± pubescent. Sepals triangular, with reddish dentate glands along margin, glabrous or somewhat puberulous. Petals dull white, suborbicular, ca. 3 mm in diam. Stamens ca. 20, nearly as long as or slightly shorter than petals. Styles 2 or 3, to 2.5 mm, glabrous. Fruit white or crimson, globose or ovoid-globose, 5–8 mm in diam., glabrous, 2- or 3-loculed, with large lenticels and persistent erect sepals. Fl. May–Jun, fr. Sep–Oct. $2n = 34$.

Broad-leaved forests, rocky slopes; 2500–4000 m. E Xizang, NW Yunnan [NE India, Myanmar, Nepal, Sikkim].

2. *Sorbus sargentiana* Koehne in Sargent, Pl. Wilson. 1: 461. 1913.

晚绣花楸 *wan xiu hua qiu*

Pyrus sargentiana (Koehne) Bean.

Trees 6–10 m tall. Branchlets grayish brown when young, dark gray when old, terete, grayish white tomentose, with numerous elliptic lenticels; buds narrowly ovoid, 1–1.7 cm, apex acute; scales many, brown, sparsely pubescent. Leaves impari-

pinnate, together with rachis 18–28 cm; petiole 5–6 cm; stipules persistent, semiorbicular, 1–2 cm in diam., margin sharply serrate; rachis adaxially shallowly sulcate, slightly winged, grayish white tomentose; leaflet blades 3–5 pairs, at intervals of 2.5–3.2 cm, terminal and basal leaflets smaller than others, elliptic-lanceolate, 7–13 × 2–4.2 cm, lateral veins 20–35 pairs, arcuate-anastomosing, abaxially initially densely tomentose, gradually glabrescent, with sparse hairs persisting only along veins, adaxially sparsely pubescent, glabrescent, base rounded or obliquely cordate, margin sharply serrate, with 28–52 teeth per side, entire on basal 1/4, apex acuminate, rarely acute. Inflorescences 8–11 × 9–15 cm, densely flowered; rachis and pedicels grayish white tomentose, gradually glabrescent, with oblong lenticels; bracts linear-lanceolate. Pedicel 1–3 mm. Flowers 5–7 mm in diam. Hypanthium campanulate, 1–1.4 mm, abaxially tomentose. Sepals triangular, 1–2(–2.5) mm, shorter than petals, apex acute or ± obtuse. Petals white, broadly ovate, 2.5–3.5 × 2–3 mm, glabrous, apex obtuse. Stamens ca. 20, shorter than petals. Styles 3 or 4(or 5), not exceeding stamens, grayish white tomentose basally. Fruit red, globose, 5–6 mm in diam.; sepals persistent, erect. Fl. May–Jun, fr. Oct–Nov. $2n = 34^*$.

• Mixed forests, woodlands, sunny slopes; 2000–3200 m. SW Sichuan, NE Yunnan.

3. *Sorbus wilsoniana* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 312. 1906.

华西花楸 hua xi hua qiu

Pyrus wilsoniana (C. K. Schneider) Cardot; *Sorbus expansa* Koehne.

Trees 5–10 m tall. Branchlets dark gray to grayish brown, terete, tomentose when young, glabrate, lenticellate; buds narrowly ovoid, 0.9–1.7 cm, apex acute; scales reddish brown, glabrous or pubescent apically. Leaves imparipinnate, together with rachis 20–25 cm; petiole 5–6 cm; stipules sometimes caducous after anthesis, suborbicular, 1–2 × 1–1.7 cm, coarsely sharply serrate; rachis abaxially glabrous or pubescent near base of petiolules, adaxially shallowly sulcate, ± winged; leaflets 6 or 7 pairs at intervals of 1.5–3 cm, terminal and basal ones usually smaller than middle ones, blades oblong-elliptic or oblong-lanceolate, 5–8.5 × 1.8–2.5 cm, lateral veins 17–20 pairs, slightly arching and anastomosing at margin, both surfaces glabrous or abaxially pubescent along midvein, base broadly cuneate or rounded, margin entire basally, minutely serrate apically, with 8–20 teeth per side, apex acute or acuminate. Inflorescences 6.5–12 × 8–20 cm, densely flowered; rachis and pedicels pubescent, with many small lenticels; bracts similar to stipules, but smaller. Pedicel 2–4 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular, 1–2.5 mm, abaxially slightly pubescent or glabrous, apex obtuse. Petals white, ovate, 3–3.5 × 2.5–3 mm, adaxially glabrous or puberulous, rarely slightly emarginate at obtuse apex. Stamens 20, shorter than petals. Styles 3–5, not exceeding stamens, densely pubescent basally. Fruit orangish red, ovoid, 5–8 mm in diam.; sepals persistent, erect. Fl. May–Jun, fr. Aug–Sep. $2n = 34^*$.

• Mixed forests in mountain regions; 1300–3300 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan, Yunnan.

4. *Sorbus amabilis* Cheng ex T. T. Yu & K. C. Kuan, Acta Phytotax. Sin. 8: 224. 1963.

黄山花楸 huang shan hua qiu

Sorbus amabilis var. *wuyishanensis* Z. X. Yu.

Trees to 10 m tall. Branchlets brown when young, blackish gray when old, terete, brown pubescent when young, gradually glabrescent, with small lenticels; buds narrowly ovoid, 0.9–1.6 cm, apex acuminate; scales several, dark reddish brown, brown pubescent apically. Leaves imparipinnate, together with rachis 13–18 cm; petiolule 2.5–3.5(–5) cm; stipules caducous after anthesis, suborbicular, coarsely toothed; rachis adaxially shallowly sulcate, reddish brown pubescent when young, glabrescent; leaflets (4- or)5- or 6-paired, at intervals of 1–1.8 cm, terminal and basal leaflets usually smaller than middle one, blades dark green adaxially, oblong or oblong-lanceolate, 4–6.5 × 1.5–2 cm, abaxially reddish brown pubescent only along midvein, gradually glabrescent, subglabrous when mature, adaxially glabrous, base obliquely rounded, margin coarsely sharply serrate in apical 2/3, with 9–21 teeth per side, apex acuminate. Inflorescences terminal, 8–10 × 12–15 cm, many flowered; rachis and pedicels densely rusty pubescent, glabrescent and subglabrous in fruit, with numerous elliptic lenticels; bracts caducous, smaller than stipules. Pedicel 1–3 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially glabrous or nearly so. Sepals triangular, 1–2 mm, abaxially glabrous, apex obtuse. Petals white, broadly ovate or suborbicular, 3–4 mm in diam., adaxially puberulous or glabrous, apex obtuse. Stamens 20, shorter than petals. Styles 3 or 4, equaling or lower than stamens, densely pubescent basally. Fruit red, subglobose, 6–7 mm in diam.; sepals persistent. Fl. May, fr. Sep–Oct.

• Mixed forests, mountain slopes; 900–2000 m. SE Anhui, NW Fujian, NE Hubei, N Jiangxi, NW Zhejiang.

5. *Sorbus discolor* (Maximowicz) Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, sér. 3, 19: 173. 1874.

北京花楸 bei jing hua qiu

Pyrus discolor Maximowicz, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 9: 103. 1859; *P. pekinensis* (Koehne) Cardot; *Sorbus pekinensis* Koehne.

Trees to 10 m tall. Branchlets purplish brown when old, terete, glabrous or nearly so when young, sparsely lenticellate when old; buds oblong-ovoid, 6–9 mm, apex shortly acuminate or acute; scales several, brownish, glabrous or puberulous. Leaves imparipinnate, together with rachis 10–20 cm; petiole 3–4(–6) cm; stipules persistent, 5–8 mm, lobed or coarsely serrate; rachis adaxially shallowly sulcate, glabrous, somewhat winged; leaflets 5–7 pairs, at intervals of 1.2–3 cm, basal pair usually smaller than others, blades oblong or oblong-elliptic to oblong-lanceolate, 3–6 × 1–1.8 cm, lateral veins 12–20 pairs, arcuate-anastomosing at margin, both surfaces glabrous, abaxially paler, glaucescent, base usually rounded, margin minutely sharply serrate, with 12–20 teeth on each margin, entire in basal 1/3, apex acute to shortly acuminate. Inflorescences loose, 5–8 × 5–10 cm, many flowered; rachis and pedicels glabrous, with small lenticels; bracts similar to stipules, but smaller. Pedicel 2–3 mm. Flower 6–8 mm in diam. Hypanthium campanulate,

abaxially glabrous. Sepals triangular, 1–2 mm, apex ± obtuse or acute. Petals white, ovate or oblong-ovate, 3–5 × 2.5–3.5 mm, glabrous, apex obtuse. Stamens 15–20, ca. 1/2 as long as petals. Styles 3 or 4, nearly as long as stamens, sparsely pubescent basally. Fruit white or yellow, ovoid, 6–8 mm in diam.; sepals persistent. Fl. May, fr. Aug–Sep. $2n = 34^*$.

• Broad-leaved mixed forests on sunny slopes; 1500–2000 m. Anhui, Gansu, Hebei, Henan, Nei Mongol, Shaanxi, Shanxi, Shandong.

6. *Sorbus esserteauana* Koehne in Sargent, Pl. Wilson. 1: 459. 1913.

麻叶花楸 ma ye hua qiu

Sorbus conradinae Koehne.

Shrubs or trees, 5–10(–14) m tall. Branchlets gray or brownish gray, terete, grayish white tomentose when young, gradually glabrescent, with minute lenticels; buds narrowly ovoid or oblong-ovoid, 0.8–1.2(–1.4) cm × 5–9 mm, apex acute to shortly acuminate; scales several, dark brown, grayish white tomentose. Leaves imparipinnate, together with rachis 15–26 cm; petiole 4–5 cm; stipules semiorbicular, 1–2 cm in diam., margin coarsely serrate; rachis shallowly sulcate adaxially, initially grayish white tomentose, with few remaining hairs when old; leaflets 5 or 6 pairs, at intervals of 2–3.5 cm, blades dark green adaxially, elliptic, oblong-elliptic, or oblong-lanceolate, 5–9 × 2–3 cm, basal ones smaller, lateral veins 12–16 pairs, arcuate-anastomosing, abaxially prominent and adaxially deeply impressed, abaxially persistently densely grayish white tomentose, adaxially glabrous, base rounded or obliquely cordate, margin sharply minutely serrate, 8–20-toothed per side, entire near base, apex acuminate. Inflorescences 7–12 × 10–18 cm, densely flowered; rachis and pedicels densely grayish white tomentose when young, glabrescent; bracts smaller than stipules. Pedicel 1–3 mm. Hypanthium campanulate, abaxially tomentose. Sepals triangular, 1.5–2.5 mm, sparsely tomentose or glabrous near apex, apex acute or ± obtuse. Petals white, ovate or suborbicular, 3–3.5 × 2.5–3 mm, glabrous, apex obtuse. Stamens 20, ca. as long as petals. Styles 3 or 4, not exceeding stamens, tomentose basally. Fruit red, globose, 5–7 mm in diam., pubescent when young, glabrous when mature; sepals persistent; seeds brownish, reniform, 2–3.5 mm. Fl. May–Jun, fr. Aug–Sep. $2n = 34^*$.

• Mountain thickets, cliffs; 1700–3000 m. W Sichuan.

7. *Sorbus pohuashanensis* (Hance) Hedlund, Kongl. Svenska Vetenskapsakad. Handl. 35: 33. 1901.

花楸树 hua qiu shu

Pyrus pohuashanensis Hance, J. Bot. 13: 132. 1875; *Sorbus amurensis* Koehne; *S. manshuriensis* Kitagawa; *S. pohuashanensis* var. *amurensis* (Koehne) Y. L. Chou & S. L. Tung; *S. pohuashanensis* var. *manshuriensis* (Kitagawa) Y. C. Zhu; *S. taishanensis* F. Z. Li & X. D. Chen.

Trees to 8 m tall. Branchlets brown or purplish brown to grayish brown, tomentose-villous when young, gradually glabrescent, with small grayish white lenticels; buds oblong-ovoid, 0.8–1.2 cm × 5–7 mm, apex acuminate; scales several, reddish brown, densely gray tomentose-villous. Leaves imparipinnate,

together with rachis 10–20 cm; petiole 2.5–5 cm; stipules broadly ovate or semiorbicular, 5–10 × 5–12 mm, margin coarsely sharply serrate; rachis slightly winged, sulcate, tomentose-villous, subglabrous when old; leaflets 5–7-paired, at intervals of 1–2.5 cm, terminal and basal ones usually smaller than others, blade ovate-lanceolate or elliptic-lanceolate, 3–5 × 1.4–1.8 cm, lateral veins 9–16 pairs, slightly arcuate-anastomosing at margin, abaxially pale, tomentose-villous when young, subglabrous or tomentose-villous only along midvein when old, adaxially sparsely tomentose-villous or glabrous, base obliquely rounded, margin minutely sharply serrate, nearly entire basally, apex acute or shortly acuminate. Inflorescences terminal, 8–12 × 10–15 cm, densely flowered; rachis and pedicels tomentose-villous, subglabrous or glabrous when old; bracts ovate, smaller than stipules, sharply serrate, rarely entire. Pedicel 3–4 mm. Flowers 5–8 mm in diam. Hypanthium campanulate, abaxially tomentose-villous or subglabrous. Sepals triangular, 1.5–2.5 × 1–2 mm, glabrous or subglabrous, apex acute. Petals white, broadly ovate or suborbicular, 3.5–5 × 3–4 mm, adaxially puberulous, apex obtuse. Stamens 20, nearly as long as petals. Styles 3(or 4), not exceeding stamens, pubescent basally. Fruit red or orangish red, 6–8 mm in diam., glabrous when mature; sepals persistent. Fl. Jun, fr. Sep–Oct. $2n = 34^*$.

• Mountain slopes, mixed forests in valleys; 900–2500 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi.

8. *Sorbus helenae* Koehne in Sargent, Pl. Wilson. 1: 462. 1913.

钝齿花楸 dun chi hua qiu

Trees 3–7(–10) m tall. Branchlets blackish gray, stout, with few indistinct lenticels, glabrous; buds oblong-ovoid, 6–9 mm, apex acute; scales dark brown, glabrous. Leaves imparipinnate, together with rachis 13–20 cm; petiole 2.5–4(–5) cm; stipules persistent, 5–7 mm, membranous, margin entire or slightly incised at apex, somewhat pubescent; rachis sulcate, narrowly winged, abaxially glabrous or reddish brown villous; leaflets 3 or 4 pairs, at intervals of 1.5–2.5 cm, blade pale abaxially, dark green adaxially, oblong or oblong-elliptic, (4.5–)5–9(–11) × 2–3 cm, basal pair smaller than middle ones, lateral veins 15–20 pairs, curved-anastomosing at margin, abaxially reddish brown villous along veins, adaxially glabrous or subglabrous, base broadly cuneate, rounded, or subcordate, margin serrate or doubly serrate, apex acute or obtuse. Inflorescences 7–11 × 8–15 cm, densely flowered; rachis and pedicels reddish brown villous; bracts 3–5 mm, membranous, margin entire or slightly serrate. Pedicel 2–5 mm. Flowers 6–8 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular-ovate, 1–2 mm, sometimes with puberulous margin, apex acute. Petals white, orbicular-ovate, 3–4 × 2.5–3.5 mm, glabrous, apex obtuse. Stamens 20, ca. 1/3 as long as petals. Styles 5, not exceeding stamens, villous basally. Fruit white, globose, 6–8 mm in diam., glabrous; sepals persistent. Fl. Jun–Jul. $2n = 34^*$.

• Forests in mountainous regions; 2500–3000 m. W Sichuan.

1a. Leaflet blade 5–9(–11) × 2–3 cm, margin crenate-serrate or doubly serrate 8a. var. *helenae*

- 1b. Leaflet blade 4.5–7 × 2–4 cm, margin sharply serrate or doubly serrate 8b. var. *argutiserrata*

8a. *Sorbus helenae* var. *helenae*

钝齿花楸(原变种) *dun chi hua qiu* (yuan bian zhong)

Sorbus helenae f. *rufidula* Koehne; *S. helenae* f. *subglabra* Koehne.

Leaflet blade 5–9(–11) × 2–3 cm, margin crenate-serrate or doubly serrate.

- Forests in mountainous areas; 2500–3000 m. W Sichuan.

8b. *Sorbus helenae* var. *argutiserrata* T. T. Yu, Acta Phytotax. Sin. 8: 224. 1963.

尖齿花楸 *jian chi hua qiu*

Leaflet blade 4.5–7 × 2–4 cm, margin sharply or doubly serrate.

- W Sichuan.

One of us (Spongberg) prefers to treat this variety as a synonym of the species because of the apparently continuous variation; Wu Zhengyi (editor's note) concurs.

9. *Sorbus tianschanica* Ruprecht, Mém. Acad. Imp. Sci. Saint Pétersbourg, sér. 7, 14: 46. 1869.

天山花楸 *tian shan hua qiu*

Shrubs or small trees, to 5 m tall. Branchlets brown or grayish brown, terete, lenticellate; young shoots reddish brown, puberulous; buds oblong-ovoid, 1–2 cm × 5–8 mm, apex acuminate; scales several, brown, white pubescent. Leaves imparipinnate, together with rachis 14–17 cm; petiole 1.5–3.3 cm; rachis sulcate adaxially, slightly winged, glabrous; stipules caducous, linear-lanceolate, 7–11 mm, membranous, slightly pubescent; leaflets (4–)6 or 7 pairs, at intervals of 1.5–2 cm, blade ovate-lanceolate, (2.5–)5–7 × 1.2–2 cm, terminal and basal ones smaller than others, both surfaces glabrous, abaxially pale, base obliquely rounded or broadly cuneate, margin sharply serrate but entire basally, or with 2–5 teeth per side, apex acuminate. Inflorescences 6–10 × 7–12(–15) cm, loosely many flowered; rachis and pedicels glabrous; bracts caducous, linear, 5–8 mm, membranous. Pedicel 4–8 mm. Flowers 15–18(–20) cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 mm, apex ± obtuse, rarely acute. Petals white, ovate or elliptic, 6–9 × 5–7 mm, adaxially white pubescent, apex obtuse. Stamens (15–)20, ca. 1/2 as long as petals or shorter. Styles (3–)5, somewhat shorter than or nearly as long as stamens, densely white tomentose basally. Fruit scarlet, globose, 1–1.2 cm in diam., glabrous; sepals persistent. Fl. May–Jun, fr. Sep–Oct. $2n = 34^*$.

Mountain valleys, stream sides, forest margins; 2000–3200 m. Gansu, Qinghai, Xinjiang [Afghanistan, W Pakistan, Russia; SW Asia].

- 1a. Leaflet blade 5–7 cm, margin usually sharply serrate, entire only basally ... 9a. var. *tianschanica*
 1b. Leaflet blade 2.5–5 cm, margin entire or apically with 2–5 teeth per side 9b. var. *integrifoliolata*

9a. *Sorbus tianschanica* var. *tianschanica*

天山花楸(原变种) *tian shan hua qiu* (yuan bian zhong)

Pyrus tianschanica (Ruprecht) Franchet.

Leaflet blade 5–7 cm, margin mostly sharply serrate, entire only basally.

Mountain valleys, stream sides, forest margins; 2000–3200 m. Gansu, Qinghai, Xinjiang [Afghanistan, W Pakistan, Russia; SW Asia].

9b. *Sorbus tianschanica* var. *integrifoliolata* T. T. Yu, Acta Phytotax. Sin. 8: 224. 1963.

全缘天山花楸 *quan yuan tian shan hua qiu*

Leaflet blade 2.5–5 cm, margin entire or apically with 2–5 teeth per side.

- Xinjiang.

One of us (Spongberg) prefers to treat this variety as a synonym of the species because of the slight differences.

10. *Sorbus tapashana* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 313. 1906.

太白花楸 *tai bai hua qiu*

Sorbus giraldiana C. K. Schneider; *S. tianschanica* Ruprecht var. *tomentosa* C. Y. Yang & Y. L. Han.

Shrubs or small trees, ca. 4 m tall. Branchlets brownish or grayish brown, terete, with distinct lenticels, white pubescent when young, glabrous when old; buds narrowly ovoid, 0.9–1.7 cm, apex acuminate; scales several, brownish, white pubescent. Leaves imparipinnate, together with rachis 9–18 cm; petiole 1.5–2.7 cm; stipules caducous, linear-lanceolate, 5–7 mm, membranous, margin entire; rachis sulcate, slightly winged, white pubescent; leaflets (4 or)5- or 6(or 7)-paired, at intervals of 1–2 cm, blade dark green adaxially, ovate-lanceolate or elliptic-lanceolate, 4–6.5 × 1–1.7 cm, terminal and basal ones slightly smaller than middle ones, abaxially with white hairs along midvein, adaxially glabrous, base obliquely rounded, margin sharply serrate, subtire basally or lower 1/3, apex shortly acuminate. Inflorescences 5–9 × 5–8 cm, loosely many flowered; rachis and pedicels white pubescent; bracts linear, 4–6 mm, membranous, margin entire. Pedicel 5–8 mm. Flowers 1.5–2 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 mm, abaxially glabrous or sparsely white pubescent only along margin, apex obtuse. Petals white, broadly ovate or suborbicular, 5–8 × 5–7 mm, adaxially with white hairs near base, apex obtuse. Stamens ca. 20, ca. 1/2 as long as petals or shorter. Styles usually 5, not exceeding stamens, densely white tomentose basally. Fruit red, globose, 8–10 mm in diam.; sepals persistent. Fl. Jun, fr. Sep.

• Coniferous forests, thickets on mountain slopes, mountain summits; 1900–3500 m. Gansu, Qinghai, Shaanxi, Xinjiang.

11. *Sorbus hupehensis* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 316. 1906.

湖北花楸 *hu bei hua qiu*

Trees 5–10 m tall. Branchlets purplish brown to grayish brown, terete, with sparse elliptic lenticels, slightly white to-

mentose when young, glabrescent; buds oblong-ovoid, 6–9 mm, apex acute or shortly acuminate; scales several, reddish brown, glabrous. Leaves imparipinnate, together with rachis 10–15 cm; petiole 1.5–3.5 cm; stipules caducous or some persistent, linear-lanceolate, 4–7 mm, membranous or nearly herbaceous, margin entire or apically 2-lobed; rachis sulcate adaxially, initially tomentose, glabrescent; leaflets (3 or)4–8 pairs, terminal and basal ones smaller than middle ones, at intervals of 0.5–1.5 cm, blades oblong, oblong-lanceolate, or ovate-lanceolate, 3–5 × 1–1.8(–3) cm, lateral veins 7–16 pairs, slightly arcuate-anastomosing, abaxially white tomentose along midvein, glabrate, adaxially glabrous, base cuneate, margin entire or subentire basally, emarginate-serrate apically, apex acute to shortly acuminate, rarely obtuse. Inflorescences (4–)5–8 × 6–10 cm, many flowered; rachis and pedicels glabrous or sparsely white pubescent; bracts linear-lanceolate, 3–6 mm, membranous, margin usually entire, glabrous. Pedicel 3–5(–7) mm. Flowers 5–7 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 mm, abaxially glabrous or puberulous only along margin, apex acute. Petals white, ovate, 3–4 × 2–3 mm, glabrous, base shortly clawed, apex obtuse. Stamens 20, ca. 1/2 as long as petals. Styles 4 or 5, slightly shorter than or nearly as long as stamens, gray pubescent basally, glabrescent. Fruit white, sometimes stained reddish, globose, 5–8 mm in diam., glabrous; sepals persistent. Fl. May–Jul, fr. Aug–Sep.

• Slopes, dense forests in gullies, thickets; 300–3800 m. Anhui, Gansu, Guizhou, Hubei, Jiangxi, Qinghai, Shaanxi, Shandong, Sichuan, Yunnan.

- 1a. Leaflets 4–8-paired, blade oblong-lanceolate or ovate-lanceolate, 1–1.8 cm wide 11a. var. *hupehensis*
 1b. Leaflets 3- or 4-paired, blade oblong, 2–3 cm wide 11b. var. *paucijuga*

11a. Sorbus hupehensis var. **hupehensis**

湖北花楸(原变种) hu bei hua qiu (yuan bian zhong)

Pyrus hupehensis (C. K. Schneider) Bean (1933), not Pampanini (1910); *P. mesogea* Cardot; *Sorbus aperta* Koehne; *S. hupehensis* var. *laxiflora* (Koehne) C. K. Schneider; *S. hupehensis* var. *obtusa* C. K. Schneider; *S. hupehensis* var. *syncarpa* Koehne; *S. laxiflora* Koehne.

Leaflets 4–8 pairs, blades oblong-lanceolate or ovate-lanceolate, 3–5 × 1–1.8 cm.

• Shaded slopes, dense forests in gullies, thickets; 300–3800 m. Anhui, Gansu, Guizhou, Hubei, Jiangxi, Qinghai, Shaanxi, Shandong, Sichuan, Yunnan.

11b. Sorbus hupehensis var. **paucijuga** (D. K. Zang & P. C. Huang) L. T. Lu, Acta Phytotax. Sin. 38: 279. 2000.

少叶花楸 shao ye hua qiu

Sorbus discolor (Maximowicz) Maximowicz var. *paucijuga* D. K. Zang & P. C. Huang, Bull. Bot. Res., Harbin 12: 322. 1992.

Leaflets 3 or 4 pairs, blades oblong, 4–5 × 2–3 cm.

• Slopes; 300–600 m. Shandong.

12. Sorbus oligodonta (Cardot) Handel-Mazzetti, Vegetationsbild. 22 Heft. 8: 8. 1932.

少齿花楸 shao chi hua qiu

Pyrus oligodonta Cardot, Notul. Syst. (Paris) 3: 351. 1918; *P. glabrescens* Cardot; *Sorbus glabrescens* (Cardot) Handel-Mazzetti.

Trees to 5–15 m tall. Branchlets reddish brown to grayish brown, terete, with scattered small lenticels, glabrous; buds oblong-ovoid, 7–12 mm, apex acute; scales several, reddish brown, glabrous, rarely reddish brown pubescent along margin. Leaves imparipinnate, together with rachis 15–20 cm; petiole 2.5–3.5 cm; stipules caducous, lanceolate, 3–5 mm, membranous; rachis adaxially sulcate, somewhat winged, glabrous; leaflets (4 or)5–8-paired; basal ones usually smaller than middle ones, at intervals of 1.2–2 cm, blades elliptic or oblong-elliptic, 3–6 × 1–2 cm, lateral veins 7–14 pairs, arcuate-anastomosing, both surfaces glabrous or abaxially sparsely pubescent at base of midvein, base broadly cuneate to rounded, margin mostly entire, with few teeth only at apex, or with 2–10 teeth per side, apex acute, or ± obtuse and apiculate. Inflorescences 6–12 × 6–10 cm, densely flowered; rachis and pedicels glabrous or sparsely pubescent; bracts lanceolate, 3–4 mm, membranous. Pedicel 2–3 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals broadly ovate or broadly ovate-triangular, 1–2 mm, apex obtuse or acute. Petals yellowish white, ovate, 3–4 × 2–3 mm, apex obtuse. Stamens 20, shorter than petals. Styles 4 or 5, not exceeding stamens, pubescent basally. Fruit white, stained red, ovoid, 6–8 mm in diam.; sepals persistent. Fl. May, fr. Sep.

Mountain slopes, mixed forests along river banks; 2000–3600 m. W Sichuan, SE Xizang, NW Yunnan [Myanmar].

13. Sorbus macrantha Merrill, Brittonia 4: 78. 1941.

大花花楸 da hua hua qiu

Trees 6–8 m tall. Branchlets dark purple or purplish brown, terete, glabrous, with few oblong, rarely suborbicular lenticels; buds ovoid, apex shortly acuminate; scales purplish brown, glabrous. Leaves imparipinnate, together with rachis 15–20 cm; petiole 3–4 cm; stipules caducous, smaller; rachis adaxially sulcate, narrowly winged, with glands in axils of petioles; leaflet blades 5- or 6-paired, opposite or subopposite, at intervals of 1.6–2 cm, pale green abaxially, oblong or oblong-elliptic, 2–5 × 1–1.8 cm, both surfaces glabrous, base obliquely truncate or subrounded-truncate, margin coarsely sharply serrate, apex obtuse to subacute. Inflorescences terminal at apices of branchlets, 8–10 × 4–8 cm, loosely few flowered; rachis and pedicels glabrous, with narrowly elliptic lenticels; bracts caducous. Pedicel 1–2 cm. Flowers 8–11 × 10–15 mm. Hypanthium campanulate, ca. 4 mm, to 8 mm in diam., abaxially glabrous. Sepals broadly triangular, ca. 2 × 3 mm, margin shallowly glandular serrate, apex acute. Petals broadly ovate or suborbicular, 5–6 × 4–5 mm, adaxially puberulous, apex obtuse. Stamens ca. 20; filaments 3–4 mm; anthers ellipsoid, ca. 1 mm. Styles 3(–5), free, ca. 5 mm, slightly yellowish brown to

mentose basally. Fruit ovoid or narrowly ovoid, ca. 1 mm in diam.; sepals persistent. Fl. May–Jul, fr. Sep.

Xizang, Yunnan [N Myanmar].

14. *Sorbus reducta* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 272. 1912.

铺地花楸 pu di hua qiu

Shrubs dwarf, 15–60 cm tall. Branchlets brownish gray to brownish black, terete, with white and brown hairs when young, gradually glabrescent; buds ovoid, 4–8 mm, apex acute to shortly acuminate; scales several, reddish brown, apically white and reddish brown pubescent. Leaves imparipinnate, together with rachis 6–8 cm; petiole 1–2 cm; stipules linear-lanceolate, 5–7 mm, submembranous; rachis sulcate, slightly winged, sparsely pubescent when young, glabrate; leaflet blades 4–6-paired, at intervals of 6–10 mm, oblong-elliptic or oblong, 1–2 cm × 6–10 mm, abaxially glabrous, adaxially sparsely appressed villous, glabrous or subglabrous when old, base obliquely rounded, margin minutely sharply serrate, entire only at base, apex obtuse or acute. Inflorescences corymbose or compound corymbose, (2–)3–6 × 3–5 cm, few flowered; rachis and pedicels white pubescent, intermixed with few reddish brown hairs; bracts linear-lanceolate, 4–6 mm. Pedicel 1–2 mm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially glabrous or reddish brown pubescent. Sepals triangular, 1.5–2.5 mm, apex obtuse. Petals white, ovate or broadly obovate, 3–5 × 3–4 mm, puberulous, apex obtuse, rarely somewhat emarginate. Stamens 20, ca. 1/2 as long as petals. Styles 3–5, equaling or lower than stamens, pubescent basally. Fruit white, globose, 6–8 mm in diam.; sepals persistent. Fl. May–Jun, fr. Sep–Oct.

• Thickets on mountain slopes, mixed woods, stony mountain valleys, scrub, grasslands; 2200–4000 m. SW Sichuan, NW Yunnan.

1a. Hypanthium glabrous abaxially 14a. var. *reducta*

1b. Hypanthium reddish brown pubescent abaxially 14b. var. *pubescens*

14a. *Sorbus reducta* var. *reducta*

铺地花楸(原变种) pu di hua qiu (yuan bian zhong)

Hypanthium glabrous abaxially.

• Thickets on mountain slopes, mixed woods, stony mountain valleys; 2200–4000 m. SW Sichuan, NW Yunnan.

14b. *Sorbus reducta* var. *pubescens* L. T. Lu, Bull. Bot. Res., Harbin 9(2): 52. 1989.

毛萼铺地花楸 mao e pu di hua qiu

Hypanthium reddish brown pubescent abaxially.

• Scrub, grasslands; 3400–3500 m. NW Yunnan (Gongshan Xian).

One of us (Spongberg) prefers to treat this variety as a synonym of the species because of the slight differences.

15. *Sorbus poteriifolia* Handel-Mazzetti, Anz. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 62: 223. 1925, p.p.

侏儒花楸 zhu ru hua qiu

Pyrus foliolosa Wallich var. *subglabra* Cardot; *P. reducta* W. W. Smith (1930), not Diels (1912).

Shrubs small, 0.1–2.7 m tall. Branchlets dark grayish brown or grayish purple, terete, with indistinct elliptic lenticels, reddish brown pubescent when young, glabrous or subglabrous when old; buds ovoid, 4–6 mm, apex acute; scales dark purple, reddish brown pubescent. Leaves imparipinnate, 5–10 cm with rachis; petiole 1–2 cm; stipules lanceolate or linear, 3–5 mm, herbaceous, slightly reddish brown pubescent; rachis sulcate, slightly winged, reddish brown pubescent when young, subglabrous when mature; leaflet blades 4–6(–9) pairs, at intervals of 6–12 mm, pale green abaxially, dark green adaxially, elliptic or oblong-elliptic, 1–2 cm × 6–9 mm, both surfaces glabrous, base obliquely rounded, margin sharply serrate except at base, apex acute or ± obtuse. Inflorescences corymbose or compound corymbose, 4–7 × 3.5–6 cm; rachis and pedicels reddish brown pubescent; bracts linear, 3–4 mm, slightly reddish brown pubescent. Pedicel 1–3 cm. Flowers 6–7 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 mm, apex obtuse. Petals pink, ovate, 3–4 × 2.5–3.5 mm, adaxially pilose, apex obtuse. Stamens 20, ca. 1/2 as long as petals. Styles 4 or 3, shorter than or nearly as long as stamens, pilose basally. Fruit globose, 6–8 mm in diam.; sepals persistent, erect. Fl. May–Jun, fr. Sep–Oct. $2n = 68$.

Stony slopes, low shrubby thickets in high mountain areas; 3000–4000 m. NW Yunnan [N Myanmar].

16. *Sorbus foliolosa* (Wallich) Spach, Hist. Nat. Vég. 2: 96. 1834.

尼泊尔花楸 ni po er hua qiu

Pyrus foliolosa Wallich, Pl. Asiat. Rar. 2: 81. 1831; *P. foliolosa* var. *ambigua* Cardot; *P. wallichii* J. D. Hooker; *Sorbus wallichii* (J. D. Hooker) T. T. Yu.

Shrubs or small trees, 1–4 m tall. Branchlets brownish to grayish brown, terete, densely rusty pubescent when young, glabrescent, with oblong lenticels; buds ovoid, 4–6 mm, apex obtuse; scales several, brown, glabrous or rusty puberulous apically. Leaves imparipinnate, together with rachis 7–12 cm; petiole 1.5–2 cm; stipules caducous, linear-lanceolate, 4–8 mm, margin entire or serrate; rachis shallowly sulcate, slightly rusty puberulous, narrowly winged; leaflet blades (4–)6–9 pairs, subleathery, at intervals of 0.8–1.2 cm, dark green adaxially, oblong-elliptic or oblong, 2–3.5(–4.5) × 0.8–1.4 cm, lateral veins slender, abaxially slightly pubescent, rusty puberulous or subglabrous along midvein, glabrous, rarely pubescent, base obliquely rounded, margin sharply few toothed apically. Compound corymbs 4.5–10 cm in diam., many flowered; rachis and pedicels with rusty hairs and oblong lenticels; bracts caducous, linear, 1–3 mm. Pedicel 1–2 mm or indistinct. Flowers 6–9 mm in diam. Hypanthium campanulate or obconic, glabrous or slightly pubescent. Sepals triangular, glabrous, apex obtuse or acute. Petals white, ovate to broadly obovate, 2–3 mm, base shortly clawed. Stamens 20, shorter than petals. Styles 2 or 3(or 4), free at base, glabrous. Fruit red, globose or ovoid, 4–6 mm in diam., with sparse small lenticels; sepals persistent; seeds brownish, 1–2 mm. Fl. Apr–Jun, fr. Sep–Oct. $2n = 68$.

Mixed forests, stream sides; 2500–4200 m. SE Xizang, Yunnan [Bhutan, N India, N Myanmar, Nepal, Sikkim].

17. *Sorbus pteridophylla* Handel-Mazzetti, Symb. Sin. 7: 470. 1933.

蕨叶花楸 jue ye hua qiu

Shrubs or small trees, 4–7 m tall. Branchlets brown or blackish brown, terete, sparsely lenticellate; buds compressed-ovoid, 4–6 mm, apex acute; scales several, dark brown, tomentulose when young, glabrescent. Leaves imparipinnate, together with rachis 6–13 cm; petiole 1–1.5 cm; stipules lanceolate to ovate, 4–6 mm, herbaceous, sharply incised-serrate, rarely subentire; rachis slender, shallowly sulcate, pubescent, glabrescent, narrowly winged; leaflet blades 9–14-paired, at intervals of 6–8 mm, pale abaxially, dark green adaxially, ovate-linear or linear-oblong, 1.5–3 cm × 6–8 mm, lateral veins ca. 10 pairs, abaxially pubescent along midvein, papillose, adaxially glabrous, base obliquely rounded, margin mostly entire, with 4–8 sharp teeth per side near apex, apex obtuse or acute. Compound corymbs 3–6 × 4–7 cm; rachis and pedicels pubescent, gradually glabrescent, sparsely minutely lenticellate. Pedicel 3–5 mm. Flowers 5–7 mm in diam. Hypanthium campanulate, puberulous when young, glabrate. Sepals broadly triangular, 1–2 mm, glabrous, apex obtuse or acute. Petals white, broadly ovate or elliptic-ovate, ca. 3 × 2.5–3 mm, glabrous, apex obtuse. Stamens 20, shorter than petals. Styles 3–5, nearly as long as stamens, pubescent basally. Fruit ovoid, 6–8 mm in diam.; sepals persistent. Fl. Jun, fr. Aug–Sep.

Dry slopes, mixed forests in mountain valleys, cliffs; 2700–3800 m. Xizang, Yunnan [N Myanmar].

- 1a. Rachis, midvein of leaflet blade, and inflorescence rusty pubescent 17a. var. *pteridophylla*
 1b. Rachis, midvein of leaflet blade, and inflorescence sparsely gray pubescent 17b. var. *tephroclada*

17a. *Sorbus pteridophylla* var. *pteridophylla*

蕨叶花楸(原变种) jue ye hua qiu (yuan bian zhong)

Rachis, midvein of leaflet blade, and inflorescence rusty pubescent.

• Dry slopes, mixed forests in mountain valleys; 2800–3800 m. Xizang, Yunnan.

17b. *Sorbus pteridophylla* var. *tephroclada* Handel-Mazzetti, Symb. Sin. 7: 471. 1933.

灰毛蕨叶花楸 hui mao jue ye hua qiu

Rachis, midvein of leaflet blade, and inflorescence sparsely gray pubescent.

Cliffs; 2700–3700 m. NW Yunnan [N Myanmar].

One of us (Spongberg) prefers to treat this variety as a synonym of the species because of the slight differences.

18. *Sorbus ursina* (Wenzig) Hedlund, Kongl. Svenska Vetenskapsakad. Handl. 35(1): 80. 1901.

美叶花楸 mei ye hua qiu

Shrubs or small trees, 2–6 m tall. Branchlets brownish or grayish brown, terete, glabrous, with sparse, orbicular or elliptic

lenticels; buds ovoid or conical, 0.8–1.4 cm × 4–8 mm, apex acute or acuminate; scales reddish brown. Leaves imparipinnate, together with rachis 7–12(–18) cm; petiole 2–5 cm; stipules broadly ovate or suborbicular, 1–1.2 cm, cleft to multifid or entire with large teeth, rarely narrower, subulate, sparsely reddish brown pubescent; rachis sulcate, narrowly winged, abaxially rust-brown pubescent, with glands at base of leaflet; leaflet blades 9–15-paired, at intervals of 1–2 cm, pale abaxially, dark green adaxially, linear or narrowly lanceolate, 2.5–5(–6) × 1–1.5 cm, abaxially rust-brown pubescent along midvein, adaxially lustrous, base rounded, margin sharply serrate from base or above middle, apex shortly acuminate. Compound corymbs terminal, 5–7(–10) cm in diam., many flowered; rachis and pedicels densely rust-brown pubescent; bracts reddish brown, broadly linear-triangular, 3–10 mm, puberulous. Pedicel 2–4 mm. Flowers ca. 8 mm in diam. Hypanthium widely obconical or somewhat shortly tubular. Sepals greenish or reddish, triangular, 1–1.5 mm, glabrous, glandular at margin. Petals white, rarely reddish at margin, orbicular, obovate, or rhombic, 2.5–3 × 1.5–2 mm, base shortly clawed. Stamens ca. 20. Ovary 5-loculed; styles 5, free, slightly pubescent. Fruit globose, 7–8 mm in diam., glabrous, with persistent erect sepals; seeds blackish, lanceolate-ellipsoid, 4–5 mm, slightly rugose. Fl. Jun–Jul, fr. Sep–Oct.

Coniferous forests, high mountain thickets; 2700–5400 m. NW Sichuan, S Xizang, NW Yunnan [Bhutan, India, NE Myanmar, Nepal, Sikkim].

- 1a. Leaflet blades linear or narrowly lanceolate, margin sharply serrate from base or above; hypanthium widely obconical or somewhat shortly tubular 18a. var. *ursina*
 1b. Leaflet blades narrowly lanceolate, margin sharply serrate apically; hypanthium somewhat turbinate 18b. var. *wenzigiana*

18a. *Sorbus ursina* var. *ursina*

美叶花楸(原变种) mei ye hua qiu (yuan bian zhong)

Sorbus foliolosa (Wallich) Spach var. *ursina* Wenzig, Linnaea 38: 75. 1874.

Leaflet blades linear or narrowly lanceolate, margin sharply serrate from base or above middle. Hypanthium widely obconical or somewhat shortly tubular.

Coniferous forests, high mountain thickets; 2700–4600 m. NW Sichuan, S Xizang, NW Yunnan [Bhutan, India, NE Myanmar, Nepal, Sikkim].

18b. *Sorbus ursina* var. *wenzigiana* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 4: 316. 1906.

西藏美叶花楸 xi zang mei ye hua qiu

Sorbus wenzigiana (C. K. Schneider) Koehne.

Leaflet blades narrowly lanceolate, margin sharply serrate apically. Hypanthium somewhat turbinate.

Coniferous forests, high mountain thickets; 3000–5400 m. SE Xizang [NW India, Nepal, Sikkim].

19. *Sorbus kiukiangensis* T. T. Yu, Acta Phytotax. Sin. 8: 225. 1963.

球江花楸 qiu jiang hua qiu

Shrubs or small trees, 3–7 m tall. Branchlets grayish brown to blackish brown, terete, glabrous, with sparse, large lenticels; buds oblong-ovoid, apex acuminate; scales several, dark reddish brown, glabrous or apically rust-brown pilose. Leaves imparipinnate, together with rachis 11–17 cm; petiole 1.3–3 cm; stipules caducous, lanceolate, 6–11 mm, membranous; rachis adaxially shallowly sulcate, distinctly narrowly winged, rust-brown pubescent, usually intermixed with white hairs; leaflet blades 7–9-paired, terminal and basal ones smaller, at intervals of 6–12 mm, dark green adaxially, oblong or ovate-oblong, 2.5–3.5 × 1.2–1.5 cm, both surfaces subglabrous, or abaxially reddish brown pubescent, later only along veins, adaxially white pubescent, glabrescent, base obliquely rounded, with few sharp teeth apically, apex usually obtuse, rarely acute. Compound corymbs 6–11 cm, many flowered; rachis and pedicels rust-brown pubescent; bracts lanceolate, 6–9 mm, membranous. Pedicel 2–4 mm. Flowers 6–8 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2 mm, apex obtuse or acute. Petals ovoid, 3–4 × 2.5–3.5 mm, glabrous, apex obtuse. Stamens ca. 1/3 as long as petals. Styles 5, pilose basally. Fruit red or reddish brown, ovoid-globose, 5–8 mm in diam.; sepals persistent. Fl. May–Jun, fr. Sep–Oct. $2n = 68^*$.

• Mixed forests, thickets, hot dry mountain valleys, stream sides; 2500–3800 m. SE Xizang, NW Yunnan.

This taxon is probably an aggregate of apomictic microspecies.

- 1a. Leaflet blade apically obtuse, rarely acute, adaxially white pilose, abaxially rust-brown pubescent 19a. var. *kiukiangensis*
 1b. Leaflet blade apically acute, both surfaces subglabrous 19b. var. *glabrescens*

19a. *Sorbus kiukiangensis* var. *kiukiangensis*

球江花楸(原变种) qiu jiang hua qiu (yuan bian zhong)

Sorbus kiukiangensis var. *crossotocalyx* (Cardot) C. Y. Wu.

Leaflet blade abaxially rust-brown pubescent, adaxially white pilose, apex obtuse, rarely acute.

• Mixed forests, thickets, hot dry mountain valleys, stream sides; 3000–3800 m. SE Xizang, NW Yunnan.

19b. *Sorbus kiukiangensis* var. *glabrescens* T. T. Yu, Acta Phytotax. Sin. 8: 225. 1963.

无毛球江花楸 wu mao qiu jiang hua qiu

Leaflet blade subglabrous on both surfaces, apex acute.

• Thickets at coniferous forest margins; 2500–3000 m. NW Yunnan.

20. *Sorbus obsoletidentata* (Cardot) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 328. 1974.

宾川花楸 bin chuan hua qiu

Pyrus obsoletidentata Cardot, Notul. Syst. (Paris) 3: 353. 1918.

Shrubs or small trees. Branchlets brownish gray, terete, glabrous when old, with few lenticels; buds ovoid, apex acute or shortly acuminate; scales several, dark red, brown pubescent. Leaves imparipinnate, together with rachis 6–9 cm; petiole 1–1.5 cm; stipules caducous, lanceolate, margin entire, membranous; rachis abaxially sparsely brown pubescent, adaxially sulcate, sometimes with few dark red glands, slightly winged; leaflet blades 11–14-paired, at intervals of 4–8 mm, blade dark green adaxially, linear-oblong to oblong-lanceolate, 1–2.5 × 0.4–0.8 cm, abaxially slightly brown pubescent or subglabrous, adaxially glabrous, base ± obliquely rounded, margin entire or apically shallowly few toothed, apex acute or ± obtuse. Compound corymbs terminal, 2–5 cm in diam., densely flowered; rachis and pedicels brown pubescent; bracts caducous, reddish brown, linear, membranous. Pedicel 1–2 mm. Flowers 5–7 mm in diam. Hypanthium campanulate, abaxially brown pubescent. Sepals triangular, slightly rust-brown pubescent or subglabrous, apex acute or obtuse. Petals white, ovate, 3–4 × 2–3 mm, adaxially glabrous or puberulous, apex obtuse. Stamens ca. 20, nearly 1/2 as long as petals. Styles 4, ca. as long as stamens, glabrous. Fruit not seen.

• Mountain slopes, roadsides. NW Yunnan.

21. *Sorbus scalaris* Koehne in Sargent, Pl. Wilson. 1: 462. 1913.

梯叶花楸 ti ye hua qiu

Pyrus scalaris (Koehne) Bean; *Sorbus foliolosa* (Wallich) Spach var. *pluripinnata* C. K. Schneider; *S. pluripinnata* (C. K. Schneider) Koehne.

Shrubs or small trees, 3–7 m tall. Branchlets blackish gray when old, terete, gray or brown pubescent when young, subglabrous when old; buds ovoid, 7–9 × 4–7 mm, apex obtuse; scales several, brownish, with grayish white hairs. Leaves imparipinnate, together with rachis 10–18 cm; petiole 1–2.5 cm; stipules persistent, suborbicular or ovate, 0.7–1.4 cm in diam., margin coarsely serrate; rachis purplish, abaxially white tomentose, adaxially sulcate; leaflet blades (8–)10–14 pairs, terminal and basal ones smaller, at intervals of 8–10 mm, oblong or nearly broadly linear, 2–3(–4) × 0.6–1.4 cm, abaxially gray tomentose and papillose, adaxially glabrous, base rounded or obliquely so, margin minutely sharply serrate near apex, with 2–8 teeth per side, apex obtuse or acute. Inflorescences terminal, 6–10 × 7–12 cm, many flowered; rachis and pedicels gray or grayish white tomentose, glabrescent, subglabrous in fruit, with prominent lenticels. Flowers 6–8 mm in diam. Hypanthium campanulate, glabrous or slightly tomentose near base. Sepals triangular, 1–2 mm, glabrous, apex obtuse. Petals white, ovate or suborbicular, 2.5–3.5 mm, glabrous, apex obtuse. Stamens ca. 20, nearly as long as petals. Styles 3 or 4, not exceeding stamens, densely pubescent basally. Fruit red, ovoid-globose, 5–6 mm in diam.; sepals persistent. Fl. May–Jun, fr. Aug–Sep. $2n = 34^*$.

• Mixed forests on mountain slopes; 1600–3000 m. W Sichuan, Yunnan.

22. *Sorbus glomerulata* Koehne in Sargent, Pl. Wilson. 1: 470. 1913.

球穗花楸 qiu sui hua qiu

Pyrus glomerulata (Koehne) Bean.

Shrubs or small trees, 3–7 m tall. Branchlets dark gray to brown gray, terete, glabrous, lenticellate; buds ovoid, 4–8 mm, apex acute to shortly acuminate; scales several, brownish, glabrous. Leaves imparipinnate, together with rachis 10–17 cm; petiole 1.5–2.5 cm; stipules lanceolate, 3–6 mm, herbaceous or submembranous; rachis shallowly sulcate, abaxially glabrous or subglabrous, slightly winged; leaflet blades 10–14(–18) pairs, terminal and basal ones smaller than others, at intervals of 5–9 mm, pale abaxially, dark green adaxially, oblong or ovate-oblong, 1.5–2.5 × 0.5–0.8 cm, abaxially pubescent or subglabrous only at base of midvein, adaxially glabrous, base obliquely rounded, with 5–8 minute sharp teeth on each margin above middle or only near apex, apex acute or ± obtuse. Compound corymbs 5–9 × 6–10 cm, densely flowered; rachis and pedicels glabrous or slightly pubescent; bracts linear or lanceolate, 3–5 mm, membranous, usually glabrous. Pedicel 2–3 mm. Hypanthium campanulate, abaxially glabrous. Sepals triangular-ovate, 1–2 mm, apex obtuse. Petals white, broadly ovate, 3–3.5 × 2–3 mm, glabrous, apex ± obtuse. Stamens 20, ca. 1/2 as long as petals. Styles 5, nearly as long as stamens, glabrous. Fruit white, ovoid, 6–8 mm in diam., glabrous; sepals persistent. Fl. May–Jun, fr. Sep–Oct. $2n = 34^*$.

• Thickets, coniferous and broad-leaved mixed forests; 1600–4000 m. Hubei, Sichuan, Yunnan.

23. *Sorbus zayuensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 494. 1980.

察隅花楸 cha yu hua qiu

Trees to 4 m tall. Branchlets brownish gray, terete, with small lenticels; buds ovoid or oblong-ovoid, small, apex acute or ± obtuse; scales several, brown. Leaves imparipinnate, together with rachis 6–10 cm; petiole 2–3 cm; stipules persistent, 5–7 mm, herbaceous, glabrous, margin dentate or entire; rachis shallowly sulcate adaxially, slightly winged, glabrous; leaflet blades 5–8-paired, terminal and basal ones smaller than middle ones, at intervals of 1–1.3 cm, oblong or elliptic-oblong, 2–3.5 × 0.9–1.2 cm, both surfaces glabrous, base broadly cuneate or obliquely rounded, margin coarsely sharply serrate except at entire base, apex obtuse or ± acute. Compound corymbs many flowered; rachis and pedicels glabrous; bracts 4–6 mm, glabrous, margin entire or few toothed. Pedicel 2–4 mm. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2 mm, apex acute. Petals white, nearly orbicular or elliptic, adaxially puberulous or subglabrous, base shortly clawed. Stamens ca. 20, shorter than petals. Styles 4, nearly as long as stamens, glabrous, base connate or ± free. Fruit not seen. $2n = 34^*$.

• Roadsides, river banks, forests on mountain slopes; below 3600 m. SE Xizang (Zayü Xian).

24. *Sorbus rehderiana* Koehne in Sargent, Pl. Wilson. 1: 464. 1913.

西南花楸 xi nan hua qiu

Shrubs or small trees, 3–8 m tall. Branchlets dark grayish brown or dark reddish brown, terete, lenticellate, puberulous when young, glabrous when old; buds narrowly ovoid, 0.9–1.4 cm, apex acute to shortly acuminate; scales several, dark reddish brown, glabrous or rust-brown pubescent along margin. Leaves pinnately compound, together with rachis 10–15 cm; petiole 1–3 cm; stipules caducous, ovate to lanceolate, 0.8–1.2 cm × 5–6 mm, margin entire or few toothed at apex; rachis shallowly sulcate, glabrous or puberulous, winged; leaflet blades 7–9(or 10) pairs, at intervals of 1–1.5 cm, oblong to oblong-lanceolate, 2.5–5 × 1–1.5 cm, lateral veins 10–20 pairs, both surfaces pilose or abaxially rust-brown pubescent along midvein, sometimes glabrescent, base obliquely rounded or broadly cuneate, margin minutely to coarsely serrate, apex acute, rarely obtuse. Compound corymbs terminal, rarely axillary, 4–6 × 3–5 cm, densely flowered; rachis and pedicels initially sparsely rust-brown pubescent, sometimes glabrescent or subglabrous; bracts caducous, linear to lanceolate, smaller than stipules. Pedicel 1–2 mm. Flowers 6–8 mm in diam. Hypanthium campanulate, abaxially glabrous or subglabrous. Sepals triangular, 1.5–2.5 mm, apex obtuse. Petals white, broadly ovate or elliptic-ovate, 3–5 × 2–3.5 mm, glabrous, base broadly clawed, apex obtuse. Stamens 20, ca. 1/2 as long as petals. Styles (4 or)5, ca. as long as or slightly longer than stamens, puberulous basally. Fruit pinkish white to crimson, ovoid, 6–8 mm in diam.; sepals persistent. Fl. May–Jun, fr. Aug–Sep. $2n = 34^*$.

Forests, forest margins, thickets on slopes and in valleys; 2600–4300 m. Qinghai, Sichuan, Xizang, Yunnan [N Myanmar].

- 1a. Leaflet margin deeply coarsely serrate; fruit pinkish white 24c. var. *grosseserrata*
- 1b. Leaflet margin minutely sharply serrate; fruit reddish to dark red.
 - 2a. Buds, leaflet blade abaxially along midvein, and inflorescence sparsely pubescent or rust-brown pubescent, glabrescent 24a. var. *rehderiana*
 - 2b. Buds, leaflet blade abaxially along midvein, and inflorescence densely rust-brown pubescent, not glabrescent 24b. var. *cupreonitens*

24a. *Sorbus rehderiana* var. *rehderiana*

西南花楸(原变种) xi nan hua qiu (yuan bian zhong)

Pyrus hypoglauca Cardot; *P. rehderiana* (Koehne) Cardot; *Sorbus hypoglauca* (Cardot) Handel-Mazzetti.

Leaflet margin minutely sharply serrate. Buds, leaflet blades abaxially along midvein, and inflorescences sparsely pubescent or rust-brown pubescent, glabrescent, subglabrous when old. Fruit reddish to dark red.

Coniferous or mixed forests, thickets on slopes; 2600–4300 m. Qinghai, Sichuan, Xizang, Yunnan [N Myanmar].

24b. *Sorbus rehderiana* var. *cupreonitens* Handel-Mazzetti, Anz. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 62: 223. 1925.

锈毛西南花楸 xiu mao xi nan hua qiu

Leaflet margin minutely sharply serrate. Buds, leaflet blades abaxially along midvein, and inflorescences densely rust-brown pubescent, not glabrescent. Fruit reddish to dark red.

- Forests and forest margins on mountain slopes, thickets in valleys; 3000–4100 m. S Xizang, NW Yunnan.

24c. *Sorbus rehderiana* var. *grosseserrata* Koehne in Sargent, Pl. Wilson. 1: 465. 1913.

巨齿西南花楸 *ju chi xi nan hua qiu*

Leaflet margin deeply coarsely serrate. Buds, leaflet blades abaxially along midvein, and inflorescences sparsely rust-brown pubescent, glabrescent. Fruit pinkish white.

- Forests, forest margins; 2600–3000 m. NW Sichuan.

25. *Sorbus randaiensis* (Hayata) Koidzumi, J. Coll. Sci. Imp. Univ. Tokyo 34(2): 52. 1913.

台湾花楸 *tai wan hua qiu*

Pyrus aucuparia (Linnaeus) Gaertner var. *randaiensis* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 98. 1911; *P. aucuparia* var. *trilocularis* Hayata; *Sorbus rufoferruginea* (Shirasawa) Koidzumi var. *trilocularis* (Hayata) Koidzumi; *S. trilocularis* (Hayata) Masamune.

Trees 3–8 m tall. Branchlets dark grayish brown, terete, glabrous, with numerous small white lenticels; buds ovoid, 8–10 mm, apex acute or acuminate; scales several, brown, glabrous, slightly viscid. Leaves imparipinnate, together with rachis 12–16 cm; petiole to 3 cm, puberulous, gradually glabrescent; stipules caducous, linear, 6–9 mm; rachis adaxially slightly sulcate, abaxially puberulous, narrowly winged; leaflet blades 8 or 9 pairs, terminal and basal ones smaller than middle ones, at intervals of 1–1.5 cm, oblong-lanceolate or elliptic-oblong, (3–)4–5.5 × (0.8–)1–1.5 cm, abaxially puberulous, adaxially glabrous, base slightly obliquely rounded, margin sharply serrate, with 20–30 teeth per side, apex shortly acuminate. Compound corymbs 7.5–8 × 9–10 cm, many flowered; rachis and pedicels sparsely pubescent or subglabrous, with oblong lenticels; bracts caducous, linear, 5–8 mm. Pedicel 3–5 mm, rarely to 8 mm. Flowers 5–6 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 mm, apex acute or shortly acuminate. Petals white, suborbicular, longer than sepals, base shortly and broadly clawed, apex obtuse. Stamens 20, slightly shorter than petals. Styles 3–5, somewhat not exceeding stamens. Fruit reddish, ovoid, 5–7 mm in diam., (3 or)4(or 5)-loculed; sepals persistent. Fl. Jun, fr. Oct. $2n = 34^*$.

- Forests; 2100–4200 m. Taiwan.

26. *Sorbus koehneana* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 316. 1906.

陕甘花楸 *shan gan hua qiu*

Pyrus koehneana (C. K. Schneider) Cardot; *Sorbus multi-juga* Koehne var. *microdonta* Koehne; *S. valbrayi* H. Léveillé.

Shrubs or small trees, 1.5–4 m tall. Branchlets dark gray or blackish gray, terete, slender, glabrous, with few lenticels; buds narrowly ovoid, 5–10 mm, apex acute or ± obtuse; scales several, reddish brown, glabrous or brown pubescent only apically.

Leaves imparipinnate, together with rachis 10–16 cm; petiole 1–2.5 cm; stipules caducous, lanceolate, 6–7 mm, submembranous, margin serrate, rarely entire; rachis adaxially sulcate, puberulous or subglabrous, slightly winged; leaflet blades 8–12-paired, rarely more, at intervals of 7–12 mm, grayish green abaxially, oblong to oblong-lanceolate, 1.5–3 × 0.5–1 cm, lateral veins 9 or 10 pairs, abaxially puberulous or subglabrous only along midvein, papillose, adaxially glabrous, base obliquely rounded, margin coarsely serrate except at base, with 10–14 teeth per side, apex obtuse or acute. Compound corymbs terminal, 5–9 × 4–6(–10) cm, many flowered; rachis and pedicels sparsely white pubescent, nearly glabrous when old; bracts caducous, linear or lanceolate, 5–6 mm. Pedicel 1–2 mm. Flowers 8–9 mm in diam. Hypanthium campanulate, glabrous. Sepals triangular, shorter than petals, apex obtuse. Petals white, 4–6 × 3–4 mm, adaxially puberulous or subglabrous, base shortly clawed. Stamens 20, ca. 1/3 as long as petals. Styles 5, nearly as long as stamens, ± free at base, puberulous or subglabrous. Fruit white, globose, 6–8 mm in diam.; sepals persistent. Fl. May–Jun, fr. Aug–Sep. $2n = 34^*$, 68^* .

- Mixed forests in mountain regions, thickets; 2300–4000 m. Gansu, Henan, Hubei, Qinghai, Shaanxi, Shanxi, Sichuan, W Yunnan.

27. *Sorbus prattii* Koehne in Sargent, Pl. Wilson. 1: 468. 1913.

西康花楸 *xi kang hua qiu*

Shrubs 2–4 m tall. Shoots dark gray to brownish gray, terete, with few lenticels, initially sparsely pubescent, glabrous when old; buds ovoid, 5–9 mm, apex acute; scales several, dark reddish brown, sparsely brown pubescent. Leaves imparipinnate, together with rachis 8–15 cm; petiole 1–2 cm; stipules caducous, lanceolate to ovate, 4–8 mm, submembranous, margin entire or sometimes lobed; rachis sulcate, initially puberulous, subglabrous when old, narrowly winged; leaflet blades 9–13(–17)-paired, at intervals of 6–10 mm, dark green adaxially, oblong, rarely oblong-ovate, 1.5–3 × 0.5–1 cm, lateral veins 7–9 pairs, abaxially puberulous along midvein, densely papillose, adaxially glabrous, base obliquely rounded, margin minutely sharply serrate apically, with 5–10 teeth, rarely more along each margin, apex obtuse or acute. Compound corymbs terminal, 5.5–9 × 4.5–8 cm, loosely many flowered; rachis and pedicels glabrous or puberulous, gradually glabrescent, with small ellipsoid lenticels; bracts caducous, lanceolate, 4–6 mm. Pedicel 2–3 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, apex obtuse. Petals white, broadly ovate, ca. 5 × 4 mm, adaxially puberulous or subglabrous, apex obtuse. Stamens 20, ca. 1/2 as long as petals. Styles 5 or 4, nearly as long as stamens, puberulous or subglabrous, connate at base to apical 1/3. Fruit white, globose, 7–8 mm in diam.; sepals persistent. Fl. May–Jun, fr. Aug–Sep.

Mixed or coniferous forests in mountain regions; 2000–4500 m. W Sichuan, S Xizang, C and NW Yunnan [Bhutan, Sikkim].

- 1a. Leaflets usually 9–13 pairs; rachis of leaves and inflorescence puberulous, subglabrous when old 27a. var. *prattii*
- 1b. Leaflets usually 13–17 pairs; rachis of leaves and inflorescence glabrous, rarely puberulous 27b. var. *aestivalis*

27a. *Sorbus prattii* var. *prattii*

西康花楸(原变种) xi kang hua qiu (yuan bian zhong)

Sorbus munda Koehne; *S. munda* f. *subarachnoidea* Koehne; *S. munda* f. *tatsienensis* Koehne; *S. pogonopetala* Koehne; *S. prattii* var. *tatsienensis* C. K. Schneider; *S. unguiculata* Koehne.

Leaflet blades usually 9–13-paired. Rachis of leaves and inflorescences initially puberulous, subglabrous when old.

Mixed or coniferous forests in mountain regions; 2100–3800 m. W Sichuan, SE Xizang, NW Yunnan [Bhutan, Sikkim].

27b. *Sorbus prattii* var. *aestivalis* (Koehne) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 340. 1974.

多对西康花楸 duo dui xi kang hua qiu

Sorbus aestivalis Koehne in Sargent, Pl. Wilson. 1: 469. 1913.

Leaflet blades usually 13–17-paired. Rachis of leaves and inflorescences glabrous, rarely puberulous.

• Sparse mixed forests in high mountain regions; 2000–4500 m. W Sichuan, S Xizang, C and NW Yunnan.

One of us (Spongberg) prefers to treat this variety as a synonym of the species because of the slight differences.

28. *Sorbus monbeigii* (Cardot) Balakr., J. Bombay Nat. Hist. Soc. 67: 59. 1970.

维西花楸 wei xi hua qiu

Pyrus monbeigii Cardot, Notul. Syst. (Paris) 3: 352. 1918.

Trees to 10 m tall. Branchlets brownish gray, glabrous, with small lenticels; buds reddish, shortly ovoid, ca. 8 mm, densely light brown pubescent; scales reddish. Leaves imparipinnate, together with rachis 10–15 cm; petiole 2–3.5 cm; stipules usually persistent, large, margin serrate, rarely entire; rachis adaxially shallowly sulcate, somewhat winged, pubescent; leaflet blades 6–8(–10) pairs, terminal and basal ones slightly smaller than others, at intervals of 1–1.5 cm, green abaxially, dark green adaxially, oblong or elliptic-oblong, 2–4 × 0.9–1.2 cm, abaxially lustrous, pubescent along midvein and margin, adaxially puberulous when young, base broadly cuneate or subrounded, oblique on one side, margin serrate except at base, apex obtuse or ± acute. Corymbs compound, 4–8 cm in diam., densely flowered; rachis and pedicels pubescent; bracts similar to stipules, but smaller. Pedicel 2–4 mm. Flowers 8–10 mm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular, 1–2 mm, apex ± obtuse or acute. Petals white, suborbicular, 3.5–5 × 3–4.5 mm, adaxially puberulous or glabrous, base shortly clawed. Stamens 20, ca. 1/2 as long as petals. Styles 4, nearly as long as stamens, glabrous, nearly free or connate at base. Fruit orangish red, ovoid, 6–8 mm in diam.; sepals persistent. Fl. May–Jun, fr. Aug–Sep. $2n = 34^*$.

• Mixed forests, thickets on mountain slopes; 2500–3000 m. NW Yunnan.

29. *Sorbus vilmorinii* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 317. 1906.

川滇花楸 chuan dian hua qiu

Shrubs or small trees, 4–6 m tall. Branchlets reddish brown to grayish brown when young, dark blackish gray when old, terete, densely rust-brown pubescent when young, gradually glabrescent; buds ovoid, 4–7 mm, apex shortly acuminate or acute; scales several, brown, rust-brown pubescent. Leaves imparipinnate, together with rachis 10–18 cm; petiole 1.2–2 cm; stipules caducous, subulate, 3–6 mm, membranous; rachis abaxially rust-brown pubescent, slightly winged, sulcate adaxially; leaflet blades 9–13-paired, at intervals of 6–12 mm, grayish green abaxially, oblong or oblong-elliptic, 1.5–2.5 × 6–10 mm, abaxially rust-brown pubescent along midvein, adaxially glabrous, base broadly cuneate or rounded, margin sparsely serrate apically, with 5–10 minute sharp teeth per side, usually entire basally, apex acute. Compound corymbs 5–7 × 2–5 cm, many flowered; rachis and pedicels rust-brown pubescent. Pedicel 1.5–3 mm. Hypanthium campanulate, rust-brown pubescent. Sepals triangular-ovate, 1–2 mm, apex ± obtuse. Petals white, ovate or subrounded, 3–3.5 × 2.5–3 mm, adaxially puberulous, apex obtuse. Stamens 20, ca. 1/2 as long as petals. Styles 5, slightly shorter than or nearly as long as stamens, glabrous. Fruit pink, globose, 7–8 mm in diam.; sepals persistent. Fl. Jun–Jul, fr. Sep–Oct. $2n = 34^*$, 68^* .

• Mountain slopes, roadsides, mixed forests along river banks, grasslands, bamboo thickets; 2800–4400 m. SW Sichuan, SE Xizang, NW Yunnan.

The type specimen is from an apomictic microspecies known only in cultivation, but almost indistinguishable specimens are diploid and frequent in the wild. In Sichuan, SE Xizang, and Yunnan there are similar apomictic microspecies with nearly identical fruits but larger leaflets. These are probably of hybrid origin with one parent being *Sorbus vilmorinii* and the other *S. rehderiana* or *S. monbeigii*. These trees have leaves 13–23(–40) cm, with 9–18 pairs of leaflets to 37(–75) × 15(–17) mm.

30. *Sorbus filipes* Handel-Mazzetti, Symb. Sin. 7: 472. 1933.

纤细花楸 qian xi hua qiu

Sorbus poteriifolia Handel-Mazzetti, p.p.

Shrubs 1.5–4.5 m tall. Branchlets brown or reddish brown when young, grayish black when old, reddish brown pubescent when young, prominently lenticellate when old; buds ovoid, 3–6 mm, apex ± obtuse or acute; scales several, dark brown, brown pubescent. Leaves imparipinnate, together with rachis 5–10 cm; petiole 0.5–1.5 cm; stipules caducous, purple, minute, 2–3 mm; rachis abaxially sparsely brown pubescent, narrowly winged, adaxially shallowly sulcate; leaflet blades usually 8–13 pairs, at intervals of 3–6 mm, elliptic or ovate-elliptic, 0.6–1.4 cm × 4–8 mm, lateral veins 4 or 5 pairs, both surfaces glabrous, base broadly cuneate or rotund, margin 3–5- coarsely toothed per side, apex obtuse or ± acute. Inflorescences corymbose or compound-corymbose, 3–6 cm, 3–10(–12)-flowered; rachis and pedicels glabrous or sparsely brown pubescent, glabrous in fruit; bracts caducous, linear, 1–3 mm, glabrous. Pedicel 7–10 mm. Hypanthium purple, campanulate, abaxially glabrous. Sepals triangular, 1.5–2.5 mm, apex obtuse. Petals crimson, broadly ovate, 4–5 × 3–4 mm, glabrous, apex obtuse. Stamens 20, shorter than petals. Styles 3–5, ca. as long as stamens, puberul-

lous basally. Fruit dark red, ovoid-globose, 7–8 mm in diam., somewhat glaucous; sepals persistent. Fl. May–Jun, fr. Aug–Sep. $2n = 68^*$.

Thickets of high mountains, river banks, stony slopes; 3000–4000 m. Xizang, NW Yunnan [N Myanmar].

For an apomictic microspecies, this taxon is remarkably constant over a wide geographic range.

31. *Sorbus microphylla* (Wallich ex J. D. Hooker) Wenzig, *Linnaea* 38: 76. 1874.

小叶花楸 xiao ye hua qiu

Pyrus microphylla Wallich ex J. D. Hooker, *Fl. Brit. India* 2: 376. 1878.

Shrubs or small trees, 2–5 m tall. Branchlets reddish brown when young, grayish brown when old, terete, puberulous when young, with sparse, oblong or suborbicular lenticels; buds conical or ovoid, 5–7(–8) mm, apex acuminate and puberulous; scales several, reddish brown. Leaves imparipinnate, together with rachis 11–14 cm; petiole 1–1.5 cm; stipules lanceolate or subulate-lanceolate, 4–6 mm, submembranous, margin entire or slightly 2-lobed; rachis slender, adaxially grooved with reddish glands at base of leaflet, \pm brown puberulous, glabrous when old, narrowly winged; leaflet blades 10–17(–19) pairs, at intervals of 5–8 mm, pale abaxially, dark green adaxially, linear-oblong, 0.7–1.5(–2) cm \times 4–8 mm, both surfaces glabrous, or abaxially with brown hairs only along midvein when young, base obliquely rounded, margin sparsely sharply serrate, apex obtuse or acute. Compound corymbs terminal, 2–4(–6) cm, laxly flowered; rachis and pedicels glabrous, rarely brown puberulous; bracts narrowly lanceolate, smaller than stipules, submembranous. Pedicel 6–9 mm. Flowers 7–10 mm in diam. Hypanthium dark purplish black, broadly campanulate, 2–3 mm, glabrous. Sepals triangular, 1.5–2 mm, apex acute, rarely \pm obtuse. Petals pink, suborbicular, 3–4 mm, glabrous, base shortly clawed. Stamens ca. 20, slightly shorter than petals; filaments rose; anthers nearly purplish black. Styles 5, ca. as long as stamens, pubescent basally. Fruit white or flushed pink or crimson, globose or ovoid, 8–10(–12) mm in diam., glabrous, without lenticels, with persistent erect sepals; seeds blackish, oblong-ovoid, 3–4 mm. Fl. May–Jun, fr. Sep–Oct.

Forests or shrubby thickets in valleys or along river banks; 3000–4000 m. E Xizang (Gongbo'gyamda Xian), NW Yunnan [Afghanistan, Bhutan, NE India, N Myanmar, Nepal, Pakistan, Sikkim].

This taxon is probably an aggregate of apomictic microspecies derived partly from *Sorbus rufopilosa* and, in China, partly from hybrids and back-crosses between the apomictic, tetraploid *S. filipes* and the diploid *S. rehderiana* and *S. monbeigii*.

32. *Sorbus lanpingensis* L. T. Lu, *Bull. Bot. Res.*, Harbin 9(2): 51. 1989.

兰坪花楸 lan ping hua qiu

Shrubs small, to 1.5 m tall. Branchlets gray or grayish brown, glabrous when old, with few oblong lenticels; buds ovoid to oblong-ovoid, apex acute or obtuse; scales several, brown, rusty pubescent. Leaves imparipinnate, together with rachis 4–7 cm; petiole 6–11 mm; stipules lanceolate or linear,

2–5 mm, margin entire, puberulous; rachis slender, abaxially rust-brown pubescent, slightly narrowly winged, adaxially shallowly grooved; leaflet blades 13–18 pairs, at intervals of 4–8 mm, elliptic or oblong-elliptic, 6–11 \times 2–4 mm, abaxially rust-brown pubescent along midvein, adaxially glabrous, base cuneate, margin deeply sharply incised-serrate, entire near base, apex acute. Compound corymbs terminal, small, usually 5–12-flowered; rachis and pedicels rust-brown pubescent; bracts lanceolate, 3–5 mm, with sparse, rust-brown hairs. Pedicel 3–9 mm. Flowers 4–6 mm in diam. Hypanthium campanulate, rust-brown pubescent when young, gradually glabrescent or subglabrous when old. Sepals triangular, apex acute, rarely obtuse. Petals pink, suborbicular, 2–3 mm and ca. as broad, without hairs, base shortly clawed. Stamens 10–15, ca. as long as petals. Styles 3, ca. as long as stamens, slightly pilose basally. Fl. May–Jun.

• Coniferous forests; below 3200 m. NW Yunnan (Lanping Xian).

33. *Sorbus rufopilosa* C. K. Schneider, *Bull. Herb. Boissier*, sér. 2, 6: 317. 1906.

红毛花楸 hong mao hua qiu

Shrubs or small trees, 2.7–5 m tall. Young branches dark gray to grayish brown, terete, rusty pubescent when young, glabrescent, with few small lenticels; buds ovoid, 5–8 mm, apex acute and slightly pubescent; scales several, dark brown. Leaves imparipinnate, together with rachis 6–10 cm; petiole ca. 1 cm; stipules lanceolate to semiorbicular, 3–5 mm, somewhat herbaceous, margin coarsely serrate; rachis abaxially pubescent, narrowly winged, adaxially grooved; leaflet blades 8–14(–17)-paired, at intervals of 5–9 mm, elliptic to narrowly elliptic or lanceolate, (0.8–)1–2 cm \times (3–)6–10 mm, lateral veins 6–8(–10) pairs, abaxially densely pubescent along midvein when young, subglabrous when old, adaxially sparsely pubescent, base broadly cuneate or rounded, with 6–10 minute sharp teeth per side, entire basally, apex acute or obtuse. Inflorescences corymbose or compound-corymbose, 2.5–4(–5) cm, 3–8(or more)-flowered; rachis and pedicels pubescent; bracts lanceolate or linear, 3–4 mm, margin slightly serrate. Pedicel 3–5 mm. Flowers 6–8 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, apex obtuse, rarely acute. Petals pink, broadly ovate, 4–5 \times 3–4 mm, glabrous. Stamens 20, shorter than petals. Styles 3 or 4(or 5), ca. as long as stamens, pilose basally. Fruit red, ovoid-globose, 8–10 mm in diam., with persistent erect sepals. Fl. May–Jun, fr. Aug–Sep. $2n = 34$.

Coniferous or mixed forests, thickets in valleys; 2700–4000 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, N Myanmar, Nepal, Sikkim].

- 1a. Leaflet blades elliptic or narrowly so, 1–2 cm \times 6–10 mm; branchlets, leaflet blades, and inflorescences rust-red hairy 33a. var. *rufopilosa*
- 1b. Leaflet blades lanceolate, 0.8–1.2 cm \times 3–5 mm, branchlets, leaflet blades, and inflorescences \pm gray woolly hairy 33b. var. *stenophylla*

33a. *Sorbus rufopilosa* var. *rufopilosa*

红毛花楸(原变种) hong mao hua qiu (yuan bian zhong)

Branchlets, leaflet blades, and inflorescences rust-red hairy. Leaflet blades elliptic or narrowly so, 1–2 cm × 6–10 mm.

Coniferous or mixed forests, thickets in valleys; 2700–4000 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, N Myanmar, Nepal, Sikkim].

33b. *Sorbus rufopilosa* var. *stenophylla* Koehne, Repert. Spec. Nov. Regni Veg. 10: 517. 1912.

狭叶花楸 xia ye hua qiu

Branchlets, leaflet blades, and inflorescences ± gray woolly hairy. Leaflet blades lanceolate, 0.8–1.2 cm × 3–5 mm.

Mixed forests in mountain regions; 2700–3700 m. SE Xizang, NE Yunnan [N Myanmar].

34. *Sorbus albopilosa* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 495. 1980.

白毛花楸 bai mao hua qiu

Shrubs or small trees, (2–)5–8 m tall. Branchlets purplish brown, terete, initially grayish white pilose, glabrous when old, with few lenticels; buds oblong-ovoid, apex acute; scales few, brown, brown pilose. Leaves imparipinnate, together with rachis 7–10 cm; petiole 1–2 cm; stipules lanceolate, 4–5 mm, margin entire, subherbaceous; rachis abaxially grooved, narrowly winged, gray white pilose when young, glabrescent; leaflet blades (9–)12–17-paired, at intervals of 5–8 mm, oblong or ovate-oblong, 1–2 cm × 4–6 mm, both surfaces white pilose when young, glabrescent, base broadly cuneate or subrounded, with 5–10 teeth per side, entire basally, apex acute. Compound corymbs many flowered; rachis and pedicels white pilose; bracts linear or lanceolate, 3–4 mm, margin entire. Pedicel 4–7 mm. Flowers 5–7 mm in diam. Hypanthium campanulate, abaxially white pilose. Sepals triangular, apex acute. Petals pink to reddish purple, suborbicular, 3–4 mm in diam., glabrous, base shortly clawed. Stamens ca. 20, somewhat shorter than petals. Styles 3–5, nearly as long as stamens, base pubescent; stigma pubescent. Fruit red, ovoid-globose, 6–8 mm in diam., with persistent erect sepals. Fr. Aug.

• Coniferous forests on slopes, cut-over lands; 3300–4100 m. S Xizang.

35. *Sorbus setschwanensis* (C. K. Schneider) Koehne in Sargent, Pl. Wilson. 1: 475. 1913.

四川花楸 si chuan hua qiu

Sorbus vilmorinii C. K. Schneider var. *setschwanensis* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 318. 1906.

Shrubs 2–5 m tall. Branchlets brownish gray to blackish gray, terete, glabrous, with inconspicuous small lenticels; buds narrowly ovoid, 5–7 mm, apex acute or shortly acuminate; scales several, dark reddish brown, reddish brown pubescent. Leaves imparipinnate, together with rachis 5–13 cm; petiole 0.8–1.5(–2.5) cm; stipules ovate-lanceolate or lanceolate, 4–6

mm, membranous, margin entire or lobed; rachis adaxially sulcate, glabrous, slightly winged; leaflets 12–17 pairs, terminal ones smaller, at intervals of 4–6 mm, pale abaxially, dark green adaxially, narrowly oblong, 0.7–1.6 cm × 4–7 mm, both surfaces glabrous, base usually obliquely rounded, apex obtuse or acute. Compound corymbs terminal on lateral branchlets, 3.5–5 × 2.5–4 cm, 10–25- or more flowered; rachis and pedicels glabrous, with small oblong lenticels; bracts lanceolate or linear-lanceolate, 3–5 mm, margin entire or sometimes lobed. Pedicel 1–3 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular, 1–2 mm, apex acute or ± obtuse. Petals white, oblong-ovate, 3–4 × 2.5–3 mm, adaxially puberulous or glabrous, base shortly clawed, apex obtuse. Stamens 20, shorter than petals. Styles 3–5, nearly as long as stamens, glabrous. Fruit white or slightly stained purplish, globose, 5–8 mm in diam., with persistent erect sepals. Fl. May–Jun, fr. Aug–Sep. $2n = 34^*$.

• Stony slopes, mixed forests; 2300–3000 m. Guizhou, Sichuan.

36. *Sorbus multijuga* Koehne in Sargent, Pl. Wilson. 1: 472. 1913.

多对花楸 duo dui hua qiu

Sorbus multijuga var. *microdenta* Koehne.

Shrubs or small trees, 2.5–5(–7) m tall. Branchlets reddish brown when young, gray or blackish gray when old, terete, puberulous when young, glabrous when old, with small oblong lenticels; buds narrowly ovoid, 5–7 mm, puberulous or glabrous, apex shortly acuminate; scales dark purplish red. Leaves imparipinnate, together with rachis 8–13 cm; petiole 1–2 cm; stipules lanceolate, 5–7 mm, herbaceous, rarely submembranous, margin incised-serrate, apex acuminate; rachis puberulous abaxially, glabrescent, somewhat winged, adaxially grooved; leaflet blades 17–21-paired, at intervals of 5–10 mm, grayish green abaxially, oblong or oblong-lanceolate, 1–2.5 × 0.5–1 cm, lateral veins 8–10 pairs, abaxially pilose only along midvein, adaxially glabrous, base obliquely rounded, margin with 6–16 minute sharp teeth per side, entire near base, apex acute or ± obtuse. Compound corymbs terminal, 5–9 × 3–7 cm, 10–30-flowered; rachis and pedicels initially sparsely pilose, glabrescent or subglabrous when mature; bracts lanceolate. Pedicels 2–4 mm. Flowers 5–6 mm in diam. Hypanthium campanulate, glabrous or sparsely pubescent. Sepals ovate, glabrous, apex acute or ± obtuse. Petals white, ovate, 4–4.5 × 3–4 mm, adaxially puberulous or subglabrous, base shortly clawed, apex obtuse. Stamens 15–20, slightly shorter than petals. Styles 3–5, basally connate, nearly as long as stamens, glabrous. Fruit white, globose, 6–7 mm in diam., with persistent erect sepals. Fl. May–Jun, fr. Aug–Sep.

• Mixed forests in mountain regions, rocky slopes; 2300–3000 m. W Sichuan, NE Yunnan (Yongshan Xian).

37. *Sorbus megalocarpa* Rehder in Sargent, Pl. Wilson. 2: 266. 1915.

大果花楸 da guo hua qiu

Shrubs or small trees, 5–8 m tall. Branchlets dark purple when young, purplish brown to blackish brown when old,

slightly cottony-hairy when young, glabrous when old, with conspicuous grayish white oblong lenticels; buds ovoid, (0.8–) 1–1.5(–2) cm, apex ± obtuse; scales brown, suborbicular or broadly ovate, glabrous. Leaves simple; petiole to 1.8 cm, glabrous; leaf blade grayish green abaxially, light green adaxially, elliptic-obovate or obovate-elliptic, 10–18 × 5–9 cm, lateral veins 14–20 pairs, nearly parallel and terminating in marginal teeth, raised abaxially and impressed adaxially, both surfaces glabrous or abaxially cottony-hairy in vein axils, base cuneate to subrounded, margin crenate-serrate or lobed, apex acuminate. Compound corymbs terminal on branchlets, 4–7 × 9–13 cm, many flowered; rachis and pedicels cottony-hairy, subglabrous when old, with conspicuous lenticels. Pedicel 5–8 mm. Flowers 5–8 mm. Hypanthium campanulate, abaxially tomentose. Sepals triangular, ca. 2 mm and ca. as broad, apex acute. Petals broadly ovate or suborbicular, ca. 3 mm and ca. as broad, apex obtuse. Stamens 20, ca. 3.5 mm. Styles 3 or 4, connate at base, ca. as long as stamens, glabrous. Fruit dark reddish brown, ovoid, ovoid-globose, or subglobose, (1.5–)2–3 × (1–) 1.5–2 mm, 3- or 4-loculed, with dense rusty lenticels, with persistent revolute sepals; seeds brown, obovoid, compressed, 4–6 mm. Fl. Apr–May, fr. Jul–Aug.

• Mountain valleys, river sides, stream sides, rocky forests on slopes, cliffs; 1200–2700 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan, N Yunnan.

- 1a. Leaf petiole 1–1.8 cm, blade cuneate to subrounded at base; fruit ovoid or ovoid-globose, 1.5–2 cm in diam. 37a. var. *megalocarpa*
 1b. Leaf petiole less than 1 cm, blade cuneate at base; fruit subglobose, 1–1.5 cm in diam. 37b. var. *cuneata*

37a. *Sorbus megalocarpa* var. *megalocarpa*

大果花楸(原变种) da guo hua qiu (yuan bian zhong)

Aria megalocarpa (Rehder) H. Ohashi & Iketani; *Pyrus megalocarpa* (Rehder) Bean.

Leaf petiole 1–1.8 cm; blade cuneate to subrounded at base. Fruit ovoid or ovoid-globose, 1.5–2 cm in diam.

• Mountain valleys, river sides, rocky forests on slopes, cliffs; 1200–2700 m. Guangxi, Guizhou, Hubei, Hunan, W Sichuan, N Yunnan.

37b. *Sorbus megalocarpa* var. *cuneata* Rehder in Sargent, Pl. Wilson. 2: 267. 1915.

楔叶大果花楸 xie ye da guo hua qiu

Aria megalocarpa var. *cuneata* (Rehder) H. Ohashi & Iketani.

Leaf petiole less than 1 cm; blade cuneate at base. Fruit subglobose, 1–1.5 cm in diam.

• Rocky forests on slopes, stream sides; 1300–2700 m. Guizhou, Sichuan.

38. *Sorbus guanxianensis* T. C. Ku, Bull. Bot. Res., Harbin 10(3): 22. 1990.

灌县花楸 guan xian hua qiu

Trees ca. 6 m tall. Branchlets yellowish brown when young, blackish brown when old, terete, usually glabrous; buds brownish, ovoid-globose, 6–8 mm, apex acute; scales several, brown, broadly ovate, subglabrous. Leaves simple; petiole 6–10 mm; leaf blade pale green abaxially, dark green adaxially, narrowly elliptic or obovately narrowly elliptic, 9–20 × 4–8.5 cm, lateral veins 12–14 pairs, raised abaxially, both surfaces usually glabrous or sparsely lanuginose at vein axils abaxially, base cuneate, margin crenulate, apex shortly acuminate. Compound corymbs terminal, 7–8 × 8–9 cm in fruit; rachis and pedicels sparsely pubescent when young, with conspicuous lenticels when mature. Pedicel 6–10 mm. Hypanthium campanulate, abaxially initially lanuginose, glabrescent. Sepals triangular, 1–2 × 1–1.5 mm, apex acute or ± obtuse. Stamens ca. 20. Fruit brownish when young, oblong or obovoid-oblong, 1.5–2 × 1–1.5 cm. Fr. Aug–Sep.

• Slopes, thickets. Sichuan (Guan Xian).

39. *Sorbus arguta* T. T. Yu, Acta Phytotax. Sin. 8: 223. 1963.

锐齿花楸 rui chi hua qiu

Aria yuarguta H. Ohashi & Iketani.

Trees small, 4–5 m tall. Branchlets reddish brown when young, dark gray or black grayish brown when old, sparsely pubescent when young, glabrous when old; buds ovoid, 5–8 mm, apex acute; scales several, brownish, glabrous. Leaves simple; petiole ca. 1 cm, glabrous when mature; leaf blade pale green abaxially, dark green adaxially, oblong-ovate or ovate-lanceolate, 6–10 × 2.5–4 cm, lateral veins 13–18 pairs, nearly parallel and terminating in marginal teeth, distinctly raised abaxially and impressed adaxially, abaxially usually with few tomentose hairs in axils of veins, adaxially puberulent when young, glabrous when old, base broadly cuneate to subrounded, margin sharply incised doubly serrate or lobed, apex acuminate. Compound corymbs terminal, 3–4 × 2–4 cm in fruit, few flowered; rachis and pedicels sparsely pubescent, glabrous when old, with sparse, inconspicuous lenticels. Flowers not seen. Fruit reddish brown, nearly globose, 1–1.2 cm in diam., 4-loculed, with many small white lenticels; sepals persistent, triangular, ca. 2 mm, puberulent, apex ± acute; fruiting pedicels 7–8 mm. Fr. Aug–Sep.

• Mixed forests on slope; 1000–1300 m. S Sichuan, Yunnan.

40. *Sorbus yunnanensis* L. T. Lu, Acta Phytotax. Sin. 38: 279. 2000.

栎叶花楸 li ye hua qiu

Sorbus carpinifolia T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 23: 215. 1985, not Hedlund (1901); *Aria carpinifolia* H. Ohashi & Iketani.

Shrubs 3.5–8 m tall. Shoots purplish brown when young, grayish brown when old, terete, glabrous when old, sparsely lenticellate; buds narrowly ovoid, 7–10 mm, apex acute; scales brown, broadly ovate, glabrous. Leaves simple; petiole 1–1.5 cm, abaxially sometimes tomentose-pilose, gradually glabrescent, adaxially glabrous; leaf blade pale green abaxially, dark green adaxially, elliptic or oblong-elliptic, 5–8 × 2–3.5 cm,

lateral veins 7–11 pairs, nearly parallel and terminating in marginal teeth, raised abaxially and impressed adaxially, both surfaces glabrous or slightly tomentose near base adaxially or at vein axils abaxially, base cuneate, margin irregularly serrate, apex acute or shortly acuminate. Compound corymbs terminal, few flowered; fruiting rachis and pedicels tomentose when young, glabrescent, with grayish white elliptic lenticels. Flowers not seen. Fruit reddish brown, subglobose, (0.8–)1–1.2 cm in diam., 2-loculed, glabrous, with few small lenticels; sepals persistent, erect or slightly spreading, triangular or triangular-ovate, tomentose. Fr. Sep–Oct.

• Forests; 1000–1800 m. SE Yunnan (Malipo Xian, Xichou Xian).

41. *Sorbus zahlbruckneri* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 318. 1906.

长果花楸 chang guo hua qiu

Aria hunanica (C. J. Qi) H. Ohashi & Iketani; *A. zahlbruckneri* (C. K. Schneider) H. Ohashi & Iketani; *Sorbus hunanica* C. J. Qi.

Trees or shrubs, to 15 m tall. Branchlets dark reddish brown to blackish brown, sparsely white tomentose when young, glabrescent, with few elliptic lenticels; buds ovoid or narrowly ovoid, 6–10 mm; scales several, dark reddish brown, glabrous or apically sparsely tomentose. Leaves simple; petiole 2–3 cm, white tomentose; leaf blade narrowly elliptic or oblong-ovate, 9–14 × 5–9 cm, lateral veins 10–14 pairs, nearly parallel and terminating in marginal teeth, raised abaxially, abaxially grayish white tomentose, gradually glabrescent, adaxially pubescent, glabrate, base rounded or broadly cuneate, margin irregularly serrate or shallowly doubly serrate, apex acute. Compound corymbs terminal, 5–8 × 4–6 cm, many flowered; rachis and pedicels white tomentose when young, glabrate, with sparse, small lenticels. Fruit narrowly ovoid to oblong, 6–10 × 4–7 mm, white tomentose, 2-loculed; sepals persistent. Fr. Jul–Aug.

• Slopes, mountain valleys, dense forests; 1300–2000 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan.

42. *Sorbus yuana* Spongberg, J. Arnold Arbor. 67: 257. 1986.

神农架花楸 shen nong jia hua qiu

Aria yuana (Spongberg) H. Ohashi & Iketani.

Trees small to medium-sized, to ca. 15 m tall. Branchlets reddish brown when young, purplish or grayish black when old, terete, sparsely white tomentose when young, glabrate, with small elongated or rounded lenticels; buds ovoid, 0.9–1.2 cm × 4–6 mm; scales chestnut-brown, glabrous except with scattered white hairs along margin. Leaves simple; petiole 1.5–2.7 cm, pubescent when young, later subglabrous; leaf blade pale green abaxially, dark green adaxially, elliptic to obovate-elliptic, 6–13 × 3.5–9.5 cm, lateral veins 11–13 pairs, nearly parallel and terminating in marginal teeth, prominent abaxially and impressed adaxially, abaxially persistently grayish white tomentose, adaxially glabrous when old, base cuneate or rounded to subcordate, margin deeply regularly doubly serrate, apex acute to shortly

acuminate. Compound corymbs terminal on elongated shoots, to 20 cm in diam., many flowered; rachis and pedicels purplish brown, tomentose when young, glabrate. Fruit cherry-red, oblong or obovoid-oblong, 1–1.6 cm × 6–13 mm, sparsely tomentose especially at base and apex, with few scattered lenticels, 2-loculed, with persistent remains of hypanthium and stamens, with densely pubescent base of style; seeds obovate, ca. 7 × 4 mm, testa dark reddish brown. Fl. May–Jun, fr. Sep.

• Steep ravine slopes; above 2000 m. W Hubei, Sichuan.

This is a rare tree.

43. *Sorbus thibetica* (Cardot) Handel-Mazzetti, Symb. Sin. 7: 467. 1933.

康藏花楸 kang zang hua qiu

Pyrus thibetica Cardot, Notul. Syst. (Paris) 3: 349. 1918; *Aria thibetica* (Cardot) H. Ohashi & Iketani; *Sorbus atosanguinea* T. T. Yu & H. T. Tsai; *S. wardii* Merrill.

Trees, rarely shrubs, ca. 7(–10) m tall or more. Branchlets brown to grayish brown, white tomentose when young, gradually glabrescent, with few gray orbicular small lenticels; buds ovoid, 5–9 mm, apex acute to acuminate; scales imbricate, several, dark reddish brown, glabrous or sparsely pubescent apically. Leaves simple; petiole 3–10 mm, initially grayish white tomentose, subglabrous when mature; leaf blade dark green adaxially, broadly elliptic, elliptic-ovate, or elliptic-obovate, 9–15 × 4–9 cm, lateral veins (10–)13–16 pairs, nearly parallel and terminating in marginal teeth, prominent abaxially, abaxially gray tomentose, subglabrous when old, adaxially glabrous, base cuneate, rarely to subrounded, margin irregularly doubly serrate, apex acute to shortly acuminate. Compound corymbs terminal, 3–6 × 4–8 cm, 20–30-flowered or more; rachis and pedicels grayish white tomentose, glabrescent. Pedicel 5–9 mm. Flowers (0.8–)1–1.6 cm in diam. Hypanthium campanulate, abaxially grayish white tomentose. Sepals triangular-lanceolate, 2–4 mm, apex acuminate. Petals white, spatulate, ovate, or obovate, 5–8 × 3.5–5 mm, adaxially grayish white tomentose near apex, apex obtuse. Stamens 15–20, shorter than petals. Styles 2, rarely 3 or 4, free or slightly connate at base, slightly longer than or nearly as long as stamens. Fruit scarlet, ovoid or obovoid, 0.9–1.2(–1.5) cm × 7–11(–13) mm, with 2, rarely 3 or 4 locules, sparsely small lenticellate; sepals persistent; seeds dark brown, obovoid or triangular-lanceolate, 6–8 mm, compressed. Fl. May–Jul, fr. Sep–Oct.

Dense forests on slopes or in valleys, rocky slopes, stream banks, shrubby thickets; 2400–3800 m. SE Xizang, NW Yunnan [Bhutan, N Myanmar].

44. *Sorbus pallescens* Rehder in Sargent, Pl. Wilson. 2: 266. 1915.

灰叶花楸 hui ye hua qiu

Aria pallescens (Rehder) H. Ohashi & Iketani; *Sorbus ochrocarpa* Rehder.

Trees to 7 m tall. Branchlets reddish brown or purplish brown when young, dark grayish brown when old, terete, sparsely pubescent when young, glabrous when old, with few

scattered prominent lenticels; buds ovoid or narrowly ovoid, 6–9 mm, apex acute to shortly acuminate; scales several, dark reddish brown, glabrous. Leaves simple; petiole 5–12 mm, sparsely tomentulose or subglabrous; leaf blade elliptic, elliptic-obovate, or ovate, 5–10 × 2–5 cm, lateral veins 10–14 pairs, nearly parallel and terminating in marginal teeth, slightly raised abaxially and impressed adaxially, both surfaces tomentose when young, abaxially persistently tomentose intermixed with soft hairs along midvein and lateral veins, adaxially glabrate, base cuneate to rounded, margin irregularly doubly serrate, apex acute to shortly acuminate. Compound corymbs terminal, 1.5–3.5 × 4–4.5 cm, 10–20(–25)-flowered; rachis and pedicels yellowish white tomentose, glabrate. Pedicel 3–4 mm. Flowers 0.9–1.2 cm in diam. Hypanthium campanulate, abaxially densely yellowish white tomentose. Sepals triangular, 1.5–2 mm, apex acute. Petals white, ovate or triangular-ovate, rarely obovate, ca. 4 × 3 mm, adaxially yellowish white tomentose, apex obtuse or emarginate. Stamens 20, shorter than or nearly as long as petals. Styles 2–4(or 5), shorter than or nearly as long as stamens, basally connate and yellowish white tomentose. Fruit white, stained red, subglobose, 6–8(–10) mm in diam., sparsely gray tomentose at base and apex when young, with or without few small lenticels, 2–4(or 5)-loculed, hypanthium persistent; seeds brown, obovoid, 3–4 mm, compressed. Fl. May–Jun, fr. Aug–Sep.

• Mixed forests on slopes, forest margins, thickets, stream sides; 2000–3300 m. W Sichuan, S Xizang, NW Yunnan.

45. *Sorbus cuspidata* (Spach) Hedlund, Kongl. Svenska Vetenskapsakad. Handl. 35: 89. 1901.

白叶花楸 bai ye hua qiu

Crataegus cuspidata Spach, Hist. Veg. Phan. 2: 106. 1834; *Pyrus crenata* Lindley (1835), not D. Don (1825); *P. vestita* Wallich ex J. D. Hooker.

Shrubs 7–8 m tall. Branchlets purplish brown when young, grayish brown when old, grayish white tomentose when young, glabrous when old; buds ovoid, 0.7–1.4 cm, glabrous, apex acute; scales imbricate, several, brown. Leaves simple; petiole 1–2.5 cm, stout, white tomentose; stipules brownish, lanceolate, 0.8–1.2 cm, membranous, tomentulose; leaf blade elliptic, 12–22 × 7–12 cm, lateral veins 10–15 pairs, nearly parallel and terminating in marginal teeth, abaxially densely white tomentose, adaxially puberulent when young, glabrate, base rounded or broadly cuneate, margin unevenly serrate or doubly serrate, sometimes ± lobed, apex acute or ± obtuse, rarely shortly acuminate. Compound corymbs 5–8 × (5–)7–10 cm, 30–45-flowered; rachis and pedicels initially white tomentose, glabrescent. Pedicel 5–8 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, abaxially white pubescent except at base. Sepals triangular or lanceolate, 2.5–3 × 1.5–2.5 mm, apex acute. Petals white, obovate, 6–8 × 4–6 mm, adaxially puberulent, base shortly clawed. Stamens 20–25, slightly shorter than petals; anthers purple. Styles 3–5, basally connate and tomentose. Fruit dark red, globose, 1.5–2 cm in diam., 3–5-loculed, with many conspicuous lenticels; sepals persistent; seeds brown, lanceolate, compressed, 7–8 × 3–4 mm. Fl. Jun–Jul, fr. Aug–Sep.

Forests on slopes, forest margins; 2000–3500 m. Xizang [?Bhutan, India, Myanmar, Nepal, Sikkim].

Records for Bhutan probably refer to *Sorbus thibetica* (Fl. Bhutan 1(3): 595. 1987).

46. *Sorbus hemsleyi* (C. K. Schneider) Rehder in Sargent, Pl. Wilson. 2: 276. 1915.

江南花楸 jiang nan hua qiu

Micromeles hemsleyi C. K. Schneider, Ill. Handb. Laubholz. 1: 704. 1906; *Aria hemsleyi* (C. K. Schneider) H. Ohashi & Iketani; *A. xanthoneura* (Rehder) H. Ohashi & Iketani; *M. schwerinii* C. K. Schneider; *Pyrus xanthoneura* (Rehder) Cardot; *Sorbus henryi* Rehder; *S. xanthoneura* Rehder.

Trees or shrubs, 7–10 m tall. Branchlets dark reddish brown when young, brown when old, terete, glabrous, prominently lenticellate; buds ovoid or narrowly ovoid, apex acute; scales several, dark red, glabrous. Leaves simple; petiole 1–2 cm, slightly tomentulose when young, later glabrous; leaf blade dark green adaxially, ovate to narrowly elliptic-ovate, rarely narrowly elliptic-obovate, 5–11(–15) × 2.5–5.5(–8) cm, lateral veins 12–14 pairs, nearly parallel and terminating in marginal teeth, raised abaxially, abaxially grayish white tomentose, glabrous only along midvein and lateral veins, adaxially glabrous, base cuneate, rarely subrounded, margin serrulate and somewhat recurved, apex acute or shortly acuminate. Compound corymbs terminal, 3–4 × 3.5–5 cm, (15–)20–30-flowered; rachis and pedicels grayish white tomentose. Pedicel 5–12 mm. Flowers 1–1.2 cm in diam. Hypanthium campanulate, abaxially densely grayish white tomentose. Sepals triangular-ovate, 1.5–2.5 mm, apex acute to shortly acuminate. Petals pale green, broadly ovate to oblong, 3–5 × 2–3(–4) mm, adaxially tomentulose, apex obtuse or somewhat emarginate. Stamens 20, unequal in length, long ones ca. as long as petals. Styles 2 or 3, not exceeding stamens, basally connate and grayish white tomentose. Fruit russet, subglobose, 5–8 mm in diam., with distinct small brownish lenticels; sepals persistent. Fl. May–Jun, fr. Jul–Sep.

• Dry forests on slopes, evergreen broad-leaved forests; 900–3200 m. Anhui, Fujian, Gansu, ?Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

One of us (Spongberg) believes that *Sorbus henryi* (*Micromeles schwerinii*) is distinct from *S. hemsleyi* and should be recognized.

47. *Sorbus coronata* (Cardot) T. T. Yu & H. T. Tsai, Bull. Fan Mem. Inst. Biol., Bot. Ser., 7: 120. 1936.

冠萼花楸 guan e hua qiu

Trees to 10 m tall. Branchlets brown or purplish brown, terete, initially densely tomentose, gradually glabrescent, with many grayish white lenticels; buds narrowly ovoid, 5–8 mm, apex acute to shortly acuminate; scales several, reddish brown. Leaves simple; petiole (0.5–)1–2 cm, sparsely tomentose or subglabrous; leaf blade dark green adaxially, oblong-elliptic or oblong-ovate to ovate-lanceolate, 7–13 × 4–6 cm, lateral veins (9–)12–16 pairs, nearly parallel and terminating in marginal teeth, distinctly raised abaxially and impressed adaxially, abaxially densely gray tomentose, sometimes glabrescent, midvein and lateral veins initially tomentose, glabrate, adaxially gla-

brous, base broadly cuneate to rounded, margin unevenly minutely serrate to doubly serrate, apex acuminate. Compound corymbs terminal, 3–4 × 4–5 cm, 20–30-flowered; rachis and pedicels densely grayish white tomentose, sometimes glabrescent. Pedicel 3–5 mm. Flowers 8–11 mm in diam. Hypanthium campanulate, abaxially grayish white tomentose. Sepals ovate-triangular, ca. 2 mm, apex acute. Petals white, obovate or suborbicular, 3–4 mm, adaxially tomentulose, apex obtuse. Stamens ca. 20, nearly as long as petals. Styles 2 or 3, not exceeding stamens, glabrous or puberulent, connate at base. Fruit red, subglobose, 8–10 mm in diam., initially tomentulose, 2- or 3-loculed, lenticellate; sepals persistent; seeds brown, ovoid or subglobose, compressed. Fl. Apr–May, fr. Aug–Sep.

Mixed forests in ravines, forests on slopes, river banks, mountain regions; 1800–3200 m. W Guizhou, Xizang, N Yunnan [N Myanmar].

- 1a. Petiole 0.5–1 cm; leaf blade abaxially and pedicel glabrescent 47c. var. *glabrescens*
 1b. Petiole 1–2 cm; leaf blade abaxially and pedicel persistently pubescent.
 2a. Leaf blade oblong-elliptic or oblong-ovate to ovate-lanceolate; lateral veins 12–16 pairs 47a. var. *coronata*
 2b. Leaf blade ovate-lanceolate; lateral veins 9 or 10 pairs 47b. var. *ambrozyana*

47a. *Sorbus coronata* var. *coronata*

冠萼花楸(原变种) guan e hua qiu (yuan bian zhong)

Pyrus coronata Cardot, Notul. Syst. (Paris) 3: 348. 1918; *Aria coronata* (Cardot) H. Ohashi & Iketani.

Petiole 1–2 cm; leaf blade oblong-elliptic or oblong-ovate to ovate-lanceolate, abaxial surface and pedicels usually persistently pubescent; lateral veins 12–16 pairs.

Mixed forests in ravines, coniferous forests on slopes, river banks; 1800–3200 m. W Guizhou, Xizang, N Yunnan [N Myanmar].

47b. *Sorbus coronata* var. *ambrozyana* (C. K. Schneider) L. T. Lu, Acta Phytotax. Sin. 38: 280. 2000.

少脉冠萼花楸 shao mai guan e hua qiu

Sorbus ambrozyana C. K. Schneider, Bot. Gaz. 63. 401. 1917.

Petiole 1–2 cm; leaf blade ovate-lanceolate, abaxial surface and pedicels usually persistently pubescent; lateral veins 9 or 10 pairs.

- Mountain regions; 3000–3200 m. NW Yunnan (Lijiang Xian).

47c. *Sorbus coronata* var. *glabrescens* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 494. 1980.

脱毛冠萼花楸 tuo mao guan e hua qiu

Petiole 0.5–1 cm; leaf blade abaxially and pedicels usually glabrescent, becoming glabrous or subglabrous.

- Forests on slopes; below 2800 m. SE Xizang (Médog Xian).

48. *Sorbus alnifolia* (Siebold & Zuccarini) K. Koch, Ann. Mus. Bot. Lugduno-Batavi 1: 249. 1864.

水榆花楸 shui yu hua qiu

Trees to 20 m tall. Branchlets dark reddish brown when young, dark grayish brown when old, terete, puberulent when young, glabrous when old, with white lenticels; buds ovoid, 4–7 mm, apex acute; scales several, dark reddish brown, glabrous. Leaves simple; petiole 1.5–3 cm, glabrous or slightly puberulent; leaf blade ovate to elliptic-ovate or suborbicular, 5–10 × 3–6 cm, lateral veins 6–10(–14) pairs, nearly parallel and terminating in marginal teeth, raised abaxially, both surfaces glabrous or abaxially puberulent along veins, base broadly cuneate to rounded, margin irregularly sharply doubly serrate or lobed, apex shortly acuminate. Compound corymbs terminal, 4–8 cm in diam., loosely 6–25-flowered; rachis and pedicels sparsely pubescent. Pedicel 6–12 mm. Flowers 1–1.4(–1.8) cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular or triangular-ovate, apex acute. Petals white, suborbicular to oblong-ovate, 5–7 × 3.5–6 mm, base clawed, apex obtuse. Stamens 20; filaments white, slightly shorter than petals. Ovary 2-loculed; styles 2, not exceeding stamens, glabrous, connate basally. Fruit red, oblong, ovoid-oblong, or globose, 1–1.4 cm × 7–10 mm, without or with few minute lenticels, sepals caducous, leaving a small annular scar; seeds pale brownish orange, linear-oblong. Fl. Apr–May, fr. Aug–Sep.

Slopes, gullies, mixed forests, thickets; 500–2300 m. Anhui, Fujian, Gansu, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Zhejiang [Japan, Korea].

- 1a. Leaf blade ovate to elliptic-ovate, margin usually not lobed, irregularly doubly serrate; fruit oblong or ovoid-oblong, rarely subglobose 48a. var. *alnifolia*
 1b. Leaf blade orbicular-ovate, or suborbicular, margin usually lobed, doubly serrate; fruit ovoid-oblong or globose.
 2a. Fruit ovoid-oblong, rarely subglobose 48b. var. *lobulata*
 2b. Fruit globose, 5-sulcate, impressed at both ends 48c. var. *angulata*

48a. *Sorbus alnifolia* var. *alnifolia*

水榆花楸(原变种) shui yu hua qiu (yuan bian zhong)

Crataegus alnifolia Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(2): 130. 1845; *Aria alnifolia* (Siebold & Zuccarini) Decaisne; *Micromeles alnifolia* (Siebold & Zuccarini) Koehne; *Pyrus alnifolia* (Siebold & Zuccarini) Franchet & Savatier.

Leaf blade ovate to elliptic-ovate, margin usually not lobed, irregularly sharply doubly serrate. Fruit oblong or ovoid-oblong, rarely subglobose.

Slopes, gullies, mixed forests, thickets; 500–2300 m. Anhui, Fujian, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Zhejiang [Japan, Korea].

48b. *Sorbus alnifolia* var. *lobulata* Rehder in Sargent, Pl. Wilson. 2: 275. 1915.

裂叶水榆花楸 lie ye shui yu hua qiu

Leaf blade orbicular-ovate or suborbicular, margin usually lobed, doubly serrate. Fruit ovoid-oblong, rarely subglobose.

Slopes, mixed forests; 700–900 m. Liaoning, Shandong [Korea].

48c. *Sorbus alnifolia* var. *angulata* S. B. Liang, Bull. Bot. Res., Harbin 10(3): 69. 1990.

棱果花楸 *leng guo hua qiu*

Leaf blade suborbicular, margin often lobed, doubly serrate. Fruit globose, 5-sulcate, impressed on both ends.

• Slopes; ca. 600 m. NC Shandong (Zibo Shi).

49. *Sorbus caloneura* (Stapf) Rehder in Sargent, Pl. Wilson. 2: 269. 1915.

美脉花楸 *mei mai hua qiu*

Trees or shrubs, 10–12 m tall. Branchlets dark reddish brown, terete, glabrous, with few inconspicuous lenticels; buds ovoid to narrowly ovoid, 6–10 mm, apex acute; scales several, brown, glabrous. Leaves simple; petiole 1–2(–3) cm, initially puberulent, glabrate; leaf blade grayish green abaxially, narrowly elliptic or narrowly ovate to obovate-elliptic, 7–12 × 3–7 cm, lateral veins (8–)10–12(–18) pairs, nearly parallel and terminating in marginal teeth, abaxially puberulent along veins, adaxially glabrous, base broadly cuneate to rounded, margin obtusely crenate, apex acuminate, rarely acute. Inflorescences compound-corymbose, 3.5–5 × 4–6 cm, many flowered; rachis and pedicels sparsely brownish yellow pubescent. Pedicel 5–8 mm. Flowers 6–10 mm in diam. Hypanthium campanulate, abaxially puberulous. Sepals triangular-ovate, 1.5–2.5 mm, apex ± obtuse or acute. Petals white, broadly ovate to obovate, 3–5 mm, apex obtuse. Stamens 20; anthers purple, shorter than petals. Styles 4 or 5, not exceeding stamens, glabrous, connate basally. Fruit brown, globose or obovoid, 1–1.4 cm × 8–10 mm, glabrous, 4- or 5-loculed, distinctly but minutely lenticellate, apex with an annular scar. Fl. Apr–May, fr. Aug–Oct.

• Mixed forests in mountain regions, valleys; 600–2100 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, SE Yunnan.

1a. Petiole 1–2 cm; lateral veins 10–12(–18) pairs 49a. var. *caloneura*

1b. Petiole to 3 cm; lateral veins 8–10 pairs 49b. var. *kwangtungensis*

49a. *Sorbus caloneura* var. *caloneura*

美脉花楸(原变种) *mei mai hua qiu (yuan bian zhong)*

Micromeles caloneura Stapf, Bull. Misc. Inform. Kew 1910: 192. 1910; *Aria caloneura* (Stapf) H. Ohashi & Iketani; *Pyrus caloneura* (Stapf) Bean.

Petiole 1–2 cm; lateral veins 10–12(–18) pairs.

• Mixed forests in mountain regions, valleys; 600–2100 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, SE Yunnan.

49b. *Sorbus caloneura* var. *kwangtungensis* T. T. Yu, Acta Phytotax. Sin. 8: 223. 1963.

广东美脉花楸 *guang dong mei mai hua qiu*

Aria caloneura var. *kwangtungensis* (T. T. Yu) H. Ohashi & Iketani.

Petiole to 3 cm; lateral veins 8–10 pairs.

• N Guangdong (Lechang Xian).

50. *Sorbus rhamnoides* (Decaisne) Rehder in Sargent, Pl. Wilson. 2: 278. 1915.

鼠李叶花楸 *shu li ye hua qiu*

Micromeles rhamnoides Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 169. 1874; *Aria rhamnoides* (Decaisne) H. Ohashi & Iketani; *Pyrus rhamnoides* (Decaisne) J. D. Hooker; *Sorbus paniculata* T. T. Yu & H. T. Tsai.

Trees to 12 m tall. Branchlets grayish brown to dark gray, terete, initially white tomentose, glabrescent, with ellipsoid or oblong lenticels; buds narrowly ovoid or ovoid, 5–8 mm, apex acute; scales reddish brown or dark brown, glabrous. Leaves simple; petiole 1–2 cm, glabrous; leaf blade ovate-elliptic or oblong-elliptic, rarely oblong-obovate, 10–17 × (3–)5–8 cm, lateral veins (9–)12–17 pairs, nearly parallel and terminating in marginal teeth, raised abaxially and impressed adaxially, white tomentose when young, both surfaces glabrous or abaxially sparsely tomentose along veins when old, base broadly cuneate to rounded, margin serrate, apex acuminate. Inflorescences compound corymbose, 4–7 × 5–8 cm, many flowered; rachis and pedicels white tomentose when young, glabrous or subglabrous in fruit, with conspicuously elliptic lenticels. Pedicel 2–4 mm. Flowers 7–9 mm in diam. Hypanthium initially tomentose, glabrescent. Sepals triangular, apex acute or ± obtuse. Petals white, broadly oblong, 2.5–3.5 mm, glabrous, base clawed. Stamens 20, slightly shorter than or ca. as long as petals. Styles 2 or 3, glabrous, connate basally or free. Fruit globose or ovoid-globose, 6–9 mm in diam., without or with few small lenticels, 2- or 3-loculed, apex with an annular scar. Fl. May–Jun, fr. Jul–Sep.

Moist broad-leaved and mixed coniferous forests, deep valleys; 1400–1700 m. NE Guizhou, S and W Yunnan [NE India, Nepal, Sikkim].

One of us (Spongberg) believes that *Sorbus salwinensis* is synonymous with this species, and that *S. paniculata* is a distinct species.

51. *Sorbus salwinensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 13(1): 102. 1975.

怒江花楸 *nu jiang hua qiu*

Trees 6–8 m tall. Branchlets grayish brown or gray when young, blackish brown and glabrous when old, terete, with numerous oblong and elliptic small lenticels; buds ovate, 5–8 mm, apex ± obtuse; scales several, reddish brown. Leaves simple; petiole 3–8 mm, pubescent, gradually glabrescent; leaf blade dark green adaxially, oblong-lanceolate to obovate-lanceolate, (6–)8–14 × 1.5–3.5 cm, lateral veins 11–17 pairs, nearly parallel and terminating in marginal teeth, raised abaxially and impressed adaxially, abaxially pubescent along veins, adaxially initially sparsely puberulous, glabrate, base cuneate, margin minutely serrate, apex acuminate to caudate-acuminate. Compound corymbs terminal, 5.5–8 × 7–10 cm when mature, densely flowered; rachis and pedicels glabrous

when mature, with distinct elliptic or oblong lenticels. Pedicel 4–7 mm. Flowers 5–7 mm in diam. Hypanthium campanulate, abaxially glabrous. Sepals ovate or triangular-ovate, apex acute or ± obtuse. Petals white, shortly clawed. Stamens ca. 20. Styles 2. Fruit globose, (4–)5–7 mm in diam., 2-loculed, without lenticels, calyx teeth abscising from apex. Fl. May–Jun, fr. Aug–Sep.

• Mountain valleys, ridges, broad-leaved and coniferous mixed forests; 2700–3100 m. NW Yunnan (Fugong Xian, Gongshan Xian).

52. *Sorbus meliosmifolia* Rehder in Sargent, Pl. Wilson. 2: 270. 1915.

泡吹叶花楸 pao chui ye hua qiu

Aria meliosmifolia (Rehder) H. Ohashi & Iketani; *Micromeles meliosmifolia* (Rehder) Kovanda & Challice; *Pyrus meliosmifolia* (Rehder) Bean.

Trees to 10 m tall. Branchlets reddish brown or purplish brown when young, blackish brown when old, puberulent, soon glabrescent, terete, with few indistinct lenticels; buds ovoid or narrowly ovoid, 6–8 mm, apex acute; scales several, reddish brown, glabrous. Leaves simple; petiole 5–8 mm, glabrous or slightly puberulous; leaf blade grayish green abaxially, light green adaxially, narrowly elliptic-ovate to elliptic-obovate, 9–13(–18) × 3–6(–8) cm, lateral veins 16–24 pairs, nearly parallel and terminating in marginal teeth, raised abaxially and impressed adaxially, abaxially lanuginose in vein axils, subglabrous when old, adaxially glabrous, base cuneate, margin doubly serrate, apex acuminate, sometimes acute. Compound corymbs terminal, 4–8 cm and nearly as broad, numerous flowered; rachis and pedicels yellow pubescent, glabrous in fruit. Pedicel 6–12 mm. Flowers to 1 cm in diam. Hypanthium campanulate, yellow pubescent. Sepals triangular-ovate, 2–4 mm, apex acute. Petals white, ovate, 3–4 mm and ca. as broad, apex obtuse. Stamens 20, ca. as long as petals. Styles 3(or 4), nearly as long as stamens, glabrous, connate basally. Fruit brown, subglobose or ovoid, 1–1.4 cm in diam., glabrous when old, with many rusty small lenticels, with an annular scar at apex, 3(or 4)-loculed; seeds brown, broadly ovoid or obovoid, 4–4.5 mm, compressed. Fl. Apr–May, fr. Aug–Sep.

• Mountain valleys, forests; 1400–2800 m. NE Guangxi, W Sichuan, NW Yunnan.

One of us (Spongberg) notes that this species appears to merge with *Sorbus corymbifera* (Miquel) N. T. Kh'ep & G. P. Yakovlev. The variation of the two taxa is continuous.

53. *Sorbus medogensis* L. T. Lu & T. C. Ku, Acta Phytotax. Sin. 40: 475. 2002.

墨脱花楸 mo tuo hua qiu

Pleiosorbus megacarpus Lihua Zhou & C. Y. Wu, Acta Bot. Yunnan. 22: 384. 2000, not *Sorbus megalocarpa* Rehder (1915).

Trees to 30 m tall. Branchlets grayish brown, terete, glabrous, with yellowish brown lenticels, glabrous; buds oblong-ovoid, apically acute; scales more than 10, reddish brown, glabrous. Leaves simple; petiole 3–5 mm; leaf blade elliptic to

obovate-elliptic, 26–29.5 × 8.5–10 cm, lateral veins 13–15 pairs, prominent abaxially, abaxially persistently sparsely hairy, adaxially glabrous when old, base narrowly cuneate, margin sparsely inconspicuously shallowly crenulate, apex acute. Compound corymbs large, ca. 40-flowered; rachis and pedicels glabrous. Pedicel 3–5.5 mm. Flowers 1–1.5 cm in diam. when open. Hypanthium campanulate, abaxially glabrous. Sepals triangular, abaxially glabrous, apex acute. Petals white, broadly ovate, 6–8 × 6–9 mm, ca. 2 × as long as sepals, base cuneate, margin slightly undulate, apex obtuse. Stamens 25–44, nearly as long as petals; filaments purple; anthers yellow. Ovary 5–7-loculed, with (2 or)3(or 4) ovules per locule; styles 5–7, unequal in length, glabrous, connate at base. Fruit subglobose, 3–5 cm in diam., with conspicuous orbicular lenticels and a slightly deep annular scar. Fl. Apr–May, fr. Oct.

• Forests; ca. 2100 m. SE Xizang (Mêdog Xian).

54. *Sorbus corymbifera* (Miquel) N. T. Kh'ep & G. P. Yakovlev, Bot. Zhurn. 66: 1188. 1981.

疣果花楸 you guo hua qiu

Vaccinium corymbiferum Miquel, Fl. Ned. Ind., Eerste Bijv. 588. 1861; *Aria corymbifera* (Miquel) H. Ohashi & Iketani; *Micromeles corymbifera* (Miquel) Kalkman; *M. granulosa* C. K. Schneider; *Photinia bartlettii* Merrill; *Pyrus granulosa* Bertoloni; *Sorbus granulosa* (Bertoloni) Rehder.

Trees, rarely shrubs, to 18 m tall. Branchlets brown when young, blackish brown when old, terete, rust-brown tomentose when young, glabrate; buds ovoid, 6–8 mm, apex acute; scales brownish, glabrous. Leaves simple; petiole 2.5–3 mm, rust-brown tomentose when young, glabrescent; leaf blade ovate or elliptic-ovate, 9–13 × 4.5–6 cm, lateral veins 7–11 pairs, slightly curved and anastomosing toward margin, both surfaces rust-brown tomentose, glabrate, base rounded, margin shallowly crenate, apex acuminate. Inflorescences 4–7 × 3–5(–6) cm, many flowered; rachis and pedicels rust-brown tomentose, glabrous when old, small lenticellate. Pedicel 3–4 mm. Flowers 6–7 mm in diam. Hypanthium initially rust-brown tomentose, glabrate. Sepals triangular, 1.5–2.5 × 2–3 mm, apex acute. Petals white, ovate, 3–4 × 2–3 mm, adaxially puberulous, apex obtuse. Stamens 20(–25), nearly as long as or somewhat shorter than petals. Styles (2 or)3 or 4, not exceeding stamens, glabrous, connate near base. Fruit reddish brown, globose to ovoid-globose, 1–1.5(–2) cm in diam., 2–4-loculed, with rusty lenticels, conspicuously marked by an annular scar. Fl. Jan–Feb, fr. Aug–Sep.

Moist mixed forests; 1200–3400 m. Guangdong, Guangxi, Guizhou, Hainan, Hunan, Yunnan [Cambodia, Indonesia, E India, Laos, N Myanmar, Thailand, SE Vietnam].

55. *Sorbus rhombifolia* C. J. Qi & K. W. Liu, Acta Bot. Yunnan. 10: 254. 1988.

菱叶花楸 ling ye hua qiu

Trees to 5 m tall. Branchlets reddish brown, glabrous, lenticellate; buds ovoid, glabrous. Leaves simple; petiole 1–2 cm, glabrous; leaf blade rhombic, 7.5–10 × 2.5–4 cm, subleathery, lateral veins 7–9 pairs, curved and anastomosing toward mar-

gin, prominent on both surfaces, both surfaces glabrous, base narrowly cuneate, margin entire basally, crenulate apically, apex shortly acuminate. Flowers not seen. Infructescences terminal; rachis and pedicels glabrous, with small lenticels. Fruiting pedicels ca. 0.5 cm. Fruit dark red, globose, 1–1.4 cm in diam., 3-loculed, lenticellate. Fr. Sep.

- Dense forests; ca. 500 m. W Hunan (Tongdao Xian).

56. *Sorbus globosa* T. T. Yu & H. T. Tsai, Bull. Fan Mem. Inst. Biol., Bot. Ser., 7: 121. 1936.

圓果花楸 yuán guo huā qiū

Aria globosa (T. T. Yu & H. T. Tsai) H. Ohashi & Iketani.

Trees, rarely shrubs, to 7 m tall. Branchlets blackish brown when old, terete, rust-brown pubescent when young, soon glabrous, with few small lenticels; buds ovoid, 5–8 mm, apex ± acute; scales several, glabrous. Leaves simple; petiole 1–1.5 cm, sparsely puberulous or glabrous; leaf blade pale green abaxially, dark green adaxially, ovate-lanceolate or elliptic-lanceolate, 8–10 × 3–4.5 cm, lateral veins 8–11 pairs, anastomosing toward margin, abaxially rust-brown pubescent along veins, gradually glabrescent, adaxially glabrous, base cuneate, rarely subrounded, margin sparsely sharply serrate, nearly entire basally, apex acuminate. Inflorescences paniculately compound corymbose, 3–6 × 2–5 cm, 15–21-flowered; rachis, pedicels, and hypanthium abaxially rust-brown pubescent. Pedicel 5–9 mm. Flowers 5–8 mm in diam. Hypanthium campanulate. Sepals reflexed, ovate-triangular, 2–2.5 mm, apex obtuse. Petals white, ovate to obovate, 4–5 × 3–3.5 mm, sparsely rust-brown pilose, base shortly clawed, apex obtuse. Stamens 20, unequal in length, longer or shorter than petals. Styles 2 or 3, not exceeding stamens, glabrous, connate basally. Fruit brown, globose, 1–1.2 cm in diam., 2- or 3-loculed, with orbicular small lenticels, with an annular scar. Fl. Mar–May, fr. Aug–Sep.

Slope forests, shrub thickets; 1000–3000 m. Guangxi, Guizhou, W Yunnan [N Myanmar].

One of us (Spongberg) believes that *Sorbus paniculata* is a related taxon and could be placed here.

57. *Sorbus thomsonii* (King ex J. D. Hooker) Rehder in Sargent, Pl. Wilson. 2: 277. 1915.

滇緬花楸 diān miàn huā qiū

Pyrus thomsonii King ex J. D. Hooker, Fl. Brit. India 2: 379. 1878; *Aria thomsonii* (King ex J. D. Hooker) H. Ohashi & Iketani.

Trees 8–10 m tall. Branchlets grayish brownish or gray brown, terete, glabrous, sparsely white lenticellate; buds ovoid, 4–6 mm, apex acute; scales several, brownish, glabrous. Leaves simple; petiole 5–10 mm, glabrous; leaf blade oblong-elliptic or elliptic-lanceolate, 4–8 × 2–3 cm, lateral veins 7–10(–12) pairs, slightly curved and anastomosing toward margin, both surfaces glabrous, base cuneate, shallowly minutely serrate, apex acute to shortly acuminate. Compound corymbs 2.5–3.5 × 4–5 cm, more than 10-flowered; rachis and pedicels glabrous. Pedicel 4–8 mm. Flowers 0.8–1.2 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals triangular or triangular-ovate, apex ±

obtuse. Petals white, ovate to obovate, 4–5.5 × 4–5 mm, adaxially sparsely pilose, apex ± obtuse. Stamens 20, unequal in length, longer ones slightly longer than petals, shorter ones shorter than petals. Styles (2 or)3(or 4), not exceeding stamens, glabrous, connate near base. Fruit subglobose, 8–10(–12) mm in diam., with few small lenticels, 2–4-loculed, with an annular scar. Fl. Apr–May, fr. Aug–Sep.

Forests on slopes, shrubby thickets in valleys; 1500–2800 m. Sichuan, SE Xizang, Yunnan [Bhutan, India, E Nepal, N Myanmar, Sikkim].

58. *Sorbus aronioides* Rehder in Sargent, Pl. Wilson. 2: 268. 1915.

毛背花楸 máo bei huā qiū

Aria aronioides (Rehder) H. Ohashi & Iketani; *Micromeles aronioides* (Rehder) Kovanda & Challice.

Shrubs or trees, 4–12(–15) m tall. Branchlets purplish brown when young, purplish black when old, terete, glabrous when old, sparsely lenticellate; buds ovoid, apex acute or ± obtuse; scales few, brown or purplish brown, glabrous. Leaves simple; petiole 5–10 mm; leaf blade pale grayish green abaxially, dark green adaxially, elliptic, oblong-elliptic, or elliptic-obovate, 6–12 × 2.5–6 cm, lateral veins 7–10 pairs, branched and anastomosing toward margin, abaxially sparsely tomentose along raised veins, glabrous when old, adaxially glabrous, sparsely glandular along somewhat impressed midvein, base cuneate, margin sharply but minutely serrate, entire near base. Compound corymbs terminal, 3.5–5 cm in diam. and nearly as long, densely flowered; rachis and pedicels glabrous. Pedicel 2–5 mm. Flowers 7–8 mm in diam. Hypanthium campanulate, glabrous. Sepals ovate-triangular, sparsely pubescent along margin, soon glabrate, apex acute. Petals white, irregularly ovate or narrowly ovate, 2.5–3.5 × 2–3 mm, glabrous, base shortly clawed, apex obtuse. Stamens ca. 20, nearly as long as or slightly longer than petals; anthers brown, broadly ovate. Styles 2 or 3, rarely 4, 3–3.5 mm, ca. as long as stamens or slightly shorter, glabrous, connate basally. Fruit red, ovoid, 0.9–1.1 cm × 8–10 mm, glabrous, 2- or 3-loculed, with an annular scar; seeds brown, obovoid, compressed. Fl. Apr–Jun, fr. Aug–Oct.

Coniferous and broad-leaved mixed forests on slopes, stream side mixed forests; 1000–3600 m. Guangxi, Guizhou, W Sichuan, W Yunnan [N Myanmar].

59. *Sorbus keissleri* (C. K. Schneider) Rehder in Sargent, Pl. Wilson. 2: 269. 1915.

毛序花楸 máo xù huā qiū

Micromeles keissleri C. K. Schneider, Ill. Handb. Laubholz. 1: 701. 1906; *Aria keissleri* (C. K. Schneider) H. Ohashi & Iketani; *M. decaisneana* C. K. Schneider var. *keissleri* C. K. Schneider; *Pyrus keissleri* H. Léveillé.

Trees or shrubs, 7–15 m tall. Branchlets grayish brown to blackish brown when old, terete, initially grayish white tomentose, soon glabrate, prominently small lenticellate; buds ovoid, apex ± acute; scales several, brown, glabrous. Leaves simple; petiole ca. 5 mm, gray tomentose when young, gradually glabrescent; leaf blade pale green abaxially, green adaxially, obovate or oblong-obovate, 7–11 × 3.5–6 cm, lateral veins 8–10

pairs, branched and anastomosing toward margin, raised abaxially, adaxially lustrous, both surfaces tomentose when young, gradually glabrate or sparsely tomentulose only abaxially along midvein, base cuneate, margin crenulate, entire near base, apex shortly acuminate. Compound corymbs terminal, 4–5 cm in diam. and ca. as long, densely flowered; rachis and pedicels grayish white tomentose. Pedicel 2–5 mm. Flowers 7–9 mm in diam. Hypanthium campanulate, sparsely grayish white tomentose. Sepals triangular-ovate, glabrous, apex \pm acute or \pm obtuse. Petals white, broadly ovate or suborbicular, ca. 3 mm and ca. as broad, apex obtuse. Stamens 20, ca. as long as petals. Styles 2 or 3, somewhat not exceeding stamens, glabrous, connate basally. Fruit brownish green, ovoid or flattened orange-shaped, 9–10(–12) mm in diam., glabrous, 2- or 3-loculed, with few inconspicuous lenticels, with an annular scar. Fl. May–Jun, fr. Aug–Sep.

• Dense forests; 1200–1900 m. Guangxi, Guizhou, W Hubei, Hunan, Jiangxi, E Sichuan, S Xizang, NE Yunnan.

60. *Sorbus folgneri* (C. K. Schneider) Rehder in Sargent, Pl. Wilson. 2: 271. 1915.

石灰树 shi hui shu

Trees to 10 m tall. Branchlets blackish brown when old, terete, initially grayish white tomentose, glabrescent, with few elliptic lenticels; buds ovoid, apex acute; scales several, brown, glabrous. Leaves simple; petiole 0.5–1.5(–2) cm, densely grayish white tomentose; leaf blade dark green adaxially, narrowly ovate or elliptic to oblong, 6–12 \times 3–7 cm, lateral veins 8–15 pairs, nearly parallel, terminating in marginal teeth, abaxially densely grayish white tomentose, adaxially glabrous, base broadly cuneate or rounded, margin obtusely to sharply serrate, apex acute to shortly acuminate. Inflorescences 4–6 \times 5–8 cm, densely 20–30-flowered; rachis and pedicels grayish white tomentose, minutely lenticellate. Pedicel 5–8 mm. Flowers 7–10 mm in diam. Hypanthium campanulate, abaxially grayish white tomentose. Sepals triangular-ovate, apex acute. Petals white, ovate, 3–4 \times 3–3.5 mm, apex obtuse. Stamens 18–20, nearly as long as or slightly longer than petals. Styles 2 or 3, not exceeding stamens, basally connate and tomentose. Fruit red or yellow, oblong or obovoid-oblong, 0.9–1.5 cm \times 6–9 mm, glabrous or with few inconspicuous lenticels, 2- or 3-loculed, with an annular scar. Fl. Apr–May, fr. Jul–Aug.

• Valleys, slopes, stream sides in mixed forests, roadsides; 800–2000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, W Zhejiang.

1a. Leaf margin serrate 60a. var. *folgneri*
1b. Leaf margin doubly serrate 60b. var. *duplicatodentata*

60a. *Sorbus folgneri* var. *folgneri*

石灰树(原变种) shi hui shu (yuan bian zhong)

Micromeles folgneri C. K. Schneider, Bull. Herb. Boissier, sér. 2, 6: 318. 1906; *Aria folgneri* (C. K. Schneider) H. Ohashi & Iketani; *Pyrus folgneri* (C. K. Schneider) C. K. Schneider ex Bean; *Sorbus nubium* Handel-Mazzetti.

Leaf margin serrate, with obtuse or slightly \pm acute teeth.

• Valleys, slopes, stream sides in mixed forests; 800–2000 m. An-

hui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan.

60b. *Sorbus folgneri* var. *duplicatodentata* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 13(1): 103. 1975.

齿叶石灰树 chi ye shi hui shu

Aria chengii (C. J. Qi) H. Ohashi & Iketani; *Sorbus chengii* C. J. Qi.

Leaf margin sharply and doubly serrate.

• Slopes, roadsides. N Hunan (Taoyuan Xian), W Zhejiang (Kaihua Xian).

Spongberg and Wu think this variety is a synonym of the species because of the slight differences.

One of us (Spongberg) prefers to treat this variety as a synonym of the species because of the slight differences; Wu Zhengyi (editor's note) concurs.

61. *Sorbus tsinlingensis* C. L. Tang, Fl. Tsinling. 1(2): 608. 1974.

秦岭花楸 qin ling hua qiu

Aria tsinlingensis (C. L. Tang) H. Ohashi & Iketani.

Trees 5–8 m tall. Branchlets reddish brown when young, blackish brown when old, terete, glabrous or subglabrous, sparsely orbicular-lenticellate; buds ovoid, 4–8 mm, glabrous, apex acute; scales several, reddish brown. Leaves simple; petiole 1.2–2 cm, grayish white tomentose; leaf blade pale green abaxially, dark green adaxially, oblong or ovate-oblong, 7–12 \times 4–6 cm, subleathery, lateral veins 8–10 pairs, usually arched and anastomosing toward margin, abaxially grayish white tomentose, adaxially sparsely tomentulose, base rounded, rarely subcordate, margin unevenly serrate, apex acute or shortly acuminate. Compound corymbs 4–6 cm in diam., densely 20–35-flowered; rachis and pedicels densely grayish white tomentose. Pedicel 5–10 mm. Flowers 1–1.2 cm in diam. Hypanthium campanulate, ca. 2.5 mm in diam., abaxially densely grayish white tomentose. Sepals triangular-lanceolate, 2–2.5 mm, tomentose along margin. Petals white, suborbicular, 4–5 mm in diam., base shortly clawed. Stamens 20, 2–3 mm; anthers yellow. Ovary tomentose apically; styles 2, not exceeding stamens, glabrous, connate basally. Fruit red, obovoid-oblong or oblong-ellipsoid, 1.3–1.5 cm \times 7–9 mm, sometimes sparsely lenticellate, with an annular scar; seeds reddish brown, narrowly ovoid, 5–6 mm, somewhat compressed. Fl. May, fr. Sep–Oct.

• Mixed forests in mountain regions; 1400–1800 m. SE Gansu (Tianshui), S Shaanxi (Taibai Shan).

62. *Sorbus dunnii* Rehder in Sargent, Pl. Wilson. 2: 273. 1915.

棕脉花楸 zhong mai hua qiu

Aria dunnii (Rehder) H. Ohashi & Iketani.

Trees small, 2–7 m tall. Branchlets brownish purple when young, brown or grayish brown when old, terete, yellow pubescent when young, glabrate, minutely lenticellate; buds ovoid, 5–8(–10) mm, apex acuminate; scales several, brown, glabrous. Leaves simple; petiole 1.5–2.5 cm, brown tomentose, gradually glabrescent; leaf blade elliptic or oblong, 6–10(–15) \times 3–5(–8)

cm, lateral veins (10–)14–18 pairs, terminating in marginal teeth, abaxially densely yellowish white tomentose and brown tomentose along veins, adaxially glabrous but brown tomentose along veins, base broadly cuneate, margin irregularly serrate, apex acute or shortly acuminate. Compound corymbs much branched in distal part, 4–7 × 5–7 cm, densely flowered; rachis and pedicels rust-brown tomentose, gradually glabrescent, with many small lenticels. Pedicel 3–6 mm. Flowers 7–10 mm. Hypanthium turbinate, abaxially densely rust-brown tomentose. Sepals triangular-ovate, 1.5–2 mm, apex acute. Petals white, broadly ovate, 3–4 mm, glabrous, base shortly clawed, apex ± acute. Stamens 20, unequal in length, longer ones longer than petals. Styles 2, connate at base, glabrous. Fruit red, subglobose, 5–8 mm in diam., 2-loculed, without or with few small lenticels; seeds blackish, lanceolate-obovate, 3–4 mm. Fl. Apr–May, fr. Aug–Sep.

• Sparse woods on slopes, shrubby thickets in valleys; 600–3000 m. SE Anhui, NW Fujian, NE Guangxi, SE Guizhou, NW Yunnan, W Zhejiang.

63. *Sorbus ferruginea* (Wenzig) Rehder in Sargent, Pl. Wilson. 2: 277. 1915.

锈色花楸 xiu se hua qiu

Sorbus sikkimensis Wenzig var. *ferruginea* Wenzig, Linnaea 38: 60. 1874; *Aria ferruginea* (Wenzig) H. Ohashi & Iketani; *Micromeles ferruginea* (Wenzig) Koehne; *Pyrus ferruginea* (Wenzig) J. D. Hooker.

Trees or shrubs, 4–10 m tall. Branchlets grayish brown when old, densely rusty tomentose when young, gradually glabrescent, prominently lenticellate when old; buds ovoid, 4–6 mm, apex obtuse; scales several, brown, glabrous. Leaves simple; petiole 1–1.5 cm, initially densely rusty tomentose, glabrous or subglabrous when old; leaf blade ovate, elliptic, or obovate, 5–8(–10) × 3–4.5 cm, lateral veins 6–8(–11) pairs, nearly parallel, terminating in marginal teeth, abaxially prominent, both surfaces initially densely rusty tomentose, glabrescent, abaxially rusty tomentose only along veins when old, base broadly cuneate to rounded, margin minutely serrate, apex shortly acuminate or acute. Compound corymbs terminal, 3–5 × 3–4 cm, few flowered; rachis and pedicels rusty tomentose. Pedicel 3–5 mm. Flowers 7–9 mm in diam. Hypanthium campanulate, abaxially rusty tomentose. Sepals triangular-ovate, apex obtuse. Petals white, broadly oblong or ovate, rarely obovate, 3–4 mm and ca. as broad, adaxially puberulent, base shortly clawed, apex obtuse. Stamens 20, slightly longer than petals. Styles 3 or 4, not exceeding stamens, glabrous, connate basally. Fruit globose, 5–8 mm in diam., smooth or with few minute lenticels, 3- or 4-loculed, with an annular scar. Fl. Apr–Jun, fr. Sep–Oct.

Slope or valley forests, rocky hills, river banks; 2200–2800 m. C and W Yunnan [Bhutan, Sikkim].

64. *Sorbus epidendron* Handel-Mazzetti, Anz. Kaiserl. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 135. 1923.

附生花楸 fu sheng hua qiu

Aria detergibilis (Merrill) H. Ohashi & Iketani; *A. epidendron* (Handel-Mazzetti) H. Ohashi & Iketani; *Micromeles epi-*

dendron (Handel-Mazzetti) Kovanda & Challice; *Sorbus detergibilis* Merrill.

Shrubs or trees, to 15 m tall. Branchlets blackish brown, terete, initially densely rust-brown tomentose, glabrous when old, with sparse, inconspicuous elliptic lenticels; buds ovoid, 5–7 mm, apex acute or ± obtuse; scales several, dark reddish brown, glabrous. Leaves simple; petiole 5–10 mm, densely rust-brown tomentose; leaf blade narrowly elliptic or elliptic-ovate to elliptic-obovate, 7–12(–15) × 3.5–6(–7) cm, lateral veins 12–15 pairs, nearly parallel, terminating in marginal teeth, abaxially densely persistent rust-brown tomentose, adaxially sparsely puberulous, base cuneate, margin minutely serrate except for basal part, apex shortly acuminate or acute. Compound corymbs terminal, 6–9 × 5–10 cm, many flowered; rachis and pedicels densely rust-brown tomentose. Pedicel 4–7 mm. Flowers 8–10 mm in diam. Hypanthium campanulate, 3–4 mm, abaxially rust-brown tomentose. Sepals triangular-ovate, 1.5–2 mm, apex acute. Petals ovate, 3–4 mm and ca. as broad, adaxially sparsely puberulous, base shortly clawed, apex obtuse. Stamens 15–20, nearly as long as or slightly shorter than petals. Styles 2 or 3, somewhat not exceeding stamens, glabrous, connate at base. Fruit globose or ovoid-globose, 5–8 mm in diam., 2- or 3-loculed, with few minute orbicular lenticels, with an annular scar. Fl. May, fr. Aug–Sep.

Sparse woods at river sides, shrub thickets in mountain valleys; 2300–3000 m. Guizhou, W Yunnan [N Myanmar, N Vietnam].

65. *Sorbus ochracea* (Handel-Mazzetti) J. E. Vidal, Adanson, n.s., 5: 577. 1965.

褐毛花楸 he mao hua qiu

Eriobotrya ochracea Handel-Mazzetti, Symb. Sin. 7: 476. 1933; *Aria ochracea* (Handel-Mazzetti) H. Ohashi & Iketani; *Sorbus rubiginosa* T. T. Yu.

Trees or shrubs, 10–15 m tall. Branchlets purplish brown to blackish brown when old, terete, initially densely rust-brown tomentose, gradually glabrescent, glabrous when old, with grayish white lenticels; buds ovoid, 5–7 mm, apex ± obtuse to ± acute; scales several, dark brown, glabrous. Leaves simple; petiole 2–3 cm, densely rust-brown tomentose; leaf blade ovate or elliptic-ovate, rarely elliptic-obovate, 9–14 × 5–8 cm, lateral veins 10–12 pairs, slightly curved and anastomosing toward leaf margin, both surfaces rust-brown tomentose when young, usually only abaxially sparsely tomentose when old, base broadly cuneate to rounded, margin shallowly crenulate apically, apex shortly acuminate, rarely acute. Compound corymbs terminal, 5–7 cm in diam., ca. 20–30-flowered or more; rachis and pedicels densely rust-brown tomentose. Pedicel 3–5 mm. Flowers 7–10 mm. Hypanthium campanulate, abaxially rust-brown tomentose. Sepals reflexed after anthesis, triangular-ovate, ca. 2 mm, apex acute. Petals yellowish white, broadly ovate or elliptic, 3–4 × ca. 3 mm, adaxially sparsely pilose, base clawed, apex obtuse or emarginate. Stamens 15–20, unequal in length, longer ones longer than petals. Styles (2 or)3 or 4, somewhat not exceeding stamens, glabrous, connate at base. Fruit subglobose, ca. 1 cm in diam., 3- or 4-loculed, prominently but minutely lenticellate, with an annular scar. Fl. Mar–Apr, fr. Jul–Aug.

• Mixed forests on slopes, valleys, stream sides; 1300–2700 m. E Xizang, Yunnan.

66. Sorbus subochracea T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 494. 1980.

尾叶花楸 wei ye hua qiu

Aria subochracea (T. T. Yu & L. T. Lu) H. Ohashi & Ike-tani.

Trees to 6 m tall. Branchlets dark purplish brown, terete, brown or grayish brown tomentose when young, glabrescent, with many grayish white oblong lenticels. Leaves simple; petiole ca. 1 cm, rusty tomentose; leaf blade elliptic-lanceolate, 11–15 × 4–6 cm, lateral veins 10–15 pairs, curved and anastomosing toward leaf margin, abaxially rusty tomentose when young, with few hairs only along midvein or at base of midvein when old, adaxially glabrous, base cuneate, margin usually entire basally or sparsely serrate in apical 1/3, apex long acuminate to caudate. Compound corymbs terminal, many flowered; rachis and pedicels tomentose, glabrate. Flowers not seen. Fruit yellowish brown, globose, 1–1.5 cm in diam., with numerous prominent lenticels, with an annular scar. Fr. Aug–Sep.

• Mixed forests along river banks; ca. 2200 m. SE Xizang.

67. Sorbus astateria (Cardot) Handel-Mazzetti, Symb. Sin. 7: 466. 1933.

多变花楸 duo bian hua qiu

Pyrus astateria Cardot, Notul. Syst. (Paris) 3: 348. 1918; *Aria astateria* (Cardot) H. Ohashi & Iketani.

Shrubs or small trees, to 8 m tall. Branchlets grayish brown, terete, ± rust-brown tomentose, later becoming glabrous, minutely lenticellate; buds narrowly ovoid, apex acute; scales several, brownish, glabrous or sparsely rust-brown pubescent apically. Leaves simple; petiole 5–7(–10) mm, tomentose; leaf blade ovate-lanceolate, 4–7(–9) × 2–4 cm, lateral veins 6–8 pairs, curved and anastomosing toward leaf margin, both surfaces densely rusty tomentose when young, glabrescent, abaxially tomentose only along veins when mature, base cuneate to rounded, margin minutely serrate apically, apex short to long acuminate. Inflorescences usually paniculate, 2–7 cm in diam., many flowered; rachis and pedicels rusty tomentose. Pedicel 4–7 mm. Flowers ca. 1 cm in diam. Hypanthium campanulate, short, abaxially rusty tomentose. Sepals reflexed after anthesis, triangular, apex acute. Petals white, obovate or suborbicular, 4–5 × 2.5–3 mm, adaxially puberulent, base clawed, apex obtuse. Stamens ca. 20, outer stamens nearly as long as petals, inner ones shorter than petals. Styles 3 or 4, glabrous, connate at base. Fruit ovoid, 5–10 mm in diam., 3- or 4-loculed, usually without lenticels, with an annular scar. Fl. Mar–May, fr. Oct.

• Mountain slopes, stream sides, mixed forests, forest margins; 1500–2700 m. SE Xizang, NW Yunnan.

19. CYDONIA Miller, Gard. Dict. Abr., ed. 4, [426]. 1754.

榲桲属 wen po shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Shrubs or small trees, deciduous. Branches unarmed; buds small, pubescent, with few scales. Leaves simple, petiolate, stipulate, venation camptodromous, margin entire. Flowers solitary at apices of leafy branchlets. Sepals 5, margin entire, reflexed. Petals 5, white or pinkish, obovate. Stamens 20. Ovary inferior, 5-loculed, with numerous ovules per locule; styles 5, free, pubescent basally. Fruit a many seeded pome, with persistent, recurved sepals.

One species: C Asia; cultivated in China.

1. Cydonia oblonga Miller, Gard. Dict., ed. 8, *Cydonia* no. 1. 1768.

榲桲 wen po

Pyrus cydonia Linnaeus, Sp. Pl. 1: 480. 1753; *Cydonia vulgaris* Persoon.

Shrubs or small trees, to 8 m tall. Branchlets purplish red when young, purplish brown when old, terete, initially densely tomentose, glabrous when old, sparsely lenticellate; buds purplish brown, tomentose. Stipules caducous, ovate; petiole 0.8–1.5 cm, tomentose; leaf blade ovate to oblong, 5–10 × 3–5 cm, abaxially with conspicuous veins and densely villous, adaxially glabrous or sparsely pubescent when young, base rounded or

subcordate, margin entire, apex acute or emarginate. Pedicel ca. 5 mm or nearly absent, densely tomentose. Flowers 4–5 cm in diam.; bracts caducous, ovate. Hypanthium campanulate, abaxially densely tomentose. Sepals ovate or broadly lanceolate, 5–6 mm, longer than hypanthium, both surfaces tomentose, margin glandular serrate, apex acute. Petals white or pinkish, ca. 1.8 cm. Stamens less than 1/2 as long as petals. Styles nearly as long as stamens, densely villous basally. Fruit fragrant, yellow, pear-shaped, 3–5 cm in diam., densely tomentose, with persistent reflexed sepals; fruiting pedicel ca. 5 mm, stout, tomentose. Fl. Apr–May, fr. Oct. $2n = 34^*$.

Cultivated. Fujian, Guizhou, Jiangxi, S Shaanxi (Qin Ling), Shanxi, Xinjiang [native to C Asia].

20. DOCYNIA Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 125, 131. 1874.

榲桲属 duo yi shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Trees evergreen or semievergreen; buds ovoid, small, with several exposed scales. Leaves simple, alternate, stipulate, petiolate,

venation camptodromous, margin entire or serrate, sometimes slightly lobed. Flowers shortly stalked, 2–5-fascicled, precocious or synantherous; bracts caducous, small. Hypanthium campanulate, abaxially densely tomentose. Sepals 5, lanceolate. Petals 5, white, base shortly clawed. Stamens 30–50, 2-whorled. Ovary inferior, 5-loculed, with 3–10 ovules per locule; styles 5, connate at base, villos. Pome subglobose, ovoid, or pyriform, 2–3 cm in diam., with persistent erect or incurved sepals.

About two species: Bhutan, China, India, Myanmar, Nepal, Pakistan, Sikkim, Thailand, Vietnam; two species (one endemic) in China.

- 1a. Leaf blade elliptic or oblong-lanceolate, abaxially pubescent or subglabrous, margin serrate, rarely entire, firmly papery; stamens ca. 30; pome globose or ellipsoid, shortly stalked 1. *D. indica*
 1b. Leaf blade lanceolate to ovate-lanceolate, abaxially densely yellow tomentose, margin entire or slightly serrate, leathery; stamens 40–45; pome ovoid or oblong, long stalked 2. *D. delavayi*

1. *Docynia indica* (Wallich) Decaisne, Nouv. Arch. Mus. Hist. Nat. 10: 131. 1874.

檵木 duo yi

Pyrus indica Wallich, Pl. Asiat. Rar. 2: 56. 1831; *Cydonia indica* (Wallich) Spach; *Docynia docynioides* (C. K. Schneider) Rehder; *D. griffithiana* Decaisne; *D. hookeriana* Decaisne; *D. rufifolia* (H. Léveillé) Rehder; *Malus docynioides* C. K. Schneider; *P. rufifolia* H. Léveillé.

Trees semievergreen or deciduous, to 2–3 m tall. Branchlets purplish brown or blackish brown when old, terete, stout, initially densely pubescent, glabrous when old; buds reddish brown, pubescent, apex acute. Stipule caducous, lanceolate, small, apex acuminate; petiole 0.5–2 cm, usually pubescent; leaf blade elliptic or oblong-lanceolate, 3.5–8 × 1.5–2.3 cm, firmly papery, abaxially sparsely pubescent or subglabrous, adaxially glabrous, lustrous, base broadly cuneate or subrounded, margin shallowly crenate, rarely serrate or entire only at apex, apex acute or acuminate. Pedicel short or nearly absent, pubescent. Flowers 3–5-fascicled, ca. 2.5 cm in diam.; bracts lanceolate. Hypanthium campanulate, abaxially densely pubescent. Sepals lanceolate or triangular-lanceolate, 5–8 mm, both surfaces pubescent, slightly shorter than hypanthium, margin entire, apex acute or acuminate. Petals white, oblong or oblong-ovate, 1.2–1.6 cm × 5–9 mm. Stamens ca. 30. Styles ca. as long as stamens, connate and pubescent at base. Pome yellow, subglobose or ellipsoid, 2–3 cm in diam., slightly pubescent when young; sepals persistent, erect. Fl. Mar–Apr, fr. Aug–Sep.

Slopes, stream sides, thickets; 2000–3000 m. SW Sichuan, NE Yunnan [Bhutan, India, Myanmar, Nepal, Pakistan, Sikkim, Thailand, Vietnam].

2. *Docynia delavayi* (Franchet) C. K. Schneider, Repert. Spec. Nov. Regni Veg. 3: 180. 1906.

云南檵木 yun nan duo yi

Pyrus delavayi Franchet, Pl. Delavay. 227. 1890; *Cotoneaster bodinieri* H. Léveillé; *Cydonia delavayi* (Franchet) Car-dot; *Eriolobus delavayi* (Franchet) C. K. Schneider.

Trees evergreen, to 3–10 m tall. Branches loose; branchlets reddish brown or purplish brown, robust, terete, initially densely yellow tomentose, glabrescent; buds reddish brown, ovoid; scales with pubescent margin, apex acuminate. Stipules caducous, lanceolate, small; petiole ca. 1 cm, densely tomentose; leaf blade lanceolate or ovate-lanceolate, 6–8 × 2–3 cm, leathery, abaxially densely yellowish white tomentose, adaxially lustrous, base cuneate or subrounded, margin entire or slightly crenulate, apex acute or acuminate. Pedicel short, subglabrous, in fruit becoming longer, densely tomentose. Flowers 3–5-fascicled, 2.5–3 cm in diam.; bracts lanceolate, apex acuminate. Hypanthium campanulate, abaxially yellowish white tomentose. Sepals lanceolate or triangular-lanceolate, 5–8 mm, both surfaces densely tomentose, shorter than hypanthium, margin entire, apex acute or acuminate. Petals white, ovate or oblong-ovate, 1.2–1.5 cm × 5–8 mm. Stamens 40–45. Styles equaling or lower than stamens, connate and pubescent at base. Pome yellow, ovoid or oblong, 2–3 cm in diam., initially densely tomentose, slightly tomentose or subglabrous when mature; sepals persistent. Fl. Mar–Apr, fr. Aug–Sep.

• River sides in valleys, mixed forests, mountainous areas; 1000–3000 m. W Guizhou, W Sichuan, NW Yunnan.

21. **CHAENOMELES** Lindley, Trans. Linn. Soc. London 13: 96, 97. 1821, nom. et orth. cons.

木瓜属 mu gua shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Pseudochaenomeles Carrière; *Pseudocydonia* C. K. Schneider.

Shrubs, subshrubs, or small trees, deciduous or evergreen, sometimes with thorny branches; buds small, with 2 exposed scales. Leaves simple, alternate, shortly petiolate, stipulate, herbaceous, venation camptodromous, margin serrate or crenate. Flowers solitary or fascicled, precocious or coetaneous. Sepals 5, caducous, margin entire or serrate. Petals 5. Stamens 20 or more, 2-whorled. Ovary 5-loculed, with many ovules per locule, 2-seriate; styles 2–5, connate at base. Fruit a pome, large, many seeded, often with persistent incurved styles; seed brown, seed coat leathery, albumen absent.

About five species: E Asia; five species (three endemic) in China.

- 1a. Branches unarmed; flowers solitary, coetaneous; sepals reflexed; stipules ovate-lanceolate, margin glandular serrate 1. *C. sinensis*

- 1b. Branches armed; flowers fascicled, precocious or coetaneous; sepals erect, rarely reflexed; stipules herbaceous, reniform or auriculate, margin serrate.
- 2a. Leaf margin entire 5. *C. thibetica*
- 2b. Leaf margin serrate or crenate.
- 3a. Branchlets scabrous, verruculose when old; fruit small, 3–4 cm in diam., maturing early; leaf blade obovate to spatulate, margin crenate 4. *C. japonica*
- 3b. Branchlets smooth, not verruculose when old; fruit medium-sized to large, 5–8 cm in diam., maturing late; leaf blade ovate, elliptic, or lanceolate, margin serrate.
- 4a. Leaf blade ovate to narrowly elliptic, abaxially glabrous or initially slightly pubescent, margin sharply serrate; styles glabrous or slightly pubescent 2. *C. speciosa*
- 4b. Leaf blade elliptic or lanceolate, abaxially densely brown tomentose, margin aristate-serrate; styles basally pubescent or lanose 3. *C. cathayensis*

1. *Chaenomeles sinensis* (Thouin) Koehne, Gatt. Pomac. 29. 1890.

木瓜 mu gua

Cydonia sinensis Thouin, Ann. Mus. Hist. Nat. 19: 145. 1812; *Pseudocydonia sinensis* (Thouin) C. K. Schneider; *Pyrus cathayensis* Hemsley; *P. chinensis* Sprengel; *P. sinensis* (Thouin) Poiret.

Shrubs or small trees, to 5–10 m. Branchlets purplish red, terete, unarmed, initially pubescent, soon glabrate, with pale lenticels; buds purplish brown, glabrous, apex obtuse. Stipules ovate-oblong, rhomboidal, or lanceolate, 5–12 mm, herbaceous, subglabrous, margin glandular serrate, apex acute; petiole 5–10 mm, pubescent, glandular serrate; leaf blade elliptic-ovate or elliptic-oblong, rarely obovate, 5–8 × 3.5–5.5 cm, abaxially yellowish white tomentose when young, soon glabrescent, base broadly cuneate or rounded, margin aristate and sharply serrate (teeth glandular at apices), apex acute. Pedicel short, 5–10 mm, glabrous. Flowers solitary, 2.5–3 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals reflexed, triangular-lanceolate, 6–10 mm, abaxially glabrous, adaxially brown tomentose, apex acute or acuminate. Petals pinkish, obovate, base shortly clawed, apex rounded. Stamens numerous, ca. 1/2 as long as petals. Styles 3–5, ca. as long as stamens, connate at base. Pome fragrant, dark yellow, narrowly ellipsoid, 10–15 cm, woody; sepals caducous; fruiting pedicel short. Fl. Apr, fr. Sep–Oct.

• About 1000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Hubei, Jiangsu, Jiangxi, Shaanxi, Shandong, Zhejiang.

The fruit are used medicinally.

2. *Chaenomeles speciosa* (Sweet) Nakai, J. Jap. Bot. 4: 331. 1929.

贴梗海棠 tie geng hai tang

Cydonia speciosa Sweet, Hort. Suburb.-Lond. 113. 1818; *Chaenomeles lagenaria* (Loiseleur-Deslongchamps) Koidzumi; *Cydonia japonica* (Thunberg) Persoon var. *lagenaria* (Loiseleur-Deslongchamps) Makino; *C. lagenaria* Loiseleur-Deslongchamps.

Shrubs deciduous, to 2 m tall, with thorns. Branchlets purplish brown or blackish brown, terete, glabrous, with pale brown lenticels; buds purplish brown, triangular-ovoid, glabrous or pubescent at margin of scales, apex obtuse. Stipules reniform or suborbicular, rarely ovate, large, 5–10 mm, herbaceous, glabrous, sharply doubly serrate at margin, apex acute;

petiole ca. 1 cm, initially sparsely pubescent, glabrescent; leaf blade ovate to elliptic, rarely narrowly elliptic, 3–9 × 1.5–5 cm, glabrous or pubescent abaxially along veins on leaves of shoots, base cuneate to broadly cuneate, margin shortly serrate, apex acute or obtuse. Pedicel absent or short, ca. 3 mm, subglabrous. Flowers precocious, 3–5-fascicled on second year's branchlets, 3–5 cm in diam. Hypanthium campanulate, glabrous. Sepals erect, suborbicular, rarely ovate, 3–4 mm, abaxially glabrous, adaxially pubescent. Petals scarlet, rarely pinkish or white, ovate or suborbicular, base shortly clawed, apex rounded. Stamens 40–50, ca. 1/2 as long as petals. Styles 5, ca. as long as stamens, connate at base, glabrous or slightly pubescent. Pome fragrant, yellow or yellowish green, globose or ovoid, 4–6 cm in diam.; sepals caducous; fruiting pedicel short or absent. Fl. Mar–May, fr. Sep–Oct. $2n = 34^*$.

Fujian, Gansu, Guangdong, Guizhou, Hubei, Jiangsu, Shaanxi, Sichuan, Xizang, Yunnan [Myanmar].

This species is planted in parks and gardens as an ornamental; its fruit are used medicinally.

3. *Chaenomeles cathayensis* (Hemsley) C. K. Schneider, Ill. Handb. Laubholz. 1: 730. 1906.

木瓜海棠 mu gua hai tang

Cydonia cathayensis Hemsley, Hooker's Icon. Pl. 27: t. 2657. 1901; *Chaenomeles lagenaria* Koidzumi var. *cathayensis* (Hemsley) Rehder; *C. lagenaria* var. *wilsonii* Rehder; *C. speciosa* Nakai var. *cathayensis* (Hemsley) H. Hara; *C. speciosa* var. *wilsonii* (Rehder) H. Hara; *Cydonia japonica* (Thunberg) Persoon var. *cathayensis* (Hemsley) Cardot.

Shrubs or small trees, deciduous, 2–6 m tall, with short thorns. Branchlets purplish brown, terete, glabrous, with sparse, pale brown lenticels; buds purplish brown, triangular-ovoid, glabrous, apex acute. Stipules reniform, auriculate, or suborbicular, 5–10 mm, herbaceous, abaxially brown tomentose, margin minutely aristate-serrate, apex acute; petiole ca. 1 cm, pubescent or nearly so; leaf blade elliptic or lanceolate to obovate-lanceolate, 5–11 × 2–4, abaxially initially densely brown tomentose, glabrescent, adaxially glabrous, base cuneate to broadly cuneate, margin minutely aristate-serrate, sparsely serrate or subtire basally, doubly serrate apically, apex acute or acuminate. Pedicel short or nearly absent. Flowers precocious, 2- or 3-fascicled, 2–4 cm in diam. Hypanthium campanulate, abaxially glabrous or slightly pubescent. Sepals erect, ovate to elliptic, 3–5 mm, abaxially glabrous, adaxially and marginally

brown pubescent, apex obtuse or acute. Petals pink or white, obovate or suborbicular. Stamens 45–50, ca. 1/2 as long as petals. Styles 5, ca. as long as stamens, pubescent or lanose basally. Pome fragrant, yellowish red, ovoid or subcylindric, 6–7 cm diam.; sepals caducous; fruiting pedicel short or nearly absent. Fl. Mar–May, fr. Sep–Oct.

• Slopes, forest margins, roadsides, widely cultivated; 900–2500 m. Fujian, Gansu, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang.

4. *Chaenomeles japonica* (Thunberg) Lindley ex Spach, Hist. Nat. Vég. 2: 159. 1834.

和圓子 he yuan zi

Pyrus japonica Thunberg, Nova Acta Regiae Soc. Sci. Upsal. 3: 208. 1780; *Chaenomeles maulei* (Masters) C. K. Schneider; *Cydonia japonica* (Thunberg) Persoon; *Pyrus maulei* Masters.

Shrubs to 1 m tall, with slender thorns. Branches spreading; branchlets purple when young, blackish brown when old, terete, scabrous and tomentose when young, verruculose, and glabrous when old; buds purple, triangular-ovate, glabrous, apex acute. Stipules reniform, ca. 1 cm, herbaceous, glabrous, margin serrate, apex obtuse; petiole ca. 5 mm, glabrous; leaf blade obovate or spatulate to broadly ovate, 3–5 × 2–3 cm, glabrous, base cuneate or broadly cuneate, margin crenate, apex obtuse or acute. Pedicel short or nearly absent, glabrous. Flowers 3–5-fascicled, 2.5–4 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals ovate, rarely suborbicular, 4–5 mm, abaxially glabrous, adaxially and margin brown pubescent. Petals dark red, obovate or suborbicular. Stamens 40–60, ca. 1/2 as long as petals. Styles ca. as long as stamens, connate at base, glabrous. Pome yellow, subglobose, 3–4 cm in diam.; sepals

caducous; fruiting pedicel short or nearly absent. Fl. Mar–Jun, fr. Aug–Oct.

Cultivated. Fujian, Hubei, Jiangsu, Shaanxi, Zhejiang [native to Japan].

This species is cultivated as an ornamental for its showy spring flowers.

5. *Chaenomeles thibetica* T. T. Yu, Acta Phytotax. Sin. 8: 234. 1963.

西藏木瓜 xi zang mu gua

Shrubs or small trees, 1.5–3 m tall, usually with many thorns. Branchlets red or purplish brown when young, blackish brown when old, terete, with sparse, oblong lenticels; buds reddish brown, triangular, with few scales, apex obtuse. Stipules subfalcate or subreniform, large, ca. 1 × 1.2 cm, herbaceous, margin irregularly serrate, apex acute, rarely obtuse; petiole short, 1–1.6 cm, initially brown tomentose, soon glabrous; leaf blade dark green adaxially, ovate-lanceolate or oblong-lanceolate, 6–8.5 × 1.8–3.5 cm, leathery, midvein and lateral veins conspicuous abaxially and impressed adaxially, abaxially densely brown tomentose, base cuneate, margin entire, apex acute. Pedicel short. Flowers 3- or 4-fascicled. Hypanthium campanulate, abaxially glabrous. Sepals reflexed, triangular, ca. 2 mm, glabrous. Petals and stamens not seen. Styles 5, connate and densely gray pubescent at base. Pome fragrant, yellow, oblong or pear-shaped, 5–9 cm in diam., sepals caducous; fruiting pedicel short. Fl. Jul, fr. Sep–Oct.

• Among shrubs on slopes or in valleys; 2600–3800 m. W Sichuan, E Xizang.

Yu and Lu (in FRPS 36: 354. 1974) suggested that this species is a hybrid between *Chaenomeles cathayensis* and *Docynia delavayi*.

22. PYRUS Linnaeus, Sp. Pl. 1: 479. 1753.

梨属 li shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Trees or shrubs, deciduous, rarely semievergreen, sometimes armed. Leaves alternate, simple, petiolate, stipulate, involute in bud, venation camptodromous, margin serrate or entire, rarely lobed. Inflorescences corymbose-racemose. Flowers precocious or synantherous. Hypanthium cupular. Sepals 5, reflexed or spreading. Petals 5, white, rarely pink, clawed. Stamens 15–30; anthers usually dark red or purple. Ovary inferior, 2–5-loculed, with 2 ovules per locule; styles 2–5, free. Pome with juicy pulp, rich in stone cells, 2–5-celled, with cartilaginous endocarp (core), with persistent or caducous sepals; seeds black or blackish brown, seed coat cartilaginous; cotyledons plano-convex.

About 25 species: N Africa, Asia, Europe; 15 species (nine endemic) in China.

Pyrus taihangshanensis S. Y. Wang & C. L. Chang (J. Henan Agric. Coll. 1980(2): 10. 1980), described from Henan, requires further study. We are unable to treat it in this account because we have seen no specimens. The same applies to *Pyrus aria* var. *silvestrii* Pampanini (Nuovo Giorn. Bot. Ital., n.s., 17: 290. 1910), described from Hubei, which may belong to *Sorbus*.

1a. Pome with few persistent sepals, most sepals caducous; styles 2–5.

2a. Leaf margin spiny serrate; styles 4 or 5.

3a. Pome yellow; leaf basally broadly cuneate 10. *P. bretschneideri*

3b. Pome brown; leaf basally rounded or subcordate 11. *P. pyrifolia*

2b. Leaf margin serrate or obtusely serrate, and without spines; styles 2–4(or 5).

4a. Leaf margin serrate.

5a. Pome subglobose, 0.5–1 cm in diam., 2- or 3-loculed; young branches, corymbs, and leaves

abaxially tomentose 12. *P. betulifolia*

ROSACEAE

- 5b. Pome globose or ovoid, 2–2.5 cm in diam., 3- or 4-loculed; young branches, corymbs, and leaves abaxially initially tomentose, glabrescent 13. *P. phaeocarpa*
- 4b. Leaf margin obtusely serrate.
- 6a. Stamens 20; styles 2 or 3; leaves and corymb glabrous 14. *P. calleryana*
- 6b. Stamens 25–30; styles 3–5; leaves and corymb initially pubescent, glabrescent 15. *P. pashia*
- 1b. Pome with persistent sepals; styles 3–5.
- 7a. Leaf margin spiny-serrate.
- 8a. Leaf blade long spiny-serrate, 5–10 cm; styles 5; pome yellow; fruiting pedicel 1–2 cm 1. *P. ussuriensis*
- 8b. Leaf blade shortly spiny-serrate, 4–7 cm; styles 4; pome brown; fruiting pedicel longer, (1.5–)3 cm 2. *P. hopeiensis*
- 7b. Leaf margin serrulate or obtusely serrate, not spinulose.
- 9a. Leaf margin serrulate.
- 10a. Pome yellowish green, ovoid or obovoid, 5-loculed; fruiting pedicel 4–5 cm, thickened distally 3. *P. sinkiangensis*
- 10b. Pome brown, subglobose or obovoid, 3- or 4-loculed; fruiting pedicel 3–4 cm, not thickened distally 4. *P. serrulata*
- 9b. Leaf margin obtusely serrate.
- 11a. Pome yellowish green; petals obovate; flowers 7–10.
- 12a. Pome obovoid or subglobose; leaf blade elliptic to ovate; petiole thin, 1.5–5 cm 5. *P. communis*
- 12b. Pome depressed-globose; leaf blade broadly ovate to suborbicular; petiole thick, 2–3 cm 6. *P. armeniacaefolia*
- 11b. Pome brown; petals broadly ovate; flowers 3–6.
- 13a. Stamens 25; pome 1.5–2.5 cm in diam. 7. *P. pseudopashia*
- 13b. Stamens 20; pome 1–1.5 cm in diam.
- 14a. Pome 4- or 5-loculed; flowers 3–6 in umbel-like racemes, petiole and leaves glabrous 8. *P. xerophila*
- 14b. Pome 3-loculed; flowers 8–10 in corymbs, petiole and leaf blade abaxially sparsely pubescent 9. *P. trilocularis*

1. *Pyrus ussuriensis* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, sér. 2, 15: 132. 1856.

秋子梨 *qiu zi li*

Pyrus simonii Carrière; *P. sinensis* Lindley var. *ussuriensis* Makino.

Trees to 15 m tall. Branchlets yellowish gray to purplish brown when young, yellowish gray or yellowish brown when old, glabrous or sparsely pubescent, sparsely lenticellate; buds ovoid, apex obtuse; scales sparsely pubescent or subglabrous at margin. Stipules caducous, linear-lanceolate, 0.8–1.3 cm, membranous, margin glandular denticulate, apex acuminate; petiole 2–5 cm, tomentose when young, soon glabrescent; leaf blade ovate to broadly ovate 5–10 × 4–6 cm, glabrous or tomentose when young, soon glabrescent, base rounded or subcordate, margin long spinulose-serrate, apex shortly acuminate or caudate-acuminate. Corymb densely 5–7-flowered; peduncle tomentose when young, soon glabrescent; bracts caducous, membranous, linear-lanceolate, 1.2–1.8 cm, margin entire, apex acuminate. Pedicel 2–5 cm, tomentose, soon glabrescent. Flower 3–3.5 cm in diam. Hypanthium campanulate, abaxially glabrous or slightly tomentose. Sepals triangular-lanceolate, 5–8 mm, abaxially glabrous, adaxially tomentose, margin initially glandular denticulate, apex acuminate. Petals white, obovate or broadly ovate, ca. 1.8 × 1.2 cm, glabrous. Stamens 20, shorter than petals. Ovary 5-loculed, with 2 ovules per locule; styles 5, nearly as long as stamens, sparsely pubescent near base. Pome yellow, subglobose, 2–6 cm in diam., 5-loculed; fruiting pedicel 1–3 cm, glabrous; sepals persistent. Fl. May, fr. Aug–Oct. *2n* = 34*, 51*.

Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi [Korea, Russia].

This species has many cultivated forms, the fruit of which are edible; it is commonly cultivated in N, NE, and NW China. It is often used as stock for grafting pear cultivars.

Pyrus ussuriensis var. *ovoidea* Rehder (J. Arnold Arbor. 2: 60. 1920) is, in fact, a cultivar of *P. ussuriensis*. It is characterized by its ovoid, subglobose, or ellipsoid fruit, longer fruiting pedicels (2–4 cm) and tomentose leaves and corymb.

Pyrus lindleyi Rehder (Proc. Amer. Acad. Arts 50: 230. 1915; *P. sinensis* Lindley, Trans. Hort. Soc. London 6: 396. 1826, not Dumont de Courset, 1811, nor Thouin, 1812, nor Poirlet, 1816, nor *P. chinensis* Sprengel, 1825) might be similar to *P. ussuriensis*, but material was not available for study.

2. *Pyrus hopeiensis* T. T. Yu, Acta Phytotax. Sin 8: 232. 1963.

河北梨 *he bei li*

Pyrus hopeiensis var. *peninsula* D. K. Zang & W. D. Peng.

Trees to 6–8 m tall. Branchlets dark purple or purplish brown, sparsely white lenticellate, apices often becoming thorn-like; buds oblong-ovoid or triangular-ovoid, glabrous or scales slightly tomentose at margin and apex, apex acute. Stipules caducous, linear-lanceolate, 7–11 mm, herbaceous, margin sparsely serrate, apex acuminate; petiole 2–4.5 cm, sparsely pubescent or glabrous; leaf blade ovate, broadly ovate, or suborbicular, 4–7 × 4–5 cm, lateral veins 8–10 pairs, glabrous, base rounded or subcordate, margin shortly spinulose-serrate, apex long or shortly acuminate. Raceme umbel-like, 6–8-flowered; peduncle sparsely pubescent or subglabrous; bracts caducous,

linear-lanceolate, 6–9 mm, membranous, villous, margin serrate, apex acuminate. Pedicel 1.2–1.5 cm, subglabrous. Flower 2.5–3 cm in diam. Hypanthium cupular, subglabrous. Sepals triangular-ovate, abaxially sparsely pubescent, adaxially densely pubescent, margin denticulate, apex acuminate. Petals white, elliptic-obovate, ca. 8 × 6 mm, shortly clawed at base. Stamens 20, less than 1/2 as long as petals. Ovary 4(or 5)-loculed, with 2 ovules per locule; styles 4, nearly as long as stamens, glabrous. Pome brown, spotted, globose or ovoid, 1.5–2.5 cm in diam., 4(or 5)-loculed; fruiting pedicel 1.5–3 cm, glabrous; sepals persistent. Fl. Apr, fr. Aug–Sep. $2n = 34^*$.

- Thicket margins on slopes; 100–800 m. Hebei, Shandong.

3. *Pyrus sinkiangensis* T. T. Yu, Acta Phytotax. Sin. 8: 233. 1963.

新疆梨 xin jiang li

Trees to 6–9 m tall. Branchlets purplish brown or grayish brown, terete, glabrous, white lenticellate; buds ovoid, apex acute; scales white pubescent at margin. Stipules caducous, linear-lanceolate, 8–10 mm, membranous, white tomentose, margin sparsely glandular denticulate, apex acuminate; petiole 3–5 cm, white tomentose when young, soon glabrous; leaf blade ovate, elliptic, or broadly ovate, 6–8 × 3.5–5 cm, glabrous or white tomentose when young, base rounded, rarely broadly cuneate, margin crenate or subentire basally, serrulate apically, apex shortly acuminate. Raceme umbel-like, 4–7-flowered; peduncle tomentose when young, glabrescent; bracts caducous, linear-lanceolate, 1–1.3 cm, membranous, margin sparsely glandular denticulate and long tomentose, apex acuminate. Pedicel 1.5–4 cm, tomentose when young, glabrescent. Flowers 1.5–2.5 cm in diam. Hypanthium cupular, abaxially glabrous. Sepals triangular-ovate, 6–7 mm, abaxially brown tomentose, margin glandular denticulate, apex acuminate. Petals white, obovate, 1.2–1.5 × 0.8–1 cm, shortly clawed at base, apex obtusely rounded. Stamens 20, less than or ca. 1/2 as long as petals. Ovary 5-loculed, with 2 ovules per locule; styles 5, not exceeding stamens, pubescent basally. Pome yellowish green, ovoid or obovoid, 2.5–5 cm in diam., 5-loculed; fruiting pedicel 4–5 cm, thickened distally, glabrescent; sepals persistent. Fl. Apr, fr. Aug–Sep. $2n = 34^*$, 51^* .

- 200–1100 m. Native in Xinjiang; cultivated in Gansu, Qinghai, Shaanxi.

This species might be a natural hybrid between *Pyrus communis* and *P. bretschneideri*.

4. *Pyrus serrulata* Rehder, Proc. Amer. Acad. Arts 50: 234. 1915.

麻梨 ma li

Trees to 8–10 m tall. Branchlets purplish brown when old, terete, brown tomentose when young, glabrous when old, sparsely white lenticellate; buds ovoid, apex acute; scales adaxially tawny tomentose. Stipules caducous, linear-lanceolate, membranous, adaxially brown tomentose, margin sparsely glandular denticulate, apex acuminate; petiole 3.5–7.5 cm, brown tomentose when young, soon glabrescent; leaf blade ovate or narrowly ovate, 5–11 × 3.5–7.5 cm, lateral veins 7–13

pairs, abaxially brown tomentose when young, soon glabrescent, base broadly cuneate or rounded, margin serrulate, apex acuminate. Raceme umbel-like, 6–11-flowered; peduncle brown tomentose, soon glabrescent; bracts caducous, linear-lanceolate, 5–10 mm, membranous, adaxially brown lanate, margin glandular denticulate, apex acuminate. Pedicel 3–5 cm, brown tomentose, soon glabrescent. Flowers 2–3 cm in diam. Hypanthium sparsely tomentose abaxially. Sepals persistent or caducous, triangular-ovate, ca. 3 mm, abaxially sparsely tomentose, adaxially tomentose, margin glandular denticulate, apex acuminate or acute. Petals white, broadly ovate, 1–1.2 cm, shortly clawed at base, apex rounded. Stamens 20, ca. 1/2 as long as petals. Ovary 3(or 4)-loculed, with 2 ovules per locule; styles 3(or 4), ca. as long as stamens, sparsely pubescent basally. Pome dark brown, subglobose or obovoid, 1.5–2.2 cm in diam., 3- or 4-loculed, with persistent sepals or sometimes a few caducous; fruiting pedicel 3–4 cm, subglabrous. Fl. Apr, fr. Jun–Aug. $2n = 34^*$.

- Among shrubs, forest margins, thickets; 100–1600 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Zhejiang.

This species is similar to *Pyrus pyrifolia*, which differs by its spinulose-serrate leaves, larger, 5-styled flowers, long acuminate sepals, and larger, brownish fruit.

5. *Pyrus communis* Linnaeus var. ***sativa*** (Candolle) Candolle, Prodr. 2: 643. 1825.

西洋梨 xi yang li

Pyrus sativa Candolle, Fl. France 4: 430. 1805.

Trees to 15 m tall, rarely to 30 m tall, sometimes armed. Branchlets grayish brown or dark brownish red when old, glabrous or slightly pubescent when young; buds ovoid, apex obtuse, glabrous or subglabrous. Stipules caducous, linear-lanceolate, ca. 1 cm, membranous, slightly pubescent, margin sparsely glandular denticulate, apex acuminate; petiole 1.5–5 cm, slender, slightly pubescent when young, soon glabrescent; leaf blade ovate or subrounded to elliptic, 2–5(–7) × 1.5–2.5 cm, pubescent when young, soon only abaxially pubescent along midvein, base broadly cuneate to subrounded, margin obtusely serrate, rarely entire, apex acute or shortly acuminate. Raceme umbel-like, 6–9-flowered; peduncle pubescent or subglabrous; bracts caducous, linear-lanceolate, 1–1.5 cm, membranous, brown pubescent, margin sparsely glandular serrate, apex acute or acuminate. Pedicel 2–3.5 cm, pubescent or subglabrous. Flowers 2.5–3 cm in diam. Hypanthium campanulate, abaxially pubescent. Sepals triangular-lanceolate, 5–9 mm, both surfaces pubescent, margin sparsely glandular denticulate when young, apex acuminate. Petals white, obovate, 1.3–1.5 × 1–1.3 cm, base shortly clawed. Stamens ca. 20, ca. 1/2 as long as petals. Ovary 5-loculed, with 2 ovules per locule; styles 5, nearly as long as stamens, pubescent basally. Pome obovoid or subglobose, 3–5 × 1.5–2 cm, 5-loculed, green or yellow, rarely reddish, dotted; fruiting pedicel 2–3.5 cm, subglabrous; sepals persistent. Fl. Apr, fr. Jul–Sep. $2n = 34^*$.

Commonly cultivated in N, NE, and SW China [Bhutan, Russia, Sikkim, Vietnam; SW Asia, Europe].

This variety includes many important cultivated forms with excellent fruit.

6. *Pyrus armeniifolia* T. T. Yu, Acta Phytotax. Sin. 8: 231. 1963.

杏叶梨 xing ye li

Trees to 8–12 m tall. Branchlets purplish brown when young, dark gray or reddish brown when old, terete, glabrous, sparsely lenticellate; buds narrowly ovoid, sparsely tomentose only at margin of scales, apex acuminate. Stipules caducous, linear-lanceolate, 5–8 mm, membranous, pilose, margin serrate, apex acuminate; petiole 2–3 cm, thick, glabrous; leaf blade broadly ovate or suborbicular, 4–5 × 4–5 cm, lateral veins 8–10 pairs, both surfaces glabrous, base rounded or truncate, margin obtusely serrate, apex acute or rounded-obtuse. Raceme umbel-like, 6–10-flowered; peduncle glabrous or subglabrous; bracts caducous, linear-lanceolate, 5–8 mm, membranous, margin sparsely glandular serrate when young, apex acuminate. Pedicel 2.3–3 cm, subglabrous. Flowers 2–3 cm. Hypanthium cupular, abaxially glabrous. Sepals ovate-lanceolate, ca. 6 mm, adaxially brown tomentose, margin entire, apex acuminate. Petals white, obovate or broadly obovate, 1–1.5 × 0.7–0.9 cm, base shortly clawed, apex rounded. Stamens 20–22, ca. 1/2 as long as petals. Ovary 3- or 4-loculed, with 2 ovules per locule; styles 4 or 5, nearly as long as stamens, glabrous. Pome yellowish green, with few dots, depressed-globose, 2.5–3 cm in diam., 4- or 5-loculed; fruiting pedicel 2.5–3 cm, glabrous; sepals persistent. Fl. Apr–May, fr. Aug–Sep. $2n = 51^*$.

- Cultivated in orchards. N Xinjiang (Tacheng Xian).

This species is characterized by its broadly ovate or suborbicular leaves, and might be allied to *Pyrus xerophila*, differing in its ovate or narrowly ovate leaf blade with serrate margin and acuminate apex, and ovoid or ellipsoid fruit.

7. *Pyrus pseudopashia* T. T. Yu, Acta Phytotax. Sin. 8: 232. 1963.

滇梨 dian li

Trees 5–10 m tall. Branchlets purplish brown when old, terete, sparsely yellow lanate when young, soon glabrescent, glabrous when old, sparsely pale lenticellate; buds ovoid, apex acuminate; scales pubescent at margin. Stipules caducous, not seen; petiole 1.5–3.5 cm, yellow lanate or subglabrous; leaf blade ovate or narrowly ovate, rarely lanceolate-ovate, 6–8 × 3.5–4.5 cm, lateral veins 7–12 conspicuous pairs, abaxially initially yellow lanate, glabrescent, adaxially glabrous, base rounded or broadly cuneate, margin obtusely serrate, apex acute or rounded-obtuse. Raceme umbel-like, 5–7-flowered; peduncle lanate when young, soon glabrescent; bracts caducous, not seen. Pedicel 2–3 cm, initially sparsely lanate. Flowers 9–12 in diam. Hypanthium campanulate, lanate when young, soon glabrescent. Sepals triangular-ovate, ca. 2–3 mm, abaxially sparsely lanate, adaxially densely, margin sparsely glandular denticulate, apex acute or obtuse. Petals white, broadly ovate, 5–8 mm, base shortly clawed, apex rounded. Stamens 25, ca. 1/2 as long as petals. Ovary 3- or 4-loculed, with 2 ovules per locule; styles 3 or 4, nearly as long as stamens, glabrous. Pome brown, with

pale dots, subglobose, 1.5–2.5 cm in diam., 3- or 4-loculed; sepals persistent; fruiting pedicel 3–4.5 cm, thickened distally, glabrous. Fl. Apr, fr. Aug–Sep.

- In mixed forests, thickets; 500–3000 m. Guizhou, Yunnan.

This species is similar to *Pyrus pashia* var. *pashia*, which differs by its smaller leaves, tomentose pedicels, caducous sepals, and smaller fruit.

8. *Pyrus xerophila* T. T. Yu, Acta Phytotax. Sin. 8: 233. 1963.

木梨 mu li

Trees to 8–10 m tall. Branchlets slightly curved, robust, glabrous or sparsely pubescent, brownish gray when old, sparsely white lenticellate; buds ovoid, small, glabrous or scales pubescent at margin and apex, apex acute. Stipules caducous, linear-lanceolate, 6–10 mm, membranous, adaxially white lanate, soon glabrescent, margin glandular denticulate, apex acuminate; petiole 2.5–5 cm, glabrous; leaf blade ovate or narrowly ovate, rarely narrowly elliptic, 4–7 × 2.5–4 cm, glabrous or those of branchlets pubescent, base rounded, margin obtusely serrate, rarely sparsely serrulate toward apex, apex acuminate, rarely acute. Raceme umbel-like, 3–6-flowered; peduncle sparsely pubescent, soon glabrescent; bracts caducous, linear-lanceolate, 6–10 mm, membranous, adaxially white lanate, soon glabrescent, margin glandular denticulate, apex acuminate. Pedicel 2–3 cm, sparsely hairy, soon glabrescent. Flowers 2–2.5 cm in diam. Hypanthium cupular, abaxially glabrous or subglabrous. Sepals triangular-ovate, 2–3 mm, abaxially glabrous, adaxially tomentose, margin glandular denticulate, apex acuminate. Petals white, broadly ovate, 9–10 mm, base shortly clawed, apex rounded. Stamens 20, slightly shorter than petals. Ovary (4- or)5-loculed, with 2 ovules per locule; styles (4 or)5, nearly as long as stamens, sparsely pubescent basally. Pome brown with few pale dots, ovoid or ellipsoid, 1–1.5 cm in diam., 4- or 5-loculed; fruiting pedicel 2–3.5 cm; sepals persistent. Fl. Apr, fr. Aug–Sep. $2n = 34^*$, 51^* .

- Slopes, among shrubs, forests; 500–2000 m. Gansu, Henan, Shaanxi, Shanxi, Xinjiang, Xizang.

In NW China, this species is often used as stock for grafting pear cultivars.

9. *Pyrus trilocularis* D. K. Zang & P. C. Huang, Bull. Bot. Res., Harbin 12: 321. 1992.

崂山梨 lao shan li

Trees small, 4–6 m tall. Branchlets grayish brown to purplish brown, glabrous. Stipules not seen; petiole slender, slightly villous; leaf blade ovate-lanceolate, 10–15 × 3–5 cm, abaxially sparsely villous, adaxially glabrous, base broadly cuneate or rounded, margin obtusely serrate, apex acute or shortly acuminate. Flowers not seen. Inflorescence a corymb, 8–10-fruited. Pome purplish brown at maturity, subglobose, 1–1.5 cm in diam., 3-loculed; sepals persistent, revolute, abaxially glabrous, adaxially densely tomentose.

- 200–300 m. E Shandong (Lao Shan).

The present authors have seen no specimens of this species; the above description is based on the protologue.

10. *Pyrus bretschneideri* Rehder, Proc. Amer. Acad. Arts 50: 231. 1915.

白梨 bai li

Trees to 5–8 m tall. Branchlets purplish brown when old, terete, robust, densely pubescent when young, glabrous when old, sparsely lenticellate; buds dark purple, ovoid, apex obtuse; scales pubescent at margin and apex. Stipules caducous, linear or linear-lanceolate, 1–1.3 cm, membranous, pubescent, margin glandular denticulate, apex acuminate; petiole 2.5–7 cm, densely tomentose when young, soon glabrescent; leaf blade ovate or elliptic-ovate, 5–11 × 3.5–6 cm, both surfaces tomentose when young, soon glabrescent, base broadly cuneate, rarely subrounded, margin spinulose-serrate, apex acuminate, rarely acute. Raceme umbel-like, 7–10-flowered; peduncle tomentose when young, soon glabrescent; bracts caducous, linear, 1–1.5 cm, membranous, adaxially brown tomentose, margin entire, apex acuminate. Pedicel 1.5–3 cm, pubescent when young. Flowers 2–3.5 cm in diam. Hypanthium cupular, slightly pubescent when young. Sepals triangular, 3.5–5 mm, abaxially glabrous, adaxially brown tomentose, margin glandular denticulate, apex acuminate. Petals white, ovate, 1.2–1.4 × 1–1.2 cm, base shortly clawed, apex rounded. Stamens 20, ca. 1/2 as long as petals. Ovary 5- or 4-loculed, with 2 ovules per locule; styles 5 or 4, ca. as long as stamens, glabrous. Pome yellow, with fine dots, ovoid or subglobose, 2–2.5 cm in diam., 4- or 5-loculed; sepals caducous; fruiting pedicel 1.5–3 cm, glabrous. Fl. Apr, fr. Aug–Sep. $2n = 34^*$, 51^* , 68^* .

• Slopes, dry cold regions; 100–2000 m. Gansu, Hebei, Henan, Shaanxi, Shandong, Shanxi, Xinjiang.

This species is commonly cultivated in N China, preferring sunny, dry, loamy soils. It includes many important forms with excellent fruit.

11. *Pyrus pyrifolia* (N. L. Burman) Nakai, Bot. Mag. (Tokyo) 40: 564. 1926.

沙梨 sha li

Ficus pyrifolia N. L. Burman, Fl. Ind. 226. 1768; *Pyrus serotina* Rehder.

Trees to 7–15 m tall. Branchlets purplish brown or dark brown when old, terete, tawny villous or tawny tomentose when young, soon glabrescent, glabrous when old, sparsely lenticellate; buds narrowly ovoid, apex obtuse; scales tomentose at margin and apex. Stipules caducous, linear-lanceolate, 1–1.5 cm, membranous, margin villous and entire, apex acuminate; petiole 3–4.5 cm, initially tomentose, glabrescent; leaf blade ovate-elliptic or ovate, 7–12 × 4–6.5 cm, glabrous or brown lanate when young, base rounded or subcordate, rarely broadly cuneate, margin spinulose-serrate, apex acute. Raceme umbel-like, 6–9-flowered; peduncle sparsely pubescent when young; bracts caducous, linear, 1–1.4 cm, membranous, villous at margin, apex acuminate. Pedicel 3.5–5 cm, sparsely pubescent when young. Flowers 2.5–3.5 cm in diam. Hypanthium cupular, abaxially glabrous. Sepals triangular-ovate, ca. 5 mm, abaxially glabrous, adaxially brown tomentose, margin glandular denticulate, apex acuminate. Petals white, ovate, 1.5–1.7 cm, base shortly clawed, apex rounded. Stamens 20, ca. 1/2 as long as petals. Ovary 5- or 4-loculed, with 2 ovules per locule; styles 5,

rarely 4, nearly as long as stamens, glabrous. Pome brownish, with pale dots, subglobose, 2–2.5 cm in diam., (4- or)5-loculed; sepals caducous; fruiting pedicel 3.5–5.5 cm, subglabrous. Fl. Apr, fr. Aug. $2n = 34^*$, 51^* .

Warm rainy regions; 100–1400 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Laos, Vietnam].

Many varieties of pear cultivated in the regions of the Chang Jiang and Zhu Jiang rivers belong to this species.

12. *Pyrus betulifolia* Bunge, Mem. Acad. Imp. Sci. St.-Petersbourg Divers Savans 20: 101. 1835.

杜梨 du li

Trees to 10 m tall, often spinescent. Branchlets purplish brown when old, terete, gray tomentose when young, sparsely tomentose or glabrous when old, sparsely lenticellate; buds ovoid, abaxially gray tomentose, apex acuminate. Stipules caducous, linear-lanceolate, ca. 2 mm, membranous, both surfaces tomentose, margin initially glandular serrate, apex acuminate; petiole 2–3 cm, gray tomentose; leaf blade rhomboidal-ovate or oblong-ovate, 4–8 × 2.5–3.5 cm, abaxially sparsely tomentose or subglabrous, adaxially gray tomentose when young, glabrous and shiny when old, base broadly cuneate, rarely subrounded, margin serrate, apex acuminate. Raceme umbel-like, 10–15-flowered; peduncle gray tomentose; bracts caducous, linear, 5–8 mm, membranous, both surfaces slightly tomentose, margin entire, apex acuminate. Pedicel 2–2.5 cm, densely gray tomentose when young. Flowers 1.5–2 cm in diam. Hypanthium cupular, abaxially gray tomentose. Sepals triangular-ovate, ca. 3 mm, both surfaces tomentose, margin entire, apex acute. Petals white, broadly ovate, 5–8 × 3–4 mm, base shortly clawed, apex rounded. Stamens 20, ca. 1/2 as long as petals. Ovary 2- or 3-loculed, with 2 ovules per locule; styles 2 or 3, nearly as long as stamens, sparsely pubescent basally. Pome brown, with pale dots, subglobose, 5–10 mm in diam., 2- or 3-loculed; sepals caducous; fruiting pedicels 1–2.5 cm, gray tomentose when young, glabrescent. Fl. Apr, fr. Aug–Sep. $2n = 34^*$.

Open slopes, plains; sea level to 1800 m. Anhui, Gansu, Guizhou, Hebei, Henan, Hubei, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xizang, Zhejiang [Laos].

This species is a common tree in N China, and is often planted in gardens and parks for ornamental purposes, preferring sunny, dry, sandy, loamy soils. It is usually used as stock to graft various pear cultivars.

13. *Pyrus phaeocarpa* Rehder, Proc. Amer. Acad. Arts 50: 235. 1915.

褐梨 he li

Trees to 5–8 m tall. Branchlets purplish red when young, purplish brown when old, terete, white tomentose when young, glabrous when old, sparsely pale lenticellate; buds narrowly ovoid, apex obtuse; scales tomentose at margin. Stipules caducous, linear-lanceolate, 1–2 mm, membranous, adaxially sparsely tomentose, margin sparsely glandular denticulate, apex acuminate; petiole 2–6 cm, sparsely pubescent or subglabrous; leaf blade elliptic-ovate or narrowly ovate, 6–10 × 3.5–5 cm, sparsely tomentose when young, soon glabrescent, base broadly cuneate, margin serrate, apex long acuminate. Raceme umbel-

like, 5–8-flowered; peduncle tomentose when young, soon glabrescent; bracts caducous, linear-lanceolate, 8–11 mm, membranous, adaxially villous, margin entire, apex acuminate. Pedicel 2–2.5 cm, subglabrous. Flowers ca. 3 cm in diam. Hypanthium campanulate, abaxially white tomentose. Sepals triangular-lanceolate, 2–3 mm, adaxially tomentose, margin entire, apex acuminate. Petals white, ovate, 1–1.5 cm, base shortly clawed, apex rounded. Stamens 20, ca. 1/2 as long as petals. Ovary (2- or)3- or 4-loculed, with 2 ovules per locule; styles (2 or)3 or 4, nearly as long as stamens, glabrous basally. Pome brown with pale dots, globose or ovoid, 2–2.5 cm in diam., 3- or 4-loculed; sepals caducous; fruiting pedicel 2–4 cm, glabrous. Fl. Apr, fr. Aug–Sep. $2n = 34^*$.

• Slopes, mixed hillside forests of the Loess Plateau; 100–1200 m Gansu, Hebei, Shaanxi, Shandong, Shanxi, Xinjiang.

This species is often used as stock to graft pear cultivars.

14. *Pyrus calleryana* Decaisne, Jard. Fruit. 1: 329. 1871–72.

豆梨 dou li

Trees 5–8 m tall. Branchlets reddish brown when young, grayish brown when old, terete, initially tomentose, soon glabrescent, glabrous when old; buds triangular-ovoid, sparsely tomentose, apex shortly acuminate. Stipules caducous, linear-lanceolate, 4–7 cm, herbaceous, glabrous, margin entire, apex acuminate; petiole 2–4 cm, glabrous; leaf blade broadly ovate or ovate, rarely narrowly elliptic, 4–8 × 3.5–6 cm, glabrous, base rounded or broadly cuneate, margin obtusely serrate, apex acuminate, rarely acute. Raceme umbel-like, 6–12-flowered; peduncle glabrous; bracts caducous, linear-lanceolate, 0.8–1.3 cm, membranous, adaxially tomentose, margin initially glandular serrate, apex acuminate. Pedicel 1.5–3 cm, glabrous. Flowers 2–2.5 cm in diam. Hypanthium cupular, glabrous. Sepals lanceolate, ca. 5 mm, abaxially glabrous, adaxially tomentose, margin entire, apex acuminate. Petals white, ovate, ca. 1.3 × 1 cm, base shortly clawed, apex rounded. Stamens 20, slightly shorter than petals. Ovary 2(or 3)-loculed, with 2 ovules per locule; styles 2(or 3), nearly as long as stamens, glabrous basally. Pome blackish brown with pale dots, globose, ca. 1 cm in diam., 2(or 3)-loculed; sepals caducous; fruiting pedicel 1.5–3 cm, glabrous. Fl. Apr, fr. Aug–Sep. $2n = 34^*$.

Slopes, plains, mixed valley forests, thickets; 100–1800 m. Anhui, Fujian, Guangdong, Guangxi, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi (Qin Ling), Shandong, Taiwan, Zhejiang [Japan, Vietnam].

The wood of this species is hard and close-grained, and is sometimes used for making furniture and stools. It is often used as stock to graft *Pyrus pyrifolia*.

Pyrus taiwanensis Iketani & H. Ohashi (J. Jap. Bot. 68: 40. 1993), described from Taiwan, might be an allied species or an ecotype of *P. calleryana*.

- 1a. Leaf basally cuneate; ovary 3- or 4-loculed 14d. var. *koehnei*
 1b. Leaf basally rounded to broadly cuneate; ovary 2(or 3)-loculed.
 2a. Leaf margin entire, blade usually ovate 14c. var. *integrifolia*
 2b. Leaf margin serrate, blade ovate-lanceolate or broadly ovate.

- 3a. Leaf blade ovate-lanceolate or oblong-lanceolate 14b. var. *lanceata*
 3b. Leaf blade broadly ovate, rarely narrowly elliptic-ovate 14a. var. *calleryana*

14a. *Pyrus calleryana* var. *calleryana*

豆梨(原变种) dou li (yuan bian zhong)

Pyrus calleryana var. *calleryana* f. *tomentella* Rehder; *P. kawakamii* Hayata.

Leaf blade ovate to broadly ovate, rarely narrowly elliptic-ovate, glabrous or rusty tomentose, soon glabrescent, margin obtusely serrate, base rounded or broadly cuneate. Fruiting pedicel and hypanthium abaxially glabrous or sparsely tomentose.

Slopes, plains, mixed valley forests; 100–1800 m. Anhui, Fujian, Guangdong, Guangxi, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Taiwan, Zhejiang [Japan, Vietnam].

14b. *Pyrus calleryana* var. *lanceata* Rehder, J. Arnold Arbor. 7: 28. 1926.

柳叶豆梨 liu ye dou li

Leaf blade ovate-lanceolate or oblong-lanceolate, margin shallowly serrate or nearly entire.

• Anhui, Fujian, Zhejiang.

14c. *Pyrus calleryana* var. *integrifolia* T. T. Yu, Acta Phytotax. Sin. 8: 232. 1963.

全缘叶豆梨 quan yuan ye dou li

Leaf blade ovate, margin entire, base obtusely rounded.

• Jiangsu, Zhejiang.

14d. *Pyrus calleryana* var. *koehnei* (C. K. Schneider) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 370. 1974.

楔叶豆梨 qi ye dou li

Pyrus koehnei C. K. Schneider, III. Handb. Laubholz. 1: 665. 1906.

Leaf blade cuneate at base. Ovary 3- or 4-loculed.

• Fujian, Guangdong, Guangxi, Zhejiang.

15. *Pyrus pashia* Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 236. 1825.

川梨 chuan li

Trees to 12 m tall, with branches often armed. Branchlets purplish brown or dark brown when old, terete, lanate when young, glabrous when old; buds ovoid, apex obtuse; scales puberulous along margin. Stipules caducous, linear-lanceolate, 4–8 mm, membranous, adaxially pubescent, margin entire, apex acuminate; petiole 1.5–3 cm, initially pilose, soon glabrescent; leaf blade ovate or narrowly ovate, rarely elliptic, 4–7 × 2–5 cm, tomentose when young, glabrescent, base rounded, rarely broadly cuneate, margin obtusely serrate, apex acuminate or acute. Raceme umbel-like, 7–13-flowered; peduncle initially tomentose, glabrescent; bracts caducous, linear, 8–10 mm, membranous, both surfaces tomentose, margin entire, apex acumi-

nate. Pedicel 2–3 cm, initially tomentose, glabrescent. Flowers 2–5 cm in diam. Hypanthium cupular, abaxially tomentose. Sepals triangular, 3–6 mm, both surfaces tomentose, margin entire, apex acute, acuminate, or obtuse. Petals white, obovate, 8–10 × 4–6 mm, base shortly clawed, apex rounded. Stamens 25–30, slightly shorter than petals. Ovary 3–5-loculed, with 2 ovules per locule; styles 3–5, nearly as long as stamens, glabrous. Pome brown, with pale dots, subglobose, 1–1.5 cm in diam.; sepals caducous; fruiting pedicel 2–3 cm, subglabrous. Fl. Mar–Apr, fr. Aug–Sep. $2n = 34^*$.

Valleys, among shrubs; 600–3000 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Laos, Myanmar, Nepal, W Pakistan, Sikkim, Thailand, Vietnam].

This tree is cultivated in Yunnan, and is often used as stock for grafting pear cultivars.

- 1a. Leaves and inflorescence glabrous 15c. var. *kumaoni*
- 1b. Leaves and inflorescence pubescent at least when young.
 - 2a. Flowers large, ca. 3 cm in diam., young leaves, petiole, pedicel, and sepals adaxially rusty tomentose 15d. var. *grandiflora*
 - 2b. Flowers smaller, 2–2.5 cm in diam., sepals on both surfaces and leaves initially tomentose.
 - 3a. Sepals apically acute; branchlets and inflorescence lanose 15a. var. *pashia*
 - 3b. Sepals apically obtuse, rarely acute or acuminate; branchlets and inflorescence tomentose 15b. var. *obtusata*

15a. *Pyrus pashia* var. *pashia*

川梨(原变种) chuan li (yuan bian zhong)

Pyrus nepalensis Hortorum ex Decaisne; *P. variolosa* Wallich ex G. Don.

Branchlets and inflorescences lanose.

Valleys, among shrubs; 600–3000 m. Guizhou, Sichuan, Yunnan [Bhutan, India, Kashmir, Laos, Myanmar, Nepal, W Pakistan, Sikkim, Thailand, Vietnam].

15b. *Pyrus pashia* var. *obtusata* Cardot, Notul. Syst. (Paris) 3: 346. 1918.

钝叶川梨 dun ye chuan li

Branchlets and inflorescences tomentose. Sepals obtuse, rarely acute or acuminate at apex.

• Sichuan, Yunnan.

15c. *Pyrus pashia* var. *kumaoni* Stapf, Bot. Mag. 135: t. 8256. 1909.

无毛川梨 wu mao chuan li

Leaf blades and inflorescences glabrous. Sepals ovate, apex obtuse.

Yunnan [N India].

15d. *Pyrus pashia* var. *grandiflora* Cardot, Notul. Syst. (Paris) 3: 346. 1918.

大花川梨 da hua chuan li

Flowers large, ca. 3 cm in diam., leaf blade initially, petiole, pedicel, and sepals adaxially rusty tomentose.

• Guizhou, Yunnan.

23. MALUS Miller, Gard. Dict. Abr., ed. 4, [835]. 1754.

苹果属 ping guo shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Sinomalus Koidzumi.

Trees or shrubs, deciduous or semievergreen, usually unarmed; buds ovoid, with several imbricate scales. Leaves alternate, simple, petiolate, stipulate, venation craspedodromous or camptodromous and merely toothed, margin serrate or lobed, folded or convolute in bud. Inflorescences corymbose-racemose. Flowers pedicellate. Hypanthium bowl-shaped. Sepals 5, persistent or caducous. Petals 5, white, pink, or red, suborbicular or obovate. Stamens 15–50, with white filaments and yellow anthers. Ovary inferior, 3–5-loculed, with 2 ovules in each cell; styles 3–5, connate at base, glabrous or pubescent. Pome usually not containing stone cells or present in a few species, 3–5-loculed, 1- or 2-seeded in each cell, with cartilaginous endocarp (core). Seeds brown or black, cotyledons plano-convex.

About 55 species: widely distributed in N temperate zone; 26 species (16 endemic) in China.

- 1a. Leaf blade not lobed, convolute in bud; pome without stone cells.
 - 2a. Sepals caducous in fruit; styles 3–5; pome usually less than 1.5 cm in diam.
 - 3a. Sepals triangular-ovate, ca. as long as or slightly shorter than hypanthium.
 - 4a. Hypanthium, sepals, branchlets, petiole, and pedicel tomentose 9. *M. daochengensis*
 - 4b. Hypanthium and sepals abaxially glabrous; branchlets, petiole, and pedicel slightly pubescent when young, soon glabrescent.
 - 5a. Leaf blade ovate-lanceolate or broadly lanceolate, apex caudate-acuminate; pome cylindrical 8. *M. muliensis*
 - 5b. Leaf blade ovate, ovate-elliptic, rarely narrowly elliptic, apex acuminate to long acuminate; pome ellipsoid, pyriform, or subglobose, rarely obovoid.
 - 6a. Leaf blade acutely serrulate; sepals apically acuminate or acute; styles 3, rarely 4; pome ellipsoid to subglobose 6. *M. hupehensis*

ROSACEAE

- 6b. Leaf blade obtusely serrulate; sepals apically obtuse; styles 4 or 5; pome pyriform or obovoid 7. *M. halliana*
- 3b. Sepals lanceolate, longer than hypanthium.
- 7a. Branchlets glabrous or puberulous; leaf blade initially puberulous, glabrescent or subglabrous later.
- 8a. Petiole, leaf veins, pedicel, and hypanthium often sparsely pubescent; pome ellipsoid or obovoid 3. *M. mandshurica*
- 8b. Petiole, leaf veins, pedicel, and hypanthium glabrous; pome subglobose or obovoid.
- 9a. Sepals lanceolate, apex long acuminate; styles 5 or 4, basally densely villous, pome subglobose with an obscure small scar at apex 1. *M. baccata*
- 9b. Sepals ovate, apex caudate, rarely acuminate; styles (3 or)4, basally slightly pilose or glabrous, pome obovoid, with a large scar at apex 2. *M. jinxianensis*
- 7b. Branchlets and leaf blade abaxially often tomentose or pubescent.
- 10a. Styles basally glabrous, pome obovoid or pyriform, white punctate; leaf blade abaxially densely tomentose 4. *M. sikkimensis*
- 10b. Styles basally pubescent or glabrous, pome subglobose, not punctate; leaf blade abaxially pubescent.
- 11a. Leaf margin appressed serrate, blade abaxially densely puberulous, base rounded or broadly cuneate; petals white but pink abaxially; pome ovoid or subglobose, slightly convex at apex; sepals caducous 5. *M. rockii*
- 11b. Leaf margin acutely serrate, blade abaxially pubescent when young, glabrescent, base cuneate; petals pink; pome subglobose, impressed at apex; sepals caducous or persistent 15. *M. ×micromalus*
- 2b. Sepals persistent in fruit; styles (4 or)5; pome larger, usually more than 2 cm in diam.
- 12a. Sepals apically acute, shorter than or ca. as long as hypanthium.
- 13a. Leaf base broadly cuneate or subrounded; petiole 1.5–2 cm; pome yellow, without cavity at base; sepals persistent 14. *M. spectabilis*
- 13b. Leaf base cuneate; petiole 2–3.5 cm; pome red with cavity at base; sepals caducous or persistent 15. *M. ×micromalus*
- 12b. Sepals apically acuminate, longer than hypanthium.
- 14a. Leaf margin obtusely serrate; pome depressed-globose or globose, often projected at apex.
- 15a. Cultivated species; pome large, with short pedicel; leaf blade serrate; branchlets, buds, and leaves with many hairs 10. *M. pumila*
- 15b. Native species; pome small, with long pedicel; leaf blade serrulate; branchlets, buds, and leaves with few hairs 11. *M. sieversii*
- 14b. Leaf margin often acutely serrate; pome ovoid, attenuate at apex, not or slightly projected at apex.
- 16a. Pome large, 4–5 cm in diam., with 1.5–2 cm pedicel; leaf blade abaxially densely puberulous 12. *M. asiatica*
- 16b. Pome smaller, 2–2.5 cm in diam., with 3.2–3.5 cm pedicel; leaf blade abaxially puberulous or subglabrous only along veins 13. *M. prunifolia*
- 1b. Leaf blade usually lobed, rarely not lobed, folded in bud; pome without or with few stone cells.
- 17a. Sepals caducous.
- 18a. Styles basally villous; pome subglobose 16. *M. sieboldii*
- 18b. Styles basally glabrous; pome ellipsoid or obovoid, rarely subglobose.
- 19a. Leaf blade often 3–5-lobed, doubly serrate at margin; pome with few stone cells.
- 20a. Lobes of leaf blade triangular-ovate; leaf blade rounded or truncate at base; fruiting pedicel 2–3.5 cm 17. *M. kansuensis*
- 20b. Lobes of leaf blade oblong-ovate; leaf blade cordate or subcordate at base; fruiting pedicel 1.2–1.5 cm 18. *M. komarovii*
- 19b. Leaf blade 3–5-parted, not doubly serrate at margin; pome without stone cells.
- 21a. Young branches puberulous, soon glabrescent; leaf blade undivided or sometimes parted, both surfaces pubescent; flower 2–2.5 cm in diam. 19. *M. toringoides*
- 21b. Young branches tomentose; leaf blade parted, tomentose on both surfaces; flowers 1.5–2 cm in diam. 20. *M. transitoria*
- 17b. Sepals persistent.
- 22a. Pome projected at apex, core separated.
- 23a. Pedicel, hypanthium, and sepals abaxially tomentose 25. *M. doumeri*
- 23b. Pedicel, hypanthium, and sepals abaxially glabrous 26. *M. leiocalyca*
- 22b. Pome with cupular cavity at apex, core not separated.
- 24a. Leaf margin not lobed; inflorescence subcorymbiform.
- 25a. Leaf margin serrulate, abaxially glabrous or sparsely puberulous; pome 1–1.5 cm in diam.; fruiting pedicel glabrous 21. *M. prattii*
- 25b. Leaf margin doubly serrate, abaxially tomentose; pome 1.5–2 cm in diam.; fruiting pedicel villous 22. *M. ombrophila*
- 24b. Leaf margin 3–6-lobed, acutely doubly serrate; inflorescence subracemose.
- 26a. Styles 3 or 4; leaf blade abaxially puberulous; hypanthium and pedicel sparsely pubescent 23. *M. honanensis*
- 26b. Styles 5; leaf blade abaxially tomentose; hypanthium and pedicel tomentose 24. *M. yunnanensis*

1. *Malus baccata* (Linnaeus) Borkhausen, Theor. Prakt. Handb. Forstbot. 2: 1280. 1803.

山荆子 shan jing zi

Trees to 10–14 m tall, with arching or pendulous branches. Branchlets reddish brown, terete, glabrous; buds reddish brown, ovoid, scales tomentose at margin. Stipules caducous, lanceolate, ca. 3 mm, membranous, margin entire or with sparse glandular teeth, apex acuminate; petiole 2–5 cm, puberulous, with few glands when young, glabrescent; leaf blade elliptic or ovate, 3–8 × 2–3.5 cm, glabrous or slightly puberulous when young, base cuneate or rounded, margin serrate, apex acuminate, rarely caudate-acuminate. Corymb at apices of branchlets, umbel-like, 5–7 cm in diam., 4–6-flowered; bracts caducous, linear-lanceolate, membranous, glabrous, margin glandular denticulate, apex acuminate. Pedicel 1.5–4 cm, slender, glabrous. Flowers 3–3.5 cm in diam. Hypanthium campanulate, glabrous. Sepals lanceolate, 5–7 mm, longer than hypanthium, abaxially glabrous, adaxially tomentose, margin entire, apex long acuminate. Petals white, obovate, 2–2.5 cm, base shortly clawed, apex obtuse-rounded. Stamens 15–20, unequal, ca. 1/2 as long as petals. Ovary 5- or 4-loculed, with 2 ovules per locule; styles 5 or 4, longer than stamens, densely villous basally. Pome red or yellow, subglobose, 8–10 mm in diam., with an obscure scar at apex; fruiting pedicel 3–4 cm, glabrous; sepals caducous. Fl. Apr–Jun, fr. Sep–Oct. $2n = 34^*$.

Mixed forests on slopes, among shrubs in valleys; sea level to 1500 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xinjiang, Xizang [Bhutan, India, Kashmir, Korea, Mongolia, Nepal, Russia (Siberia)].

This is a beautiful, ornamental tree grown for its showy flowers and red or yellow fruit. It is commonly used as stock to graft *Malus pumila* and *M. asiatica* in N and NE China.

- 1a. Trees to 10–14 m tall; branchlets slender, slightly curved, not pendulous; leaf margin acutely serrate; flowers 3–3.5 cm in diam.; styles 5 or 4 1a. var. *baccata*
 1b. Small trees, 4–6 m tall; branchlets pendulous; leaf margin obtusely serrate; flowers ca. 3 cm in diam.; styles 3 or 4 1b. var. *gracilis*

1a. *Malus baccata* var. *baccata*

山荆子(原变种) shan jing zi (yuan bian zhong)

Pyrus baccata Linnaeus, Mant. Pl. 75. 1767; *M. baccata* var. *sibirica* (Maximowicz) C. K. Schneider; *M. sibirica* Borkhausen.

Trees, to 10–14 m tall. Branchlets slender, slightly curved. Leaf blade 3–8 cm, margin acutely serrate. Flowers 3–3.5 in diam. Styles 5 or 4.

Mixed forests on slopes, among shrubs in valleys; sea level to 1500 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi [Korea, Mongolia, Russia (Siberia)].

1b. *Malus baccata* var. *gracilis* (Rehder) T. C. Ku, comb. et stat. nov.

垂枝山荆子 chui zhi shan jing zi

Basionym: *Malus baccata* f. *gracilis* Rehder, J. Arnold Arbor. 2: 49. 1920.

Trees, small, 4–6 m tall. Branchlets pendulous. Leaf margin obtusely serrate. Flowers ca. 3 cm in diam. Styles 3 or 4.

- Gansu, Shaanxi.

2. *Malus jinxianensis* J. Q. Deng & J. Y. Hong, Acta Phytotax. Sin. 25: 326. 1987.

金具山荆子 jin xian shan jing zi

Malus baccata (Linnaeus) Borkhausen var. *jinxianensis* (J. Q. Deng & J. Y. Hong) C. Y. Li.

Trees small. Branchlets dark brown, terete, slender, subglabrous; buds reddish brown, ovoid; scales slightly pubescent at margin. Stipules usually caducous, lanceolate, ca. 1 cm, membranous, margin serrulate, apex acuminate; petiole 1–1.5 cm, pubescent when young, glabrescent; leaf blade elliptic to ovate, rarely suborbicular, 4–8 × 2–5 cm, both surfaces initially pubescent, soon glabrous, base broadly cuneate or subrounded, margin serrulate, sometimes shortly curved-serrate, apex acuminate or caudate-acuminate. Corymbs clustered at ends of short shoots, 3–5 cm in diam., 3–6-flowered; bracts caducous, linear-lanceolate, adaxially pilose, margin sparsely glandular serrate, apex acuminate. Pedicel 2–3.3 cm, slender, glabrous. Flowers 1–2 cm in diam. Hypanthium campanulate, abaxially glabrous. Sepals ovate, 3–4 mm, longer than hypanthium, tomentose adaxially, margin entire, apex caudate, rarely acuminate. Petals pink, ovate, 1–1.5 cm, base shortly clawed, apex rounded. Stamens 20–30, unequal, ca. 1/2 as long as petals. Ovary (3- or)4-loculed, with 2 ovules per locule; styles (3 or)4, slightly connate at base, longer than stamens, sparsely white pilose, rarely glabrous. Pome purplish red, obovoid, ca. 1 cm in diam., with a large scar at apex; fruiting pedicel 3–3.5 cm; sepals caducous. Fl. May, fr. Oct.

- Cultivated. S Liaoning (Jin Xian).

3. *Malus mandshurica* (Maximowicz) Komarov ex Juzepczuk, Fl. URSS 9: 371. 1939.

毛山荆子 mao shan jing zi

Pyrus baccata Linnaeus var. *mandshurica* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 19: 170. 1874; *Malus baccata* (Linnaeus) Borkhausen subsp. *mandshurica* (Komarov) Likhonos; *M. baccata* var. *mandshurica* (Maximowicz) C. K. Schneider.

Trees to 15 m tall. Branchlets purplish brown, terete, densely puberulous when young, glabrescent; buds reddish brown, ovoid, glabrous or scales slightly puberulous at margin. Stipules caducous, linear-lanceolate, 5–7 mm, herbaceous or membranous, adaxially sparsely puberulous, margin sparsely glandular denticulate, apex acuminate; petiole 3–4 cm, sparsely puberulous; leaf blade ovate, elliptic, or obovate, 5–8 × 3–4 cm, abaxially puberulous or subglabrous along midvein and lateral veins, base cuneate or subrounded, margin serrulate, apex acute or acuminate. Corymb sessile, at ends of branchlets, umbel-like, 6–8 cm in diam., 3–6-flowered; bracts caducous, linear-lanceolate, small, membranous, margin entire or glandular denticulate.

late, apex acuminate. Pedicel 3–5 cm, sparsely puberulous. Flowers 3–3.5 cm in diam. Hypanthium campanulate, abaxially pubescent. Sepals lanceolate, 5–7 mm, slightly longer than hypanthium, adaxially tomentose, margin entire, apex acuminate. Petals white, narrowly obovate, 1.5–2 cm, base shortly clawed, apex rounded. Stamens 30, unequal, ca. 1/2 as long as petals or longer. Ovary 4- or 5-loculed, with 2 ovules per locule; styles 4(or 5), slightly longer than stamens, tomentose basally. Pome red, ellipsoid or obovoid, 0.8–1.2 cm in diam.; fruiting pedicel 3–5 cm, slightly puberulous; sepals caducous, with a small scar at apex. Fl. May–Jul, fr. Aug–Sep. $2n = 34^*$.

Mixed forests on slopes, mountain summits, valleys; 100–2100 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi [Russia].

In NE China, this species is often used as stock for grafting *Malus pumila* and *M. asiatica*.

4. *Malus sikkimensis* (Wenzig) Koehne, Gatt. 5 Pomac. 27. 1890.

锡金海棠 xi jin hai tang

Pyrus pashia Buchanan-Hamilton ex D. Don var. *sikkimensis* Wenzig, Linnaea 38: 49. 1874; *Malus baccata* subsp. *sikkimensis* (Wenzig) Likhonos; *P. sikkimensis* (Wenzig) J. D. Hooker.

Trees small, 6–8 m tall. Branchlets reddish brown when young, blackish brown when old, terete, gray tomentose when young, subglabrous when old; buds reddish brown, ovoid; scales tomentose at margin. Stipules caducous, lanceolate, 6–8 mm, membranous, glandular at margin, apex acuminate; petiole 2–3 cm, initially densely tomentose, glabrescent; leaf blade elliptic, ovate, or ovate-lanceolate, 5–7 × 2–3 cm, abaxially gray tomentose, densely so along veins, later subglabrous, adaxially glabrous, base rounded or broadly cuneate, margin sharply serrate, apex acuminate or caudate-acuminate. Corymbs 5–9 cm in diam., 6–10-flowered; bracts caducous, lanceolate, membranous, margin entire or serrate, apex acuminate. Pedicel 1.5–5 cm, tomentose, later subglabrous. Flowers 2.5–3 cm in diam. Hypanthium campanulate, adaxially tomentose, later subglabrous. Sepals ovate-lanceolate, 5–6 mm, longer than hypanthium, both surfaces tomentose, later subglabrous, margin entire, apex acuminate. Petals white adaxially, pink abaxially, suborbicular, 1.2–1.5 cm, base shortly clawed, apex rounded. Stamens 25–30, unequal, ca. 1/2 as long as petals. Ovary 5-loculed, with 2 ovules per locule; styles 5, longer than stamens, connate at base, glabrous. Pome dark red, white punctate, obovoid or pyriform, 1–1.8 cm in diam., with a small scar at apex; fruiting pedicel 2–2 × ca. 8 cm, slightly tomentose or subglabrous; sepals caducous. Fl. May–Jul, fr. Sep–Oct. $2n = 34^*$, 51^* , 68^* .

Open forests on slopes, mixed forests in valleys; 2500–3000 m. W Sichuan, S and SE Xizang, NW Yunnan [Bhutan, NE India, Nepal, Sikkim].

This is a rare species with small, isolated populations threatened by forest clearing.

5. *Malus rockii* Rehder, J. Arnold Arbor. 14: 206. 1933.

丽江山荆子 li jiang shan jing zi

Malus baccata (Linnaeus) Borkhausen subsp. *himalaica* (Maximowicz) Likhonos; *M. baccata* var. *himalaica* (Maximowicz) C. K. Schneider; *Pyrus baccata* Linnaeus var. *himalaica* Maximowicz.

Trees 8–10 m tall, pendulous. Branchlets dark brown, terete, villous when young, glabrescent; buds reddish brown, ovoid, subglabrous or scales puberulous at margin. Stipules caducous, lanceolate, 5–6 mm, membranous, subglabrous, margin slightly glandular denticulate, apex acuminate; petiole 2–4 cm, villous; leaf blade elliptic, ovate-elliptic, or oblong-ovate, 6–12 × 3.5–7 cm, abaxially puberulous along midvein and lateral veins, adaxially sparsely pubescent along midvein, base rounded or broadly cuneate, margin irregularly appressed serrulate, apex acuminate. Corymbs umbel-like, 4–6 cm in diam., 4–8-flowered; bracts caducous, lanceolate, membranous, margin sparsely glandular serrate, apex acuminate. Pedicel 2–4 cm, pubescent. Flowers 2.5–3 cm in diam. Hypanthium campanulate, densely villous. Sepals triangular-lanceolate, 5–7 mm, slightly longer than or ca. as long as hypanthium, abaxially sparsely pubescent or subglabrous, adaxially densely pubescent, margin entire, apex acute or acuminate. Petals white, obovate, 1.2–1.5 cm, base shortly clawed, apex rounded. Stamens 25, unequal, shorter than petals. Ovary 4- or 5-loculed, with 2 ovules per locule; styles 4 or 5, slightly longer than stamens, villous basally. Pome red, ovoid or subglobose, 1–1.5 cm in diam. with a small scar at apex; sepals caducous; fruiting pedicel 2–4 cm, puberulous. Fl. May–Jun, fr. Sep. $2n = 34^*$, 51^* .

Mixed forests in valleys; 2400–3800 m. SW Sichuan, SE Xizang, NW Yunnan [Bhutan].

6. *Malus hupehensis* (Pampanini) Rehder, J. Arnold Arbor. 14: 207. 1933.

湖北海棠 hu bei hai tang

Pyrus hupehensis Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 291. 1910, not (C. K. Schneider) Bean (1933); *Malus domestica* Borkhausen var. *hupehensis* (Pampanini) Likhonos; *Malus theifera* Rehder.

Trees to 8 m tall. Branchlets initially dark green, purple or purplish brown when old, terete, initially puberulous, glabrous when old; buds dark purple, ovoid; scales sparsely ciliate at margin. Stipules caducous, linear-lanceolate, 5–6 mm, herbaceous or membranous, sparsely pubescent, margin sparsely glandular denticulate, apex acuminate; petiole 1–3 cm, sparsely puberulous when young, glabrescent; leaf blade ovate or ovate-elliptic, 5–10 × 2.5–4 cm, sparsely puberulous when young, glabrescent, base broadly cuneate, rarely rounded, margin acutely serrulate, apex acuminate. Corymb 4–6 cm in diam., 4–6-flowered; bracts caducous, lanceolate, membranous, margin sparsely glandular serrate when young, apex acuminate. Pedicel 3–6 cm, sparsely villous when young, later glabrous. Flowers 3.5–4 cm diam. Hypanthium campanulate, adaxially glabrous or sparsely villous. Sepals triangular-ovate, 4–5 mm, ca. as long as or shorter than hypanthium, abaxially glabrous, adaxially pubescent, margin entire, apex acuminate or acute. Petals pink in bud, becoming white, obovate, ca. 1.5 cm, base shortly claw-

ed, apex rounded. Stamens 20 unequal, ca. 1/2 as long as petals. Ovary 3- or 4-loculed, with 2 ovules per locule; styles 3(or 4), slightly longer than stamens, tomentose basally. Pome yellowish green, tinged red, ellipsoid or subglobose, ca. 1 cm in diam.; fruiting pedicel 3–6 cm, glabrous; sepals caducous, with a small scar at apex. Fl. Apr–May, fr. Aug–Sep. $2n = 51^*$, 68^* .

• Slopes, valley thickets; sea level to 2900 m. Anhui, Fujian, Gansu, Guangdong, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Zhejiang.

This species is used as grafting stock for apple trees in Hubei and Sichuan. Its young leaves can be processed as a tea substitute. It has showy flowers in the spring and abundant, beautiful fruit in the autumn, and can be used as an ornamental tree.

7. *Malus halliana* Koehne, Gatt. Pomac. 27. 1890.

垂丝海棠 chui si hai tang

Malus domestica Borkhausen var. *halliana* (Koehne) Likhonos; *M. floribunda* Siebold ex Van Houtte var. *parkmanni* Koehne; *Pyrus halliana* (Koehne) Voss.

Trees to 5 m tall. Branchlets purple or purplish brown, terete, slender, puberulous when young, glabrescent; buds purplish brown, ovoid, glabrous or scales ciliate at margin. Stipules caducous, lanceolate, small, 4–6 mm, membranous, puberulous adaxially, margin glandular denticulate when young, apex acuminate; petiole 0.5–2.5 cm, sparsely pubescent when young, glabrescent; leaf blade dark green and often tinged purple adaxially, ovate, elliptic, or narrowly elliptic, 3.5–8 × 2.5–4.5 cm, glabrous except sometimes puberulous along midvein, base cuneate or subrounded, margin obtusely serrulate, apex long acuminate. Corymb 4–6 cm in diam., 4–6-flowered; bracts caducous, lanceolate, membranous, margin entire, apex acuminate. Pedicel pendulous, purple, 2–4 cm, slender, sparsely pubescent. Flowers 3–3.5 cm diam. Hypanthium glabrous abaxially. Sepals triangular-ovate, 3–5 mm, ca. as long as or slightly shorter than hypanthium, abaxially glabrous, adaxially tomentose, margin entire, apex obtuse. Petals often more than 5, pink, obovate, ca. 1.5 cm, base shortly clawed, apex rounded. Stamens 20–25, unequal, ca. 1/2 as long as petals. Ovary 4- or 5-loculed, with 2 ovules per locule; styles 4 or 5, slightly longer than stamens, long tomentose basally. Pome purplish, pyriform or obovoid, 6–8 mm in diam.; fruiting pedicel 2–4 cm, subglabrous; sepals caducous, with a small scar at apex. Fl. Mar–Apr, fr. Sep–Oct. $2n = 34^*$, 51^* .

• Thickets on slopes or by streams; sea level to 1200 m. Anhui, Guizhou, Hubei, Jiangsu, Shaanxi, Sichuan, Yunnan, Zhejiang.

This species has been used as an ornamental because of its purplish red young branches and leaves and pink, showy flowers in the spring.

According to Bean (Trees Shrubs Hardy Brit. Isles, ed. 8, 2: 699. 1981), this is a Japanese species and does not occur in China. Further study is required on Chinese specimens attributed to *Malus halliana*.

Malus halliana is similar to *M. baccata*, which differs by its serrulate leaves, white petals, and apically acuminate sepals larger than the hypanthium.

8. *Malus muliensis* T. C. Ku, Acta Phytotax. Sin. 29: 83. 1991.

木里海棠 mu li hai tang

Trees small, 3–4 m tall. Branchlets black-gray, terete; buds purple-red, ellipsoid-ovoid, apex acute; scales several, exposed, abaxially pubescent. Stipules caducous, lanceolate, pubescent, apex acuminate; petiole 2–2.5 cm, densely pubescent; leaf blade pale green abaxially, deep green adaxially, ovate-lanceolate or broadly lanceolate, 4–6 × 1.5–2.3 cm, abaxially sparsely pubescent, densely so on midvein, adaxially glabrous, base broadly cuneate or rounded, margin shallowly obtusely serrate, apex caudate-acuminate. Flowers not seen. Pome purplish red, cylindrical, 6.5–7.5 × 4.5–5 mm; fruiting pedicel 3–3.5 cm, pilose or subglabrous; sepals deciduous. Fr. Aug–Sep.

• *Picea* forests; ca. 3200 m. SW Sichuan (Muli Xian).

9. *Malus daochengensis* C. L. Li, Acta Phytotax. Sin. 27: 301. 1989.

稻城海棠 dao cheng hai tang

Trees to 5–7 m tall. Branchlets grayish brown when old, terete, densely grayish white tomentose when young, glabrous when old; buds purplish brown, long elliptic-ovoid; scales pubescent at margin, tomentose abaxially. Stipules caducous, linear-lanceolate, 4–6 mm, membranous, pubescent, margin sparsely glandular serrate, apex acuminate; petiole 1–3 cm, gray tomentose; leaf blade pale green abaxially, green adaxially, elliptic-lanceolate or elliptic, 4–9.5 × 2–4 cm, abaxially tomentose when young, glabrescent, adaxially gray tomentose along veins when young, soon glabrescent, base cuneate or rounded, margin obtusely serrate, apex acuminate, acute, or obtuse. Corymbs umbel-like, 3–5 cm in diam., 3–6-flowered; bracts caducous, linear-lanceolate, membranous, both surfaces tomentose, margin entire, apex acuminate. Pedicel 3.5–4 cm, densely grayish white tomentose. Flowers 3.5–4 cm in diam. Hypanthium densely grayish white tomentose. Sepals triangular-lanceolate, 4–6 mm, nearly as long as hypanthium, both surfaces grayish white tomentose, margin entire, apex acuminate. Petals white or pinkish white, broadly elliptic, ca. 2 cm, base shortly clawed, apex rounded. Stamens 25, unequal, ca. 1/2 as long as petals. Ovary 5-loculed, with 2 ovules per locule; styles 5, slightly longer than stamens, tomentose basally. Pome yellowish red, pyriform, 1–1.5 cm in diam.; fruiting pedicel 3.5–4 cm, grayish white tomentose; sepals caducous, with a small scar at apex. Fl. Jun, fr. Aug.

• Thickets, field margins; ca. 2800 m. W Sichuan, NW Yunnan.

10. *Malus pumila* Miller, Gard. Dict., ed. 8, *Malus* no. 3. 1768.

苹果 ping guo

Malus communis Poirer; *M. dasyphylla* Borkhausen; *M. dasyphylla* var. *domestica* Koidzumi; *M. domestica* Borkhausen; *M. domestica* subsp. *pumila* (Miller) Likhonos; *M. pumila* var. *domestica* C. K. Schneider; *M. niedzwetzkyana* Dieck ex Koehne; *M. sylvestris* Miller subsp. *mitis* Mansfeld; *Pyrus malus* Linnaeus; *P. malus* var. *pumila* Henry.

Trees to 15 m tall. Branchlets purplish brown when old, terete, robust, short, densely tomentose when young, glabrous when old; buds purplish brown, ovoid, densely puberulous.

Stipules caducous, lanceolate, 3–5 mm, herbaceous, densely puberulous, margin entire, apex acuminate; petiole robust, 1.5–3 cm, puberulous; leaf blade elliptic, ovate, or broadly elliptic, 4.5–10 × 3–5.5 cm, both surfaces densely puberulous when young, adaxially glabrescent, base broadly cuneate or rounded, margin obtusely serrate, apex acute. Corymb at apices of branchlets, 4–6 cm in diam., 3–7-flowered; bracts caducous, linear-lanceolate, membranous, tomentose, margin entire, apex acuminate. Pedicel 1–2.5 cm, tomentose. Flowers 3–4 cm in diam. Hypanthium tomentose abaxially. Sepals triangular-lanceolate or triangular-ovate, 6–8 mm, longer than hypanthium, both surfaces tomentose, margin entire, apex acuminate. Petals white, obovate, 1.5–1.8 cm, base shortly clawed, apex rounded. Stamens 20, unequal, ca. 1/2 as long as petals. Ovary 5-loculed, with 2 ovules per locule; styles 5, slightly longer than stamens, gray tomentose basally. Pome red or yellow, depressed-subglobose, ca. 2 cm in diam., impressed at base; fruiting pedicel short and thickened; sepals persistent. Fl. May, fr. Jul–Oct. $2n = 24^*$, 34^* , 51^* , 68 .

Commonly cultivated in N, NW, and SW China [Bhutan; Native to SW Asia and Europe].

11. *Malus sieversii* (Ledebour) M. Roemer, Syn. Rosifl. 216. 1830.

新疆野苹果 xin jiang ye ping guo

Pyrus sieversii Ledebour, Fl. Altaic. 2: 222. 1830.

Trees 2–10(–14) m tall; branchlets dark grayish red when old, terete, short, robust, puberulous when young, slightly curved, glabrescent when old; buds dark red, ovoid, villous abaxially. Stipules caducous, lanceolate, 3–5 mm, membranous, margin white ciliate, apex acuminate; petiole 1.2–3.5 cm, sparsely pubescent; leaf blade ovate or broadly elliptic, rarely obovate, 6–11 × 3–5.5 cm, abaxially densely villous when young, sparsely pubescent when old, adaxially sparsely pubescent along veins, base cuneate, rarely rounded, margin obtusely serrate, apex acute. Corymb umbel-like, 4–6 cm in diam., 3–6-flowered; bracts caducous, lanceolate, membranous, margin glandular serrate when young, apex acuminate. Pedicel ca. 1.5 cm, white tomentose. Flowers 3–3.5 cm in diam. Hypanthium campanulate, abaxially tomentose. Sepals broadly lanceolate or triangular-lanceolate, ca. 6 mm, longer than hypanthium, both surfaces tomentose, margin entire, apex acuminate. Petals pinkish, tinged rose when in bud, obovate, 1.5–2 cm, base shortly clawed, apex rounded. Stamens 20, unequal, ca. 1/2 as long as petals. Ovary 5-loculed, with 2 ovules per locule; styles 5, ca. as long as or slightly longer than stamens, white tomentose basally. Pome yellowish green, tinged red, globose or depressed-globose, 3–4.5(–7) cm in diam.; fruiting pedicel 3.5–4 cm, white tomentose; sepals persistent, reflexed, with cavity at apex. Fl. May, fr. Aug–Oct. $2n = 34^*$.

Mountain summits, slopes, valleys, often the dominant tree of forests; 1200–1300 m. W Xinjiang [Kazakhstan, Russia].

This species is vulnerable to extinction because of its limited range and exploitation. It is believed to be the principal ancestor of commercially grown apples.

12. *Malus asiatica* Nakai in Matsumura, Icon. Pl. Koisikav. 3: 19. 1915.

花红 hua hong

Malus domestica Borkhausen var. *asiatica* (Nakai) V. V. Ponomarenko; *M. domestica* var. *rinki* (Koidzumi) H. Ohle; *M. dulcissima* Koidzumi var. *asiatica* Koidzumi; *M. dulcissima* var. *rinki* (Koidzumi) Koidzumi; *M. matsumurae* Koidzumi; *M. prunifolia* Borkhausen var. *rinki* (Koidzumi) Rehder; *M. pumila* Miller var. *rinki* Koidzumi; *Pyrus matsumurae* (Koidzumi) Cardot; *P. ringo* Wenzig.

Trees small, 4–6 m tall. Branchlets purplish brown when old, terete, robust, densely pubescent when young, glabrous when old; buds grayish red, ovoid, initially densely pubescent, glabrescent. Stipules caducous, lanceolate, small, 3–5 mm, membranous, margin glandular serrate when young, apex acuminate; petiole 1.5–5 cm, puberulous; leaf blade ovate or elliptic, 5–11 × 4–5.5 cm, abaxially densely puberulous, adaxially initially puberulous, glabrescent, base rounded or broadly cuneate, margin serrulate, apex acute or acuminate. Corymb at apices of branchlets, umbel-like, 3–5 cm in diam., 4–7(–10)-flowered; bracts caducous, lanceolate, membranous, pubescent, apex acuminate. Pedicel 1.5–2 cm, densely pubescent. Flowers 3–4 cm in diam. Hypanthium densely pubescent abaxially. Sepals triangular-lanceolate, 4–5 mm, slightly longer than hypanthium, both surfaces densely pubescent, margin entire, apex acuminate. Petals pinkish, obovate or oblong-obovate, 0.8–1.3 cm, base shortly clawed, apex rounded. Stamens 17–20, unequal, shorter than petals. Ovary 4- or 5-loculed, with 2 ovules per locule; styles 4(or 5), longer than stamens, tomentose basally. Pome yellow or red, ovoid or subglobose, 4–5 cm in diam., impressed at base; fruiting pedicel 1.5–2.5 cm, pubescent; sepals persistent. Fl. Apr–May, fr. Aug–Sep. $2n = 34^*$, 51^* , 68^* .

• Open slopes, sandy soils of plains; sea level to 2800 m. Gansu, Guizhou, Hebei, Henan, Hubei, Jiangsu, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Yunnan, Zhejiang.

This species is a famous fruit tree in N and NE China. During its long cultivation, many cultivars have been bred, the fruit of which differ in shape, color, size, and ripening period.

13. *Malus prunifolia* (Willdenow) Borkhausen, Theor. Prakt. Handb. Forstbot. 2: 1278. 1803.

秋子 qiu zi

Trees small, to 3–8 m tall. Branchlets grayish purple or grayish brown when old, terete, robust, densely puberulous when young, glabrous when old; buds purplish brown, ovoid, sparsely pubescent. Stipules caducous, lanceolate, small, 4–5 mm, membranous, margin glandular serrate when young, apex acuminate; petiole 1–5 cm, initially densely puberulous, glabrescent; leaf blade ovate or elliptic, 5–9 × 4–5 cm, pubescent along veins when young, pubescent only along midvein or subglabrous when old, base broadly cuneate, margin serrulate, apex acuminate or acute. Corymb umbel-like, 4–8 cm in diam., 4–10-flowered; bracts caducous, linear-lanceolate, membranous, sparsely pubescent, margin entire, apex acuminate. Pedicel 2–3.5 cm; puberulous. Flowers 4–5 cm in diam. Hypan-

thium campanulate, abaxially puberulous. Sepals lanceolate or triangular-lanceolate, 7–9 mm, slightly longer than hypanthium, both surfaces puberulous, margin entire, apex acuminate. Petals white, pink in bud, obovate or elliptic, 2.5–3 cm, base shortly clawed, apex rounded. Stamens 20, unequal, ca. 1/3 as long as petals. Ovary 4- or 5-loculed, with 2 ovules per locule; styles 4(or 5), longer than stamens, tomentose basally. Pome yellow, red, ovoid, 2–2.5 cm in diam., with cavity at base; fruiting pedicel 2–3.5 cm, puberulous, apex sometimes thickened and oblique; sepals persistent, partly so, or caducous. Fl. Apr–May, fr. Aug–Sep. $2n = 34^*$, 51^* .

• Slopes, plains; sea level to 1300 m, Gansu, Guizhou, Hebei, Henan, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, ?Xinjiang.

- 1a. Fruiting pedicel thickened and oblique at apex; sepals persistent or partly so 13b. var. *obliquipedicellata*
 1b. Fruiting pedicel neither thickened nor oblique at apex; sepals caducous 13a. var. *prunifolia*

13a. *Malus prunifolia* var. *prunifolia*

秋子(原变种) qiu zi (yuan bian zhong)

Pyrus prunifolia Willdenow, Phytogr. 8. 1794; *Malus domestica* Borkhausen subsp. *prunifolia* (Willdenow) Likhonos.

Fruiting pedicel neither thickened nor oblique at apex; sepals caducous.

• Slopes, plains; sea level to 1300 m, Gansu, Guizhou, Hebei, Henan, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, ?Xinjiang.

This variety is an excellent stock for grafting apple trees. Many varieties have also been bred as good fruit trees.

13b. *Malus prunifolia* var. *obliquipedicellata* X. W. Li & J. W. Sun, Bull. Bot. Res., Harbin 13: 336. 1993.

歪把海棠 wai ba hai tang

Fruiting pedicel thickened and oblique at apex; sepals persistent or partly so. Fl. May, fr. Aug.

• About 300 m. C Shandong (Tai Shan).

14. *Malus spectabilis* (Aiton) Borkhausen, Theor. Prakt. Handb. Forstbot. 2: 1279. 1803.

海棠花 hai tang hua

Pyrus spectabilis Aiton, Hort. Kew 2: 175. 1789; *Malus domestica* Borkhausen var. *spectabilis* (Aiton) Likhonos; *M. microcarpa* A. Savatier var. *spectabilis* (Aiton) Carrière.

Trees to 8 m tall. Branchlets reddish brown or purplish brown when old, terete, puberulous when young, glabrous when old; buds purplish brown, ovoid, sparsely pubescent. Stipules caducous, narrowly lanceolate, 4–6 mm, membranous, adaxially villous, margin entire, apex acuminate; petiole 1.5–2 cm, puberulous; leaf blade elliptic or narrowly elliptic, 5–8 × 2–3 cm, both surfaces sparsely puberulous when young, glabre-

scent, base broadly cuneate or subrounded, margin appressed serrulate, apex shortly acuminate or rounded-obtuse. Corymb subumbel-like, 4–6 cm in diam., 4–6-flowered; bracts caducous, lanceolate, membranous, margin entire, apex acuminate. Pedicel 2–3 cm, pubescent. Flowers 4–5 cm in diam. Hypanthium campanulate, abaxially glabrous or white tomentose. Sepals triangular-ovate, 2–4 mm, slightly shorter than hypanthium, abaxially glabrous or pubescent, adaxially white tomentose, margin entire, apex acute. Petals white, pink in bud, ovate, 2–2.5 cm, base shortly clawed, apex rounded. Stamens 20–25, unequal, ca. 1/2 as long as petals. Ovary (4- or)5-loculed; with 2 ovules per locule; styles (4 or)5, slightly longer than stamens, white tomentose basally. Pome yellow, subglobose, ca. 2 cm in diam., not impressed at apex, convex at base; fruiting pedicel 3–3.5 cm, thickened distally, subglabrous; sepals persistent. Fl. Apr–May, fr. Aug–Sep. $2n = 34^*$, 51^* .

• Plains, mountain regions; 500–2000 m. Hebei, Jiangsu, Liaoning, Qinghai, Shaanxi, Shandong, Yunnan, Zhejiang.

This species is one of the most famous ornamental trees in China, widely cultivated in the E and N regions. The cultivated var. *roversis* (G. Kirchner) Rehder has double, pink flowers, and var. *albipena* Schelle, also cultivated, has double, white flowers.

15. *Malus ×micromalus* Makino, Bot. Mag. (Tokyo) 22: 69. 1908.

西府海棠 xi fu hai tang

Malus domestica Borkhausen var. *micromalus* (Makino) Likhonos; *M. microcarpa* A. Savatier var. *kaido* (Siebold) Carrière; *M. spectabilis* Borkhausen var. *kaido* Siebold; *M. spectabilis* var. *micromalus* (Makino) Koidzumi; *Pyrus micromalus* (Makino) Makino.

Trees small, to 2.5–5 m tall. Branchlets purplish brown or dark brown, terete, slender, puberulous when young, glabrescent; buds dark purple, ovoid, glabrous, or scales tomentose at margin. Stipules caducous, linear-lanceolate, 4–6 mm, membranous, subglabrous, margin sparsely glandular denticulate, apex acuminate; petiole 2–3.5 cm, pubescent when young, glabrescent; leaf blade narrowly elliptic or elliptic, 5–10 × 2.5–5 cm, puberulous when young, glabrescent, base cuneate, rarely subrounded, margin serrate, apex acute or acuminate. Corymb umbel-like, 4–6 cm in diam., 4–7-flowered; bracts caducous, linear-lanceolate, membranous, margin entire, apex acuminate. Pedicel 2–3 cm, villous when young, glabrescent. Flowers ca. 4 mm in diam. Hypanthium white tomentose abaxially. Sepals triangular-ovate or triangular-lanceolate, 5–8 mm, ca. as long as or slightly shorter than hypanthium, abaxially pubescent, adaxially white tomentose, margin entire, apex acute or shortly acuminate. Petals pink, suborbicular or narrowly elliptic, ca. 1.5 cm, base shortly clawed, apex rounded. Stamens ca. 20, unequal, slightly shorter than petals. Styles 5, ca. as long as stamens, tomentose basally. Pome red, subglobose, 1–1.5 cm in diam.; impressed at apex, with cavity at base; fruiting pedicel 2–3 cm, subglabrous; sepals caducous or a few persistent. Fl. Apr–May, fr. Aug–Sep. $2n = 34^*$, 51^* .

• Commonly cultivated. Gansu, Guizhou, Hebei, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Yunnan, Zhejiang.

According to Bean (Trees Shrubs Hardy Brit. Isles, ed. 8, 2: 710), this taxon is a hybrid between *Malus spectabilis* and probably *M. baccata*.

In N China, this taxon is usually planted in gardens and parks for ornamental purposes and for its edible fruit. It is used as stock to graft *Malus asiatica* and *M. pumila* in some regions.

16. *Malus sieboldii* (Regel) Rehder in Sargent, Pl. Wilson. 2: 293. 1915.

三叶海棠 san ye hai tang

Pyrus sieboldii Regel, Index Sem. Hort. Petrop. 1858: 51. 1859; *Crataegus cavaleriei* H. Léveillé & Vaniot; *C. taquetii* H. Léveillé; *Malus baccata* (Linnaeus) Borkhausen subsp. *toringo* (K. Koch) Koidzumi; *M. sieboldii* (Regel) Rehder var. *toringo* (K. Koch) Siebold ex C. K. Schneider; *M. toringo* (K. Koch) Carrière; *Photinia rubrolutea* H. Léveillé; *Pyrus esquirolii* H. Léveillé; *P. subcrataegifolia* H. Léveillé; *P. toringo* (K. Koch) Miquel; *Sorbus toringo* K. Koch.

Shrubs 2–6 m tall. Branchlets spreading, dark purple or purplish brown, terete, puberulous when young, glabrescent; buds purplish brown, ovoid, glabrous or only terminal scales puberulous at margin. Stipules narrowly lanceolate, 4–6 mm, herbaceous, slightly puberulous, margin entire, apex acuminate; petiole 1–2.5 cm, puberulous; leaf blade ovate, elliptic, or narrowly elliptic, 3–7.5 × 2–4 cm, both surfaces puberulous when young, abaxially puberulous along midvein and lateral veins when old, adaxially subglabrous, base rounded or broadly cuneate, margin serrate, often 3-lobed, rarely 5-lobed on new branches, apex acute. Corymb at apices of branchlets, 4–6 cm in diam., 4–8-flowered; bracts caducous, linear-lanceolate, membranous, adaxially pubescent, margin entire, apex acuminate. Pedicel 2–2.5 cm, pubescent or subglabrous. Flowers 2–3 cm in diam. Hypanthium campanulate, subglabrous or pubescent. Sepals ca. as long as or slightly longer than hypanthium, abaxially glabrous, adaxially tomentose, margin entire, apex caudate-acuminate. Petals pinkish, elliptic-obovate, 1.5–1.8 cm, base shortly clawed, apex rounded. Stamens 20, unequal, ca. 1/2 as long as petals. Ovary 3–5-loculed, with 2 ovules per locule; styles 3–5, slightly longer than stamens, villous basally. Pome red or brownish yellow, subglobose, 6–8 mm in diam.; sepals caducous; fruiting pedicel 2–3 cm. Fl. Apr–May, fr. Aug–Sep. *2n* = 34*, 51*.

Mixed forests, among shrubs, slopes; 150–2000 m. Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Liaoning, Shaanxi, Shandong, Sichuan, Zhejiang [Korea, Japan].

This species can be used as an ornamental tree for its showy flowers in the spring. In Liaoning and Shandong provinces, it is sometimes used as stock for grafting apple trees.

17. *Malus kansuensis* (Batalin) C. K. Schneider, Repert. Spec. Nov. Regni Veg. 3: 178. 1906.

陇东海棠 long dong hai tang

Shrubs or small trees, 3–5 m tall; branchlets purplish brown or dark brown when old, terete, puberulous when young, glabrous when old; buds dark purple, ovoid; scales tomentose at margin. Stipules linear-lanceolate, 6–10 mm, herbaceous, sparsely pubescent, margin sparsely glandular denticulate, apex

acuminate; petiole 1.5–4 cm, sparsely puberulous; leaf blade ovate or broadly ovate, 5–8 × 4–6 cm, abaxially sparsely puberulous or glabrous, base rounded or truncate, margin doubly serrulate, often 3-lobed, rarely irregularly or not lobed, apex acute or acuminate. Corymb 5–6.5 cm in diam., 4–10-flowered; bracts caducous, linear-lanceolate, membranous, margin entire, apex acuminate. Pedicel 2.5–3.5 cm, sparsely pubescent or glabrous. Flowers 1.5–2 cm in diam. Hypanthium campanulate, abaxially villous or glabrous. Sepals triangular-ovate or triangular-lanceolate, 5–6 mm, ca. as long as or slightly longer than hypanthium, abaxially glabrous, adaxially villous, margin entire, apex acuminate. Petals white, broadly obovate, 0.8–1 cm, base shortly clawed, apex rounded. Stamens 20, unequal, ca. 1/2 as long as petals. Styles (2 or)3(or 4), slightly longer than stamens, glabrous basally. Pome yellowish red, ellipsoid or obovoid, 1–1.5 cm in diam.; sepals caducous; fruiting pedicel 2–3.5 cm. Fl. May–Jun, fr. Jul–Aug. *2n* = 34*.

• Mixed forests, scrub; 1500–3300 m. Gansu, Henan, Hubei, ?Qinghai, Shaanxi, Sichuan.

This species is similar to *Malus honanensis*, which differs in its more lobed leaf margin, glabrous or sparsely villous corymb, and subglobose fruit often with a persistent calyx.

- 1a. Pedicel and leaves abaxially sparsely puberulous, hypanthium villous outside 17a. var. *kansuensis*
- 1b. Pedicel, hypanthium, and leaves abaxially glabrous 17b. var. *calva*

17a. *Malus kansuensis* var. *kansuensis*

陇东海棠(原变种) long dong hai tang (yuan bian zhong)

Pyrus kansuensis Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 94. 1893; *Eriolobus kansuensis* (Batalin) C. K. Schneider; *Malus komarovii* var. *funiushanensis* S. Y. Wang.

Pedicel and leaves abaxially sparsely puberulous; hypanthium villous outside.

• Mixed forests, scrub; 1500–3000 m. Gansu, Henan, Shaanxi, Sichuan.

17b. *Malus kansuensis* var. *calva* (Rehder) T. C. Ku & Spongberg, **comb. et stat. nov.**

光叶陇东海棠 guang ye long dong hai tang

Basionym: *Malus kansuensis* f. *calva* Rehder, J. Arnold Arbor. 2: 50. 1920.

Pedicel, hypanthium outside and leaves abaxially glabrous.

• 2300–3300 m. Hubei, Shaanxi, Sichuan.

18. *Malus komarovii* (Sargent) Rehder, J. Arnold Arbor. 2: 51. 1920.

山楂海棠 shan zha hai tang

Crataegus komarovii Sargent, Pl. Wilson. 1: 183. 1912.

Shrubs or small trees, to 3 m tall. Branchlets dark red when young, reddish brown or purplish brown when old, terete,

pubescent when young, glabrous when old; buds dark red, ovoid; scales pubescent at margin. Stipules caducous, linear-lanceolate, 4–6 mm, membranous, margin glandular denticulate, apex acuminate; petiole 1–3 cm, pubescent; leaf blade broadly ovate, rarely narrowly elliptic, 4–8 × 3–7 cm, abaxially densely pubescent along veins when young, adaxially sparsely pubescent, base cordate or subcordate, margin doubly serrate, usually 3-parted at middle, 1-lobed on each side near base, irregularly lobed or undivided apically, apex acuminate or acute. Corymb 4–6 cm in diam., 6–8-flowered; bracts caducous, linear-lanceolate, membranous, margin sparsely glandular serrate, apex acuminate. Pedicel ca. 2 cm, villous. Flowers ca. 3.5 cm in diam. Hypanthium campanulate, abaxially tomentose. Sepals triangular-lanceolate, 2–3 mm, slightly longer than hypanthium, abaxially subglabrous, adaxially tomentose, margin entire, apex acuminate. Petals white, obovate, ca. 1.8 cm, base shortly clawed, apex rounded. Stamens 20–30, ca. 1/2 as long as petals. Ovary 3- or 4-loculed, with 2 ovules per locule; styles 3 or 4, slightly longer than stamens, glabrous basally. Pome red, ellipsoid, 1–1.5 × 0.8–1 cm, core free at apex; sepals caducous; fruiting pedicel 1.2–1.5 cm. Fl. May, fr. Sep. $2n = 34^*$.

Among shrubs; 1100–1300 m. S Jilin (Changbai Shan) [N Korea].

This species is resistant to cold temperatures. It is also endangered because of habitat loss.

19. *Malus toringoides* (Rehder) Hughes, Bull. Misc. Inform. Kew 1920: 205. 1920.

变叶海棠 bian ye hai tang

Malus transitoria C. K. Schneider var. *toringoides* Rehder in Sargent, Pl. Wilson. 2: 286. 1915; *Pyrus toringoides* (Rehder) Osborn; *P. transitoria* Batalin var. *toringoides* (Rehder) Bailey; *Sinomalus toringoides* (Rehder) Koidzumi.

Shrubs or small trees, 3–6 m tall. Branchlets purplish brown or dark brown when old, terete, puberulous when young, glabrous when old; buds purplish brown, ovoid, pubescent, apex acute. Stipules lanceolate, 4–6 mm, sparsely pubescent, margin entire, apex acuminate; petiole 1–3 cm, puberulous; leaf blade variable in shape, ovate or narrowly elliptic, 3–8 × ca. 1.5 cm, abaxially densely pubescent along midvein and lateral veins, adaxially sparsely pubescent, base broadly cuneate or subcordate, margin obtusely serrate, often 3–5-parted, sometimes undivided, apex acute. Corymb umbel-like, 3–5 cm in diam., 3–5-flowered; bracts caducous, linear, membranous, adaxially pubescent when young, margin sparsely glandular serrate, apex acuminate. Pedicel 1.8–2.5 cm, sparsely villous. Flowers 2–2.5 cm in diam. Hypanthium tomentose abaxially. Sepals triangular-lanceolate or narrowly triangular, 3–4 mm, nearly as long as hypanthium, both surfaces white tomentose, margin entire, apex acuminate. Petals white, ovate or elliptic-obovate, 8–11 mm, adaxially sparsely pubescent or glabrous, base shortly clawed, apex rounded. Stamens ca. 20; filaments unequal, shorter than petals. Styles 3 (or 4 or 5), not exceeding stamens, glabrous. Pome yellow, tinged red, obovoid or narrowly ellipsoid, 1–1.3 cm; sepals caducous; fruiting pedicel 3–4 cm, glabrous. Fl. Apr–May, fr. Sep. $2n = 34^*$, 51^* , 68^* .

• Thickets on slopes; 2000–3000 m. SE Gansu, W Sichuan, SE Xizang.

20. *Malus transitoria* (Batalin) C. K. Schneider, Ill. Handb. Laubholz. 1: 726. 1906.

花叶海棠 hua ye hai tang

Shrubs or small trees, to 8 m tall. Branchlets dark purple or purplish brown when old, terete, slender, tomentose when young; buds dark purple, ovoid, tomentose. Stipules ovate-lanceolate, 4–6 mm, herbaceous, tomentose, margin entire, apex acute; petiole 1.5–3.5 cm, tomentose; leaf blade ovate or broadly ovate, 2.5–5 × 2–4.5 cm, both surfaces tomentose or adaxially subglabrous, base rounded or broadly cuneate, margin irregularly serrate, usually irregularly 3–5-parted; lobes narrowly ovate or narrowly elliptic, apex acute. Corymb umbel-like, 3–5 cm in diam., 3–6-flowered; bracts caducous, linear-lanceolate, membranous, pubescent, margin entire, apex acuminate. Pedicel 1.5–2 cm, tomentose. Flowers 1–2 cm in diam. Hypanthium campanulate, tomentose. Sepals caducous, triangular-ovate, ca. 3 mm, slightly shorter than hypanthium, both surfaces tomentose, margin entire, apex rounded-obtuse or slightly acute. Petals white, ovate, 8–10 mm, base shortly clawed, apex rounded. Stamens 20–25, unequal, slightly shorter than petals. Styles 3–5, slightly longer than or nearly as long as stamens, glabrous. Pome yellowish red, subglobose or oblong-ellipsoid to oblong-ovoid, 6–8 mm in diam., impressed at apex; sepals caducous; fruiting pedicel 1.5–2 cm, tomentose. Fl. May, fr. Sep. $2n = 34^*$, 51^* .

• Thickets, slopes, hills of the Loess Plateau, roadsides; 1500–3900 m. Gansu, Nei Mongol, Qinghai, Shaanxi, Sichuan, E Xizang.

This species is resistant to drought and cold temperatures. It has been used as stock to graft apple trees in NE and NW Shaanxi.

Malus setok Vassilczenko might be an allied species or an ecotype of *M. transitoria*.

- 1a. Pome oblong-elliptic or oblong-ovate, 10–12 × 6–8 mm 20c. var. *centralasiatica*
- 1b. Pome subglobose, 6–8 mm in diam.
 - 2a. Leaf blade abaxially densely tomentose, adaxially sparsely tomentose or subglabrous; pedicel and hypanthium densely tomentose 20a. var. *transitoria*
 - 2b. Leaf blade abaxially glabrous; pedicel and hypanthium abaxially sparsely pubescent 20b. var. *glabrescens*

20a. *Malus transitoria* var. *transitoria*

花叶海棠(原变种) hua ye hai tang (yuan bian zhong)

Pyrus transitoria Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 95. 1893; *Sinomalus transitoria* (Batalin) Koidzumi.

Leaf blade densely tomentose abaxially, sparsely tomentose or subglabrous adaxially. Pedicel and hypanthium densely tomentose. Pome subglobose.

• Thickets, slopes, hills of the Loess Plateau; 1500–3900 m. Gansu, Nei Mongol, Qinghai, Shaanxi, Sichuan.

20b. *Malus transitoria* var. *glabrescens* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 496. 1980.

少毛花叶海棠 shao mao hua ye hai tang

Leaf blade glabrous abaxially. Pedicel and hypanthium abaxially sparsely pubescent.

- Roadsides; 3500–3700 m. E Xizang (Qamdo Xian).

20c. *Malus transitoria* var. *centralasiatica* (Vassilczenko) T. T. Yu, Fl. Reipubl. Popularis Sin. 36: 394. 1974.

长圆果花叶海棠 chang yuan guo hua ye hai tang

Malus centralasiatica Vassilczenko, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 19: 202. 1959.

Pome oblong-ellipsoid or oblong-ovoid, 10–12 × 6–8 mm.

- 3300–3900 m. Gansu, Qinghai, Shaanxi.

21. *Malus prattii* (Hemsley) C. K. Schneider, Ill. Handb. Laubholz. 1: 719. 1906.

西蜀海棠 xi shu hai tang

Pyrus prattii Hemsley, Bull. Misc. Inform. Kew 1895: 16. 1895; *Docyniopsis prattii* (Hemsley) Koidzumi.

Trees to 10 m tall. Branchlets dark red or purplish brown when old, short, robust, pubescent when young, glabrous when old; buds purplish brown, ovoid; scales pubescent at margin. Stipules linear-lanceolate, 1–1.3 cm, membranous, glabrous or subglabrous, margin sparsely glandular denticulate, apex acuminate; petiole 1.5–3 cm, sparsely pubescent or subglabrous; leaf blade ovate, elliptic, or narrowly elliptic-ovate, 6–15 × 3.5–7.5 cm, both surfaces puberulous when young, glabrescent, abaxially sparsely puberulous or glabrous when old, base rounded, margin serrulate, apex acuminate. Corymb umbel-like, 5–9 cm in diam., 5–12-flowered; bracts caducous, linear-lanceolate, membranous, margin entire, apex acuminate. Pedicel 1.5–3 cm, sparsely pubescent. Flowers 1.5–2 cm in diam. Hypanthium campanulate, abaxially densely pubescent when young, glabrescent. Sepals triangular-ovate, 4–5 mm, slightly longer than or ca. as long as hypanthium, abaxially subglabrous, adaxially tomentose, margin entire, apex acuminate or caudate-acuminate. Petals white, suborbicular, 0.8–1 cm, base shortly clawed, apex rounded. Stamens 20, unequal, slightly shorter than petals. Ovary (4- or)5-loculed, with 2 ovules per locule; styles (4 or)5, nearly as long as stamens, glabrous basally. Pome red or yellow, ovoid or subglobose, 1–1.5 cm in diam.; fruiting pedicel 2.5–3 cm, glabrous; sepals persistent. Fl. Jun, fr. Aug. $2n = 34^*$.

- Mixed forests on slopes; 1400–3500 m. W Sichuan, NW Yunnan.

22. *Malus ombrophila* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 63: 8. 1926.

沧江海棠 cang jiang hai tang

Trees to 10 m tall. Branchlets dark purple or purplish brown when old, terete, densely puberulous when young, glabrous when old; buds dark purple, ovoid, subglabrous or scales puberulous at margin. Stipules caducous, linear-lanceolate, membranous, 6–8 mm, glabrous or subglabrous, margin entire,

apex acuminate; petiole 2–3.5 cm, tomentose; leaf blade ovate, 9–13 × 5–6.5 cm, abaxially white tomentose, adaxially rarely sparsely puberulous along midvein and lateral veins when young, base truncate, rounded or subcordate, margin doubly serrate, apex acuminate. Corymb umbel-like, 5–8 cm in diam., 4–13-flowered; bracts caducous, linear or lanceolate, membranous, tomentose, margin entire, apex acuminate. Pedicel 2–2.5 cm, densely pubescent. Flowers 1.5–1.8 cm in diam. Hypanthium campanulate, abaxially densely pubescent. Sepals triangular, ca. 3 mm, slightly shorter than hypanthium, abaxially pubescent, adaxially glabrous or sparsely puberulous, margin entire, apex acute. Petals white, ovate, ca. 8 mm, base shortly clawed, apex rounded. Stamens 15–20, unequal, slightly shorter than petals. Ovary 3–5-loculed, with 2 ovules per locule; styles 3–5, slightly longer than stamens, glabrous basally. Pome red, subglobose, 1.5–2 cm in diam., with cupular cavity at apex; fruiting pedicel ca. 3 cm, villous; sepals persistent. Fl. Jun, fr. Aug. $2n = 34^*$.

- Mixed stream side forests, valleys; 2000–3500 m. SW Sichuan, Xizang, NW Yunnan.

23. *Malus honanensis* Rehder, J. Arnold Arbor. 2: 51. 1920.

河南海棠 he nan hai tang

Sinomalus honanensis (Rehder) Koidzumi.

Shrubs or small trees, to 5–7 m tall. Branchlets reddish brown when old, terete, slender, pubescent when young, soon glabrescent, glabrous when old; buds reddish brown, ovoid; scales villous at margin. Stipules caducous, linear-lanceolate, ca. 6 mm, membranous, pubescent, margin entire, apex acuminate; petiole 1.5–2.5 cm, pubescent; leaf blade broadly ovate, narrowly elliptic, or ovate, 4–7 × 3.5–6 cm, both surfaces puberulous, adaxially soon glabrescent, base rounded, cordate, or truncate, margin doubly serrate, 3–6-lobed, apex acute. Corymb umbel-like, 4–6.5 cm in diam., 5–10-flowered; bracts caducous, linear-lanceolate, 5–6 mm, membranous, pubescent, margin entire, apex acuminate. Pedicel 1.5–3 cm, slender, pubescent when young, soon glabrescent. Flowers ca. 1.5 cm in diam. Hypanthium campanulate, abaxially sparsely pubescent. Sepals triangular-ovate, ca. 2 mm, shorter than hypanthium, abaxially glabrous, adaxially densely villous, margin entire, apex acute. Petals pinkish white, ovate, 7–8 mm, base subcordate and shortly clawed, apex rounded. Stamens ca. 20, ca. as long as or slightly shorter than petals. Ovary 3- or 4-loculed, with 2 ovules per locule; styles 3 or 4, connate at base, glabrous. Pome yellowish red, subglobose, ca. 8 mm in diam.; fruiting pedicel 1.5–3 cm, subglabrous; sepals persistent. Fl. May, fr. Aug–Sep. $2n = 34^*$.

- Thickets in valleys or on slopes; 800–2600 m. Gansu, Hebei, Henan, Hubei, Shaanxi, Shanxi.

In floral structure, this species is most similar to *Malus kansuensis*, which is distinguished by its leaves with fewer lobes and coarser serration, caducous sepals, and ellipsoid fruit.

24. *Malus yunnanensis* (Franchet) C. K. Schneider, Repert. Spec. Nov. Regni Veg. 3: 179. 1906.

滇池海棠 dian chi hai tang

Trees to 10 m tall. Branchlets dark purple or purplish

brown when old, terete, robust, tomentose when young, glabrous when old; buds dark purple, ovoid, glabrous or scales sparsely puberulous at margin. Stipules caducous, linear, 6–8 mm, membranous, white tomentose adaxially, margin sparsely glandular denticulate, apex acute; petiole 2–3.5 cm, tomentose; leaf blade ovate, broadly ovate, or narrowly elliptic-ovate, 6–12 × 4–7 cm, abaxially tomentose or subglabrous, adaxially subglabrous, base rounded or cordate, margin doubly serrate, each side 3–5-lobed, apex acute. Corymb umbel-like, 5–9 cm in diam., 8–12-flowered; bracts caducous, linear-lanceolate, membranous, adaxially tomentose, margin sparsely glandular denticulate, apex acuminate. Pedicel 1.5–3 cm, tomentose. Flowers ca. 1.5 cm in diam. Hypanthium campanulate, abaxially tomentose. Sepals triangular-ovate, 3–4 mm, ca. as long as hypanthium, both surfaces tomentose, margin entire, apex acuminate. Petals white, suborbicular, ca. 8 mm, base shortly clawed, apex rounded. Stamens 20–25, unequal, slightly shorter than petals. Ovary 5-loculed, with 2 ovules per locule; styles 5, nearly as long as stamens, glabrous basally. Pome red, globose, 1–1.5 cm in diam., white punctate; fruiting pedicel 2–3 cm; sepals persistent. Fl. May, fr. Aug–Sep. $2n = 34^*$.

Mixed forests on slopes or by streams in valleys; 1600–3800 m. Guizhou, Hubei, Shaanxi, Sichuan, Xizang, Yunnan [Myanmar].

In autumn, this is an ornamental tree with red leaves and abundant, red fruit. It is very adaptable to poor environmental conditions and can be used as stock for grafting apple trees in W China.

- 1a. Leaf blade ovate, broadly ovate, or narrowly elliptic-ovate, abaxially tomentose, base rounded or cordate, lobes apically shortly acuminate 24a. var. *yunnanensis*
 1b. Leaf blade ovate, abaxially subglabrous, base usually cordate, lobes apically acute 24b. var. *veitchii*

24a. *Malus yunnanensis* var. *yunnanensis*

滇池海棠(原变种) dian chi hai tang (yuan bian zhong)

Pyrus yunnanensis Franchet, Pl. Delavay. 228. 1890; *Cormus yunnanensis* (Franchet) Koidzumi; *Docyniopsis yunnanensis* (Franchet) Koidzumi; *Eriolobus yunnanensis* (Franchet) C. K. Schneider.

Leaf blade ovate, broadly ovate, or elliptic-ovate, abaxially tomentose, base rounded or cordate, lobes shortly acuminate at apex.

Mixed forests on slopes or by streams in valleys; 1600–3800 m. Sichuan, Yunnan [Myanmar].

24b. *Malus yunnanensis* var. *veitchii* (Osborn) Rehder, J. Arnold Arbor. 4: 115. 1923.

川鄂滇池海棠 chuan e dian chi hai tang

Pyrus yunnanensis var. *veitchii* Osborn, Gard. Chron., ser. 3, 78: 227. 1925.

Leaf blade ovate, abaxially subglabrous, base usually cordate, lobes acute at apex.

- Guizhou, Hubei, Shaanxi, Sichuan, Xizang.

25. *Malus doumeri* (Bois) A. Chevalier, Compt. Rend. Acad. Sci. (Paris) 170: 1129. 1920.

台湾海棠 tai wan hai tang

Pyrus doumeri Bois, Bull. Soc. Bot. France 51: 113. 1904; *Docynia doumeri* (Bois) C. K. Schneider; *D. indica* (Wallich) Decaisne var. *doumeri* (Bois) A. Chevalier; *D. indica* var. *laosensis* (Cardot) A. Chevalier; *Eriolobus doumeri* (Bois) C. K. Schneider; *Malus asiatica* Nakai var. *argutiserrata* Hu & Chen; *M. doumeri* var. *formosana* (Kawakami & Koidzumi ex Hayata) S. S. Ying; *M. formosana* (Kawakami & Koidzumi ex Hayata) Kawakami & Koidzumi; *M. laosensis* (Cardot) A. Chevalier; *M. melliana* (Handel-Mazzetti) Rehder; *Pyrus formosana* Kawakami & Koidzumi ex Hayata; *P. laosensis* Cardot; *P. melliana* Handel-Mazzetti.

Trees to 15 m tall. Branchlets grayish brown or purplish brown when old, terete, villous when young, glabrous when old; buds reddish purple, ovoid, pubescent or only pubescent along margin of scales. Stipules caducous, linear-lanceolate, membranous, glabrous, margin entire, apex acuminate; petiole 1.5–3 cm, tomentose when young, glabrescent; leaf blade narrowly elliptic-ovate or obovate-lanceolate, 9–15 × 4–6.5 cm, both surfaces white tomentose when young, glabrescent, base rounded or cuneate, margin irregularly serrate, apex acuminate, Corymb umbel-like, 3–5 cm in diam., 4- or 5-flowered; bracts caducous, linear-lanceolate, membranous, glabrous, margin entire, apex obtuse. Pedicel 1.5–3 cm, white tomentose. Flowers 2.5–3 cm in diam. Hypanthium campanulate, abaxially tomentose, prolonged into short tube at apex. Sepals ovate or lanceolate, ca. 8 mm, ca. as long as or slightly longer than hypanthium, abaxially tomentose, adaxially densely tomentose, margin entire, apex acuminate. Petals yellowish white; obovate, 1–2 cm, base shortly clawed, apex rounded. Stamens unequal, slightly shorter than petals. Ovary 4- or 5-loculed, with 2 ovules per locule; styles 4 or 5, longer than stamens, long tomentose basally. Pome yellowish red, globose, 2.5–5.5 cm in diam.; distal part of hypanthium tubular, 5–8 mm, core free; fruiting pedicel 1–3 cm, glabrous; sepals persistent. Fl. May, fr. Aug–Sep.

Forests; 1000–2000 m. Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Taiwan, Yunnan, Zhejiang [Laos, Vietnam].

This species can be used as stock for grafting apple trees in subtropical regions. The fruit are edible.

In floral structure, this species is similar to *Docynia*, and some authors have placed it in that genus. However, in *Malus*, there are two ovules per locule, not many, as in *Docynia*. Consequently, it should be retained in the genus *Malus*.

26. *Malus leiocalyca* S. Z. Huang, Guihaia 9: 305. 1989.

光萼海棠 guang e hai tang

Shrubs or small trees, 4–10 m tall. Branchlets dark gray when old, slightly curved, terete, sparsely pubescent when young, glabrous when old; buds reddish purple, ovoid, glabrous, rarely scales sparsely pubescent at margin. Stipules caducous, linear-lanceolate, membranous, adaxially sparsely pubescent, margin entire, apex acuminate; petiole 1.5–2.5 cm; leaf blade elliptic or ovate-elliptic, 5–10 × 2.5–4 cm, sparsely pubescent when young, glabrescent, base rounded or broadly

cune

ate, margin obtusely serrate, apex acute or acuminate. Corymb umbel-like, 4–5.5 cm in diam., 5–7-flowered; bracts caducous, lanceolate, membranous, glabrous, margin entire, apex acuminate. Pedicel 3–5 cm, glabrous. Flowers ca. 2.5 cm in diam. Hypanthium obcampanulate, glabrous, prolonged into short tube at apex. Sepals triangular-lanceolate, ca. 8 mm, ca. as long as or slightly longer than hypanthium, abaxially glabrous, adaxially tomentose, margin entire, apex acuminate. Petals purplish white, obovate, 1–2 cm, base shortly clawed, apex rounded. Stamens ca. 30, unequal, slightly shorter than petals. Ovary 5-loculed, with 2 ovules per locule; styles 5, slightly longer than stamens, white tomentose basally. Pome yellowish red, glo

bose, 1.5–2.5 cm in diam., core free; fruiting pedicel 1–3 cm, glabrous; distal part of hypanthium tubular, 5–8 mm; sepals persistent. Fl. May, fr. Aug–Sep.

- Mixed mountain forests, stream sides in valleys; 700–2400 m. Anhui, Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Yunnan, Zhejiang.

The protologue appears to indicate two types. However, rather than regard the name as invalid, we consider the first-cited, flowering type (*Exped. Wuyi 2414*, IBSC, as “*Typus fl*”) to be the holotype because it is immediately followed by an explicit citation of two isotypes (IBK, PE, as “*Isotypus*”). We consider the second-cited, fruiting type (*Exped. Wuyi 00585*, IBSC, as “*Typus fr*”) to be a paratype.

24. AMELANCHIER Medikus, Philos. Bot. 1: 155. 1789.¹⁶

唐棣属 tang di shu

Gu Cui zhi (谷粹芝 Ku Tsue-chih); Stephen A. Spongberg

Shrubs or trees, deciduous; buds conspicuous, narrowly conical, with several scales. Leaves simple, petiolate, stipulate, venation camptodromous, margin entire or serrate. Racemes terminal; bracts caducous. Hypanthium campanulate. Sepals 5, margin entire. Petals 5, white, oblong or lanceolate, slender. Stamens 10–20. Ovary inferior or semi-inferior, 2–5-loculed, with 2 ovules per locule, separated by a false partition from back of locule; styles 2–5, partly connate or free. Fruit a small berrylike pome, bluish black to dark purple, usually juicy and sweet, incompletely 4–10-loculed, with one seed in each locule, crowned by persistent, usually recurved sepals.

About 25 species: Asia, Europe, North America; two species (one endemic) in China.

- 1a. Leaf margin serrate apically, entire basally, abaxially pubescent only along midvein when young; peduncle and pedicels glabrous 1. *A. sinica*
 1b. Leaf margin wholly serrate, densely tomentose abaxially; peduncle and pedicels densely tomentose 2. *A. asiatica*

1. Amelanchier sinica (C. K. Schneider) Chun, Chin. Econ. Trees 168. 1921.

唐棣 tang di

Amelanchier asiatica (Siebold & Zuccarini) Endlicher ex Walpers var. *sinica* C. K. Schneider, Ill. Handb. Laubholz. 1: 736. 1906.

Trees 3–5 m tall, rarely to 15 m tall, with loose branches. Branchlets purplish brown or blackish brown, terete, slender, glabrous or subglabrous, sparsely lenticellate; buds purplish brown, narrowly conical, margin of scales pubescent. Stipules caducous, lanceolate, membranous; petiole 1–2.1 cm, sometimes sparsely pubescent; leaf blade ovate or narrowly elliptic, 4–7 × 2.5–3.5 cm, abaxially pubescent along midvein when young, glabrescent, base rounded, rarely subcordate or broadly cuneate, margin entire basally, minutely serrate apically, apex acute. Raceme 4–5 × 3–5 cm, many flowered; peduncle initially sparsely pubescent, glabrescent; bracts caducous, linear-lanceolate. Pedicel 0.8–2.8 cm, slender, initially sparsely pubescent, glabrescent. Flowers 3–4.5 cm in diam. Hypanthium cupular, abaxially initially pubescent, glabrescent. Sepals lanceolate or triangular-lanceolate, ca. 5 mm, nearly as long as hypanthium. Petals white, oblong, lanceolate, or elliptic-lanceolate, ca. 1.5 cm × 5 mm, slender, apex acute. Stamens 20, 1/7–1/5 as long as petals, 2–4 mm. Styles 5, shorter than stamens, densely yellow-

ish white tomentose basally. Pome bluish black, subglobose or depressed-globose, ca. 1 cm in diam.; sepals reflexed. Fl. May, fr. Sep–Oct.

- Slopes, among shrubs; 1000–2000 m. Henan, Gansu, Shaanxi, Hubei, Sichuan.

2. Amelanchier asiatica (Siebold & Zuccarini) Endlicher ex Walpers, Repert. Bot. Syst. 2: 55. 1843.

东亚唐棣 dong ya tang di

Aronia asiatica Siebold & Zuccarini, Fl. Jap. 1: 87. 1839; *Amelanchier canadensis* Medikus var. *asiatica* (Siebold & Zuccarini) Koidzumii; *Pyrus taquetii* H. Léveillé; *P. vaniotii* H. Léveillé.

Trees or shrubs, to 12 m tall, with loose branches. Branchlets blackish brown when old, terete, initially grayish white lanose, glabrate, sparsely pale lenticellate; buds conspicuous, pale brown, narrowly conical, margin of scales pubescent. Stipules caducous, lanceolate, membranous; petiole 1–1.5 cm, grayish white tomentose when young, glabrescent; leaf blade ovate to elliptic, rarely ovate-lanceolate, 4–6 × 2.5–3.5 cm, abaxially initially densely grayish white or yellowish brown tomentose, subglabrescent, base rounded or subcordate, margin minutely sharply serrate along entire length, apex acute. Raceme 4–7 × 3–5 cm, many flowered; peduncle white tomentose when young, glabrescent; bracts linear-lanceolate. Pedicel 1.5–2.5

¹⁶Contributions were received from Christopher S. Campbell, Herbarium, Biological Sciences Department, University of Maine, Orono, Maine 04469-5722, U.S.A.

ROSACEAE

cm, slender, white tomentose when young, glabrescent. Flowers 3–3.5 cm in diam. Hypanthium campanulate, abaxially tomentose. Sepals lanceolate, ca. 8 mm, ca. 2 × as long as hypanthium. Petals white, oblong-lanceolate or ovate-lanceolate, 1.5–2 cm × 5–7 mm, slender, apex acute. Stamens 15–20, 1/7–1/5 as long as petals. Styles 5, mostly connate, tomentose basally. Pome bluish black, subglobose or depressed-globose, 1–1.5 cm

in diam.; sepals reflexed. Fl. Apr–May, fr. Aug–Sep.

On slopes by streams, mixed forests; 1000–2000 m. S Anhui (Huang Shan), NW Jiangxi (Mufu Shan), S Shaanxi (Qin Ling), NW Zhejiang (Tianmu Shan) [Japan, Korea].

3. Subfam. **ROSOIDEAE**

蔷薇亚科 qiang wei ya ke

Shrubs or herbs. Leaves stipulate; leaf blade compound, rarely simple, margin usually serrate. Carpels many, free; ovary superior, rarely inferior; ovules 1 or 2, pendulous or erect, anatropous. Fruit an achene (torus sometimes fleshy and berrylike), rarely a drupelet. $x = 7, 8, 9$.

About 35 genera and 1500 species: nearly cosmopolitan, especially in temperate and subarctic regions of N hemisphere; 22 genera (one endemic) and 459 species (242 endemic) in China.

- 1a. Achenes enclosed in cupular or urn-shaped torus.
 - 2a. Carpels numerous; torus fleshy at maturity; shrubs; stems usually prickly 41. *Rosa*
 - 2b. Carpels 1–4; torus dry and hard at maturity; herbs perennial or shrublets; stems not prickly.
 - 3a. Flowers 3-merous; style basal; shrublets 42. *Potaninia*
 - 3b. Flowers (4 or)5-merous; style terminal, rarely basal or sub-basal; herbs perennial.
 - 4a. Petals present.
 - 5a. Hypanthium with hooklike spines abaxially; epicalyx segments absent; stamens 5–15 43. *Agrimonia*
 - 5b. Hypanthium without hooklike spines abaxially; epicalyx segments present; stamens 35–40 44. *Spenceria*
 - 4b. Petals absent.
 - 6a. Leaves pinnate; sepals imbricate, epicalyx segments absent; stamens 4–15; style terminal; flowers usually in spicate or capitate inflorescences, bisexual, rarely unisexual (when plants monoecious) 45. *Sanguisorba*
 - 6b. Leaves simple, mostly palmately lobed or parted; sepals valvate, epicalyx segments present; stamens 1–5; style basal or sub-basal; flowers usually in corymbose cymes, always bisexual 46. *Alchemilla*
- 1b. Achenes or drupelets borne on flat or convex torus.
 - 7a. Carpels 4–15, borne at base of flat or slightly concave torus; stipules not adnate to petiole.
 - 8a. Herbs perennial; leaves pinnate or pinnately or palmately lobed; flowers numerous in a terminal panicle or corymb, small 27. *Filipendula*
 - 8b. Shrubs; leaves simple; flowers solitary, large.
 - 9a. Leaves alternate; flowers 5-merous; petals yellow; epicalyx segments absent; carpels 5–8 25. *Kerria*
 - 9b. Leaves opposite; flowers 4-merous; petals white; epicalyx segments present; carpels 4 26. *Rhodotypos*
 - 7b. Carpels several to numerous, borne on globose or conic torus; stipules adnate to petiole or not.
 - 10a. Fruit drupelets or drupaceous achenes; stems prickly, rarely unarmed 28. *Rubus*
 - 10b. Fruit achenes; stems unarmed.
 - 11a. Style terminal or subterminal.
 - 12a. Style deciduous.
 - 13a. Herbs low; basal leaves pinnate, with many leaflets; carpels many; stamens persistent 33. *Coluria*
 - 13b. Herbs creeping; basal leaves 3–5-foliolate or 3–5-parted; carpels 2–6; stamens deciduous 34. *Waldsteinia*
 - 12b. Style persistent.
 - 14a. Shrubs dwarf; leaves simple, entire or lobed; flowers (6–)8–10-merous 29. *Dryas*
 - 14b. Herbs perennial; basal leaves pinnate, rarely simple; flowers 5-merous.
 - 15a. Style jointed, distal part separating from joint at fruit maturity, proximal part persistent and apically hooked 30. *Geum*
 - 15b. Style not jointed, wholly persistent at fruit maturity.
 - 16a. Basal leaves pinnate, with many leaflets; plants hermaphroditic; petals yellow; style not or slightly elongated at fruiting 31. *Acomastylis*
 - 16b. Basal leaves simple; plants polygamo-monoecious or polygamo-dioecious; petals white; style distinctly elongated at fruiting 32. *Taihangia*
 - 11b. Style basal, lateral, or subterminal.
 - 17a. Torus inflated and fleshy when ripe.
 - 18a. Petals white; epicalyx segments smaller than sepals 39. *Fragaria*

- 18b. Petals yellow; epicalyx segments larger than sepals 40. *Duchesnea*
 17b. Torus dry when ripe.
 19a. Stamens and carpels many.
 20a. Petals yellow or white, longer than sepals 35. *Potentilla*
 20b. Petals purple or white, shorter than or subequaling sepals 36. *Comarum*
 19b. Stamens 4 or 5; carpels 4–20.
 21a. Stamens alternate with petals; basal leaves palmately or pinnately
 compound; epicalyx segments present 37. *Sibbaldia*
 21b. Stamens opposite to petals; leaves 3-parted or 2 or 3 × compound;
 epicalyx segments absent 38. *Chamaerhodos*

25. KERRIA Candolle, Trans. Linn. Soc. London 12: 156. 1818.

棣棠花属 di tang hua shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Shrubs deciduous. Branchlets virgate, arising from scaly buds, slender. Leaves alternate; stipules linear-subulate, caducous; leaf blade simple, margin doubly serrate. Flowers terminal on lateral branchlets, solitary, large, bisexual. Hypanthium shortly saucer-shaped, flat. Sepals 5, valvate. Petals 5, yellow, base shortly clawed. Stamens numerous, in several series. Carpels 5, free, included in hypanthium; ovules 2, laterally attached to middle of suture, 1 abortive; style apical, erect, filiform, apex truncate. Fruit an achene, laterally compressed, glabrous. $x = 9$.

One species: China, Japan.

1. *Kerria japonica* (Linnaeus) Candolle, Trans. Linn. Soc. London 12: 157. 1818.

棣棠花 di tang hua

Rubus japonicus Linnaeus, Mant. Pl. 2: 245. 1771; *Corchorus japonicus* Thunberg; *Kerria japonica* var. *denticulata* L. C. Wang & X. G. Sun.

Shrubs 1–2(–3) m tall. Branchlets green, usually arcuate, terete, angled when young, glabrous. Stipules deciduous after flowering, oblong-lanceolate, membranous, margin ciliate; petiole 5–15 mm, glabrous or pilose; leaf blade triangular-ovate or ovate, 3–10 × 2–4 cm, abaxially pilose on veins or in vein axils,

adaxially glabrous or sparsely pilose, base subcordate, rounded, or truncate, margin sharply doubly serrate, apex acuminate. Flowers 2.5–6 cm in diam.; pedicel 8–15 mm, glabrous. Sepals persistent in fruit, ovate-elliptic, glabrous, margin serrulate or entire, apex rounded to acute. Petals broadly elliptic, 1.5–2 × 1–1.8 cm, 1–4 × as long as sepals, apex emarginate. Achenes brownish black, obovoid or hemispheric, 4–4.5 × 3.5–4 mm, rugose. Fl. Apr–Jun, fr. Jun–Aug. $2n = 18$.

Thickets on mountain slopes; 200–3000 m. Anhui, Fujian, Gansu, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Yunnan, Zhejiang [Japan].

This species is used medicinally and cultivated for ornament.

26. RHODOTYPOS Siebold & Zuccarini, Fl. Jap. 1: 185. 1841.

鸡麻属 ji ma shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Shrubs deciduous. Buds with imbricate scales. Leaves opposite; stipules free, linear, membranous, caducous; leaf blade simple, ovate, margin sharply doubly serrate. Flowers terminal on branchlets, solitary, bisexual. Hypanthium saucer-shaped, flat. Sepals 4, in 2 pairs, imbricate, leaflike, with 4 epicalyx segments in-between. Petals 4, opposite sepals, white, base shortly clawed. Stamens numerous, in several series. Disk crowning hypanthium, large, thick, dissected into 4 lobes. Carpels usually 4; ovary covered by 4 lobes of disk at flowering; ovules 2, pendulous, 1 abortive; style terminal, exserted, filiform; stigma capitate. Fruit a drupe; epicarp smooth, dry. Seed 1, obovoid; cotyledons plano-convex, adaxially 3-veined. $x = 9$.

One species: China, Japan, Korea.

1. *Rhodotypos scandens* (Thunberg) Makino, Bot. Mag. (Tokyo) 27: 126. 1913.

鸡麻 ji ma

Corchorus scandens Thunberg, Trans. Linn. Soc. London 2: 335. 1794; *Kerria tetrapetala* Siebold; *Rhodotypos kerrioides* Siebold & Zuccarini; *R. tetrapetala* (Siebold) Makino.

Shrubs 0.5–2(3) m tall. Branchlets green when young, later brown, glabrous. Stipules pilose; petiole 2–5 mm, pilose;

leaf blade 4–11 × 3–6 cm, abaxially sericeous when young, sparsely pilose on veins when old, adaxially pilose when young, glabrescent later, base rounded to subcordate, apex acuminate. Flowers 3–5 cm in diam. Sepals ovate-elliptic, sparsely sericeous distally, apex acute; epicalyx segments linear, 1/5–1/4 as long as sepals. Petals obovate, 1/4–1/3 as long as sepals. Drupes 1–4, brownish black, obliquely ellipsoid, ca. 8 mm. Fl. Apr–May, fr. Jun–Sep. $2n = 18$.

Forests on mountain slopes or in valleys; 100–800 m. Anhui, Gansu, Henan, Hubei, Jiangsu, Liaoning, Shaanxi, Shandong, Zhejiang [Japan, Korea].

This species is used medicinally and cultivated for ornament.

27. FILIPENDULA Miller, Gard. Dict. Abr., ed. 4, [512]. 1754.

蚊子草属 wen zi cao shu

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial, rhizomatous. Rhizome short, oblique, here and there thickened into tubers, clothed with fibers. Stipules large or small, subcordate to ovate-lanceolate; leaf blade pinnate; leaflets pinnately or palmately lobed. Inflorescence corymbose-cymose or paniculate-cymose; central branch shortened and flowering first. Flowers bisexual, rarely unisexual (when plants dioecious). Sepals 5, reflexed after flowering. Petals 5, imbricate, white, pink, or red, base clawed. Stamens 20–40. Carpels 5–15, inserted on plane or slightly elevated receptacle, free; ovules 1 or 2; style terminal; stigma capitate. Fruit an achene, free, compressed, crowned by base of style. Seed pendulous, terete, with very little endosperm. $x = 7, 8$.

More than ten species: mainly in N temperate zone; seven species (one endemic) in China.

The fruit of *Filipendula* has been described as an indehiscent follicle. It is described here as an achene because it is indehiscent, as opposed to a typical, dehiscent follicle. In fact, it may be intermediate between an achene and a follicle.

- 1a. Achenes attached to receptacle adaxially near base, spirally contorted and appearing united; terminal leaflets 3–5-lobed 7. *F. ulmaria*
- 1b. Achenes attached to receptacle at base, not contorted, obviously free; terminal leaflets 5–9-lobed.
 - 2a. Terminal leaflets with linear to lanceolate lobes.
 - 3a. Leaf blades abaxially white tomentose; pedicels distally densely pubescent; sepals distally densely pubescent; achenes shortly stipitate, bristly-hairy at margin 5. *F. ×intermedia*
 - 3b. Leaf blades abaxially glabrous; pedicels glabrescent or pilose; sepals distally glabrous; achenes sessile, glabrous, rarely hairy at margin 6. *F. angustiloba*
 - 2b. Terminal leaflets with ovate or lanceolate to rhombic-ovate or rhombic-lanceolate lobes.
 - 4a. Lateral leaflets of radical and lower cauline leaves 3–5-parted, terminal leaflet with lanceolate to rhombic-lanceolate lobes 1. *F. palmata*
 - 4b. Lateral leaflets of radical and lower cauline leaves entire or only slightly lobed, terminal leaflet with ovate to rhombic-ovate lobes.
 - 5a. Leaf blade abaxially densely white or brownish tomentose, appressed ferruginous pilose on veins 2. *F. vestita*
 - 5b. Leaf blade abaxially glabrescent or sparsely pilose on veins.
 - 6a. Lateral leaflets of radical leaves in 6–8 pairs; stipules of cauline leaves oblong to ovate, large, margin serrate 3. *F. kiraihiensis*
 - 6b. Lateral leaflets of radical leaves in 1–3 pairs; stipules of cauline leaves ovate-lanceolate, small, margin entire or few serrate 4. *F. glaberrima*

1. *Filipendula palmata* (Pallas) Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 250. 1879.

蚊子草 wen zi cao

Plants 0.6–1.5 m tall. Stems sulcate, pubescent or glabrescent. Stipules semicordate, large, herbaceous, margin sharply doubly serrate; petiole pubescent or subglabrous; leaf blade pinnate, with 2 pairs of lateral leaflets, abaxially densely white tomentose, sparsely pubescent, or glabrous, adaxially sparsely pubescent or glabrous; terminal leaflet palmately 5–9-parted, rather large, segments lanceolate to rhombic-lanceolate, margin lobed or sharply doubly serrate; lateral leaflets 3–5-parted, smaller than terminal one. Inflorescence terminal, paniculate, many flowered. Flowers bisexual, 5–7 mm in diam.; pedicel sparsely pubescent, glabrescent when old. Sepals ovate, glabrous abaxially. Petals white, obovate, base long clawed. Achenes basally attached to receptacle, shortly stipitate, erect, long ciliate along abaxial and adaxial sides. Fl. and fr. Jul–Sep. $2n = 28, 42–44$.

Forest margins, sunny mountain slopes, valleys, grassy areas,

shady and moist places; 200–2300 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi [N Korea, Mongolia, E Russia].

- 1a. Stems pubescent; leaf blades abaxially densely white tomentose 1a. var. *palmata*
- 1b. Stems glabrescent; leaf blades abaxially glabrous or sparsely pubescent 1b. var. *glabra*

1a. *Filipendula palmata* var. *palmata*

蚊子草(原变种) wen zi cao (yuan bian zhong)

Spiraea palmata Pallas, Reise Russ. Reich. 3: 735. 1776; *Filipendula amurensis* (Baranov) Baranov; *F. palmata* var. *amurensis* Baranov; *F. palmata* var. *stenoloba* Baranov ex Liou et al.; *S. digitata* Willdenow.

Stems pubescent. Leaf blades abaxially densely white tomentose, adaxially glabrous. Fl. and fr. Jul–Sep.

Forest margins, valleys, grassy areas; 200–2000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi [N Korea, Mongolia, E Russia].

1b. *Filipendula palmata* var. *glabra* Ledebour ex Komarov &

Alissova-Klobulova, Key Pl. Far East. URSS 2: 650. 1932.

光叶蚊子草 *guang ye wen zi cao*

Filipendula nuda Grubov; *F. palmata* f. *nuda* (Grubov) T. Shimizu.

Stems glabrescent. Leaf blades on both surfaces glabrous or sparsely pubescent. Fl. and fr. Jul–Sep.

Sunny mountain slopes, valleys, shady and moist places; 400–2300 m. Hebei, Jilin, Nei Mongol, Shaanxi [E Russia].

2. *Filipendula vestita* (Wallich ex G. Don) Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 248. 1879.

锈脉蚊子草 *xiu mai wen zi cao*

Spiraea vestita Wallich ex G. Don, Gen. Hist. 2: 521. 1832; *S. camtschatica* Pallas var. *himalensis* Lindley.

Plants 0.7–1.5 m tall. Stems sulcate, ferruginous pubescent. Radical leaves: stipules semicordate, large, herbaceous, margin doubly serrate; petiole ferruginous pubescent; leaf blade lyrate pinnate, with 3–5 pairs of leaflets and intercalary segments, abaxially densely grayish white or brownish tomentose, densely ferruginous pubescent on veins, adaxially subglabrous or sparsely pubescent; terminal leaflet usually palmately 3–5-lobed, rather large, lobes ovate, margin doubly serrate or inconspicuously lobed, apex acute to acuminate; lateral leaflets small. Inflorescence terminal, paniculate. Flowers bisexual, 5–6 mm in diam.; pedicel densely tomentose. Sepals ovate, abaxially sparsely pilose and tomentose, apex subobtusate or acute. Petals white, obovate. Achenes sessile, strigose-ciliate along abaxial and adaxial sides. Fl. and fr. May–Aug.

Alpine meadows, river banks; 3000–3200 m. Yunnan [Afghanistan, Kashmir, Nepal].

3. *Filipendula kiraishiensis* Hayata, Icon. Pl. Formosan. 9: 39. 1920.

台湾蚊子草 *tai wan wen zi cao*

Plants ca. 30 cm tall, polygamous. Stems sparsely pilose. Stipules of radical and lower cauline leaves membranous, those of middle-upper cauline leaves herbaceous, oblong to ovate, margin irregularly serrate; radical leaves: petiole of subglabrous; leaf blade lyrate pinnate, with 6–8 pairs of leaflets, abaxially sparsely pilose on veins; terminal leaflet usually palmately 5-lobed, large, lobes ovate, margin sharply doubly serrate, apex shortly acuminate to caudate; lateral leaflets ovate, gradually smaller toward base of leaf, margin irregularly serrate or doubly serrate, apex acute or acuminate; cauline leaves resembling radical ones but with 1–4 pairs of leaflets. Inflorescence cymose; peduncle brown villous. Flowers 6–8 mm in diam. Sepals triangular, minute, glabrous. Petals oblong or obovate, base tapering into a short claw, apex rounded. Achenes 7–9, glabrous. Fl. and fr. Jul–Aug.

• Alpine habitats; ca. 3000 m. Taiwan.

4. *Filipendula glaberrima* Nakai, Repert. Spec. Nov. Regni Veg. 13: 274. 1914.

槭叶蚊子草 *qi ye wen zi cao*

Filipendula camtschatica (Pallas) Maximowicz subsp. *glaberrima* (Nakai) Voroschilov; *F. glabra* Nakai ex Komarov & Alissova-Klobukova; *F. multijuga* Maximowicz var. *alba* Nakai; *F. multijuga* subsp. *yezoensis* (H. Hara) Voroschilov; *F. yezoensis* H. Hara; *F. yezoensis* f. *alba* (Nakai) Y. N. Lee.

Plants 0.5–1.5 m tall. Stems erect, sulcate, glabrous. Stipules usually tinged brown-green, small, ovate-lanceolate, herbaceous or semimembranous, margin entire or few serrate; petiole 3–10 cm, glabrous; leaf blade pinnate, with 1–3 pairs of leaflets and intercalary segments, glabrous or abaxially sparsely pilose on veins; terminal leaflet orbicular to broadly ovate, usually palmately 5–7-lobed, 7–15 × 8–16 cm, base shallowly cordate, lobes ovate, margin doubly serrate or somewhat lobed, apex caudate-acuminate; lateral leaflets oblong-ovate or ovate-lanceolate, small, margin doubly serrate. Inflorescence terminal or from axils of upper cauline leaves, paniculate. Flowers bisexual, 4–5 mm in diam.; pedicel glabrous. Sepals 4 or 5, ovate, 1–1.5 × 0.8–1.5 mm, glabrous abaxially, apex obtuse or acute. Petals 4 or 5, pink to white, obovate, base shortly clawed. Achenes erect, stipitate, long ciliate along abaxial and adaxial sides. Fl. and fr. Jun–Aug.

Forests, forest and mountain stream banks; 700–1500 m. Heilongjiang, Jilin, Liaoning [Japan, Korea, Russia].

This species was treated in FRPS as *Filipendula purpurea* Maximowicz, but true ×*F. purpurea* is a cultivated hybrid in Japan.

5. *Filipendula ×intermedia* (Glehn) Juzepczuk in Komarov, Fl. URSS 10: 284. 1941.

翻白蚊子草 *fan bai wen zi cao*

Spiraea digitata Willdenow var. *intermedia* Glehn, Trudy Imp. S.-Peterburgsk. Bot. Sada 4: 38. 1876; *Filipendula angustiloba* (Turczaninow) Maximowicz var. *tomentosa* Maximowicz.

Plants 80–100 cm tall. Stems sulcate, subglabrous. Stipules semicordate, enlarged, herbaceous, margin serrate; petiole subglabrous; leaf blade pinnate, with 2–5 pairs of leaflets, abaxially white tomentose and pilose on veins, adaxially glabrous; terminal leaflet usually 7–9-lobed, equaling or slightly larger than lateral ones, lobes linear or lanceolate, margin regularly serrate or not, apex acuminate; lateral leaflets resembling terminal one, becoming smaller and less lobed toward base of leaf. Inflorescence terminal, paniculate. Flowers bisexual; pedicel usually pubescent. Sepals ovate, densely pubescent abaxially, apex obtuse or acute. Petals white, obovate. Achenes erect, shortly stipitate, hirsute-ciliate along abaxial and adaxial sides. Fl. and fr. Jun–Aug.

Mountain thickets, meadows, river banks. Heilongjiang, Jilin [Mongolia, Russia].

Filipendula ×intermedia is a putative, natural hybrid between *F. angustiloba* and *F. palmata*.

6. *Filipendula angustiloba* (Turczaninow) Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 250. 1879.

细叶蚊子草 *xi ye wen zi cao*

Spiraea angustiloba Turczaninow in Fischer & C. A.

Meyer, Index Sem. Hort. Petrop. 8: 72. 1842; *Filipendula angustiloba* var. *glabra* Maximowicz.

Plants 50–120 cm tall. Stems sulcate, glabrous. Stipules green, broadly semicordate, herbaceous, margin serrate; leaf blade pinnate, with 2–5 pairs of leaflets, both surfaces green and glabrous; terminal leaflet usually 7–9-lobed, slightly larger than lateral ones, lobes lanceolate, margin sharply irregularly serrate, apex acuminate; lateral leaflets resembling terminal one but less lobed. Inflorescence terminal, paniculate. Flowers bisexual, ca. 5 mm in diam.; pedicel glabrescent or sparsely pilose. Sepals ovate, apex obtuse. Petals white, obovate. Achenes erect, sessile, glabrous or hairy along ridge. Fl. and fr. Jun–Aug.

Damp places in forests, meadows, river banks; 600–1300 m. Heilongjiang, Nei Mongol [Mongolia, E Russia].

7. *Filipendula ulmaria* (Linnaeus) Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 251. 1879.

旋果蚊子草 xuan guo wen zi cao

Spiraea ulmaria Linnaeus, Sp. Pl. 1: 490. 1753.

Plants 80–100 cm tall. Stems sulcate, glabrous. Stipules green, semicordate or ovate-lanceolate, herbaceous, margin

sharply serrate; petiole glabrous; leaf blade pinnate, with 2–5 pairs of leaflets, abaxially white tomentose, sometimes a few basal leaflets glabrescent, adaxially glabrous; terminal leaflet 3–5-lobed, slightly smaller to slightly larger than lateral ones, lobes lanceolate to oblong-lanceolate, margin doubly serrate or slightly lobed, apex acuminate; lateral leaflets oblong-ovate or elliptic-lanceolate, base rounded, margin doubly serrate, apex acuminate. Inflorescence terminal, paniculate. Flowers bisexual, ca. 5 mm in diam.; pedicel sparsely pubescent. Sepals ovate, densely pubescent abaxially, apex obtuse or acute. Petals white, obovate. Achenes attached to receptacle adaxially near base, subsessile, spirally contorted and appearing united. Fl. and fr. Jun–Sep. $2n = 14$.

Mountain thickets, meadows, river banks. Xinjiang [Mongolia, Russia; C and SW Asia, Europe].

28. **RUBUS** Linnaeus, Sp. Pl. 1: 492. 1753.

悬钩子属 xuan gou zi shu

Lu Lingdi (陆玲娣 Lu Ling-ti); David E. Boufford

Shrubs or subshrubs, deciduous, rarely evergreen or semievergreen, sometimes perennial creeping dwarf herbs. Stems erect, climbing, arching, or prostrate, glabrous or hairy, usually with prickles or bristles, sometimes with glandular hairs, rarely unarmed. Leaves alternate, petiolate, simple, palmately or pinnately compound, divided or undivided, toothed, glabrous or hairy, sometimes with glandular hairs, bristles, or glands; stipules persistent, ± adnate to petiole basally, undivided or occasionally lobed, persistent or caducous, near base of petiole or at junction of stem and petiole, free, usually dissected, occasionally entire. Flowers bisexual, rarely unisexual and plants dioecious, in cymose panicles, racemes, or corymbs, or several in clusters or solitary. Calyx expanded, sometimes with a short, broad tube; sepals persistent, erect or reflexed, (4 or)5(–8). Petals usually 5, rarely more, occasionally absent, white, pink, or red, glabrous or hairy, margin entire, rarely premorse. Stamens numerous, sometimes few, inserted at mouth of hypanthium; filaments filiform; anthers didymous. Carpels many, rarely few, inserted on convex torus, each carpel becoming a drupelet or drupaceous achene; locule 1; ovules 2, only 1 developing, collateral, pendulous; style filiform, subterminal, glabrous or hairy; stigma simple, capitate. Drupelets or drupaceous achenes aggregated on semispherical, conical, or cylindrical torus, forming an aggregate fruit, separating from torus and aggregate hollow, or adnate to torus and falling with torus attached at maturity and aggregate solid; seed pendulous, testa membranous; cotyledons plano-convex.

About 700 species: worldwide, particularly abundant in temperate regions of N hemisphere, a few species extending into S hemisphere; 208 species (139 endemic) in China.

Rubus umbellifer H. Léveillé (Repert. Spec. Nov. Regni Veg 6: 111. 1908), described from China, is referable to *Grewia biloba* G. Don var. *biflora* (Bunge) Handel-Mazzetti (Tiliaceae).

The Chinese species of *Rubus* are mostly native and rare in cultivation. The fruit of many species are eaten raw or used for making jam, jelly, juice, candy, various drinks, wine, and vinegar. The dried fruits, seeds, and leaves are used in traditional Chinese medicine and the leaves are also used for tea. Some species are suitable for ornamental use, for hedges, or as ground covers. The stems and roots of some species are a source of tannin.

- 1a. Herbs, prostrate or creeping, rarely subshrubs, unarmed or sometimes with needle-like prickles or bristles; stipules free.
 - 2a. Flowers unisexual (plants dioecious); leaves simple 8. *R.* sect. *Chamaemorus*
 - 2b. Flowers bisexual; leaves simple or compound.
 - 3a. Plants with needle-like prickles or bristles; leaves simple; calyx usually with needle-like prickles or bristles abaxially; carpels more than 20, rarely less 6. *R.* sect. *Chamaebatus*
 - 3b. Plants unarmed, rarely with needle-like prickles; leaves compound, 3–5-foliolate; calyx unarmed

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- abaxially or sometimes with soft bristles; carpels fewer than 20, rarely more 7. *R.* sect. *Cylactis*
- 1b. Shrubs, rarely subshrubs or herbs, usually with robust or needle-like prickles; stipules free or adnate to base of petiole.
- 4a. Stipules free, usually dissected, persistent or caducous; leaves simple or palmately compound.
- 5a. Plants prickly; stipules caducous or persistent; leaves simple, rarely palmately or pedately compound 4. *R.* sect. *Malachobatus*
- 5b. Plants densely bristly, bristles rarely with intermixed sparse, needle-like or small prickles; stipules persistent, rarely caducous; leaves simple 5. *R.* sect. *Dalibardastrum*
- 4b. Stipules adnate to base of petiole, rarely free, undivided, occasionally lobed, persistent.
- 6a. Leaves pinnately or palmately compound, (3–)5–11(–15)-foliolate, or simple; aggregate fruit separating from torus at maturity, hollow 1. *R.* sect. *Idaeobatus*
- 6b. Leaves usually ternate, sometimes pedately or palmately compound, rarely simple; aggregate fruit separating from or adnate to torus, hollow or not.
- 7a. Evergreen shrubs; leaves leathery; aggregate fruit separating from or adnate to torus at maturity, hollow or not 2. *R.* sect. *Lampobatus*
- 7b. Deciduous shrubs; leaves papery; aggregate fruit adnate to, rarely separating from torus at maturity, rarely hollow 3. *R.* sect. *Rubus*

1. *Rubus* sect. *Idaeobatus* Focke, Abh. Naturwiss. Vereine Bremen 4: 143. 1874.

空心莓组 kong xin mei zu

Shrubs, rarely subshrubs or herbs, usually with robust or needle-like prickles. Leaves pinnately or palmately compound, (3–)5–11(–15)-foliolate, or simple; stipules persistent, mostly adnate to base of petiole, narrower than petiole, rarely broader, undivided, sometimes lobed. Flowers bisexual, in cymose panicles, subracemes, or corymbs, rarely several in clusters or solitary. Aggregate fruit separating from torus at maturity, hollow.

Eighty-eight species (55 endemic) in China.

- 1a. Leaves simple.
- 2a. Carpels ca. 100 or slightly more; aggregate fruit terete or cylindrical; leaves peltate 79. *R. peltatus*
- 2b. Carpels ca. 10–60, rarely slightly more; aggregate fruit subglobose or ovoid-globose; leaves not peltate.
- 3a. Leaves palmately 3–5(–7)-divided, palmately 5-veined from base, pubescent along veins on both surfaces.
- 4a. Leaves ovate to narrowly ovate, 3–5-lobed; flowers 1–1.5 cm, several in clusters or in short terminal racemes; aggregate fruit ca. 1 cm in diam., glabrous 87. *R. crataegifolius*
- 4b. Leaves suborbicular, palmately (3–)5(–7)-parted; flowers 2.5–4 cm in diam., solitary; aggregate fruit 1.5–2 cm in diam., densely hairy 88. *R. chingii*
- 3b. Leaves undivided or 3-lobed, palmately 3-veined from base, glabrous or hairy.
- 5a. Plants glabrous, without glandular hairs.
- 6a. Flowers 3 or more, in short racemes; pistils ca. 10–50, glabrous 84. *R. trianthus*
- 6b. Flowers solitary; pistils 50–100, glabrous or tomentose.
- 7a. Leaf margin coarsely sharply serrate or doubly serrate; flowers red; pistils glabrous 85. *R. grayanus*
- 7b. Leaf margin simply serrate; flowers white; pistils densely gray tomentose 86. *R. yanyunii*
- 5b. Plants soft hairy, rarely pubescent only along veins.
- 8a. Plants with glandular hairs; flowers ca. 1.5 cm in diam.; aggregate fruit glabrous 80. *R. glabricarpus*
- 8b. Plants without glandular hairs; flowers 2–3 cm in diam.; aggregate fruit pubescent.
- 9a. Leaves broadly ovate or triangular-ovate, usually 3-parted to near middle; abaxial surface of calyx with sparse, straight needle-like prickles; flowers solitary or in clusters of 2 or 3 83. *R. taitoensis*
- 9b. Leaves ovate to ovate-lanceolate, undivided, rarely those of sterile branchlets 3-lobed; abaxial surface of calyx unarmed; flowers solitary or several in a cluster.
- 10a. Plants pubescent throughout; sepals ovate or triangular-ovate, 5–8 mm, acute to shortly acuminate; petals white, longer than sepals 81. *R. corchorifolius*
- 10b. Plants glabrous or slightly pubescent only on leaf veins; sepals triangular-lanceolate, 10–15 mm, acuminate to caudate; petals red, shorter than sepals 82. *R. kwangsiensis*
- 1b. Leaves compound (only *R. impressinervus* with simple leaves).
- 11a. Leaves palmately compound; terminal leaflet sessile or nearly so.
- 12a. Leaves palmately 3-foliolate; leaflets pilose on both surfaces; branchlets, petioles, pedicel, and abaxial surface of calyx with glandular hairs; abaxial surface of calyx with needle-like prickles; aggregate fruit glabrous 77. *R. pentagonus*
- 12b. Leaves palmately 5-foliolate; leaflets pilose only along veins on both surfaces; branchlets, petioles, pedicel, and abaxial surface of calyx without glandular hairs; abaxial surface of calyx unarmed;

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- aggregate fruit villous 78. *R. quinquefoliolatus*
- 11b. Leaves imparipinnate, terminal leaflet prominently petiolulate.
- 13a. Stipules and bracts ovate-lanceolate, ovate, or suborbicular.
- 14a. Stipules and bracts ovate-lanceolate to ovate; leaves 3(–5)-foliolate, terminal leaflet broadly ovate, 2- or 3-lobed, lateral leaflets coarsely doubly serrate; pedicel with minute prickles 75. *R. lasiostylus*
- 14b. Stipules and bracts broadly ovate or suborbicular; leaves 5(–7)-foliolate, terminal leaflet elliptic, undivided, lateral leaflets coarsely serrate; pedicel unarmed 76. *R. wushanensis*
- 13b. Stipules and bracts linear, linear-lanceolate, or lanceolate, occasionally subulate.
- 15a. Leaves 3-foliolate, rarely 5-foliolate, sometimes simple, leathery; carpels 70–100, rarely more.
- 16a. Leaves simple; herbs; flowers solitary 74. *R. impressinervis*
- 16b. Leaves 3-foliolate, rarely 5-foliolate; shrubs or subshrubs; flowers several, in terminal corymbs, in clusters of 2 or 3, or solitary.
- 17a. Abaxial surface of calyx with hooklike prickles; petiolule of terminal leaflet 0.5–0.8 cm; leaflets lanceolate to narrowly lanceolate, coarsely serrate; flowers solitary or in clusters of 2 or 3 69. *R. delavayi*
- 17b. Abaxial surface of calyx unarmed; petiolule of terminal leaflet 1–2 cm; leaflets ovate to elliptic-lanceolate; flowers 1–8.
- 18a. Terminal leaflet nearly as long as or slightly longer than lateral leaflets; pistils 70–80, rarely to 100 or more; torus nearly sessile.
- 19a. Leaflets ovate to ovate-elliptic, base rounded, coarsely sharply serrate; sepals ovate, apically acute; flowers 3–8 in terminal corymbs 70. *R. leucanthus*
- 19b. Leaflets narrowly elliptic to elliptic-lanceolate, base cuneate, densely sharply serrulate to incised-doubly serrate; sepals ovate-lanceolate, long caudate; flowers 1–3(–5) 71. *R. zhaogoshanensis*
- 18b. Terminal leaflet much longer than lateral leaflets; pistils more than 100; torus shortly stipitate.
- 20a. Leaflets elliptic or ovate-lanceolate, terminal one ca. 2 × as long as lateral leaflets, margin densely unevenly coarsely serrate; flowers 3–4 cm in diam., in terminal corymbs 3–7-flowered, rarely flowers solitary; ovary glabrous 72. *R. columellaris*
- 20b. Leaflets narrowly lanceolate, terminal leaflet ca. 4 × as long as lateral leaflets, margin remotely and shallowly serrulate; flowers 1.5–2 cm, solitary or in clusters of 2 or 3; apex of ovary pubescent 73. *R. paucidentatus*
- 15b. Leaves (3–)5–11(–15)-foliolate, not leathery; carpels 10–70 or ca. 100 or more.
- 21a. Carpels ca. 100 or more, usually inserted on stipitate torus; terminal inflorescences corymbs, rarely short racemes, or flowers several in clusters or solitary.
- 22a. Plants without glandular hairs, but with glands, sometimes with sparse, short glandular hairs only on flowering branchlets or pedicel; flowers solitary or several in cluster, occasionally in short racemes.
- 23a. Plants eglandular.
- 24a. Leaflets ovate or elliptic, rarely ovate-lanceolate, sharply incised-doubly serrate; pedicel 2.5–5 cm; aggregate fruit subglobose, 0.9–1.1 cm in diam. 67. *R. eustephanos*
- 24b. Leaflets ovate-lanceolate or lanceolate, irregularly and doubly serrate; pedicel 1.5–2.5 cm; aggregate fruit globose to ellipsoid, to 1.5 cm in diam. 68. *R. fraxinifoliolus*
- 23b. Plants glandular.
- 25a. Plants glabrous; ovary with few hairs apically 66. *R. lanyuensis*
- 25b. Plants pubescent; ovary glabrous or pubescent.
- 26a. Shrubs, erect or scandent; flowers 2–3 cm in diam.; ovary glabrous; aggregate fruit ovoid-globose or narrowly obovoid to oblong, 8–12 mm in diam. 64. *R. rosifolius*
- 26b. Subshrubs; flowers less than 2 cm in diam.; ovary pubescent; aggregate fruit globose, 5–7 mm in diam. 65. *R. pararosifolius*
- 22b. Plants with glandular hairs; terminal corymbs several flowered or sometimes flowers solitary.
- 27a. Plants pubescent, with longer glandular hairs; aggregate fruit oblong or subglobose.
- 28a. Aggregate fruit oblong; flowers 1–2 cm in diam. 58. *R. sumatranus*
- 28b. Aggregate fruit subglobose; flowers 2–4 cm in diam.
- 29a. Flowers 2–3 cm in diam.; pedicel 2–3 cm 59. *R. croceacanthus*
- 29b. Flowers 3–4 cm in diam.; pedicel (2–)3–6 cm 60. *R. hirsutus*
- 27b. Plants glabrous, rarely partly pilose, with shorter glandular hairs; aggregate fruit subglobose.
- 30a. Flowers 2–3 cm in diam., solitary, rarely 2–5 in terminal corymbs; sepals narrowly triangular or triangular-lanceolate 61. *R. glandulosocalycinus*
- 30b. Flowers 3–4 cm in diam., 2–5 in terminal corymbs, rarely solitary; sepals lanceolate, ovate-lanceolate, oblong-lanceolate, or narrowly ovate-lanceolate.
- 31a. Leaves 7–9(–11)-foliolate; leaflets lanceolate or ovate-lanceolate; carpels more than 100; torus sessile; ovary and aggregate fruit without glandular hairs 62. *R. tsangii*

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- 31b. Leaves 5–7-foliolate; leaflets ovate to ovate-oblong; carpels less than 100; torus stipitate, stipe ca. 3 mm; ovary and aggregate fruit with sparse, glandular hairs 63. *R. glandulosocarpus*
- 21b. Carpels 10–70 or slightly more, inserted on sessile torus.
- 32a. Terminal inflorescences cymose-panicles or subracemes.
- 33a. Abaxial surface of leaflets pubescent or subglabrous.
- 34a. Plants without glandular hairs; flowers white.
- 35a. Branchlets with sparse prickles; leaflets ovate-lanceolate to elliptic-lanceolate; sepals ovate-lanceolate, sparsely glandular abaxially; petals pilose abaxially 11. *R. alnifoliolatus*
- 35b. Branchlets unarmed; leaflets elliptic or oblong; sepals triangular-ovate, not glandular abaxially; petals glabrous 12. *R. fraxinifolius*
- 34b. Plants with glandular hairs; flowers white or purple.
- 36a. Leaflets ovate to ovate-lanceolate, margin coarsely and sharply serrate; pedicel 1–2 cm; petals white, glabrous; aggregate fruit 7–9 mm in diam. 8. *R. chiliadenus*
- 36b. Leaflets broadly ovate to suborbicular, margin coarsely and sharply doubly serrate; pedicel 0.5–1 cm; petals purple, glabrous or pubescent; aggregate fruit 8–15 mm in diam.
- 37a. Petals glabrous; aggregate fruit 8–10 mm in diam. 9. *R. adenophorus*
- 37b. Petals hirsute basally on both surfaces; aggregate fruit 10–15 mm in diam. 10. *R. parviaraliifolius*
- 33b. Abaxial surface of leaflets densely tomentose.
- 38a. Plants without glandular hairs.
- 39a. Inflorescences subracemes; branchlets, petioles, pedicel, and abaxial surface of calyx minutely pubescent; sepals acute 7. *R. lishuiensis*
- 39b. Inflorescences cymose panicles or subracemes; branchlets, petioles, pedicel, and abaxial surface of calyx tomentose or glabrous; sepals acute or long acuminate.
- 40a. Branchlets, petioles, and pedicels pubescent; abaxial surface of calyx tomentose; sepals acute 5. *R. flosculosus*
- 40b. Branchlets, petioles, and pedicels glabrous; abaxial surface of calyx glabrous; sepals long acuminate 6. *R. cockburnianus*
- 38b. Plants with glandular hairs.
- 41a. Leaves 5–7-foliolate.
- 42a. Plants with unequal long glandular hairs; terminal inflorescences large cymose panicles; sepals ovate-lanceolate, apex caudate; leaflets ovate to ovate-lanceolate 1. *R. grandipaniculatus*
- 42b. Plants with 1–2 mm glandular hairs; terminal inflorescences short subracemes or narrow cymose panicles; sepals ovate, apex acute; leaflets usually elliptic to ovate-lanceolate 2. *R. idaopsis*
- 41b. Leaves 3-, rarely 5-foliolate.
- 43a. Leaflets coarsely serrate or doubly serrate; terminal inflorescences subracemes or narrow panicles; pedicel 0.4–1 cm; sepals ovate, apically acute 3. *R. innominatus*
- 43b. Leaflets coarsely obtusely serrate; terminal inflorescences large cymose panicles; pedicel 1.5–2.5 cm; sepals lanceolate or ovate-lanceolate, apically caudate 4. *R. spinulosoides*
- 32b. Terminal inflorescences corymbs, rarely short racemes, or flowers several in a cluster or solitary.
- 44a. Aggregate fruit densely tomentose.
- 45a. Abaxial surface of leaflets densely tomentose.
- 46a. Leaves 5–9-, rarely 3- or 11-foliolate.
- 47a. Flowers solitary, white; sepals caudate 16. *R. bonatianus*
- 47b. Flowers in terminal corymbs or several in a cluster; sepals acute, acuminate, or caudate.
- 48a. Flowers white; leaflets incised to doubly serrate; sepals caudate; inflorescences corymbs or flowers 3 or 4 in a cluster 15. *R. trijugus*
- 48b. Flowers red; leaflets coarsely sharply serrate or coarsely incised to doubly serrate; sepals acute or acuminate; inflorescences corymbs, rarely short thyrses.
- 49a. Leaves (5–)7–9(–11)-foliolate, coarsely sharply serrate; sepals acute; carpels 55–70; aggregate fruit 8–12 mm in diam. 13. *R. niveus*
- 49b. Leaves 3–5-foliolate, coarsely incised-doubly serrate; sepals acuminate; carpels 20–40; aggregate fruit 5–8 mm in diam. 14. *R. piluliferus*
- 46b. Leaves 3–5(–7)-foliolate.
- 50a. Plants with needle-like prickles and glandular hairs.
- 51a. Leaves 5–7-foliolate; flowers solitary or in clusters of 2 or 3; abaxial surface of calyx tomentose 17. *R. wawushanensis*
- 51b. Leaves 3-foliolate, rarely 5-foliolate; flowers in terminal corymbs or solitary; abaxial surface of calyx pubescent.

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- 52a. Low shrubs; flowers ca. 1 cm in diam., 5–9 or more in terminal corymbs 18. *R. sachalinensis*
 52b. Subshrubs or herblike; flowers 1.5–2 cm in diam., 1–3 terminal on branchlets 19. *R. irritans*
- 50b. Plants unarmed, glandular hairs absent or rarely with sparse, needle-like prickles or glandular hairs on some parts.
- 53a. Aggregate fruit yellow at maturity, with caducous hairs.
- 54a. Plants villous; leaflets rhombic or ovate to elliptic; abaxial surface of calyx villous, with dense, needle-like prickles; sepals ovate-lanceolate or lanceolate, apex caudate 40. *R. alexeterius*
 54b. Plants glabrous; leaflets broadly ovate, suborbicular, or elliptic; abaxial surface of calyx glabrous, unarmed; sepals broadly ovate or orbicular-ovate, apex acute 39. *R. biflorus*
- 53b. Aggregate fruit red or orange-red at maturity, persistently tomentose.
- 55a. Aggregate fruit subglobose, 12–20 mm in diam., densely long tomentose; petiole and pedicel with sparse, glandular hairs; abaxial surface of calyx with sparse, glandular hairs, prickly 20. *R. eucalyptus*
 55b. Aggregate fruit subglobose or narrowly ovoid, 10–14 mm in diam., shortly tomentose; petiole, pedicel, and abaxial surface of calyx without glandular hairs; abaxial surface of calyx unarmed or prickly.
- 56a. Leaves (3–)5–7-foliolate; abaxial surface of calyx ± with needle-like prickles; flowers white 21. *R. idaeus*
 56b. Leaves usually 3-foliolate; abaxial surface of calyx unarmed; flowers white, pinkish, or purple.
- 57a. Leaflets ovate or elliptic; flowers white or pinkish; aggregate fruit semiglobose, less than 10 mm, orange, yellow, or orange-red 22. *R. aurantiacus*
 57b. Leaflets broadly ovate to ovate-lanceolate; flowers purple; aggregate fruit narrowly ovoid, 10–15 mm, red 23. *R. austrotibetanus*
- 45b. Abaxial surface of leaflets pubescent.
- 58a. Flowers usually solitary; pedicel 4–6 cm; leaflets, branchlets, pedicel, and abaxial surface of calyx pubescent, without glandular hairs 28. *R. gyamdaensis*
 58b. Flowers 3–10 or more in terminal corymbs; pedicel (0.7–)1–3.5 cm; abaxial surface of leaflets pubescent only along veins.
- 59a. Plants with sparse, glandular hairs; branchlets, petioles, and abaxial surface of calyx pubescent; flowers ca. 1 cm in diam.; abaxial surface of calyx with needle-like prickles and soft hairs 24. *R. komarovii*
 59b. Plants without glandular hairs; flowers 1–3 cm in diam.; abaxial surface of calyx unarmed or rarely prickly, puberulous, finely pubescent or glabrous.
- 60a. Branchlets, pedicel, and abaxial surface of calyx glabrous; flowers 1–1.5(–2) cm in diam.; abaxial surface of calyx unarmed; aggregate fruit 8–12 mm in diam., densely tomentose 25. *R. pileatus*
 60b. Branchlets, pedicel, and abaxial surface of calyx pubescent, rarely glabrous; flowers 2–3 cm in diam.; abaxial surface of calyx sometimes with minute prickles; aggregate fruit 8–20 mm in diam., densely long tomentose, shortly tomentose, or pubescent.
- 61a. Flowers 2–3 cm in diam.; aggregate fruit 13–20 mm in diam., densely long tomentose; leaves (3–)5–7-foliolate 26. *R. pseudopileatus*
 61b. Flowers 1–1.5 cm in diam.; aggregate fruit 8–12 mm in diam., shortly tomentose or pubescent; leaves (5–)7–11-foliolate.
- 62a. Branchlets and inflorescences minutely pubescent; terminal corymbs or short racemes more than 10-flowered; ovary and base of style tomentose; aggregate fruit yellowish red to purplish red, densely shortly tomentose 27. *R. subinopertus*
 62b. Branchlets and inflorescences glabrous; short terminal corymbs several flowered; ovary and base of style pubescent; aggregate fruit purplish black, thinly pubescent 42. *R. inopertus*
- 44b. Aggregate fruit pubescent or glabrous.
- 63a. Abaxial surface of leaflets tomentose.
- 64a. Leaves (5–)7–11(–13)-foliolate, terminal leaflet more than 2 × as long as lateral leaflets; aggregate fruit densely pubescent 29. *R. thibetanus*
 64b. Leaves 3–7-foliolate, terminal leaflet slightly longer than lateral leaflets; aggregate fruit glabrous or pubescent.
- 65a. Plants densely bristly or with glandular hairs.
- 66a. Plants with glandular hairs; leaflets coarsely serrate or incised; apex of sepals caudate; aggregate fruit red 30. *R. phoenicolasius*
 66b. Plants without glandular hairs; leaflets sharply serrulate; apex of sepals acute;

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- aggregate fruit golden yellow.
- 67a. Leaflets elliptic, apex acute or abruptly pointed, abaxially tomentose 31. *R. ellipticus*
- 67b. Leaflets elliptic or ovate, rarely obovate, apex caudate or acute, rarely obtuse, abaxially glabrous, sparsely pubescent and bristly only along veins 48. *R. wallichianus*
- 65b. Plants without bristles and glandular hairs, rarely sparsely stipitate glandular on some parts.
- 68a. Leaves 5–7-foliolate; leaflets pinnatilobate; branchlets, petioles, and pedicels sometimes sparsely stipitate glandular; abaxial surface of calyx pubescent, with needle-like prickles or sparsely stipitate glandular; aggregate fruit red, glabrous 32. *R. stimulanus*
- 68b. Leaves 3–5-foliolate; branchlets, petioles, and pedicel not stipitate glandular; abaxial surface of calyx glabrous, pubescent or with needle-like prickles; aggregate fruit red, dark red, purplish red, yellow, or black.
- 69a. Aggregate fruit yellow.
- 70a. Branchlets, rachis, pedicels, and abaxial surface of calyx glabrous; sepals broadly ovate or orbicular-ovate, apically acute 39. *R. biflorus*
- 70b. Branchlets, rachis, pedicels, and abaxial surface of calyx pubescent; sepals narrowly ovate, ovate-lanceolate, or lanceolate, apically long acuminate to caudate.
- 71a. Leaflets rhombic, ovate, narrowly ovate, or elliptic; calyx 1.5–2 cm, with dense, needle-like prickles; flowers white; ovary glabrous, or tomentose only at apex, style tomentose basally 40. *R. alexeterius*
- 71b. Leaflets ovate to ovate-lanceolate; calyx to 1.5 cm, unarmed; flowers pink; ovary sericeous-villous, style glabrous 41. *R. pedunculosus*
- 69b. Aggregate fruit red, blue-black, or black.
- 72a. Aggregate fruit black or blue-black.
- 73a. Pedicel 1.5–3.5 cm; apex of calyx lobes long acuminate to caudate; leaflets coarsely incised-doubly serrate; terminal corymbs several flowered 41. *R. pedunculosus*
- 73b. Pedicel 0.6–1.2 cm; apex of calyx lobes acute to acuminate; leaflets large- or incised-serrate; terminal corymbs several to more than 20-flowered.
- 74a. Leaflets lobed, coarsely serrate; branchlets, petioles, and pedicels with sparse, needle-like prickles; aggregate fruit glabrous 37. *R. mesogaeus*
- 74b. Leaflets coarsely incised-serrate; branchlets, petioles, and pedicels with dense, needle-like prickles; aggregate fruit puberulous 38. *R. subtibetanus*
- 72b. Aggregate fruit red.
- 75a. Apex of leaflets obtuse, rarely acute; abaxial surface of calyx with needle-like prickles 33. *R. parvifolius*
- 75b. Apex of leaflets shortly acuminate to acuminate, rarely acute; abaxial surface of calyx usually unarmed.
- 76a. Leaflets lanceolate or oblong-lanceolate; abaxial surface of calyx tomentose; branchlets, petioles, and pedicel pubescent 36. *R. kulinganus*
- 76b. Leaflets ovate or narrowly ovate to ovate-lanceolate; abaxial surface of calyx glabrous or hairy; branchlets, petioles, and pedicel glabrous or tomentose.
- 77a. Branchlets, petioles, pedicel, and abaxial surface of calyx glabrous; terminal corymbs 3- or 4-flowered 34. *R. erythrocarpus*
- 77b. Branchlets, petioles, and pedicel pubescent; abaxial surface of calyx pubescent, intermixed tomentose; terminal corymbs 6–10-flowered 35. *R. subornatus*
- 63b. Abaxial surface of leaflets pubescent or glabrous.
- 78a. Leaves (5–)7–15-foliolate.
- 79a. Flowers several in clusters or in short terminal corymbs; rachis, pedicels, and abaxial surface of calyx glabrous.
- 80a. Leaves (5–)7–11-foliolate; leaflets puberulent on both surfaces; flowers 10–12 mm in diam.; calyx brown; petals obovate, 4–6 mm in diam. 42. *R. inopertus*
- 80b. Leaves 5-foliolate; leaflets glabrous on both surfaces, or abaxially puberulent only along veins; flowers 12–14 mm in diam.; calyx dark brownish purple; petals suborbicular, 8–9 mm in diam. 43. *R. wilsonii*
- 79b. Flowers solitary or in clusters of 2 or 3, terminal or axillary; rachis, pedicels, and abaxial surface of calyx pubescent.
- 81a. Aggregate fruit oblong, rarely ellipsoid, red; flowers 3–4 cm in diam.; branchlets, petioles, and leaflets glabrous or subglabrous 44. *R. amabilis*
- 81b. Aggregate fruit subglobose, blackish red, yellowish red or red; flowers 2–3 cm in diam.;

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- plants glabrous or with glandular hairs.
- 82a. Plants glabrous, without glandular hairs; aggregate fruit red 47. *R. taiwanicola*
- 82b. Plants with glandular hairs or not; aggregate fruit blackish red or yellowish red.
- 83a. Shrubs 1–2 m tall, with glandular hairs; leaflets ovate, ovate-lanceolate, or rhombic-ovate; aggregate fruit blackish red, 1–1.2 cm in diam. 45. *R. ptilocarpus*
- 83b. Subshrubs, 10–50 cm tall, without glandular hairs, rarely petioles or pedicels with sparse, glandular hairs; leaflets broadly ovate or rhombic-ovate, rarely oblong; aggregate fruit yellowish red, 1.4–2 cm in diam. 46. *R. lutescens*
- 78b. Leaves 3–7(–9)-foliolate.
- 84a. Plants with reddish brown bristles; flowers white; aggregate fruit golden yellow or reddish yellow; leaves 3-foliolate 48. *R. wallichianus*
- 84b. Plants without bristles; flowers red or white; aggregate fruit red, dark red, or purplish black; leaves 3–7-foliolate.
- 85a. Terminal inflorescences corymbs or short racemes, several to more than 30-flowered.
- 86a. Terminal inflorescences corymbs; apex of sepals acuminate to caudate; abaxial surface of calyx pubescent 49. *R. coreanus*
- 86b. Terminal inflorescences short racemes; apex of sepals obtuse, acute, or acuminate; abaxial surface of calyx villous.
- 87a. Leaves 5-foliolate; leaflets ovate, broadly ovate, or rhombic-ovate, apex acute; sepals ovate or broadly ovate, apex obtuse or acute 50. *R. subcoreanus*
- 87b. Leaves 3-foliolate; leaflets narrowly ovate or ovate-lanceolate, apex acuminate; sepals ovate-lanceolate, apex subulate-acuminate 51. *R. spananthus*
- 85b. Terminal inflorescences corymbs, 2–4-flowered or slightly more, sometimes flowers several in clusters or solitary.
- 88a. Plants stipitate glandular; leaves 3-foliolate.
- 89a. Leaflets 2–4 cm, coarsely sharply serrate; petioles 2–3.5 cm; flowers 1–1.5 cm in diam.; ovary sparsely pilose 52. *R. stans*
- 89b. Leaflets 4–8 cm, irregularly obtusely dentate; petioles 4–8(–10) cm; flowers 2–3 cm in diam.; ovary glabrous 53. *R. sikkimensis*
- 88b. Plants not stipitate glandular, rarely with stipitate glands on some parts; leaves 3–7(–9)-foliolate.
- 90a. Leaves (3–)5–7(–9)-foliolate; branchlets and abaxial surface of calyx with dense, straight needle-like prickles 54. *R. pungens*
- 90b. Leaves 3-foliolate, rarely 5-foliolate; branchlets and abaxial surface of calyx with sparse, curved or straight minute prickles, or abaxial surface of calyx unarmed.
- 91a. Subshrubs, 40–60 cm tall; terminal leaflet slightly longer than lateral leaflets; abaxial surface of calyx with sparse, curved minute prickles 57. *R. simplex*
- 91b. Shrubs or subshrubs, 15–200 cm tall; terminal leaflet much longer than lateral leaflets; abaxial surface of calyx with straight needle-like prickles or unarmed.
- 92a. Shrubs 1–2 m tall; leaflets lanceolate, ovate-lanceolate, or ovate; petiolule of terminal leaflet 0.5–1 cm; abaxial surface of calyx unarmed 55. *R. macilentus*
- 92b. Subshrubs, 15–50 cm tall; leaflets oblong or elliptic-oblong, rarely ovate-lanceolate; petiolule of terminal leaflet 1–2.5 cm; abaxial surface of calyx with straight needle-like prickles 56. *R. xanthocarpus*

1. *Rubus grandipaniculatus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 296. 1982.

大序悬钩子 da xu xuan gou zi

Shrubs 1–3 m tall, with arching branches. Branchlets with sparse, curved minute prickles, densely villous, with intermixed glandular hairs of unequal length. Leaves imparipinnate, 5–7-foliolate, rarely 3-foliolate at base of inflorescence; petiole 3.5–6 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets shortly petiolulate or subsessile, petiolule and rachis pubescent, with intermixed unequal glandular hairs, with sparse, minute prickles; stipules brownish, linear, pubescent, with intermixed glandular hairs; blade of leaflets ovate to ovate-lanceolate, 2.5–5 × 1.5–3 cm, abaxially densely gray tomentose, with purple

stalked glands along veins, adaxially pilose, base broadly cuneate or subrounded, sometimes shallowly cordate on terminal leaflet, margin irregularly coarsely serrate, often lobed on terminal leaflet, apex acuminate. Inflorescences terminal or axillary, large broad cymose panicles, numerous flowered; rachis and pedicels with dense, unequal stalked glands and soft hairs; bracts brownish, lanceolate or ovate-lanceolate, not or 2- or 3-laciniate at apex. Pedicel 5–10 mm. Flowers not more than 1 cm in diam. Calyx abaxially with dense soft hairs and glandular hairs; sepals erect at anthesis, sometimes reflexed in fruit, ovate-lanceolate, 6–10 mm, apex long acuminate. Petals pink-white to purple, suborbicular, base broadly clawed and soft hairy. Stamens many, in 1 whorl; filaments linear. Ovary hairy; style glabrous. Aggregate fruit red, subglobose, 7–10 mm in

diam., glabrous or subglabrous; pyrenes reticulate-rugose. Fl. May–Jun, fr. Jul–Aug.

• Sparse forests on mountain slopes, rock crevices along river banks and sides of ravines; 800–1100 m. Chongqing (Fengjie Xian), S Shaanxi (Pingli Xian).

2. *Rubus idaeopsis* Focke, *Biblioth. Bot.* 17(Heft 72): 203. 1911.

拟覆盆子 ni fu pen zi

Shrubs 1–3 m tall. Branchlets brown, purplish brown, or grayish brown, slightly angular, with broad purplish brown prickles, densely tomentose, with intermixed 1–2 mm glandular hairs or not. Leaves imparipinnate, 5–7-foliolate, rarely at base of inflorescence reduced to 3-foliolate; petiole 3–5 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolule and rachis densely tomentose, with intermixed short glandular hairs, rarely glandular hairs absent, usually with sparse prickles; stipules linear, 5–9 × 1.5–2.5 mm, pubescent, with intermixed sparse, short glandular hairs; blade of leaflets 3–7 × 2–4 cm, terminal one elliptic to ovate-lanceolate, rarely ovate, lateral leaflets obliquely elliptic to ovate-lanceolate, abaxially densely gray tomentose, adaxially pilose, base cuneate to rounded, margin irregularly coarsely simple-serrate, apex acute to shortly acuminate. Inflorescences terminal or axillary, subracemes or narrow cymose panicles, many flowered, 5–10 cm; rachis and pedicels tomentose, rarely with sparse, short glandular hairs; bracts linear, 4–6 mm, pubescent, rarely with sparse, glandular hairs. Pedicel 7–12 mm. Flowers 1–1.5 cm in diam. Calyx abaxially densely tomentose, sometimes with shortly stalked glands; sepals erect, ovate, 5–7 mm, gray tomentose at margin, apex acute. Petals purple, suborbicular, 4–6 mm in diam., slightly shorter than sepals, base shortly clawed, margin premorse. Stamens many in 1 whorl; filaments shorter than petals, basally broad and compressed. Pistils many, nearly as long as stamens; ovary soft hairy; styles glabrous. Aggregate fruit red, semiglobose or subglobose, ca. 1 cm in diam., glabrous or sparsely soft hairy; pyrenes rugose, minutely punctate. Fl. May–Jun, fr. Jul–Aug.

• Montane valleys, stream sides, mountain slopes; 1000–2600 m. Fujian, Gansu, Guangxi, Guizhou, Henan, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan.

3. *Rubus innominatus* S. Moore, *J. Bot.* 13: 226. 1875.

白叶莓 bai ye mei

Shrubs 1–3 m tall, with arching branches. Branchlets brown or reddish brown, densely tomentose, with sparse, curved prickles. Leaves imparipinnately compound, 3-foliolate, rarely 5-foliolate on sterile branches; petiole 2–4 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets nearly sessile, petiolule and rachis densely tomentose; stipules linear, 6–8 mm, pubescent; blade of leaflets variable in shape, 4–10 × 2.5–5(–7) cm, terminal one ovate or suborbicular, rarely ovate-lanceolate, base rounded to shallowly cordate, margin 3-lobed or incised-lobed, lateral leaflets obliquely ovate-lanceolate or elliptic, base cuneate to rounded, abaxially densely gray tomentose, adaxially appressed pubescent or subglabrous, margin unevenly coarsely

serrate or incised doubly serrate, apex acute to shortly acuminate. Inflorescences terminal or axillary, subracemes or narrow cymose panicles, 6–13(–18) cm; rachis, pedicels, and abaxial surface of calyx densely yellowish gray or gray tomentose-villous and stipitate glandular; bracts linear-lanceolate, tomentose-villous. Pedicel 4–10 mm. Flowers 6–10 mm in diam. Sepals erect, ovate, 5–9(–12) × 3–5 mm, inner sepals gray tomentose-villous at margin, apex acute. Petals purple, obovate or suborbicular, nearly as long as sepals, margin premorse, base clawed. Stamens many, shorter than petals. Pistils numerous, slightly shorter than stamens; ovary slightly soft hairy; styles glabrous. Aggregate fruit orange-red, subglobose, ca. 1 cm in diam., initially sparsely soft hairy, glabrous at maturity; pyrenes minutely rugose. Fl. May–Jun, fr. Jul–Aug. $2n = 14^*$.

• Dense or sparse forests, thickets, slopes, roadsides, stream sides, river sides; 400–2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

- 1a. Plants with dense, glandular hairs throughout; abaxial surface of leaflets sometimes deciduously tomentose 3e. var. *aralioides*
- 1b. Plants wholly without or partly with few glandular hairs; abaxial surface of leaflets persistently tomentose.
 - 2a. Leaves 5-foliolate; apex of leaflets long acuminate 3d. var. *quinatus*
 - 2b. Leaves 3-foliolate; apex of leaflets acute to shortly acuminate.
 - 3a. Plants with few glandular hairs only on rachis, pedicel, and abaxial surface of calyx 3a. var. *innominatus*
 - 3b. Plants without glandular hairs.
 - 4a. Inflorescences long subracemes or narrow cymose panicles; sepals ovate, 5–8 mm 3b. var. *kuntzeanus*
 - 4b. Inflorescences compact short subracemes; sepals broadly ovate, 8–12 mm 3c. var. *macrosepalus*

3a. *Rubus innominatus* var. *innominatus*

白叶莓(原变种) bai ye mei (yuan bian zhong)

Rubus kuntzeanus Hemsley var. *glandulosus* Cardot; *R. kuntzeanus* var. *xanthacanthus* H. Léveillé; *R. xanthacanthus* H. Léveillé (1907), not *R. Keller* (1906), nor *R. xanthoacanthus* Gandoger (1884).

Plants with few glandular hairs only on rachis, pedicels, and abaxial surface of calyx.

• Sparse forests, thickets, slopes, roadsides, river sides in mountain valleys; 400–2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

3b. *Rubus innominatus* var. *kuntzeanus* (Hemsley) L. H. Bailey, *Gentes Herb.* 1: 30. 1920.

无腺白叶莓 wu xian bai ye mei

Rubus kuntzeanus Hemsley, J. Linn. Soc., Bot 23: 232. 1887; *R. adenocalyx* Cardot.

Plants without glandular hairs. Inflorescences long subracemes or narrow cymose panicles. Sepals ovate, 5–8 mm.

• Thickets, slopes, roadsides; 800–2000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

3c. *Rubus innominatus* var. *macrosepalus* F. P. Metcalf, Lingnan Sci. J. 19: 27. 1940.

宽萼白叶莓 kuan e bai ye mei

Plants without glandular hairs. Inflorescences compact short subracemes. Sepals broadly ovate, 0.8–1.2 cm.

• Slopes; below 2000 m. Anhui, Zhejiang.

3d. *Rubus innominatus* var. *quinatus* L. H. Bailey, Gentes Herb. 1: 30. 1920.

五叶白叶莓 wu ye bai ye mei

Leaves 5-foliolate; leaflets lanceolate-ovate, sometimes ovate, relatively narrow, apex long acuminate.

• Slopes. Jiangxi.

3e. *Rubus innominatus* var. *aralioides* (Hance) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 37: 48. 1985.

密腺白叶莓 mi xian bai ye mei

Rubus aralioides Hance, J. Bot. 22: 41. 1884.

Plants with dense, glandular hairs throughout. Leaflets abaxially sometimes deciduously tomentose.

• Dense forests, stream sides, slopes, river sides; 400–900 m. Fujian, Guangdong, Guizhou, Jiangxi, Zhejiang.

4. *Rubus spinulosoides* F. P. Metcalf, Lingnan Sci. J. 19: 32. 1940.

刺毛白叶莓 ci mao bai ye mei

Rubus innominatus S. Moore subsp. *plebejus* Focke; *R. teledapos* Focke; *R. triphyllus* Thunberg var. *internuntius* Hance.

Shrubs. Branchlets yellow villous, with reddish glandular hairs and sparse, curved prickles. Leaves imparipinnately compound, usually 3-foliolate; petiole 5–9 cm, petiolule of terminal leaflet 2–3.5 cm, lateral leaflets subsessile, petiolule and rachis villous, with sparse, minute prickles, with short glandular hairs; stipules linear, densely villous; blade of leaflets ovate, elliptic, or rhombic-elliptic, 4–10 × 2–6 cm, abaxially densely gray- or yellowish gray tomentose, adaxially sparsely appressed pubescent, base broadly cuneate to rounded, margin irregularly obtusely dentate, sometimes lobed on terminal leaflet, apex acute. Inflorescences terminal or axillary, terminal ones large cymose panicles, lateral ones usually subracemes; rachis, pedicels, and abaxial surface of calyx villous, with short purple glandular hairs and sparse, needle-like prickles; bracts linear, villous. Pedicel 1.5–2.5 cm. Flowers ca. 1 cm in diam. Sepals erect, lanceolate or ovate-lanceolate, 1–1.5 cm, margin gray tomentose, apex caudate. Petals pink, suborbicular, base shortly clawed,

margin incised. Stamens many, erect; filaments broad and compressed basally. Pistils numerous; ovary soft hairy. Aggregate fruit red, subglobose, ca. 1 cm in diam., glabrous at maturity; pyrenes prominently rugose.

• Mixed forested slopes; 800–1000 m. Hubei, Shandong.

5. *Rubus flosculosus* Focke, Hooker's Icon. Pl., ser. 3, 10: sub t. 1952. 1891.

弓茎悬钩子 gong jing xuan gou zi

Shrubs 1.5–2.5 m tall. Branchlets arching, reddish brown, sometimes glaucous, with sparse, compressed purplish red curved prickles, pubescent when young, glabrescent. Leaves imparipinnate, 5–7-foliolate; petiole 3–5 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets nearly sessile, petiolule and rachis pubescent, with curved prickles; stipules linear, 5–6 mm, margin entire, pubescent; blade of leaflets ovate, ovate-lanceolate, or ovate-oblong, terminal leaflet sometimes rhombic-lanceolate, 3–7 × 1.5–4 cm, abaxially gray tomentose, adaxially glabrous or subglabrous, base broadly cuneate to rounded, margin coarsely doubly serrate, rarely lobed, apex acuminate. Inflorescences terminal or axillary, terminal ones narrow cymose panicles, 7–12 cm, axillary ones subracemes; rachis and pedicels pubescent; bracts linear, small, 3–5 mm. Pedicel 5–8 mm, slender. Flowers 5–8 mm in diam. Calyx abaxially gray tomentose, sometimes glabrescent; sepals erect, ovate to narrowly ovate, 4–6 × 1.5–2.5 mm, apex acute, abruptly pointed. Petals pink, suborbicular, nearly as long as or slightly longer than sepals, base shortly clawed. Stamens many; filaments filiform; anthers purple. Pistils numerous; ovary pubescent; styles glabrous. Aggregate fruit red to reddish black, globose, 5–8 mm in diam., pubescent, glabrescent; pyrenes ovoid-globose, rugose. Fl. Jun–Jul, fr. Aug–Sep.

• River banks, montane valleys, forested slopes, thickets, roadsides; 900–2800 m. Fujian, Gansu, Henan, Hubei, Shaanxi, Shanxi, Sichuan, Xizang, Zhejiang.

- 1a. Abaxial surface of calyx densely gray tomentose 5a. var. *flosculosus*
 1b. Abaxial surface of calyx tomentose when young, glabrescent 5b. var. *etomentosus*

5a. *Rubus flosculosus* var. *flosculosus*

弓茎悬钩子(原变种) gong jing xuan gou zi (yuan bian zhong)

Rubus eriocalyx Cardot.

Calyx densely gray tomentose abaxially.

• River banks, montane valleys, mixed forests on slopes, thickets; 900–2600 m. Gansu, Henan, Hubei, Shaanxi, Shanxi, Sichuan, Xizang.

5b. *Rubus flosculosus* var. *etomentosus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 295. 1982.

脱毛弓茎悬钩子 tuo mao gong jing xuan gou zi

Calyx tomentose abaxially when young, glabrescent.

• Forested slopes, roadsides; below 2800 m. Fujian, Sichuan.

6. *Rubus cockburnianus* Hemsley, J. Linn. Soc., Bot. 29: 305. 1892.

华中悬钩子 hua zhong xuan gou zi

Rubus giraldianus Focke.

Shrubs 1.5–3 m tall. Branchlets brownish to reddish brown, glabrous, glaucous, with sparse, curved prickles. Leaves imparipinnate, 7–9-foliolate, rarely 5-foliolate; petiole 3–5 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolule and rachis glabrous, with sparse, curved minute prickles; stipules linear or linear-lanceolate, 5–7 mm, glabrous; blade of leaflets oblong-lanceolate or ovate-lanceolate, terminal leaflet sometimes nearly rhombic and minutely lobed, 5–10 × 1.5–4(–5) cm, abaxially gray tomentose, adaxially glabrous or sparsely pilose, base broadly cuneate or rounded, margin irregularly coarsely serrate or incised-doubly serrate, usually lobed on terminal leaflet, apex acuminate. Inflorescences terminal or axillary, terminal ones cymose panicles, 10–16(–18) cm, lateral ones often subracemes, rarely subcorymbose; rachis and pedicels glabrous; bracts linear, 2–5 mm, glabrous. Pedicel somewhat reddish when young, 7–12 mm, slender. Flowers to 1 cm in diam. Calyx abaxially glabrous; sepals erect at anthesis, reflexed in fruit, ovate-lanceolate, 5–8 × 2–4 mm, margin gray tomentose and entire, apex long acuminate. Petals pink, suborbicular or obovate, 5–7 × 4–5 mm, margin premorse or coarsely serrate above middle, base shortly clawed. Stamens many, slightly shorter than petals; filaments linear, broader toward base. Pistils slightly shorter than stamens; ovary soft hairy; styles glabrous. Aggregate fruit purplish black, subglobose, less than 1 cm in diam., slightly pubescent or subglabrous; pyrenes shallowly rugose. Fl. May–Jul, fr. Aug–Sep.

• Thickets on sunny slopes, dense forests in montane valleys, river sides; 900–4000 m. Henan, Shaanxi, Sichuan, Xizang, Yunnan.

7. *Rubus lishuiensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 295. 1982.

丽水悬钩子 li shui xuan gou zi

Shrubs lianoid or scandent. Branchlets brown or reddish brown, terete, puberulous when young, gradually glabrescent, with sparse prickles broader at base. Leaves compound, usually 5–7-foliolate; petiole 5–7 cm, petiolule of terminal leaflet 1.5–2 cm, lateral leaflets subsessile, petiolule and rachis minutely pubescent, gradually glabrescent, with sparse, curved prickles; stipules linear-lanceolate, pubescent; blade of leaflets ovate-lanceolate or narrowly ovate, 5–7 × 2–3.5 cm, abaxially gray tomentose, with sparse, minute prickles along midvein, adaxial veins glabrous or pilose, base broadly cuneate to rounded, margin unevenly sharply serrate or incised-doubly serrate, apex acuminate. Inflorescences terminal or axillary, short subracemes; rachis and pedicels minutely pubescent, gradually glabrescent; bracts lanceolate or linear-lanceolate, minutely pubescent. Pedicel 6–11 mm. Calyx abaxially densely minute pubescent; sepals erect in fruit, ovate, 4–6 × 3–4 mm, apex acute and abruptly pointed. Stamens many; filaments linear. Pistils numerous. Aggregate fruit red, subglobose, ca. 1 cm in diam., glabrous; pyrenes ovoid-globose, prominently small-punctate. Fl. Jul, fr. Aug–Sep.

• Forest margins, slopes; low elevations. Zhejiang (Lishui Xian).

8. *Rubus chiliadenus* Focke, Hooker's Icon. Pl., ser. 3, 10: sub t. 1952. 1891.

长序莓 chang xu mei

Shrubs 1–2 m tall. Branchlets brownish to reddish brown, pubescent, with purple glandular hairs and sparse prickles flattened and broadened basally. Leaves imparipinnate, often 5-foliolate, sometimes 3-foliolate at base of inflorescence; petiole 3–5 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolule and rachis pubescent, with intermixed stalked purple glands; stipules linear, 7–10 mm, pubescent, with glandular hairs; blade of leaflets ovate to ovate-lanceolate, 3–8 × 1–4 cm, both surfaces pubescent and with glandular hairs, abaxially more densely so, base cuneate to subcordate or subcordate on terminal leaflet, margin irregularly coarsely sharply serrate, apex acuminate. Inflorescences terminal, cymose panicles, 15–20 cm, axillary inflorescences subracemes, many flowered; rachis, pedicels, and abaxial surface of calyx pubescent and with stalked glands; bracts linear-lanceolate, 5–8 mm, pubescent, with intermixed glandular hairs. Pedicel 1–2 cm. Flowers ca. 1 cm in diam. Calyx tube pelviform, short; sepals usually erect, lanceolate, 5–8 × 3–4 mm, apex acute to acuminate. Petals white or with reddish spots at apex, suborbicular or broadly obovate, 4–6 mm in diam., slightly shorter than sepals, glabrous, base prominently clawed, margin premorse or minutely obtusely serrate. Stamens numerous; filaments linear. Pistils many, nearly as long as or slightly longer than stamens; ovary pubescent; style glabrous. Aggregate fruit enclosed in calyx, red, subglobose, 7–9 mm in diam., pubescent; pyrenes distinctly rugose. Fl. May–Jul, fr. Aug–Sep.

• Forests, wastelands, shaded rocky places, trail- and roadsides; 600–2000 m. Guizhou, Hubei, Sichuan.

9. *Rubus adenophorus* Rolfe, Bull. Misc. Inform. Kew 1910: 382. 1910.

腺毛莓 xian mao mei

Rubus sagatus Focke.

Shrubs scandent, 0.5–2 m tall. Branchlets brownish to brownish red, villous, with intermixed stalked purple glands and sparse, basally broadened and flattened prickles. Leaves imparipinnate, often 3-foliolate; petiole 5–8 cm, petiolule of terminal leaflet 2.5–4 cm, lateral leaflets subsessile, petiolule and rachis villous, with glandular hairs, sparsely prickly; stipules linear-lanceolate, 0.9–1.4 cm, villous, with sparse, stalked glands; blade of leaflets ovate to broadly ovate, 4–11 × 2–8 cm, both surfaces sparsely villous, abaxially with few stalked glands along veins, base rounded to subcordate, margin coarsely sharp doubly serrate, apex acuminate. Inflorescences terminal or axillary, subracemes, 8–20(–25) cm; rachis, pedicels, and bracts yellow villous, with intermixed stalked purple glands; bracts lanceolate, 0.8–1.2 cm. Pedicel 6–9 mm. Flowers 6–8 mm in diam. Calyx abaxially with long yellow hairs and stipitate purple glands; sepals usually erect after anthesis, lanceolate or ovate-lanceolate, 6–9 × 2.5–5 mm, apex acuminate. Petals purple, obovate or suborbicular, 5–8 × 5–7 mm, glabrous, base

long clawed, margin premorse or dentate. Stamens many, nearly as long as petals; filaments linear. Pistils numerous, slightly shorter than stamens; styles glabrous or pilose at base; apex of ovary pilose when young. Aggregate fruit red, globose, 8–10 mm in diam., glabrous or slightly pilose; pyrenes distinctly rugose. Fl. Apr–Jun, fr. Jul–Aug.

• Mountainous regions, valleys, sparse forests, forest margins, thickets; low to medium elevations. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Zhejiang.

10. *Rubus parvialiiifolius* Hayata, Icon. Pl. Formosan. 5: 48. 1915.

榕叶悬钩子 *cong ye xuan gou zi*

Rubus parvialiiifolius var. *laxiflorus* Y. C. Liu & F. Y. Lu.

Subshrubs or small shrubs, suberect. Branchlets fulvous-red, villous, with glandular hairs, with sparse prickles; prickles few, recurved, to 3 mm. Leaves imparipinnate, 3–5(–7)-foliolate; petioles 3–5 mm, petiolule of terminal leaflet 2–3 mm, lateral leaflets subsessile, petiolule and rachis hairy, stipitate glandular, with sparse prickles; stipules linear, to 1 cm, hairy, stipitate glandular; blade of leaflets variable in size, terminal leaflet orbicular, 5–10 × 5–8 cm, base rounded to slightly cordate, apex acuminate to cuspidate, lateral leaflets ovate, 3–5 × 2–4 cm, abaxially densely pale villous, adaxially sparsely hairy, base rounded, margin irregularly doubly serrate, apex acute. Inflorescences terminal, subracemes or cymose panicles, 7–10 × 5–6 cm; rachis, pedicels, and bracts hairy, with stalked glands; bracts linear, 6–8 mm. Pedicel 5–10 mm. Calyx abaxially hairy, with stalked glands; sepals narrowly oblong-triangular, 5–6 mm, apex caudate. Petals orbicular, 3–4 mm, both surfaces hirsute at base, base clawed, margin crenate. Stamens many; filaments ca. 3 mm. Pistils many; ovary ca. 1 mm, hairy; styles to 2 mm, hairy at base. Aggregate fruit globose, 1–1.5 cm in diam. Fl. May–Jun, fr. Jun–Aug. $2n = 14^*$.

• 1000–3000 m. Taiwan.

11. *Rubus alnifoliolatus* H. Léveillé, Bull. Soc. Bot. France 53: 549. 1906.

楷叶悬钩子 *qi ye xuan gou zi*

Shrubs erect, small. Branchlets reddish brown to purplish brown, glabrous, often with white bloom; prickles curved or straight, few, to 5 mm. Leaves imparipinnate, 7–9-foliolate, rarely 5-foliolate; petiole reddish, 4–8 cm, petiolule of terminal leaflet to 2.5 cm, lateral leaflets subsessile, petiolule and rachis glabrous or subglabrous, with sparse prickles; stipules linear-lanceolate, 4–10 mm, margin slightly hairy; blade of leaflets ovate-lanceolate to elliptic-lanceolate, 5–10 × 1.5–3.5 cm, both surfaces glabrous or abaxially slightly pubescent along veins, base ± obliquely broadly cuneate to rounded, margin irregularly serrate or doubly serrate, apex acute to acuminate. Inflorescences terminal, usually cymose panicles, to 10 × 14 cm, many flowered; rachis and pedicels glabrous or nearly so; bracts linear, 5–9 mm, glabrous. Pedicel 1–1.4 cm, slender, unarmed. Calyx abaxially glabrous; tube pelviform; sepals ovate-lanceolate, 7–11 × 3–5 mm, abaxially with few glands, apex acuminate to caudate. Petals white, ovate-oblong, 0.7–1.4 cm × 4–6

mm, abaxially with few hairs, apex obtuse. Stamens many, glabrous, shorter than petals. Pistils numerous; style and ovary glabrous. Aggregate fruit red at maturity, oblong or ellipsoid, 0.8–1.5 cm. Fl. spring–summer, fr. summer.

• Thickets, roadsides; low to medium elevations. Taiwan.

12. *Rubus fraxinifolius* Poir. in Lamarck, Encycl. 6: 242. 1806.

兰屿楷叶悬钩子 *lan yu qi ye xuan gou zi*

Rubus alnifoliolatus H. Léveillé var. *kotoensis* (Hayata) H. L. Li; *R. fraxinifolius* var. *kotoensis* (Hayata) Koidzumi; *R. kotoensis* Hayata.

Shrubs erect. Branchlets unarmed. Leaves imparipinnate, 5–7-foliolate, rarely 3-foliolate; petiole 2–5 cm, grooved, petiolule of terminal leaflet much longer than those of lateral leaflets, petiolule of lateral leaflets to 5 mm, petiolule and rachis soft hairy; stipules linear, to 1.2 cm; blade of leaflets elliptic to oblong, 3–10 × 2–4 cm, terminal leaflet usually larger than lateral leaflets, lateral veins 10–15 pairs, midvein and lateral veins prominent abaxially, impressed adaxially, abaxially sparsely hairy along veins, adaxially sparsely hairy along midvein, base rounded to slightly cordate, of lateral leaflets often oblique, margin serrate, apex acute to acuminate. Inflorescences usually terminal, cymose panicles, to 14 cm; rachis, pedicels, and bracts often glabrous; bracts lanceolate to oblong, divided at apex. Pedicel 1–3 cm. Sepals triangular-ovate, 6–10 mm, abaxially glabrous except margin tomentose, apex narrowly acute. Petals white, orbicular, 7–12 mm, glabrous. Stamens and pistils many, glabrous. Aggregate fruit red at maturity, globose to ellipsoid, 0.8–1.4 cm. $2n = 14^*$.

Thickets; near sea level. Taiwan (Lan Yu) [Indonesia, Malaysia, Philippines; N Africa, Pacific Islands].

13. *Rubus niveus* Thunberg, Diss. Bot.-Med. de Rubo 9. 1813.

红泡刺藤 *hong pao ci teng*

Rubus bonatii H. Léveillé; *R. boudieri* H. Léveillé; *R. distans* D. Don; *R. foliolosus* D. Don; *R. godongensis* Y. Gu & W. L. Li; *R. incanus* Sasaki ex Y. C. Liu & Yang; *R. lasiocarpus* Smith; *R. lasiocarpus* var. *ectenothyrsus* Cardot; *R. lasiocarpus* var. *micranthus* (D. Don) J. D. Hooker; *R. longistylus* H. Léveillé; *R. mairei* H. Léveillé; *R. micranthus* D. Don; *R. mysorensis* F. Heyne; *R. niveus* var. *micranthus* (D. Don) H. Hara; *R. pinnatus* D. Don; *R. pyi* H. Léveillé; *R. tongchouanensis* H. Léveillé.

Shrubs 1–2.5 m tall. Branchlets purple or green, tomentose when young, soon glabrous, with whitish bloom, with sparse prickles. Leaves imparipinnate, (5–)7–9(–11)-foliolate; petiole 1.5–4 cm, petiolule of terminal leaflet 0.5–1.5 cm, lateral leaflets subsessile, petiolule and rachis tomentose, with sparse, curved minute prickles; stipules linear-lanceolate, 5–8 mm, soft hairy; blade of leaflets elliptic, ovate-elliptic, or rhombic-elliptic, terminal leaflet ovate to elliptic, slightly longer than lateral leaflets, 2.5–6(–8) × 1–3(–4) cm, abaxially gray tomentose, adaxially soft hairy along veins or glabrate, base cuneate to rounded, margin coarsely serrate or doubly serrate, sometimes terminal leaflet 3-lobed, apex acute, rarely obtuse, terminal

leaflet sometimes acuminate. Inflorescences terminal or axillary, corymbs, rarely short thyrses, 4–6 cm; rachis and pedicels tomentose; bracts lanceolate or linear, pubescent. Pedicel 5–10 mm. Flowers to 1 cm in diam. Calyx abaxially densely tomentose, with intermixed soft hairs; sepals erect, triangular-ovate or triangular-lanceolate, 5–8 × 2–3 mm, apex acute or abruptly pointed, rarely shortly acuminate. Petals red, suborbicular, 3–5 mm in diam, shorter than sepals, base shortly clawed. Stamens many, nearly as long as petals; filaments broadened basally. Pistils ca. 55–70, nearly as long as stamens; ovary gray tomentose; styles purplish red, base densely gray tomentose. Aggregate fruit dark red when immature, black at maturity, semiglobose, 0.8–1.2 cm in diam., densely gray tomentose; pyrenes shallowly rugose. Fl. May–Jul, fr. Aug–Sep. $2n = 14^*$.

Thickets on slopes, sparse forests, montane valleys, stream sides, flood plains; 500–2800 m. Gansu, Guangxi, Guizhou, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [Afghanistan, Bhutan, India, Indonesia, Kashmir, Laos, Malaysia, Myanmar, Nepal, Philippines, Sikkim, Sri Lanka, Thailand, Vietnam].

14. *Rubus piluliferus* Focke, Bot. Jahrb. Syst. 36(Beibl. 82): 55. 1905.

陕西悬钩子 shan xi xuan gou zi

Rubus lachnocarpus Focke.

Shrubs to 2 m tall, with arcuate branches. Branchlets terete, soft hairy, glabrescent, with sparse, needle-like prickles or nearly unarmed, rarely with dense, minute prickles. Leaves imparipinnate, 3–5-foliolate; petiole 2–4 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets sessile, petiolule and rachis with soft hairs and sparse, minute prickles; stipules linear, 5–10 mm, soft hairy; blade of leaflets ovate, rhombic-ovate, or ovate-lanceolate, 3–8 × 1.5–5.5 cm, lateral veins 5 or 6 pairs, abaxially densely whitish tomentose, adaxially sparsely pubescent or subglabrous, base broadly cuneate or rounded, margin often pinnate-lobed, coarsely incised-doubly serrate, apex variable, caudate-acuminate on terminal leaflet, acute to shortly acuminate on lateral leaflets. Inflorescences terminal on short branchlets, corymbose, 5–10-flowered; rachis and pedicels yellow pubescent; bracts linear, 5–7 mm, pubescent. Pedicel 0.7–1.5 cm. Flowers 1–1.5 cm in diam. Calyx abaxially pubescent; sepals lanceolate or ovate-lanceolate, 5–7 mm, apex acuminate. Petals pink, suborbicular, slightly shorter than sepals, base long clawed. Stamens many, shorter than petals; filaments linear, basally broadened and flattened. Pistils 20–40; ovary and base of style densely whitish tomentose. Aggregate fruit subglobose, 5–8 mm in diam., densely shortly whitish tomentose; pyrenes rugulose or slightly smooth. Fl. May–Jun, fr. Jul–Aug.

• Slopes, forests, montane valleys; 1100–2000 m. Gansu, Hubei, Shaanxi, Sichuan.

15. *Rubus trijugus* Focke, Notes Roy. Bot. Gard. Edinburgh 5: 74. 1911.

三对叶悬钩子 san dui ye xuan gou zi

Shrubs to 2 m tall. Branches purplish red or purplish brown, cylindrical, soft hairy when young, gradually glabrescent,

glaucous, with sparse prickles. Leaves imparipinnate, (5–)7–9-foliolate; petiole 5–11 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets sessile, petiolules and rachis with soft hairs and needle-like prickles; stipules linear, 4–7 mm, soft hairy; blade of leaflets ovate or ovate-elliptic, 2–5 × 1.5–4 cm, abaxially gray tomentose, adaxially appressed pubescent, base broadly cuneate or rounded, sometimes subtruncate on terminal leaflet, margin usually incised-doubly serrate, apex acute, sometimes acuminate on terminal leaflet. Inflorescences terminal corymbs or flowers in clusters of 3 or 4 at apex of branchlets, rarely flowers solitary in leaf axils; bracts linear, 3–6 mm, soft hairy. Pedicel 1–2(–3) cm, pubescent, with sparse, minute prickles. Flowers 1.5–2 cm in diam. Calyx abaxially pubescent; sepals erect, spreading, rarely reflexed in fruit, triangular-lanceolate or ovate-lanceolate, 1–1.4 cm × 4–6 mm, margin tomentose, apex caudate. Petals nearly erect, white, elliptic or oblong, shorter than or rarely as long as sepals, base clawed and pubescent. Stamens numerous, shorter than petals; base of filaments slightly broadened, flattened. Pistils many, slightly longer than stamens; ovary and base of style densely gray tomentose. Aggregate fruit red, subglobose, ca. 1 cm in diam., densely gray tomentose. Fl. May–Jun, fr. Jul–Aug.

• Low slopes, mixed forests and forest margins in mountainous regions, grasslands, stream sides; 2500–3500 m. Sichuan, Xizang, Yunnan.

16. *Rubus bonatianus* Focke, Biblioth. Bot. 19(Heft 83): 43. 1914.

滇北悬钩子 dian bei xuan gou zi

Shrubs nearly erect or prostrate. Branches dark brown or brownish, soft hairy when young, gradually glabrescent, with sparse prickles. Leaves imparipinnate, (5–)7–9-foliolate; petiole 3–8 cm, petiolule of terminal leaflet 0.5–1 cm, lateral leaflets sessile, petiolule and rachis with soft hairs and minute prickles, sometimes with sparse, stalked glands; stipules linear, to 1 cm, soft hairy; blade of leaflets rhombic, ovate-lanceolate, or oblong, 2–5 × 1–2.5 cm, abaxially densely gray tomentose, adaxially minutely appressed pubescent, base broadly cuneate to rounded, margin incised, sharply doubly serrate, apex acuminate. Inflorescence 1-flowered. Pedicel 1–2 cm, with soft hairs or sparse, stalked glands. Flowers 2–3 cm in diam. Calyx abaxially densely minutely pubescent; sepals ovate-lanceolate or triangular-lanceolate, to 1.7 cm, apex long caudate, inner sepals gray tomentose marginally. Petals white, together with calyx turning red upon withering, spatulate, ca. 1.5 cm × 8–9 mm, slightly shorter than sepals, both surfaces minutely pubescent, base broadly clawed. Stamens numerous, shorter than petals; filaments linear, with somewhat broadened base. Pistils many, slightly longer than stamens; ovary and basal part of style long white tomentose. Fruit unknown. Fl. summer.

• Montane valleys, grassy places, stream sides, moist slopes; 3200–3500 m. Sichuan, N Yunnan.

17. *Rubus wawushanensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 298. 1982.

瓦屋山悬钩子 wa wu shan xuan gou zi

Shrubs upright, spreading. Branchlets purplish brown, pi-

lose, with dense needle-like prickles, with intermixed sparse, long stalked glands. Leaves imparipinnate, 5–7-foliolate; petiole 3–6 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets sessile or nearly so, petiolules and rachis minutely pubescent, with needle-like prickles; stipules linear or narrowly lanceolate, soft hairy; blade of leaflets ovate, rhombic-ovate, or oblong, 2.5–7 × 2–5(–6) cm, abaxially densely gray tomentose, with sparse, small needle-like prickles along veins, adaxially minutely appressed pubescent, base often truncate, base of lateral leaflets rounded, margin unevenly coarsely incised or sharply doubly serrate, terminal leaflet sometimes 2- or 3-lobed, apex acute, often acuminate on terminal leaflet. Inflorescences usually terminal on short lateral branchlets, 1-flowered or flowers in clusters of 2 or 3; bracts linear, puberulent. Pedicel 1.8–2.5 cm, minutely pubescent, with needle-like prickles and with glandular hairs. Calyx abaxially gray tomentose, with needle-like prickles, ± with intermixed longer stalked glands; sepals erect, narrowly ovate-lanceolate, 1.2–1.7 cm × 5–7 mm, apex long caudate. Flowers to 2.5 cm in diam. Petals white, elliptic or spatulate, shorter than sepals, both surfaces puberulent, apex clawed. Stamens many; filaments linear, or basally slightly broader. Pistils shorter than stamens; ovary and base of style densely long gray tomentose. Aggregate fruit subglobose, ca. 1 cm or more in diam., long gray tomentose; styles persistent; pyrenes rugulose. Fl. May–Jun, fr. Jul–Aug.

- Forest understories. Sichuan (Hongya Xian, Wawu Shan).

18. *Rubus sachalinensis* H. Léveillé, Repert. Spec. Nov. Regni Veg. 6: 332. 1909.

库页悬钩子 *ku ye xuan gou zi*

Shrubs 0.6–2 m tall. Branches purplish brown; branchlets brownish or brown, soft hairy when young, gradually glabrescent, with dense yellow, brownish, or purplish red straight prickles and stalked glands. Leaves imparipinnate, usually 3(–5)-foliolate; petiole 2–5 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolules and rachis with soft hairs and needle-like prickles or glandular hairs; stipules linear, 5–8 mm, with soft hairs or sparse, glandular hairs; blade of leaflets ovate, ovate-lanceolate, or narrowly obovate, 3–7 × 1.5–4(–5) cm, abaxially densely gray tomentose, adaxially glabrous or slightly hairy, base rounded, sometimes shallowly cordate on terminal leaflet, margin irregularly roughly serrate or incised-serrate, apex acute, but usually acuminate on terminal leaflet. Inflorescences terminal and axillary, corymbose, 5–9-flowered, rarely flowers solitary in leaf axils; rachis, pedicels, and abaxial surface of calyx pubescent, with glandular hairs, with needle-like prickles; bracts linear, 3–5 mm, pubescent, with stalked glands. Pedicel 1–2 cm. Flowers ca. 1 cm in diam. Sepals erect, triangular-lanceolate, 7–10 × 2.5–5 mm, margin often gray tomentose, apex long caudate. Petals white, ligulate or spatulate, shorter than sepals, base clawed. Stamens numerous, slightly shorter than or nearly as long as petals. Pistils many, nearly as long as stamens; ovary and base of style tomentose. Aggregate fruit red, ovoid-globose, ca. 1 cm in diam., tomentose; pyrenes rugose. Fl. Jun–Jul, fr. Aug–Sep. $2n = 14^*$, 24, 28*.

Forests, forest margins, thickets, grasslands, ravines, valleys, rock crevices, slopes; 400–3100 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Qinghai, Xinjiang [Japan, Korea, Mongolia, Russia; Europe].

- 1a. Pedicel and abaxial surface of calyx without glandular hairs; flowers and fruit less than 1 cm in diam. 18c. var. *eglandulatus*
- 1b. Pedicel and abaxial surface of calyx with glandular hairs; flowers and fruit 0.9–1.5 cm in diam.
 - 2a. Flowers and fruit ca. 1 cm in diam.; aggregate fruit densely tomentose 18a. var. *sachalinensis*
 - 2b. Flowers and fruit more than 1 cm, to 1.5 cm in diam.; aggregate fruit sparsely hairy or subglabrous 18b. var. *przewalskii*

18a. *Rubus sachalinensis* var. *sachalinensis*

库页悬钩子(原变种) *ku ye xuan gou zi* (yuan bian zhong)

Rubus idaeus Linnaeus var. *aculeatissimus* Regel & Tilg; *R. idaeus* var. *matsumuranus* (H. Léveillé & Vaniot) Koidzumi; *R. idaeus* var. *microphyllus* Turczaninow; *R. idaeus* subsp. *sachalinensis* (H. Léveillé) Focke; *R. idaeus* var. *strigosus* Maximowicz; *Rubus matsumuranus* H. Léveillé & Vaniot; *R. melanolasius* Focke var. *discolor* Komarov.

Pedicel and abaxial surface of calyx with glandular hairs. Flowers and fruit ca. 1 cm in diam. Aggregate fruit densely tomentose.

Forests, forest margins, thickets, grasslands, ravines, valleys, rock crevices; 1000–2500 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Qinghai, Xinjiang [Japan, Korea, Mongolia, Russia; Europe].

18b. *Rubus sachalinensis* var. *przewalskii* (Prochanov) L. T. Lu, Acta Phytotax. Sin., 38: 280. 2000.

甘肃悬钩子 *gan su xuan gou zi*

Rubus przewalskii Prochanov, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR5: 56. 1924.

Pedicel and abaxial surface of calyx with glandular hairs. Flowers and fruit 1–1.5 cm in diam. Aggregate fruit sparsely hairy or subglabrous.

- Forests; 2100–3100 m. Gansu.

18c. *Rubus sachalinensis* var. *eglandulatus* (Y. B. Chang) L. T. Lu, Acta Phytotax. Sin. 38: 280. 2000.

无腺里白悬钩子 *wu xian li bai xuan gou zi*

Rubus matsumuranus H. Léveillé & Vaniot var. *eglandulatus* Y. B. Chang, Bull. Bot. Res., Harbin 1(3): 97. 1981.

Pedicel and abaxial surface of calyx without glandular hairs. Flowers and fruit less than 1 cm in diam. Indumentum of aggregate fruit unknown.

- Forests, slopes; 400–500 m. Heilongjiang (Yichuan), S Jilin (Fusong Xian).

19. *Rubus irritans* Focke, Biblioth. Bot. 17(Heft 72): 192. 1911.

紫色悬钩子 *zi se xuan gou zi*

Rubus purpureus Bunge ex J. D. Hooker.

Subshrubs or herblike, 10–60 cm tall. Branchlets brown or

reddish brown to purplish red, with purple needle-like prickles, soft hairs, and stipitate glands. Leaves imparipinnate, 3-foliolate, rarely 5-foliolate; petiole 3–5 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, with purple needle-like prickles, soft hairs, and glandular hairs; stipules greenish brown, linear or linear-lanceolate, 7–9 mm, pubescent, with intermixed glandular hairs; blade of leaflets ovate or elliptic, 3–5 × 2–3.5 cm, abaxially densely gray tomentose, adaxially puberulous, base broadly cuneate to subrounded, subtruncate on terminal leaflet, margin unevenly coarsely serrate or doubly serrate, apex acute to shortly acuminate. Inflorescences terminal, nutant, 1–3-flowered; bracts linear, 5–7 mm, pubescent, with intermixed glandular hairs. Pedicel 1.5–3 cm, prickly, pubescent, with stalked glands. Flowers 1.5–2 cm in diam. Calyx tinged purplish red, with purple needle-like prickles, soft hairs, and stalked glands; tube shallowly cupular; sepals erect, narrowly ovate or ovate-lanceolate, 1–1.5 cm × 3–5 mm, apex acuminate to caudate. Petals white, broadly elliptic or spatulate, 8–11 × 5–7 mm, shorter than sepals, pubescent, base shortly clawed. Stamens numerous, slightly shorter than petals; filaments linear. Pistils nearly as long as or slightly shorter than stamens; ovary gray tomentose. Aggregate fruit red, subglobose, 1–1.5 cm in diam., tomentose; pyrenes smooth or somewhat reticulate. Fl. Jun–Jul, fr. Aug–Sep.

Slopes, forest margins, thickets; 2000–4500 m. Gansu, Qinghai, Sichuan, SE Xizang [Afghanistan, Bhutan, NW India, Kashmir, Pakistan].

20. *Rubus eucalyptus* Focke, *Biblioth. Bot.* 17(Heft 72): 169. 1911.

桉叶悬钩子 an ye xuan gou zi

Shrubs 1.5–4 m tall. Branchlets dark purplish brown or brown, glabrous, with sparse, curved robust prickles; flowering shoots short, pubescent, stipitate glandular, with curved prickles. Leaves imparipinnate, 3–5 (or 7)-foliolate; petiole 5–8 cm, petiolule of terminal leaflet 1–2.5 cm, lateral leaflets subsessile, petiolules and rachis sparsely pubescent, stipitate glandular, with needle-like prickles; stipules linear, 6–9 mm, pubescent, with intermixed glandular hairs; terminal leaflet blade ovate, rhombic-ovate, or rhombic-lanceolate, lateral blade of leaflets rhombic-ovate or elliptic, 2–6(–8) × 1.5–4(–5) cm, abaxially densely gray tomentose, adaxially glabrous, base broadly cuneate to rounded, rarely subcordate, margin irregularly coarsely serrate or incised-doubly serrate, sometimes 3-lobed on terminal leaflet, often acuminate, but acute on lateral leaflets. Inflorescences terminal, rarely axillary, 1- or 2-flowered; bracts linear, 5–7 mm, pubescent, with intermixed glandular hairs. Pedicel 2–4(–5) cm, pubescent, with stalked glands and needle-like prickles. Flowers 1.5–2 cm in diam. Calyx abaxially ± pubescent, with stalked glands and needle-like prickles; sepals spreading, rarely reflexed in fruit, ovate-lanceolate or triangular-lanceolate, 1–1.5(–2) cm × 4–6 mm, apex caudate, margin gray tomentose. Petals white, spatulate, 7–8 × 3–4 mm, shorter than sepals, base broadly clawed, apex obtuse. Stamens numerous, shorter than petals; filaments linear. Pistils longer than stamens; basal part of style and apical part of ovary densely long gray tomentose. Aggregate fruit red at maturity, subglobose, 1.2–2 cm in diam., densely long gray tomentose; pyrenes rugu-

lose. Fl. Apr–May, fr. Jun–Jul.

• Mixed forests, thickets, bamboo thickets, grasslands, ravines, valleys; 1000–3400 m. Gansu, Guizhou, Hubei, Shaanxi, Sichuan, NE Yunnan.

- 1a. Leaflets at first tomentose, glabrescent abaxially, subglabrous when old; branchlets, petioles, pedicels, and abaxial surface of calyx with sparse, glandular hairs; leaves 3–5-foliolate 20d. var. *etomentosus*
- 1b. Leaflet persistently tomentose abaxially; branchlets, petioles, pedicels, and abaxial surface of calyx with sparse, glandular hairs or not; leaves 3–7-foliolate.
 - 2a. Branchlets, petioles, pedicel, and abaxial surface of calyx without glandular hairs 20c. var. *trullisatus*
 - 2b. Branchlets, petioles, pedicel, and abaxial surface of calyx with glandular hairs.
 - 3a. Leaves 3–5-foliolate, sepals 1–1.5 cm 20a. var. *eucalyptus*
 - 3b. Leaves 7-foliolate; sepals 1.5–2 cm 20b. var. *yunnanensis*

20a. *Rubus eucalyptus* var. *eucalyptus*

桉叶悬钩子(原变种) an ye xuan gou zi (yuan bian zhong)

Rubus lasiostylus Focke f. *glandulosus* Focke.

Leaves 3–5-foliolate. Branchlets, petioles, pedicel, and abaxial surface of calyx with glandular hairs. Sepals narrower, 1–1.5 cm wide. Aggregate fruit 1.2–2 cm in diam.

• Mixed forests, thickets, grassy wastelands; 1000–2500 m. Gansu, Guizhou, Hubei, Shaanxi, Sichuan.

20b. *Rubus eucalyptus* var. *yunnanensis* T. T. Yu & L. T. Lu, *Acta. Phytotax. Sin.* 20: 296. 1982.

云南桉叶悬钩子 yun nan an ye xuan gou zi

Leaves 7-foliolate. Branchlets, petioles, pedicel, and abaxial surface of calyx with glandular hairs. Sepals broader, 1.5–2 cm wide. Aggregate fruit to 2 cm in diam.

• Grasslands, bamboo thickets; ca. 3400 m. NE Yunnan (Huize Xian).

20c. *Rubus eucalyptus* var. *trullisatus* (Focke) T. T. Yu & L. T. Lu, *Fl. Reipubl. Popularis Sin.* 37: 54. 1985.

无腺桉叶悬钩子 wu xian an ye xuan gou zi

Rubus trullisatus Focke, *Biblioth. Bot.* 17(Heft 72): 169. 1911; *R. eriococcus* Cardot; *R. lasiostylus* Focke var. *villosus* Cardot.

Leaves 3-foliolate, rarely 5-foliolate. Branchlets, petioles, pedicel, and abaxial surface of calyx with soft hairs, without glandular hairs. Calyx abaxially with sparse, needle-like prickles.

• Thickets, ravines, valleys; 1000–2500 m. W Hubei, SE Shaanxi, Sichuan.

20d. *Rubus eucalyptus* var. *etomentosus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 296. 1982.

脱毛桉叶悬钩子 tuo mao an ye xuan gou zi

Leaves 3–5-foliolate, abaxially tomentose, glabrescent, subglabrous when old. Branchlets, petioles, pedicel, and abaxial surface of calyx with sparse, glandular hairs.

• Slopes in mixed forests; ca. 2300 m. N Sichuan (Songpan Xian).

21. *Rubus idaeus* Linnaeus, Sp. Pl. 1: 492. 1753.

覆盆子 fu pen zi

Shrubs 1–2 m tall. Branchlets brown or reddish brown, terete, sparsely tomentose when young, with sparse prickles, without stalked glands. Leaves imparipinnate, 5–7-foliolate, rarely 3-foliolate; petiole 3–6 cm, petiolule of terminal leaflet ca. 1 cm, petiolule and rachis tomentose, with sparse, minute prickles, without glandular hairs; stipules linear, pubescent; blade of leaflets narrowly ovate or elliptic, often ovate on terminal leaflet, 3–8 × 1.5–4.5 cm, abaxially densely tomentose, adaxially glabrous or pilose, base rounded, sometimes subcordate on terminal leaflet, margin unevenly coarsely serrate or doubly serrate, sometimes lobed on terminal leaflet, apex shortly acuminate. Inflorescences terminal, short racemes, rarely several flowers in clusters in leaf axils; rachis, pedicels, and abaxial surface of calyx densely tomentose, with dense or sparse, needle-like prickles, without glandular hairs; bracts linear, soft hairy. Pedicel 1–2 cm. Flowers 1–1.5 cm in diam. Sepals erect, ovate-lanceolate, margin gray tomentose, apex caudate. Petals white, spatulate, puberulous or glabrous, base broadly clawed. Stamens many, shorter than petals; filaments broadened and flattened. Pistils shorter than stamens; ovary and base of style densely gray tomentose. Aggregate fruit red or orange, subglobose, 1–1.4 cm in diam., densely shortly tomentose; pyrenes prominently pitted. $2n = 14^*$.

Forests, forest margins, thickets, valleys, slopes, meadows, roadsides, waste places; 500–2500 m. Hebei, S Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi, Xinjiang [Japan, Russia; Europe, North America].

The fruit are eaten raw and are used for making jam, jelly, juice, wine, and vinegar. The dried fruit are used in medicine. The stems and roots are a source of tannin.

- 1a. Inflorescence rachis, pedicels, and abaxial surface of calyx with glandular hairs; branchlets, petioles, and pedicel with sparse prickles or nearly unarmed 21c. var. *borealisinensis*
- 1b. Inflorescence rachis, pedicels, and abaxial surface of calyx without glandular hairs.
- 2a. Branchlets, petioles, and pedicel tomentose, ± prickly 21a. var. *idaeus*
- 2b. Branchlets, petioles, and pedicel glabrous, with sparse prickles 21b. var. *glabratus*

21a. *Rubus idaeus* var. *idaeus*

覆盆子(原变种) fu pen zi (yuan bian zhong)

Rubus idaeus subsp. *vulgatus* Arrhenius.

Inflorescence rachis, pedicels, and abaxial surface of calyx without glandular hairs. Branchlets, petioles, and pedicels tomentose, ± prickly.

Mixed forests and forest margins in mountainous regions, thickets, waste places; 500–2500 m. Hebei, Jilin, Liaoning, Shanxi, Xinjiang [Japan, Russia; Europe, North America].

21b. *Rubus idaeus* var. *glabratus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 297. 1982.

无毛覆盆子 wu mao fu pen zi

Inflorescence rachis, pedicels, and abaxial surface of calyx without glandular hairs. Branchlets, petioles, and pedicels glabrous, with sparse prickles.

• Mixed forests, roadsides. S Heilongjiang.

21c. *Rubus idaeus* var. *borealisinensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 297. 1982.

华北覆盆子 hua bei fu pen zi

Inflorescence rachis, pedicels, and abaxial surface of calyx with glandular hairs. Branchlets, petioles, and pedicels with sparse prickles or nearly unarmed.

• Valleys, forests, forest margins, slopes, meadows; 1200–2500 m. W Hebei, Nei Mongol (Daqingshan, Liangcheng), Shanxi.

22. *Rubus aurantiacus* Focke, Biblioth. Bot. 17(Heft 72): 211. 1911.

橘红悬钩子 ju hong xuan gou zi

Shrubs 1–3 m tall. Branchlets brown or reddish brown, with sparse curved prickles, pubescent, gradually glabrescent, subglabrous or glabrous when old. Leaves imparipinnate, usually 3-foliolate; petiole 2–5(–7) cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolule and rachis with soft hairs and sparse, curved prickles; stipules linear, 4–7 mm, pubescent; blade of leaflets ovate, elliptic, or suborbicular, 2–6 (–9) × 1.5–5(–6) cm, abaxially densely gray tomentose, adaxially puberulous or subglabrous, base variable in shape, rounded to shallowly cordate on terminal leaflet, cuneate on lateral leaflets, margin irregularly coarsely sharply serrate or incised-doubly serrate, apex acute, shortly acuminate, or obtuse. Inflorescences terminal, corymbose or short racemes, 6–8 cm, ca. 5–10-flowered, or axillary and 1–3-flowered; rachis and pedicels densely tomentose, with sparse, minute prickles; bracts linear, 4–6 mm, pubescent. Pedicel 1–2.5 cm. Flowers 1–2 cm in diam. Calyx abaxially densely tomentose, unarmed, rarely with sparse, minute prickles; tube pelviform; sepals erect, broadly ovate or triangular-lanceolate, 7–9 × 3–4 mm, abaxially densely tomentose, apex acuminate to caudate. Petals white, rarely pink, obovate or suborbicular, 4–6 mm in diam., slightly shorter than sepals, base shortly clawed, soft hairy. Stamens many, shorter than petals; filaments broadened and flattened. Pistils nearly as long as stamens; ovary and base of style densely gray tomentose. Aggregate fruit orange or orange-red, semiglobose, less than 1 cm, ca. 1 cm or more in diam., densely tomentose; dru-

pelets few; pyrenes shallowly reticulate. Fl. May–Jun, fr. Jul–Aug.

• Valleys, wet places, stream sides, slopes, forests, thickets; 1500–3300 m. W Guizhou, W Sichuan, SE Xizang, Yunnan.

- 1a. Leaflets ovate to elliptic, apex acute
or shortly acuminate 22a. var. *aurantiacus*
1b. Leaflets suborbicular to ovate, apex
obtuse, rarely acute 22b. var. *obtusifolius*

22a. *Rubus aurantiacus* var. *aurantiacus*

橘红悬钩子(原变种) ju hong xuan gou zi (yuan bian zhong)

Leaflets ovate or elliptic, apex acute or shortly acuminate.

• Valleys, stream sides, slopes, forests, thickets; 1500–3300 m. W Sichuan, SE Xizang, Yunnan.

22b. *Rubus aurantiacus* var. *obtusifolius* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 297. 1982.

钝叶橘红悬钩子 dun ye ju hong xuan gou zi

Leaflets suborbicular or ovate, apex obtuse, rarely acute.

• Valleys, stream sides, grassy slopes, wet places; below 1600 m. W Guizhou, S and W Yunnan.

23. *Rubus austrotibetanus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 496. 1980.

藏南悬钩子 zang nan xuan gou zi

Shrubs 1–2 m tall. Branchlets brownish to purplish brown, cylindric, soft hairy, gradually glabrescent, with sparse prickles. Leaves imparipinnate, usually 3-foliolate, those below inflorescence sometimes 3-lobed; petiole 5–8 cm, petiolule of terminal leaflet 1–2.5 cm, lateral leaflets shortly petiolulate or sessile, pubescent when young, glabrescent, with sparse, minute prickles; stipules linear, 1–1.3 cm, pubescent; blade of leaflets broadly ovate, terminal leaflet sometimes ovate-lanceolate, 4–8 × 3–6 cm, abaxially densely gray tomentose, adaxially glabrous, base broadly cuneate to rounded, margin unevenly coarsely serrate or doubly serrate, apex shortly acuminate to caudate. Inflorescences terminal or axillary, corymbose or short racemes, 5–10-flowered, sometimes axillary and 1–3-flowered; rachis and pedicels pubescent, with sparse, minute prickles; bracts linear, smaller than stipules. Pedicel 1–2 cm. Flowers 1.5–2 cm in diam. Calyx tube purple, abaxially pubescent, sometimes with sparse, minute prickles; sepals erect after anthesis, broadly ovate or ovate-lanceolate, 0.8–1.4 cm, gray tomentose, apex abruptly pointed or acuminate. Petals purple, broadly obovate or elliptic, 5–8 mm, both surfaces soft hairy, base shortly clawed. Stamens many, shorter than petals; filaments linear. Pistils numerous, shorter than stamens; ovary and basal part of style gray tomentose. Aggregate fruit red, narrowly ovoid, 1–1.5 cm, ca. 1 cm in diam., gray tomentose; drupelets many; pyrenes reticulate. Fl. Jun–Jul, fr. Aug–Sep.

• Mixed forests, broad-leaved evergreen forests, valleys, slopes on roadsides, thickets; 2600–3800 m. S Xizang, W Yunnan.

24. *Rubus komarovii* Nakai, Chosenshokubutsu 1: 304. 1914.

绿叶悬钩子 lu ye xuan gou zi

Rubus idaeus Linnaeus f. *concolor* (Komarov) Ohwi; *R. idaeus* subsp. *komarovii* (Nakai) V. N. Voroschilov; *R. idaeus* var. *concolor* (Komarov) Nakai; *R. kanayamensis* H. Léveillé & Vaniot; *R. melanolasius* Focke; *R. melanolasius* var. *concolor* Komarov; *R. sachalinensis* H. Léveillé var. *concolor* (Komarov) Lauener & D. K. Ferguson.

Shrubs to 1 m tall. Annotinous shoots green or greenish brown, without or with white bloom, prickly, occasionally sparsely stipitate glandular; prickles green. Leaves imparipinnate, 3-foliolate, rarely 5-foliolate; petiole 2–4 cm, petiolule of terminal leaflet 1–1.5 cm, lateral leaflets subsessile, petiolule and rachis thinly pubescent, prickly; stipules linear, 4–6 mm, thinly pubescent, with stalked glands; blade of leaflets ovate, rarely ovate-lanceolate, 3–6 × 1.5–4.5 cm, abaxially thinly pubescent, with sparse, needle-like prickles only along veins, adaxially glabrous or subglabrous, base cuneate to rounded, margin unevenly coarsely sharply serrate, apex acute, sometimes shortly acuminate. Inflorescences terminal, corymbs or flowers several in clusters in leaf axils; rachis and pedicels puberulous, with sparse, stalked glands; bracts linear-lanceolate, 3–5 mm, with soft hairs and stalked glands. Pedicel 1–2 cm. Flowers ca. 1 cm in diam. Calyx abaxially with soft hairs, needle-like prickles, and sparse, stalked glands; tube pelviform; sepals often erect after anthesis, triangular to triangular-lanceolate, 8–12 × 2–3.5 cm, apex acuminate to caudate. Petals white, oblong or spatulate, nearly as long as or somewhat shorter than sepals, base clawed. Stamens numerous, shorter than petals; filaments linear. Pistils many; ovary and base of style shortly gray tomentose. Aggregate fruit red, ovoid, ca. 1 cm in diam., shortly tomentose, aromatic; pyrenes rugulose. Fl. May–Jun, fr. Jul–Aug. $2n = 28^*$.

Forest margins, logged forests, rocky slopes; 500–1500 m. N Heilongjiang (Da Hinggan Ling), S Jilin (Changbai Shan), Liaoning [Korea, E Russia].

25. *Rubus pileatus* Focke, Hooker's Icon. Pl., ser. 3, 10: sub t. 1952. 1891.

蕈帽悬钩子 gu mao xuan gou zi

Shrubs scandent, 1–3 m tall. Branchlets purple when young, brownish or grayish brown in age, glabrous, with sparse prickles, with white bloom. Leaves imparipinnate, usually 5–7-foliolate; petiole 3–10 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolules and rachis sparsely pubescent, with sparse, minute prickles; stipules lanceolate or linear-lanceolate, 8–10(–12) × 2–3 mm, pilose, glabrescent; blade of leaflets ovate, narrowly obovate, or elliptic, 2.5–6(–8) × 1.5–4(–6) cm, both surfaces pubescent along veins, base subrounded or broadly cuneate, margin coarsely doubly serrate, sometimes slightly lobed on terminal leaflet, apex acute to acuminate. Inflorescences terminal, corymbose, 2–4 cm, 3–5-flowered, rarely flowers solitary; bracts linear, 6–7 mm, pilose when young, glabrescent. Pedicel (1.5–)2–3.5 cm, slender, glabrous, with sparse, minute prickles or unarmed. Flowers 1–1.5(–2) cm in diam. Calyx purple, abaxially glabrous; sepals reflexed in fruit, ovate-lanceolate, 7–10 × 2–4 mm, long caudate, margin tomentose. Petals white, obovate, slightly shorter than or nearly as long as sepals, base sparsely pubescent and shortly clawed.

Stamens many, shorter than sepals; filaments linear. Pistils numerous; ovary and basal part of style densely long gray tomentose; styles elongated in fruit. Aggregate fruit red, ovoid-globose, 0.8–1.2 cm in diam. densely gray tomentose; style persistent; pyrenes distinctly rugose. Fl. Jun–Jul, fr. Aug–Sep.

• Sparse forests on roadsides, dense forests in montane valleys, river sides, ravines; 1400–2800 m. Gansu, Henan, Hubei, Qinghai, Shaanxi, Sichuan.

26. *Rubus pseudopileatus* Cardot, Notul. Syst. (Paris) 3: 308. 1914.

假帽莓 *jia mao mei*

Shrubs scandent, 1–2 m tall. Branchlets purple, with soft hairs and ± slender prickles. Leaves imparipinnate, 5–7-foliolate, rarely 3-foliolate; petiole 4–9 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolules and rachis with soft hairs and minute prickles; stipules linear or linear-lanceolate, soft hairy; blade of leaflets ovate or ovate-lanceolate, 4–8 × 2.5–5 cm, abaxially glabrous except pilose along veins, adaxially glabrous, base broadly cuneate to subrounded, margin irregularly incised-doubly serrate, apex acuminate, rarely acute. Inflorescences terminal, corymbose, 3–5-flowered, or flowers solitary in leaf axils; bracts linear or linear-lanceolate, soft hairy. Pedicel 1–2 cm, soft hairy, unarmed or prickly. Flowers 2–3 cm in diam. Calyx purple, abaxially puberulous to subglabrous, sometimes prickly; sepals erect after anthesis, triangular-lanceolate or triangular-ovate, 1–1.5 cm × 5–8 mm, apex acuminate, inner sepals with gray tomentose margin. Petals pink or white turning red, broadly obovate, slightly longer than or nearly as long as sepals, soft hairy basally, base shortly clawed. Stamens many in several whorls, unequal in length; filaments glabrous or slightly pilose. Pistils numerous, slightly longer or shorter than stamens; ovary and base of style densely long gray tomentose. Aggregate fruit red, ovoid-globose, 1.3–2 cm in diam., densely long gray tomentose; pyrenes shallowly rugose or ± smooth. Fl. Jun–Jul, fr. Aug–Sep.

• Forests and forest margins in mountainous regions, shaded montane valleys, sparsely forested slopes; 2100–3200 m. Sichuan.

- 1a. Pedicel soft hairy; abaxial surface of calyx soft hairy or subglabrous 26a. var. *pseudopileatus*
 1b. Pedicel and abaxial surface of calyx glabrous.
 2a. Pedicel with dense needle-like prickles and sparse, stalked glands 26b. var. *kangdingensis*
 2b. Pedicel unarmed or nearly unarmed, usually without stalked glands 26c. var. *glabratus*

26a. *Rubus pseudopileatus* var. *pseudopileatus*

假帽莓(原变种) *jia mao mei* (*yuan bian zhong*)

Pedicel soft hairy. Calyx abaxially soft hairy or subglabrous.

• Forests and forest margins in mountainous regions; 2300–3200 m. Sichuan.

26b. *Rubus pseudopileatus* var. *kangdingensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 299. 1982.

康定假帽莓 *kang ding jia mao mei*

Pedicel glabrous, with dense needle-like prickles and sparse, stalked glands. Calyx abaxially glabrous.

• C Sichuan (Kangding Xian).

26c. *Rubus pseudopileatus* var. *glabratus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 298. 1982.

光梗假帽莓 *guang geng jia mao mei*

Pedicel unarmed or nearly so, usually without stalked glands. Calyx abaxially glabrous margin.

• Shaded montane valleys, sparsely forested slopes; 2100–2900 m. W Sichuan.

27. *Rubus subinoptus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 497. 1980.

紫红悬钩子 *zi hong xuan gou zi*

Shrubs 1–3 m tall. Branchlets brownish to purplish brown, terete, densely slender pubescent, glabrescent, with sparse, curved prickles. Leaves imparipinnate, (5–)7–9(–11)-foliolate; petiole 3–6 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolules and rachis slender pubescent, with sparse, curved minute prickles; stipules linear or linear-lanceolate, 5–7 mm, slender pubescent; blade of leaflets ovate to ovate-lanceolate, 4–7 × 2–4 cm, abaxially pubescent only along veins, adaxially soft hairy when young, glabrescent, base broadly cuneate to rounded, margin coarsely sharp doubly serrate or incised-doubly serrate, often pinnate-lobed on terminal leaflet, apex acuminate. Inflorescences terminal or axillary, corymbose or short racemes, 3–4.5 cm, terminal ones more than 10-flowered, axillary ones 3–5-flowered, rarely flowers solitary in leaf axils; rachis and pedicels finely pubescent; bracts linear or linear-lanceolate, 4–6 mm, puberulous. Pedicel 0.7–1.5 cm. Flowers 1–1.5 cm in diam. Calyx brownish purple, abaxially finely pubescent; sepals reflexed in fruit, ovate or triangular-lanceolate, 4–7 mm, margin tomentose, apex acute to acuminate. Petals pink or purplish red, obovate or suborbicular, 4–6 × 3–4(–5) mm, base shortly clawed and finely pubescent. Stamens many, shorter than petals; filaments linear. Pistils numerous, somewhat shorter than or nearly as long as stamens; ovary and base of style densely gray tomentose. Aggregate fruit yellowish red when immature, purplish red at maturity, semiglobose, 0.8–1.2 cm in diam., densely shortly gray tomentose; pyrenes rugulose. Fl. Jun–Jul, fr. Aug–Sep.

• Thickets on slopes, forests, forest margins; 1300–2500 m. W Sichuan, SE Xizang, N Yunnan.

28. *Rubus gyamdaensis* L. T. Lu & Boufford, **nom. nov.**

柔毛悬钩子 *rou mao xuan gou zi*

Replaced synonym: *Rubus pubifolius* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 498. 1980, not L. H. Bailey (1945).

Shrubs. Branchlets purplish red, cylindric, pubescent, with

slender prickles. Leaves imparipinnate, 5–7-foliolate, rarely 3-foliolate on flower bearing branchlets; petiole 4–7 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolules and rachis pubescent, with slender prickles; stipules linear or linear-lanceolate, pubescent; blade of leaflets variable in shape, terminal leaflet ovate or ovate-lanceolate, sometimes 3-lobed, lateral leaflets elliptic or ovate, 4–7 × 2–4.5 cm, both surfaces pubescent, more densely so abaxially, base broadly cuneate to rounded, margin irregularly slenderly sharply serrate, coarsely serrate, or doubly serrate, apex acute to shortly acuminate. Inflorescences often 1-flowered. Pedicel 4–6 cm, pubescent, with sparse, intermixed short glandular hairs, with needle-like prickles. Flowers to 2 cm in diam. Calyx abaxially pubescent, unarmed or with sparse, needle-like prickles; sepals spreading after anthesis, ovate or ovate-lanceolate, 1–1.8(–2.5) cm, apex caudate. Petals white. Stamens many, in 2 or 3 whorls, much shorter than sepals; filaments linear, somewhat broadened and flattened basally. Pistils numerous; ovary densely tomentose. Fruit unknown. Fl. Jul–Aug.

- Roadsides in mountains, forest margins, river sides; below 2400–4200 m. W Sichuan, Xizang.

- 1a. Leaflets pubescent on both surfaces, more densely so abaxially, margin sharply slenderly serrate or doubly serrate; sepals to 1.8 cm 28a. var. *gyamdaensis*
 1b. Leaflets sparsely pilose or pilose only along veins on both surfaces, margin coarsely serrate; sepals to 2.5 cm 28b. var. *glabriusculus*

28a. *Rubus gyamdaensis* var. *gyamdaensis*

柔毛悬钩子(原变种) rou mao xuan gou zi (yuan bian zhong)

Leaflets pubescent on both surfaces, more densely so abaxially, margin sharply slenderly serrate or doubly serrate. Sepals to 1.8 cm.

- Roadsides in mountains; ca. 4200 m. Xizang (Gongbo'gyamda Xian).

28b. *Rubus gyamdaensis* var. *glabriusculus* (T. T. Yu & L. T. Lu) L. T. Lu & Boufford, **comb. nov.**

川西柔毛悬钩子 chuan xi rou mao xuan gou zi

Basionym: *Rubus pubifolius* var. *glabriusculus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 299. 1982.

Leaflets sparsely pilose or pilose only along veins on both surfaces, margin coarsely serrate. Sepals to 2.5 cm.

- Forest margins, river sides; below 2400 m. W Sichuan.

29. *Rubus thibetanus* Franchet, Nouv. Arch. Mus. Hist. Nat., ser. 2, 8: 221. 1885.

西藏悬钩子 xi zang xuan gou zi

Rubus veitchii Rolfe.

Shrubs 2–3 m tall. Branchlets reddish brown, cylindrical,

initially densely soft hairy, glabrescent, with sparse prickles, with white bloom. Leaves imparipinnate, (5–)7–11(–13)-foliolate; petiole 1–2 cm, petiolule of terminal leaflet 0.7–1.5 cm, lateral leaflets sessile, petiolule and rachis with dense soft hairs and sparse, slender prickles; stipules linear-lanceolate, 4–8 mm, pubescent; blade of leaflets variable, terminal leaflet ovate-lanceolate, 2.5–6.5 × 1.5–2.5 cm, more than 2 × as long as lateral leaflets, margin often pinnately lobed, deeply incised or coarsely sharply serrate, apex long acuminate, lateral leaflets obliquely ovate or ovate-orbicular, 1–3 × 0.6–1.5 cm, margin with several large sharp teeth above middle, abaxially densely gray tomentose, adaxially pubescent. Inflorescences terminal, corymbose, 2–4 cm, 3–8-flowered, rarely flowers solitary in leaf axils; rachis and pedicels densely pubescent; bracts linear, 4–6 mm, pubescent. Pedicel 1–1.5 cm. Flowers 1–1.2 cm in diam. Calyx abaxially densely pubescent; sepals spreading at anthesis, reflexed in fruit, triangular-lanceolate, 5–7 × 2–4 mm, apex acuminate. Petals pink or purplish red, orbicular-ovate, 3–4.5 × 3–4 mm. Stamens numerous, purplish red; filaments linear. Pistils nearly as long as stamens; ovary densely pubescent; styles ca. 3 mm, glabrous. Aggregate fruit purplish black or dark red, subglobose, 8–10 mm in diam., densely gray pubescent; pyrenes densely rugulose. Fl. Jun, fr. Aug.

- Thickets, forest margins, roadsides, slopes, ravines, dry places; 900–2100 m. Gansu, Shaanxi, Sichuan, Xizang.

30. *Rubus phoenicolasius* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, ser. 3, 17: 160. 1872.

多腺悬钩子 duo xian xuan gou zi

Shrubs 1–3 m tall. Branches upright at first, finally scrambling, densely pubescent, with intermixed reddish brown bristles, stalked glands, and sparse prickles. Leaves imparipinnate, 3-foliolate, rarely 5-foliolate; petiole 3–6 cm, petiolule of terminal leaflet 2–3 cm, lateral leaflets subsessile, petiolule and rachis pubescent, with intermixed reddish brown bristles, stalked glands, and sparse prickles; stipules linear, 5–8 mm, pubescent, with intermixed glandular hairs; blade of leaflets ovate, broadly ovate, or rhombic, rarely elliptic, 4–8(–10) × 2–5(–7) cm, abaxially densely gray tomentose, bristly, stipitate glandular, with sparse, minute needle-like prickles, adaxially appressed pubescent or pubescent only along veins, base rounded to subcordate, margin irregularly roughly serrate, usually incised, terminal leaflet often lobed, apex acute to acuminate. Inflorescences terminal or axillary, short racemes, few flowered, terminal racemes 6–10 cm, lateral ones shorter; rachis, pedicels, and abaxial surface of calyx densely pubescent, bristly, stipitate glandular; bracts lanceolate, 5–8 mm, pubescent, stipitate glandular, margin entire or apically 2-lobed. Pedicel 0.5–1.5 cm. Flowers 6–10 mm in diam. Sepals erect, lanceolate, 1–1.5 cm × 4–7 mm, apex caudate. Petals purplish red, obovate-spatulate or suborbicular, much longer than sepals, base long clawed and pubescent. Stamens many, nearly as long as or slightly shorter than petals. Pistils somewhat longer than stamens; ovary glabrous or puberulous. Aggregate fruit orange or red, subglobose, ca. 1 cm in diam., glabrous; pyrenes prominently rugose, pitted. Fl. May–Jun, fr. Jul–Aug. *2n* = 14.

- Roadsides, montane valleys; low to medium elevations. Gansu,

Henan, Hubei, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan [Japan, Korea; naturalized in Europe and North America].

31. *Rubus ellipticus* Smith in Rees, Cycl. 30: *Rubus* no. 16. 1819.

椭圆悬钩子 tuo yuan xuan gou zi

Shrubs 1–3 m tall. Branchlets purplish brown or brownish, pubescent, with sparse, curved prickles and dense, purplish brown bristles or glandular hairs. Leaves imparipinnate, 3-foliolate; petiole 2–6 cm, petiolule of terminal leaflet 2–3 cm, lateral leaflets sessile, petiolule and rachis purplish red bristly, pubescent, with minute prickles; stipules linear, 7–11 mm, pubescent, with intermixed glandular hairs; blade of leaflets elliptic or obovate, 4–8(–12) × 3–6(–9) cm, terminal leaflet much larger than lateral leaflets, abaxially densely tomentose, with purplish red bristles along prominent veins, adaxially veins impressed, pubescent along midvein, base rounded, margin unevenly minute sharply serrate, apex acute, abruptly pointed, shallowly cordate, or subtruncate. Inflorescences terminal, dense glomerate racemes, (1.5–)2–4 cm, flowers several to 10 or more, or flowers several in clusters in leaf axils, rarely flowers solitary; rachis and pedicels pubescent, bristly; bracts linear, 5–9 mm, pubescent. Pedicel 4–6 mm. Flowers 1–1.5 cm in diam. Calyx abaxially pubescent, intermixed yellowish tomentose, sparsely bristly; sepals erect, ovate, 4–5(–6) × 2–3(–4) mm, abaxially densely yellowish gray tomentose, apex acute and abruptly pointed. Petals white or pink, spatulate, longer than sepals, margin premorse, densely pubescent, base clawed. Stamens numerous, shorter than petals; filaments broadened and flattened basally. Ovary pubescent; styles glabrous, slightly longer than stamens. Aggregate fruit golden yellow, subglobose, ca. 1 cm in diam., glabrous or drupelets pubescent at apex; pyrenes triangular-ovoid, densely rugulose. Fl. Mar–Apr, fr. Apr–May. $2n = 14$.

Slopes, montane valleys, sparse forests, thickets, roadsides; 300–2600 m. Guangxi, Guizhou, Sichuan, S Xizang, Yunnan [Bhutan, India, Laos, Myanmar, Nepal, Pakistan, Philippines, Sikkim, Sri Lanka, Thailand, Vietnam].

Rubus fasciculatus Duthie var. *tomentosus* Cardot (Notul. Syst. (Paris) 3: 314. 1917), described from Yunnan based on *P. Ngeou s.n.* and *Ducloux 5147*, is probably a synonym of *R. ellipticus*; the present authors have not seen the syntypes.

- 1a. Leaflets elliptic, apex acute or abruptly pointed; pedicel and abaxial surface of calyx bristly 31a. var. *ellipticus*
 1b. Leaflets obovate, apex shallowly cordate or subtruncate; pedicel and abaxial surface of calyx with few bristles 31b. var. *obcordatus*

31a. *Rubus ellipticus* var. *ellipticus*

椭圆悬钩子(原变种) tuo yuan xuan gou zi (yuan bian zhong)

Leaflets elliptic, apex acute or abruptly pointed. Pedicel and abaxial surface of calyx bristly.

Dry slopes, montane valleys, sparse forests; 1000–2600 m. Sichuan, S Xizang, Yunnan [Bhutan, NE India, Laos, Myanmar, Nepal, Pakistan, Philippines, Sikkim, Sri Lanka, Thailand, Vietnam].

31b. *Rubus ellipticus* var. *obcordatus* (Franchet) Focke, Biblioth. Bot. 17(Heft 72): 199. 1911.

裁秧泡 zai yang pao

Rubus ellipticus Smith f. *obcordatus* Franchet, Pl. Delavay. 206. 1890; *Rubus obcordatus* (Franchet) Thuan.

Leaflets obovate, apex shallowly cordate or subtruncate. Pedicel and abaxial surface of calyx very sparsely bristly.

Slopes, roadsides, thickets; 300–1000 m. Guangxi, Guizhou, Sichuan, SE Xizang, Yunnan [India, Laos, Thailand, Vietnam].

32. *Rubus stimulans* Focke, Notes Roy. Bot. Gard. Edinburgh 5: 74. 1911.

华西悬钩子 hua xi xuan gou zi

Rubus chinensis Franchet (1890), not Thunberg (1813), nor Seringe (1825); *R. chinensis* Franchet var. *concolor* Cardot; *R. stimulans* var. *concolor* (Cardot) C. Y. Wu.

Shrubs 1–2 m tall. Branchlets brown or reddish brown to purplish brown, soft hairy at first, gradually glabrescent, glabrous when old, with needle-like prickles, with sparse, stalked glands. Leaves imparipinnate, 5–7-foliolate; petiole 4–8 cm, petiolule of terminal leaflet 1.5–3 cm, lateral leaflets subsessile, petiolule and rachis pubescent, with needle-like prickles, or with intermixed sparse, stalked glands; stipules lanceolate or linear lanceolate, 7–11 mm, pubescent or with sparse, stalked glands, blade of leaflets ovate to ovate-lanceolate, 4–8 × 2–6 cm, abaxially densely gray tomentose, adaxially sparsely pubescent, base rounded, often subtruncate on terminal leaflet, margin irregularly pinnate-lobed, sharply incised doubly serrate, apex acute to acuminate. Inflorescences terminal on short branchlets, 2- or 3-flowered, or flowers solitary in leaf axils; bracts linear, 5–8 mm, pubescent. Pedicel 1–2.5 cm, with abaxial surface of calyx pubescent, with needle-like prickles or with sparse, stipitate glandular hairs. Flowers 1.2–2 cm in diam. Calyx tube pelviform; sepals erect, spreading, ovate-lanceolate, 1.5–2 cm × 4–6 mm, margin gray tomentose, apex caudate. Petals pink or white with red spots, obovate or suborbicular, 5–6 mm in diam., much shorter than sepals, base pubescent and shortly clawed. Stamens numerous in 1 whorl, slightly shorter than or nearly as long as petals; filaments purplish red, linear. Pistils many, longer than stamens; style and ovary glabrous, rarely sparsely pilose. Aggregate fruit red, subglobose, 1–1.5 cm in diam., glabrous; pyrenes shallowly rugose or pitted. Fl. Jun–Jul, fr. Aug–Sep.

• Coniferous forests, thickets in mountainous areas; 2000–4100 m. SE Xizang, NW Yunnan.

33. *Rubus parvifolius* Linnaeus, Sp. Pl. 2: 1197. 1753.

茅莓 mao mei

Shrubs 1–2 m tall, with arching branches. Branchlets grayish brown or reddish brown to blackish brown, with soft hairs and sparse, curved prickles. Leaves imparipinnate, 3–5-foliolate; petiole 2.5–5 cm, terminal leaflet 1–2 cm, petiolulate, lateral leaflets sessile, with soft hairs and sparse, minute prickles; stipules linear, 7–10 mm, soft hairy; blade of leaflets

rhombic-orbicular or obovate, 2.5–6 × 2–6 cm, abaxially densely gray tomentose, adaxially appressed-pilose, base rounded or broadly cuneate, margin unevenly coarsely serrate or coarsely incised-doubly serrate, often lobed, apex obtuse or acute. Inflorescences terminal, corymbose, rarely short racemes, 4–8 cm, several to many flowered, axillary inflorescences corymbose; rachis and pedicels pubescent, with minute prickles; bracts linear, 6–10 mm, pubescent. Pedicel 0.5–1.5 cm. Flowers ca. 1 cm in diam. Calyx abaxially densely pubescent, with unequal long needle-like prickles; sepals erect, spreading, ovate-lanceolate or lanceolate, 5–8 × 2–4 mm, apex acuminate, occasionally lacinate. Petals pink to purplish red, ovate-orbicular or oblong, 4–6 × 3–4 mm, base clawed. Stamens numerous, somewhat shorter than petals; filaments white, linear. Pistils slightly longer than or ca. as long as stamens; ovary pubescent. Aggregate fruit red, ovoid-globose, 1–1.5 cm in diam., glabrous or somewhat pubescent; pyrenes shallowly rugose. Fl May–Jun, fr. Jul–Aug. 2n = 14*, 21*, 28*.

Forests, thickets, clearings, slopes, sunny valleys, roadsides, waste places; 400–2700 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea, Vietnam].

The fruit are eaten raw and are also used for making jam, jelly, juice, syrup, candy, wine, and vinegar. The dried fruit are used in traditional Chinese medicine. The young plants are used as a substitute for tea, and the stems and roots are a source of tannin.

- 1a. Leaves 5-foliolate 33c. var. *toapiensis*
- 1b. Leaves 3-foliolate.
 - 2a. Inflorescence rachis, pedicels, and abaxial surface of calyx without rust colored stalked glands 33a. var. *parvifolius*
 - 2b. Inflorescence rachis, pedicels, and abaxial surface of calyx with rust colored stalked glands 33b. var. *adenochlamys*

33a. *Rubus parvifolius* var. *parvifolius*

茅莓(原变种) mao mei (yuan bian zhong)

Rubus parvifolius subvar. *subconcolor* (Cardot) Masamune; *R. parvifolius* var. *subconcolor* (Cardot) Makino & Nemoto; *R. parvifolius* var. *triphyllus* (Thunberg) Nakai; *R. pauciflorus* Baker; *R. taquetii* H. Léveillé; *R. triphyllus* Thunberg; *R. triphyllus* var. *eglandulosus* L. H. Bailey; *R. triphyllus* var. *subconcolor* Cardot.

Leaves 3-foliolate. Inflorescence rachis, pedicels, and abaxial surface of calyx without rust colored stalked glands.

Mixed forested slopes, sunny valleys, roadsides, waste places; 400–2600 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea, Vietnam].

33b. *Rubus parvifolius* var. *adenochlamys* (Focke) Migo, J. Shanghai Sci. Inst. 3: 169. 1939.

腺花茅莓 xian hua mao mei

Rubus triphyllus Thunberg var. *adenochlamys* Focke, Bot. Jahrb. Syst. 36(Beibl. 82): 55. 1905; *R. adenochlamys* (Focke) Focke; *R. adenochlamys* var. *orientalis* F. P. Metcalf; *R. triphyllus* var. *oukiakiensis* Pampanini.

Leaves 3-foliolate. Inflorescence rachis, pedicels, and abaxial surface of calyx with rust colored stalked glands.

Sunny slopes, forests; 500–2700 m. Gansu, Hebei, Henan, Hubei, Hunan, Jiangsu, Qinghai, Shaanxi, Shanxi, Sichuan, Zhejiang [Japan].

33c. *Rubus parvifolius* var. *toapiensis* (Yamamoto) Hosokawa in Makino, Fl. Jap. Suppl. 352. 1936.

五叶红梅消 wu ye hong mei xiao

Rubus triphyllus Thunberg var. *toapiensis* Yamamoto, J. Soc. Trop. Agric. 4: 305. 1932.

Leaves 5-foliolate.

- Thickets, clearings; low elevations. E Taiwan.

34. *Rubus erythrocarpus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 299. 1982.

红果悬钩子 hong guo xuan gou zi

Shrubs 1–2 m tall. Branchlets reddish brown or purplish brown to purplish black, cylindric, glabrous, with ± slender prickles, without stalked glands. Leaves imparipinnate, usually 3-foliolate; petiole 4–7 cm, petiolule of terminal leaflet 1.5–3 cm, lateral leaflets subsessile, glabrous or pilose, rarely with sparse, stalked glands, with ± slender prickles; stipules linear or linear-lanceolate, 7–9 mm, glabrous; blade of leaflets 4–10 × 2.5–6 cm, terminal one ovate to ovate-lanceolate, base rounded to shallowly cordate, lateral leaflets ovate or elliptic, base broadly cuneate to rounded, abaxially densely gray tomentose, with sparse, slender prickles along veins, adaxially pilose, margin coarsely incised-doubly serrate or irregularly sharply serrate, apex acute to shortly acuminate. Inflorescences terminal or axillary, corymbose, 3–4(–5) cm, 3- or 4-flowered, sometimes flowers solitary in leaf axils; rachis and pedicels glabrous, with ± slender prickles, without stalked glands; bracts linear, 5–7 mm, glabrous. Pedicel 1–2.5 cm. Flowers 1.5–2 cm in diam. Calyx abaxially usually glabrous, with needle-like prickles, occasionally with sparse, stalked glands; sepals erect, rarely reflexed in fruit, lanceolate or ovate-lanceolate, 1–1.5 cm × 3–5 mm, often tomentose at margin, caudate. Petals pink, elliptic or obovate, shorter than sepals, puberulous. Stamens numerous in 1 whorl, shorter than petals; filaments linear. Pistils many, slightly shorter than stamens; ovary pilose. Aggregate fruit red, subglobose, 1–1.5 cm in diam., glabrous at maturity; pyrenes densely rugulose. Fl. Jul–Aug, fr. Sep–Oct.

- Rocky slopes, thickets, mixed forests; 3000–3800 m. NW Yunnan.

- 1a. Abaxial surface of calyx with few needle-like prickles, without stalked glands or occasionally with sparse, stalked glands 34a. var. *erythrocarpus*
- 1b. Abaxial surface of calyx with dense needle-like prickles

and stalked glands 34b. var. *weixiensis*

34a. *Rubus erythrocarpus* var. *erythrocarpus*

红果悬钩子(原变种) hong guo xuan gou zi (yuan bian zhong)

Abaxial surface of calyx with few needle-like prickles, without stalked glands or occasionally with sparse, stalked glands.

- Rocky slopes, thickets; 3000–3800 m. NW Yunnan.

34b. *Rubus erythrocarpus* var. *weixiensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 300. 1982.

腺萼红果悬钩子 xian e hong guo xuan gou zi

Abaxial surface of calyx with dense needle-like prickles and stalked glands.

- Mixed forests; below 3200 m. NW Yunnan (Weixi Xian).

35. *Rubus subornatus* Focke, Notes Roy. Bot. Gard. Edinburgh 5: 77. 1911.

美饰悬钩子 mei shi xuan gou zi

Shrubs 1–3 m tall. Branchlets grayish brown or brown to purplish red, initially soft hairy, glabrescent, glabrous when old, with sparse, slender prickles. Leaves imparipinnate, usually 3-foliolate. Petiole 4–8 cm, petiolule of terminal leaflet 1.5–3.5 cm, lateral leaflets shortly petiolulate or subsessile, with soft hairs or sparse prickles; stipules linear-lanceolate, 0.8–1.5 cm, pubescent; blade of leaflets broadly ovate to narrowly ovate, 4–8 × 2.5–5.5 cm, abaxially densely gray tomentose, adaxially pilose, basally rounded to shallowly cordate on terminal leaflet, broadly cuneate to subrounded on lateral leaflets, margin coarsely sharply serrate or incised-doubly serrate, sometimes pinnately lobed, apex shortly acuminate or acute. Inflorescences terminal, corymbose, 3–5 cm, 6–10-flowered, or flowers solitary or in clusters of 2 or 3 in leaf axils; rachis and pedicels pubescent, ± with needle-like prickles; bracts linear, 6–12 mm, pubescent. Pedicel 1–2.5 cm, sometimes with sparse, stipitate glands. Flowers 2–3 cm in diam. Calyx abaxially gray pubescent, intermixed tomentose, sometimes with needle-like prickles and stipitate glands; tube pelviform; sepals erect, spreading after anthesis, triangular-lanceolate, unequal in length, longer sepals to 1.5 cm, shorter sepals only (6–)7–10 mm, margin gray tomentose and entire, apex caudate. Petals purplish red, obovate, 7–10 × 5–7 mm, both surfaces puberulous, base shortly clawed. Stamens many in 1 whorl, slightly shorter than petals; filaments linear, glabrous. Pistils numerous, somewhat shorter than stamens; ovary ± pubescent. Aggregate fruit red, ovoid-globose, 8–11 mm in diam., glabrous or slightly pilose; pyrenes prominently rugose. Fl. May–Jun, fr. Aug–Sep.

Slopes, thickets, roadsides, forests, ravines; 1900–4000 m. W Sichuan, E Xizang, NW Yunnan [N Myanmar].

- 1a. Branchlets, petioles, and inflorescences without stipitate glands 35a. var. *subornatus*
- 1b. Branchlets, petioles, and inflorescences with purplish black or purplish brown stipitate glands 35b. var. *melanadenus*

35a. *Rubus subornatus* var. *subornatus*

美饰悬钩子(原变种) mei shi xuan gou zi (yuan bian zhong)

Rubus parvifolius Linnaeus f. *parce* Focke; *R. parvifolius* var. *purpureus* Y. Gu & W. L. Li; *R. subornatus* var. *concolor* Cardot; *R. subornatus* var. *fockei* H. Léveillé.

Branchlets, petioles, and inflorescences without stipitate glands.

Thickets on rocky slopes, mixed forests in valleys, ravines; 1900–4000 m. W Sichuan, SE Xizang, NW Yunnan [N Myanmar].

35b. *Rubus subornatus* var. *melanadenus* Focke, Biblioth. Bot. 19(Heft 83): 47. 1914.

黑腺美饰悬钩子 hei xian mei shi xuan gou zi

Rubus vicarius Focke.

Branchlets, petioles, and inflorescences with purplish black or purplish brown stipitate glands.

- Slopes, roadsides, thickets, forests; 2700–4000 m. W Sichuan, E Xizang, NW Yunnan.

36. *Rubus kulinganus* L. H. Bailey, Gentes Herb. 1: 30. 1920.

牯岭悬钩子 gu ling xuan gou zi

Shrubs 1–2 m tall. Branchlets brown or reddish brown, pubescent at first, glabrescent, glabrous when old, nearly unarmed or with sparse prickles. Leaves imparipinnate, 3-foliolate; petiole 5–9 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile or shortly petiolulate, pubescent, with sparse, needle-like prickles; stipules linear, 5–7 mm, pubescent; blade of leaflets lanceolate or oblong-lanceolate, 4–8(–10) × 1.5–3(–4) cm, abaxially densely gray tomentose, adaxially glabrous, base rounded or broadly cuneate, margin irregularly roughly sharply serrate, apex acuminate. Inflorescences usually terminal, corymbose or short racemes, (3–)4–5 cm, several to more than 10-flowered; rachis and pedicels pubescent; bracts lanceolate or linear, 5–6 mm, pubescent. Pedicel 0.5–1 cm. Flowers 6–9 mm in diam. Calyx abaxially densely white tomentose, with intermixed straight hairs; sepals erect in flower and fruit, ovate, 5–6 × 2–3 mm, apex acute, cuspidate. Petals purplish red, broadly elliptic or narrowly obovate, tomentose, base long clawed. Stamens many, nearly as long as petals; filaments broadened and flattened basally. Pistils numerous, nearly as long as or slightly shorter than stamens; ovary and base of style pubescent. Aggregate fruit red, subglobose, less than 1 cm in diam., pilose; pyrenes shallowly rugose. Fl. May–Jun, fr. Jul.

- Mixed forested slopes, hillsides; below 2000 m. Anhui Jiangxi, Zhejiang.

37. *Rubus mesogaeus* Focke, Bot. Jahrb. Syst. 29: 399. 1900.

喜阴悬钩子 xi yin xuan gou zi

Shrubs scandent, 1–4 m tall. Branchlets reddish brown or purplish brown, with soft hairs and sparse, needle-like prickles or nearly unarmed, old branches grayish brown, with sparse prickles broadened basally. Leaves imparipinnate, often 3-foliolate, rarely 5-foliolate; petiole 3–7 cm, petiolule of terminal

leaflet 1.5–4 cm, lateral leaflets shortly petiolulate or subsessile, petiolules and rachis pubescent, with sparse, curved minute prickles; stipules linear, to 1.2 cm, pubescent, margin entire; blade of leaflets variable in shape, terminal leaflet broadly rhombic-ovate or elliptic-ovate, base rounded to subcordate, margin often pinnate-lobed, apex acuminate, lateral leaflets obliquely elliptic or ovate, 4–9(–11) × 3–7(–9) cm, abaxially densely gray tomentose, adaxially appressed pubescent or glabrescent, base cuneate to rounded, margin unevenly coarsely serrate, often lobed, apex acute. Inflorescences terminal or axillary, corymbose, (2–)3–4.5 cm, shorter than petiole, several to more than 20-flowered; rachis and pedicels pubescent, with sparse, needle-like prickles; bracts linear, 7–10 mm, pubescent. Pedicel 6–12 mm. Flowers ca. 1 cm or more in diam. Calyx abaxially densely pubescent; sepals often reflexed after anthesis, lanceolate, (4–)5–8 × 3–4 mm, inner sepals with tomentose margin, apex acute to shortly acuminate. Petals white or pink, obovate, suborbicular, or elliptic, 5–6 × 4–5 mm, premorse, base slightly pubescent and shortly clawed. Stamens many, ca. as long as petals. Styles glabrous; ovary pilose. Aggregate fruit purplish black, compressed globose, 6–8 mm in diam., glabrous; pyrenes triangularly ovoid-globose, rugose. Fl. Apr–May, fr. Jul–Aug. $2n = 14^*$.

Forests, slopes, montane valleys, river banks, stream sides, near water courses, roadsides; 600–3600 m. Chongqing, Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, Japan, Nepal, Sikkim, Russia (Sakhalin)].

- 1a. Leaflets tomentose in fruit, glabrescent, subglabrous abaxially 37c. var. *glabrescens*
- 1b. Leaflets persistently tomentose abaxially.
 - 2a. Branchlets, petioles, and pedicel without stalked glands 37a. var. *mesogaeus*
 - 2b. Branchlets, petioles, and pedicels ± with stalked glands 37b. var. *oxycomus*

37a. *Rubus mesogaeus* var. *mesogaeus*

喜阴悬钩子(原变种) xi yin xuan gou zi (yuan bian zhong)

Rubus eous Focke; *R. euleucus* Focke ex Handel-Mazzetti; *R. idaeus* Linnaeus var. *exsuccus* Franchet & Savatier; *R. illudens* H. Léveillé; *R. kinashii* H. Léveillé & Vaniot; *R. kinashii* f. *macrophyllus* Cardot; *R. kinashii* f. *microphyllus* Cardot; *R. mesogaeus* var. *incisus* Cardot; *R. occidentalis* H. Léveillé; *R. occidentalis* var. *exsuccus* (Franchet & Savatier) Makino; *R. occidentalis* var. *japonicus* Miyabe; *R. rarissimus* Hayata.

Leaflets persistently tomentose abaxially. Branchlets, petioles, and pedicels without stalked glands.

Slopes, forest understories in montane valleys, river banks; 600–3600 m. Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, Japan, Nepal, Sikkim, Russia (Sakhalin)].

37b. *Rubus mesogaeus* var. *oxycomus* Focke, Bot. Jahrb. Syst. 29: 399. 1900.

腺毛喜阴悬钩子 xian mao xi yin xuan gou zi

Leaflets persistently tomentose abaxially. Branchlets, peti-

oles, and pedicels ± with stalked glands.

- Mixed forested slopes, montane valleys, roadsides, stream sides; below 2800 m. Gansu, Shaanxi, Sichuan, Yunnan.

37c. *Rubus mesogaeus* var. *glabrescens* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 300. 1982.

脱毛喜阴悬钩子 tuo mao xi yin xuan gou zi

Leaflets tomentose at first, glabrescent, subglabrous when old abaxially.

- Broad-leaved evergreen forests, near water courses; 2000–2200 m. Chongqing (Jinfo Shan), S Sichuan (Leibo Xian).

38. *Rubus subtibetanus* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 57: 268. 1920.

密刺悬钩子 mi ci xuan gou zi

Shrubs climbing, 1–2 m tall. Old branches brown or reddish brown, pubescent, with dense unequal needle-like prickles and basally broadened short prickles; branchlets dark green, more with dense, needle-like prickles. Leaves imparipinnate, 3–5-foliolate; petiole 2.5–4.5 cm, petiolule of terminal leaflet 1.5–2.5 cm, lateral leaflets subsessile, petiolules and rachis pubescent, with dense, needle-like prickles; stipules linear-lanceolate, 7–10 mm, pubescent; terminal leaflet broadly ovate to ovate-lanceolate, base truncate to subcordate, margin often pinnately lobed, apex acuminate, slightly longer than lateral leaflets, lateral leaflets oblique-elliptic or oblique-ovate, 2–5 × 1.5–4 cm, abaxially densely gray to yellowish gray tomentose, adaxially pubescent, margin irregularly or incised roughly serrate, base rounded or broadly cuneate, apex acute to shortly acuminate. Inflorescences terminal or axillary, corymbose, 2–4 cm; rachis and pedicels pubescent, with dense, needle-like prickles; bracts linear, 5–7 mm, pubescent. Pedicel 6–10 mm. Flowers 6–8 mm in diam. Calyx abaxially densely pubescent; sepals erect at anthesis, reflexed in fruit, narrowly ovate to ovate-lanceolate, 5–7 × 2–3 mm, apex acute to acuminate. Petals white, with red or purplish red spots, suborbicular or obovate, 5–6 mm in diam., slightly longer than sepals, base puberulous. Stamens many, somewhat shorter than petals; filaments linear, glabrous. Pistils slightly longer than stamens; ovary pubescent; styles glabrous. Aggregate fruit blue-black at maturity, subglobose, 6–8 mm in diam., puberulous; pyrenes smooth or rugulose. Fl. May–Jun, fr. Jun–Jul.

- Slopes, thickets, valleys; below 2300 m. Gansu, Shaanxi, Sichuan.

- 1a. Branchlets, petioles, pedicel, and abaxial surface of calyx without glandular hairs 38a. var. *subtibetanus*
- 1b. Branchlets, petioles, pedicel, and abaxial surface of calyx with dense, glandular hairs 38b. var. *glandulosus*

38a. *Rubus subtibetanus* var. *subtibetanus*

密刺悬钩子(原变种) mi ci xuan gou zi (yuan bian zhong)

Branchlets, petioles, pedicel, and abaxial surface of calyx without glandular hairs.

• Slopes, thickets, valleys; below 2300 m. Gansu, Shaanxi, Sichuan.

38b. *Rubus subtibetanus* var. *glandulosus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 300. 1982.

脱毛密刺悬钩子 tuo mao mi ci xuan gou zi

Branchlets, petioles, pedicel, and abaxial surface of calyx with dense, glandular hairs.

• Slopes, thickets, valleys; below 2300 m. Gansu, C Sichuan (Baoting Xian).

39. *Rubus biflorus* Buchanan-Hamilton ex Smith in Rees, Cycl. 30: *Rubus* no. 9. 1819.

粉枝莓 fen zhi mei

Shrubs climbing, 1–3 m tall. Branchlets purplish brown to brownish, glabrous, with sparse, robust curved prickles and glaucous bloom. Leaves imparipinnate, 3-foliolate, rarely 5-foliolate; petiole 2–4(–5) cm, petiolule of terminal leaflet 1–2.5 cm, lateral leaflets subsessile, glabrous, rarely pilose, sparsely stipitate glandular; stipules narrowly lanceolate, 6–8 mm, pubescent, with few stipitate glands; terminal leaflet blade broadly ovate or suborbicular, lateral blade of leaflets ovate or elliptic, 2.5–5 × 1.5–4(–5) cm, abaxially densely gray or yellowish gray tomentose, with sparse, minute prickles along midvein, adaxially appressed pubescent, base broadly cuneate to rounded, margin unevenly coarsely serrate or doubly serrate, often 3-lobed on terminal leaflet, apex acute or acuminate. Inflorescences terminal, rarely axillary, corymbs, 4–6 cm, often 4–8-flowered, or flowers 2 to several in clusters in leaf axils; rachis and pedicels glabrous, with needle-like prickles; bracts linear or narrowly lanceolate, 4–7 mm, glabrous, rarely pilose. Pedicel (1–) 2–3 cm. Flowers 1.5–2 cm in diam. Calyx abaxially glabrous; sepals erect, spreading at anthesis, broadly ovate or orbicular-ovate, 6–8 × 5–7 mm, apex acute, apiculate. Petals white, suborbicular, 7–8 mm in diam., longer than sepals. Stamens many, shorter than petals; filaments linear, broader at base. Pistils somewhat shorter than stamens; apex of ovary and base of style densely gray tomentose. Aggregate fruit enclosed in calyx, yellow, globose, 1–1.5(–2) cm in diam., glabrous; drupelets apically with persistently tomentose styles; pyrenes reniform, densely rugulose. Fl. May–Jun, fr. Jul–Aug.

Valleys, river sides, slopes, roadsides, thickets, forests, forest margins; 1500–3500 m. Gansu, Guizhou, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, NE India, Kashmir, Myanmar, Nepal, Sikkim].

1a. Petioles, pedicel, and abaxial surface of calyx glabrous, usually without stalked glands 39a. var. *biflorus*

1b. Petioles, pedicel, and abaxial surface of calyx hairy, with or without stalked glands.

2a. Petioles, pedicels, and abaxial surface of calyx tomentose, with sparse, stalked glands 39b. var. *adenophorus*

2b. Petioles, pedicel, and abaxial surface of calyx densely pubescent, without stalked

glands 39c. var. *pubescens*

39a. *Rubus biflorus* var. *biflorus*

粉枝莓(原变种) fen zhi mei (yuan bian zhong)

Rubus biflorus var. *quinqueflorus* Focke; *R. biflorus* var. *spinocalycinus* Y. Gu & W. L. Li.

Petioles, pedicel, and abaxial surface of calyx glabrous, often without stalked glands.

Valleys, river sides, mixed forests in mountainous regions; 1500–3500 m. Gansu, Guizhou, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, NE India, Kashmir, Myanmar, Nepal, Sikkim].

39b. *Rubus biflorus* var. *adenophorus* Franchet, Pl. Delavay. 207. 1890.

腺毛粉枝莓 xian ma fen zhi mei

Rubus biflorus f. *parceglanduliger* Focke.

Petioles, pedicel, and abaxial surface of calyx tomentose, with sparse, stalked glands.

• Forests, forest margins; below 3000 m. S Xizang, NW Yunnan.

39c. *Rubus biflorus* var. *pubescens* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 300. 1982.

柔毛粉枝莓 rou mao fen zhi mei

Petioles, pedicel, and abaxial surface of calyx densely pubescent, without stalked glands.

• Slopes, roadsides, thickets; below 2500 m. S Sichuan (Yanyuan Xian).

40. *Rubus alexeterius* Focke, Notes Roy. Bot. Gard. Edinburgh 5: 75. 1911.

刺萼悬钩子 ci e xuan gou zi

Shrubs 1–2 m tall. Old branches reddish brown, glabrous, glaucous and curved prickles 6–8 mm; flower bearing branchlets short, densely villous, with curved minute prickles. Leaves imparipinnate, 3-foliolate, rarely 5-foliolate; petiole 2.5–3.5 cm, petiolule of terminal leaflet 0.5–1 cm, lateral leaflets subsessile, petiolules and rachis densely villous, with sparse, curved minute prickles; stipules linear or subulate, 4–6 mm, villous; terminal leaflet rhombic, rarely ovate, lateral leaflets ovate or elliptic, 3–4(–5) × 1.5–3 cm, abaxially densely gray tomentose, adaxially appressed villous, base cuneate to rounded, margin irregularly sharply serrate or incised doubly serrate above middle, sometimes 3-lobed or incised-lobed on terminal leaflet, apex acute. Inflorescences clusters of 3 or 4 flowers at apex of short lateral branchlets, or flowers solitary in leaf axils. Pedicel 1–2(–3) cm, villous, with slender prickles. Flowers 1.5–2 cm in diam. Calyx 1.5–2 cm, abaxially villous, with needle-like prickles; tube pelviform; sepals erect, spreading, ovate-lanceolate or lanceolate, unequal in length, longer sepals to 1.5 cm, shorter sepals 6–10 mm, occasionally with sparse, glandular hairs, apex caudate and enlarged, sometimes divided. Petals white, suborbicular, shorter than sepals, base very shortly clawed. Stamens shorter than petals; filaments linear or basally somewhat broadened. Pistils many, shorter than stamens; ovary glabrous or to-

mentose only at apex; styles densely white tomentose basally. Aggregate fruit yellow, globose, 1.2–1.5(–2) cm in diam., glabrous, enclosed in calyx; drupelets apically with persistently tomentose styles; pyrenes reniform, shallowly rugulose. Fl. Apr–May, fr. Jun–Jul.

Montane valleys, stream sides, waste slopes, forested slopes, forest clearings and margins; 2000–3700 m. Sichuan, Xizang, Yunnan [Bhutan, Nepal].

- 1a. Petioles, pedicel, and abaxial surface of calyx without glandular hairs 40a. var. *alexeterius*
- 1b. Petioles, pedicel, and abaxial surface of calyx with prominent glandular hairs 40b. var. *acaenocalyx*

40a. *Rubus alexeterius* var. *alexeterius*

刺萼悬钩子(原变种) *ci e xuan gou zi (yuan bian zhong)*

Petioles, pedicel, and abaxial surface of calyx without glandular hairs.

Montane valleys, stream sides, waste slopes, forest clearings; 2000–3700 m. Sichuan, S Xizang, NW Yunnan [Bhutan, Nepal].

40b. *Rubus alexeterius* var. *acaenocalyx* (H. Hara) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 37: 77. 1985.

腺毛刺萼悬钩子 *xian mao ci e xuan gou zi*

Rubus acaenocalyx H. Hara, J. Jap. Bot. 47: 109. 1972.

Petioles, pedicel, and abaxial surface of calyx with prominent glandular hairs.

Forested slopes, forest margins; 2000–3200 m. Sichuan, Xizang, Yunnan [Bhutan, C Nepal].

41. *Rubus pedunculatus* D. Don, Prodr. Fl. Nepal. 234. 1825.

密毛细悬钩子 *mi mao xian xi xuan gou zi*

Rubus gracilis Roxburgh (1824), not J. Presl & C. Presl (1822); *R. gracilis* Roxburgh var. *chiliacanthus* Handel-Mazzetti; *R. gracilis* Roxburgh var. *pluvialis* Handel-Mazzetti; *R. hypargyrus* Edgeworth; *R. hypargyrus* var. *niveus* H. Hara; *R. niveus* Wallich ex G. Don (1832), not Thunberg (1813); *R. pedunculatus* var. *hypargyrus* (Edgeworth) Kitamura.

Shrubs. Branchlets brownish to reddish brown, initially pubescent, gradually glabrescent, with few prickles or nearly unarmed. Leaves imparipinnate, 3-foliolate, rarely 5-foliolate; petiole 3–5 cm, with rachis pubescent, with sparse, minute prickles; stipules linear or linear-lanceolate, 5–8 mm, soft hairy; blade of leaflets ovate or broadly ovate, rarely ovate-lanceolate, 2.5–6 × 2–5 cm, abaxially densely persistent tomentose, adaxially pubescent, glabrescent, base subrounded to shallowly cordate, margin irregularly incised roughly sharply doubly serrate, apex acute to acuminate. Inflorescences corymbose, several flowered. Pedicel 1.5–3.5 cm, soft hairy. Flowers 1.5–2 cm in diam. Calyx to ca. 1.5 cm, abaxially pubescent; tube pelviform; sepals erect after anthesis, narrowly ovate to ovate-lanceolate, 1–1.2 cm × 3–6 mm, margin tomentose, apex long acuminate or caudate. Petals pink, ovate, 7–10 × 4–6 mm, shorter than sepals,

base shortly clawed, apex slightly incised or entire. Stamens many. Pistils somewhat shorter than or nearly as long as stamens; ovary sericeous, soft hairy. Aggregate fruit initially yellow, black at maturity, ovoid-globose.

Forested slopes, thickets, logged lands; 2700–3200 m. SE Xizang, W Yunnan [Bhutan, NW India, Kashmir, Nepal, Sikkim].

42. *Rubus inopertus* (Focke) Focke, Biblioth. Bot. 17(Heft 72): 182. 1911.

红花悬钩子 *hong hua xuan gou zi*

Shrubs climbing, 1–2 m tall. Branchlets brownish to purplish brown, angled, glabrous, with sparse, curved prickles. Leaves imparipinnate, 7–11-foliolate, rarely 5-foliolate; petiole 3.5–6 cm, purplish brown, petiolule of terminal leaflet 0.6–2(–3) cm, lateral leaflets subsessile, petiolules and rachis glabrous or slightly pubescent, with sparse, curved minute prickles; stipules linear-lanceolate, 3–5 mm, glabrous or margin slightly puberulous, margin entire; blade of leaflets ovate to ovate-lanceolate, (2–)3–7 × 1–3 cm, abaxially pubescent along veins, adaxially pilose, base rounded or subtruncate, margin coarsely sharp doubly serrate, apex acuminate. Inflorescences terminal, corymbs, 2–4 cm, several flowered, or flowers several in clusters; rachis and pedicels glabrous, unarmed; bracts linear-lanceolate, 3–5 mm, glabrous or slightly puberulous. Pedicel (0.7–)1–1.5 cm. Flowers 1–1.2 cm in diam. Calyx abaxially glabrous; tube pelviform; sepals erect at anthesis, reflexed in fruit, narrowly ovate or triangular-ovate, 4–7 × 2–4 mm, inner sepals tomentose at margin, apex acute to acuminate. Petals pink to purplish red, obovate, 5–7 × 4–6 mm, base puberulent and shortly clawed. Stamens numerous, slightly shorter than or nearly as long as petals; filaments linear or broadened basally. Pistils slightly shorter than or ca. as long as stamens; ovary and base of style soft hairy. Aggregate fruit purplish black at maturity, globose, 8–9 mm in diam., thinly pubescent; pyrenes rugulose. Fl. May–Jun, fr. Jul–Aug. $2n = 14^*$.

Dense forests in mountainous regions, river valleys, rocky slopes; 800–2800 m. Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Taiwan, Yunnan [Vietnam].

- 1a. Abaxial surface of calyx without needle-like prickles 42a. var. *inopertus*
- 1b. Abaxial surface of calyx with needle-like prickles 42b. var. *echinocalyx*

42a. *Rubus inopertus* var. *inopertus*

红花悬钩子(原变种) *hong hua xuan gou zi (yuan bian zhong)*

Rubus niveus Thunberg subsp. *inopertus* Focke, Bot. Jahrb. Syst. 29: 400. 1900; *R. fraxinifolius* Poir. var. *yushunii* Suzuki & Yamamoto; *R. ohwianus* Koidzumii; *R. ritozanensis* Sasaki; *R. yamamotoanus* H. L. Li; *R. yushunii* (Suzuki & Yamamoto) Suzuki & Yamamoto.

Abaxial surface of calyx without needle-like prickles.

Dense forests in mountainous regions, river valleys, rocky slopes; 800–2800 m. Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Taiwan, Yunnan [Vietnam].

42b. *Rubus inopertus* var. *echinocalyx* Cardot, Notul. Syst.

(Paris) 3: 310. 1914.

刺萼红花悬钩子 *ci e hong hua xuan gou zi*

Abaxial surface of calyx with needle-like prickles.

• Yunnan.

43. *Rubus wilsonii* Duthie, Bull. Misc. Inform. Kew 1912: 36. 1912.

湖北悬钩子 *hu bei xuan gou zi*

Shrubs scandent, 1–2 m tall. Branches brownish purple, cylindric, with many curved prickles and glaucous bloom; branchlets purplish red, prominently angled, glabrous, with sparse, small curved prickles. Leaves imparipinnate, 5-foliolate; petiole brownish purple, 5–6 cm, petiolule of terminal leaflet 2.5–3 cm, lateral leaflets subsessile, petiolule and rachis glabrous, with sparse, curved minute prickles; stipules lanceolate or oblong-lanceolate, 8–11 × 2–4 mm, glabrous, apex acuminate; blade of leaflets 4–6 × 2.5–5.5 cm, membranous, abaxially paler, glabrous or somewhat puberulous along veins, or with sparse, curved small prickles along midvein, adaxially green, glabrous, slightly rugulose, margin coarsely doubly serrate; terminal leaflet broadly ovate or suborbicular, base subcordate, rarely rounded, sometimes 3-lobed above middle, apex acute, rarely somewhat obtuse, lateral leaflets ovate, base obliquely rounded to subtruncate, margin not divided, apex acute to shortly acuminate. Inflorescences terminal, shortly corymbose, 4- or 5-flowered, or flowers in clusters of 2 or 3 in leaf axils; rachis and pedicels glabrous, with few small curved prickles; bracts lanceolate or oblong-lanceolate, 6–9 × 2–3 mm, glabrous, apex acuminate. Pedicel 6–12 mm. Flowers 1.2–1.4 cm in diam. Calyx dark brownish purple, glabrous; tube pelviform; sepals erect at anthesis, reflexed in fruit, broadly ovate, 6–8 × 5–7 mm, caudate, inner sepals marginally tomentose. Petals purplish red, suborbicular, 8–9 mm in diam., base broadly shortly clawed, margin erose. Stamens many, slightly shorter than petals. Pistils longer than stamens; style and ovary densely villous. Fruit unknown. Fl. May–Jun.

• Mountainous areas. Hubei.

44. *Rubus amabilis* Focke, Bot. Jahrb. Syst. 36(Beibl. 82): 53. 1905.

秀丽莓 *xiu li mei*

Shrubs 1–3 m tall. Branches purplish brown or dark brown, glabrous, with sparse prickles; flower bearing branchlets short, soft hairy, with minute prickles. Leaves imparipinnate, 7–11-foliolate; petiole 1–3 cm, petiolule of terminal leaflet ca. 1 cm, lateral leaflets subsessile, petiolule and rachis pubescent when young, gradually glabrescent, glabrous or subglabrous, with sparse, small prickles; stipule linear-lanceolate, 5–8 mm, soft hairy; blade of leaflets ovate or ovate-lanceolate, 1–5.5 × 0.8–2.5 cm, usually apical ones larger than basal ones, abaxially soft hairy and with small prickles along veins, adaxially glabrous or sparsely appressed-hairy, base subrounded, sometimes subcuneate on terminal leaflet, margin incised-doubly serrate, occasionally 2- or 3-lobed on terminal leaflet, apex acute, often acuminate on terminal leaflet. Inflorescences 1-flowered, terminal on lateral branchlets, pendent. Pedicel 2.5–6 cm, with

soft hairs and sparse, minute prickles, sometimes with intermixed sparse, stipitate glands. Flowers 3–4 cm in diam. Calyx green, tinged red, abaxially pubescent, unarmed, rarely with short needle-like prickles or stipitate glands; tube pelviform; sepals spreading, broadly ovate, 1–1.5 cm × 5–8 mm, apex acuminate or abruptly pointed. Petals white, suborbicular, 1–1.7 cm in diam., longer than or nearly as long as sepals, base shortly clawed and pubescent. Stamens numerous, slightly shorter than petals; filaments whitish, linear, broadened basally. Pistils shorter than stamens; ovary pubescent; styles greenish, glabrous. Aggregate fruit red, oblong; rarely ellipsoid, (0.8–)1.5–2.5 × 1–1.2 cm, sparsely pubescent when young, glabrescent; pyrenes reniform, somewhat reticulate. Fl. Apr–May, fr. Jul–Aug.

• Foothills, montane valleys, ravines, slopes, forests, forest margins, thickets, roadsides; 1000–3700 m. Chongqing, Gansu, Henan, Hubei, Qinghai, Shaanxi, Shanxi, Sichuan.

The fruit are edible.

- 1a. Abaxial surface of calyx unarmed, rarely with sparse, short needle-like prickles or stipitate glands; aggregate fruit oblong, rarely ellipsoid, 15–25 mm 44a. var. *amabilis*
- 1b. Abaxial surface of calyx ± with needle-like prickles, without or with stipitate glands; aggregate fruit not longer than 14 mm.
 - 2a. Abaxial surface of calyx with sparse, needle-like prickles, without stipitate glands; aggregate fruit ovoid-globose or ellipsoid, 8–13 mm 44b. var. *microcarpus*
 - 2b. Abaxial surface of calyx with dense needle-like prickles, with sparse, stipitate glands; aggregate fruit narrowly ovoid, 9–14 mm 44c. var. *aculeatissimus*

44a. *Rubus amabilis* var. *amabilis*

秀丽莓(原变种) *xiu li mei* (*yuan bian zhong*)

Abaxial surface of calyx unarmed, rarely with sparse, short needle-like prickles or stalked glands. Aggregate fruit oblong, rarely ellipsoid, 1.5–2.5 cm.

• Foothills, ravines, thickets in valleys; 1000–3700 m. Gansu, Henan, Hubei, Qinghai, Shaanxi, Shanxi, Sichuan.

44b. *Rubus amabilis* var. *microcarpus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 301. 1982.

小果秀丽莓 *xiao gou xiu li mei*

Abaxial surface of calyx with sparse, needle-like prickles, without stipitate glands. Aggregate fruit ovoid-globose or ellipsoid, 0.8–1.3 cm.

• Montane valleys, slopes, forests, thickets; 2000–3500 m. Gansu, Qinghai.

44c. *Rubus amabilis* var. *aculeatissimus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 301. 1982.

刺萼秀丽莓 *ci e xiu li mei*

Abaxial surface of calyx with dense needle-like prickles, with sparse, stalked glands. Aggregate fruit narrowly ovoid, 0.9–1.4 cm.

• Forest margins, roadsides; 1900–2600 m. Chongqing (Nanchuan Xian), N Sichuan (Pingwu Xian).

45. *Rubus ptilocarpus* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 301. 1982.

毛果悬钩子 *mao guo xuan gou zi*

Shrubs 1–2 m tall. Old branches purplish brown or brown, glabrous, prickly; flower bearing branchlets brownish, pubescent, with intermixed glandular hairs, with sparse, minute prickles. Leaves imparipinnate, 7–11-foliolate; petiole 2–3(–4) cm, petiolule of terminal leaflet 0.6–2 cm, lateral leaflets subsessile, petiolule and rachis pubescent, with intermixed glandular hairs, with minute prickles; stipules linear or linear-lanceolate, (5–)6–8 mm, pubescent or with glandular hairs; blade of leaflets ovate, ovate-lanceolate, or rhombic-ovate, 1.5–4(–6) × 1–3(–4) cm, both surfaces soft hairy, base rounded, rarely subcordate, margin deeply incised-doubly serrate, sometimes pinnate-lobed on terminal leaflet, apex acute, or shortly acuminate on terminal leaflet. Inflorescences terminal, rarely axillary, 1–3-flowered; bracts linear to linear-lanceolate, shorter than stipules, with soft hairs or glandular hairs. Pedicel 1.5–3(–6) cm, with soft hairs and intermixed glandular hairs, with sparse, minute prickles or unarmed. Flowers to 2 cm in diam. Calyx abaxially pubescent, with intermixed glandular hairs; tube broad and short, often unarmed; sepals spreading or rarely reflexed, ovate to ovate-lanceolate or narrowly lanceolate to linear-lanceolate, unequal, longer sepals to 1.8 cm, shorter sepals 6–7 mm, apex long acuminate or long caudate. Petals oblong, shorter than sepals. Stamens many; filaments linear. Ovary with dense grayish yellow or gray slender soft hairs. Aggregate fruit blackish red, subglobose, 1–1.2 cm in diam., densely grayish yellow or gray slender pubescent; pyrenes reniform, slightly rugulose. Fl. May–Jun, fr. Jul–Aug.

• Shaded slopes, river valleys, forests, grasslands; 2300–4100 m. Qinghai, W Sichuan, NE Yunnan.

- 1a. Flowers usually 1–3; pedicel 1.5–3 cm; sepals ovate to ovate-lanceolate, to 12 mm, apex long acuminate 45a. var. *ptilocarpus*
 1b. Flowers often solitary; pedicel to 6 cm; sepals narrowly lanceolate to linear-lanceolate, to 18 mm, apex long caudate 45b. var. *degensis*

45a. *Rubus ptilocarpus* var. *ptilocarpus*毛果悬钩子(原变种) *mao guo xuan gou zi (yuan bian zhong)*

Flowers often 1–3. Pedicel 1.5–3 cm. Sepals ovate to ovate-lanceolate, to 1.2 cm, apex long acuminate.

• Shaded slopes, river valleys, forests, grasslands; 2300–4100 m. Qinghai, W Sichuan, NE Yunnan.

45b. *Rubus ptilocarpus* var. *degensis* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 302. 1982.

长萼毛果悬钩子 *chang e mao guo xuan gou zi*

Flowers usually solitary. Pedicel to 6 cm. Sepals narrowly lanceolate to linear-lanceolate, to 1.8 cm, apex long caudate.

• Coniferous forests. NW Sichuan (Dêgê Xian).

46. *Rubus lutescens* Franchet, *Pl. Delavay.* 206. 1890.

黄色悬钩子 *huang se xuan gou zi*

Rubus lutescens f. *glabrescens* Cardot.

Subshrubs low, 10–50 cm tall. Stems upright, ± solitary; flower bearing branchlets arising from rhizome, grayish brown, reddish brown in age, finely pubescent, with sparse, unequal long straight or somewhat curved prickles. Leaves imparipinnate, 7–11-foliolate, sometimes 5-foliolate on apical part of flower bearing branchlet; petiole 2–3 cm, petiolule of terminal leaflet 0.7–1.5 cm, lateral leaflets subsessile, petiolule and rachis with fine soft hairs and minute, curved prickles, occasionally with sparse, glandular hairs; stipules variable, stipules in proximal part of branches larger, ovate-lanceolate, 6–9 mm, margin entire, rarely lobed, stipules apically of branches narrower, linear, 5–7 mm, not divided, finely soft hairy; blade of leaflets broadly ovate or rhombic-ovate, rarely oblong, 1.5–5 × 1–3(–4) cm, both surfaces soft hairy, abaxially more dense along veins, with sparse, minute prickles along veins, base rounded, margin unevenly serrate or incised-doubly serrate, sometimes pinnate-lobed on terminal leaflet, apex acute, rarely obtuse, or shortly acuminate on terminal leaflet. Inflorescences terminal or axillary, 1- or 2-flowered, sometimes 3 or 4 flowers terminal on short branchlets; bracts similar to stipules, but smaller. Pedicel 2–3(–4) cm, thinly pubescent, with sparse, minute prickles, sometimes with sparse, glandular hairs. Flowers 2–3 cm in diam. Calyx abaxially thinly pubescent; tube without or with sparse, minute prickles; sepals spreading, rarely reflexed in fruit, ovate-lanceolate to lanceolate, 0.9–1.2 cm × 3.5–5 mm, apex acuminate or shortly caudate. Petals white, turning yellowish, obovate or suborbicular, 5–7.5 × 5–6 mm, base shortly clawed. Stamens many, shorter than petals; filaments linear, broadened basally; anthers yellowish. Pistils numerous, slightly shorter than stamens. Ovary densely gray thinly pubescent. Aggregate fruit yellowish red, globose, 1.4–2 cm in diam., densely thinly pubescent; pyrenes ovoid-globose, shallowly reticulate. Fl. May–Jun, fr. Jul–Aug.

• Forest margins on slopes, mixed forests, stony places; 2500–4300 m. Sichuan, E Xizang, Yunnan.

47. *Rubus taiwanicola* Koidzumi & Ohwi, *J. Jap. Bot.* 12: 657. 1936.

小叶悬钩子 *xiao ye xuan gou zi*

Rubus elegans Hayata (1906), not P. J. Mueller (1858), nor Utsch (1885), nor Sudre (1898).

Subshrubs ca. 10 cm tall. Stems ascending, brown, glabrescent. Leaves imparipinnate, to 10 cm, 9–15-foliolate; petiole 1–2 cm, petiolule of terminal leaflet shorter, 2–4 mm, lateral leaflets sessile or subsessile, petiolule and purplish red rachis glabrous, with curved minute prickles; stipules lanceolate or linear-lanceolate, 6–10 mm, glabrous; blade of leaflets elliptic

to broadly oblong, lateral leaflets sometimes obovate, 0.7–1.5 cm × 5–9 mm, both surfaces glabrous, only sparsely pubescent along midvein abaxially, base cuneate, margin sharply serrate above middle, becoming entire toward base, apex acute or obtuse. Inflorescences with flowers solitary or in pairs; bracts linear-lanceolate, 3–5 mm, glabrous. Pedicel 2–4 cm, glabrous, with curved minute prickles. Flowers 1–2 cm in diam. Calyx abaxially glabrous or sparsely soft hairy; sepals erect in fruit, ovate or triangular-ovate, 6–8 × 2–4 mm, margin slightly tomentose, apex shortly caudate. Petals white, broadly ovate to suborbicular, rarely oblong, 7–10 × 5–6 mm, glabrous or sparsely hairy, base shortly clawed, apex obtuse or rounded. Stamens many, shorter than petals; filaments linear or somewhat broadened and flattened. Pistils numerous, shorter than stamens; style and ovary glabrous. Aggregate fruit red, subglobose, 7–9(–12) mm in diam., glabrous. Fl. Jun–Jul, fr. Aug–Sep. $2n = 14^*$.

- Mountains; 1500–3000 m. C Taiwan.

48. *Rubus wallichianus* Wight & Arnott in Wight, Catal. 61. 1833.

红毛悬钩子 hong mao xuan gou zi

Rubus ellipticus Smith subsp. *fasciculatus* (Duthie) Focke; *R. ellipticus* var. *fasciculatus* (Duthie) Masamune; *R. erythrolasius* Focke; *R. fasciculatus* Duthie; *R. pinfaensis* H. Léveillé & Vaniot.

Shrubs climbing, 1–2 m tall. Branchlets reddish brown, grayish brown in age, robust, angled, pubescent, with sparse, curved prickles, with dense, spreading reddish brown bristles to 7 mm. Leaves imparipinnate, usually 3-foliolate; petiole 2–4.5 cm, petiolule of terminal leaflet 1.5–3 cm, lateral leaflets subsessile, reddish brown bristly, pubescent, with sparse prickles; stipules linear, 0.7–1.4 cm, pubescent, intermixed sparsely setose; blade of leaflets elliptic or ovate, rarely obovate, 4–9(–12) × 3–7(–10) cm, terminal leaflet larger than lateral leaflets, midvein and veins raised abaxially, impressed adaxially, often sparsely setose, with minute prickles, abaxially dark green, glabrous or slightly pubescent along midvein, adaxially slightly pale, pilose only along veins, base rounded or broadly cuneate, margin irregularly sharply serrate, apex acuminate to caudate, rarely nearly acute. Inflorescences clusters of 4–8 flowers in leaf axils, rarely flowers solitary; bracts linear or linear-lanceolate, 6–10 mm, pubescent. Pedicel 4–7 mm, pubescent, intermixed setose, with minute prickles. Flowers 1–1.3 cm in diam. Calyx abaxially densely tomentose; sepals erect in fruit, broadly ovate or triangular-ovate, 5–7 × 4–5 mm, apex subacute, abruptly long pointed. Petals white, spatulate to elliptic-obovate, 6–10 × 4–6 mm, both surfaces tomentose, base clawed, apex rounded to acute. Stamens many, shorter than petals; filaments linear, but somewhat broadened and flattened. Pistils slightly shorter than or nearly as long as stamens; apex of ovary and base of style soft hairy. Aggregate fruit golden or reddish yellow at maturity, globose, 5–8 mm in diam., glabrous; pyrenes deeply rugose. Fl. Mar–Apr, fr. May–Jun. $2n = 14^*$.

Thickets on slopes, mixed forests, montane valleys, ravines, stream sides, cliffs; 300–2200 m. Guangxi, Guizhou, Hubei, Hunan, Si-

chuan, Taiwan, Yunnan [Bhutan, India, Nepal, Sikkim, Vietnam].

49. *Rubus coreanus* Miquel, Ann. Mus. Bot. Lugduno-Batavi 3: 34. 1867.

插田泡 cha tian pao

Shrubs 1–3 m tall. Branchlets reddish brown to purplish brown, cylindrical, robust, glabrous, with ± straight flattened curved prickles and glaucous bloom. Leaves imparipinnate, 5-foliolate, rarely 3-foliolate; petiole 2–5 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets subsessile, petiolule and rachis pubescent, with sparse, curved minute prickles; stipules linear-lanceolate, 4–7 mm, soft hairy; blade of leaflets ovate, rhombic ovate, or broadly ovate, (2–)3–8 × 2–5 cm, abaxially pubescent or only along veins or shortly tomentose, adaxially glabrous or pubescent only along veins, base cuneate to subrounded, margin irregularly coarse serrate to incised coarsely serrate, sometimes 3-lobed on terminal leaflet, apex acute. Inflorescences terminal on lateral short branchlets, corymbose, 2.5–5 cm, several to more than 30-flowered; rachis and pedicels gray pubescent, with sparse, curved minute prickles; bracts linear, nearly as long as or slightly shorter than stipules, pubescent. Pedicel 5–10 mm. Flowers 7–10 mm in diam. Calyx abaxially gray pubescent; tube shallowly cupular; sepals spreading at anthesis, reflexed in fruit, narrowly ovate to ovate-lanceolate, 4–7 × 2–3.5 mm, margin tomentose, apex acuminate to caudate. Petals pink to dark red, obovate, premorse, nearly as long as or somewhat shorter than sepals. Stamens numerous, shorter than or ca. as long as petals; filaments pinkish, linear. Pistils slightly shorter than stamens; ovary sparsely pubescent; styles glabrous. Aggregate fruit dark red or purplish black, subglobose, 5–8 mm in diam., glabrous or subglabrous; pyrenes rugose. Fl. Apr–Jun, fr. Jun–Aug. $2n = 14$.

Thickets on slopes, montane valleys, ravines, river banks, roadsides; 100–3100 m. Anhui, Fujian, Gansu, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Xinjiang, Yunnan, Zhejiang [Japan, Korea].

- 1a. Leaflets sparsely pubescent or pubescent only along veins abaxially 49a. var. *coreanus*
- 1b. Leaflets densely shortly tomentose abaxially 49b. var. *tomentosus*

49a. *Rubus coreanus* var. *coreanus*

插田泡(原变种) cha tian pao (yuan bian zhong)

Rubus coreanus var. *kouytchensis* (H. Léveillé) H. Léveillé; *R. coreanus* var. *nakaianus* H. Léveillé; *R. pseudosaxatilis* H. Léveillé; *R. pseudosaxatilis* var. *kouytchensis* H. Léveillé; *R. nakaianus* H. Léveillé ex Nakai; *R. quelpaertensis* H. Léveillé.

Leaflets sparsely pubescent or pubescent only along veins abaxially.

Thickets on slopes, montane valleys, river banks, roadsides; 100–1700 m. Anhui, Fujian, Gansu, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Xinjiang, Yunnan, Zhejiang [Japan, Korea].

49b. *Rubus coreanus* var. *tomentosus* Cardot, Notul. Syst.

(Paris) 3: 310. 1914.

毛叶插田泡 *mao ye cha tian pao*

Leaflets densely shortly tomentose abaxially.

• Thickets on slopes, montane valleys, ravines; 800–3100 m. Anhui, Gansu, Guizhou, Henan, Hubei, Hunan, Shaanxi, Sichuan, Yunnan.

50. *Rubus subcoreanus* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 302. 1982.

柱序悬钩子 *zhu xu xuan gou zi*

Shrubs erect, 1–2 m tall, with arching branches. Branchlets reddish brown, glabrous, without glaucous bloom, with straight or somewhat curved prickles. Leaves imparipinnate, usually 5-foliolate; petiole 2–4 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets sessile or subsessile, together with petiolule and rachis thinly pubescent, with sparse, minute prickles; stipules linear-lanceolate, puberulous; blade of leaflets ovate, broadly ovate, or rhombic-ovate, 2–6 × 1.5–4 cm, abaxially glabrous or pilose only along veins, adaxially glabrous or sparsely pubescent, base cuneate or broadly cuneate, rarely subrounded, margin incised coarsely sharply serrate or doubly serrate, sometimes pinnate-lobed on terminal leaflet, apex acute. Inflorescences terminal on lateral branchlets, racemes, compact, cylindrical, short; rachis and pedicels densely grayish yellow villous; bracts lanceolate, grayish yellow villous. Pedicel 5–10 mm. Flowers 5–8 mm in diam. Calyx abaxially densely grayish yellow villous; sepals erect, spreading, ovate or broadly ovate, 3–5 mm, margin not tomentose, apex obtuse or acute, abruptly shortly pointed. Petals purplish red, spatulate, rarely obovate, ca. 2 × or longer than sepals, base shortly clawed, soft hairy. Stamens many; filaments purplish red, linear, basally slightly broadened and flattened. Pistils numerous; ovary densely gray villous; styles glabrous. Aggregate fruit red, subglobose, 6–8 mm in diam., glabrous or subglabrous. Fl. May–Jun, fr. Jul–Aug.

• Slopes, thickets along stream sides or ditches, riverbank bluffs; 900–1500 m. Gansu, Henan, Shaanxi.

51. *Rubus spananthus* Z. M. Wu & Z. L. Cheng, *Bull. Bot. Res.*, Harbin 11(4): 53. 1991.

少花悬钩子 *shao hua xuan gou zi*

Shrubs scandent, 1–2 m tall. Branches brownish or reddish brown, with sparse prickles, villous when young. Leaves imparipinnate, 3-foliolate; petiole 3–6 cm, petiolule of terminal leaflet ca. 2 cm, lateral leaflets subsessile, sparsely villous, with minute prickles; stipules persistent, linear, ca. 7 mm, villous; blade of leaflets narrowly ovate or narrowly ovate-lanceolate, 4–8 × 2–4.5 cm, terminal leaflet slightly longer than lateral leaflets, lateral veins 8–10 pairs, abaxially villous along veins, with sparse, curved prickles along midvein, adaxially sparsely appressed villous, base obliquely broadly cuneate or subrounded, or rounded to subcordate on terminal leaflet, margin unevenly coarsely sharply serrate, apex acuminate to long acuminate. Inflorescences terminal on lateral short branchlets, corymbose or short racemes, shorter than petioles, several to 10-flowered; rachis and pedicels densely villous; bracts linear,

soft hairy. Pedicel 5–10 mm. Flowers ca. 1 cm in diam. Calyx abaxially tomentose, intermixed villous; sepals ovate-lanceolate, 5–7 mm, subulate-caudate. Petals purplish red, narrowly obovate, abaxially soft hairy in middle part, base long clawed. Stamens numerous; filaments complanate. Pistils 20–40; ovary and base of style soft hairy. Fruit unknown. Fl. May–Jun.

• Thickets on mountain slopes; 400–900 m. W Anhui (Dabie Shan, Jinzhai Xian).

52. *Rubus stans* Focke, *Notes Roy. Bot. Gard. Edinburgh* 5: 76. 1911.

直立悬钩子 *zhi li xuan gou zi*

Shrubs 1–2 m tall. Branchlets brownish to dark brown, sometimes blackish, pubescent, with intermixed glandular hairs and prickles; flower bearing branchlets lateral, 5–8 cm, pubescent, with intermixed glandular hairs. Leaves imparipinnate, 3-foliolate; petiole 2–3.5 cm, petiolule of lateral leaflet 0.5–1.5(–2) cm, lateral leaflets subsessile, pubescent, with intermixed glandular hairs, with sparse, minute prickles; stipules linear, 0.6–1 cm, pubescent, with glandular hairs; blade of leaflets broadly ovate to narrowly ovate, rarely suborbicular, 2–4 × 1.8–3 cm, terminal leaflet slightly longer than lateral leaflets, both surfaces appressed pubescent, more densely so and with glandular hairs along veins abaxially, base rounded, usually subtruncate on terminal leaflet, margin with sparse, glandular hairs and irregularly minute sharply serrate, sometimes 3-lobed on terminal leaflet, apex obtuse or acute. Inflorescences terminal on lateral branchlets, corymbose, 2–4 cm, 3- or 4-flowered or more, or flowers solitary in leaf axils; rachis and pedicels with soft hairs, intermixed glandular hairs, and sparse, minute prickles; bracts linear, 4–7 mm, pubescent, with stalked glands. Pedicel (1–)1.5–3 cm. Flowers 1–1.5 cm in diam. Calyx purplish red, abaxially densely pubescent, with stalked glands, unarmed or with needle-like prickles; tube pelviform; sepals erect, lanceolate, 0.8–1.4 cm × 2.5–5 mm, apex acuminate. Petals white, tinged purplish, or purplish red, broadly elliptic or oblong, 5–6 mm in diam., slightly shorter than sepals, base shortly and broadly clawed, margin entire or sometimes erose. Stamens many, shorter than petals; filaments linear, basally broadened and flattened. Pistils somewhat shorter than stamens; ovary sparsely pubescent, glabrescent; styles glabrous. Aggregate fruit orange-red, subglobose, 8–11 mm in diam., glabrous; pyrenes somewhat reniform, alveolate. Fl. May–Jun, fr. Jul–Aug.

• High montane forests, coniferous forests, forest margins, open stony thickets; 2000–4000 m. Qinghai, Sichuan, E Xizang, Yunnan.

The fruit are edible.

- 1a. Branchlets with sparse prickles; abaxial surface of calyx unarmed or with sparse, minute needle-like prickles; petals white or tinged purplish 52a. var. *stans*
- 1b. Branchlets densely prickly; abaxial surface of calyx with dense, needle-like prickles; petals purplish red 52b. var. *soulieanus*

52a. *Rubus stans* var. *stans*

直立悬钩子(原变种) *zhi li xuan gou zi* (yuan bian zhong)

Rubus testaceus C. K. Schneider.

Branchlets with sparse prickles. Calyx abaxially unarmed or with sparse, minute needle-like prickles. Petals white or tinged purplish.

• High montane forests, forest margins, open stony thickets; 2000–3400 m. Qinghai, Sichuan, E Xizang, Yunnan.

52b. *Rubus stans* var. *soulieanus* (Cardot) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 37: 86. 1985.

多刺直立悬钩子 *duo ci zhi li xuan gou zi*

Rubus soulieanus Cardot, Notul. Syst. (Paris) 3: 307. 1914.

Branchlets densely prickly. Calyx abaxially with dense, needle-like prickles. Petals purplish red.

• Coniferous forests; below 4000 m. W Sichuan, E Xizang.

53. *Rubus sikkimensis* J. D. Hooker, Fl. Brit. India 2: 336. 1878.

锡金悬钩子 *xi jing xuan gou zi*

Shrubs low, to 2 m tall. Branchlets purplish brown, terete, pubescent, with sparse, intermixed stipitate glandular hairs and straight or somewhat curved slender prickles. Leaves imparipinnate, 3-foliolate; petiole 4–8(–10) cm, petiolule of terminal leaflet 2.5–3.5 cm, lateral leaflets subsessile, pubescent, with minute prickles, with sparse, purplish red stipitate glands; stipules linear, 1–1.5 cm, pubescent, sparsely stipitate glandular; blade of leaflets ovate to broadly ovate, 4–8 × 2.5–5.5 cm, both surfaces pubescent along veins, subglabrescent, base broadly cuneate to rounded, subcordate on terminal leaflet, margin irregularly obtusely dentate, often lobed or deeply divided on terminal leaflet, apex shortly acuminate to acuminate. Inflorescences with flowers 1 or 2 in leaf axils; bracts linear, to 1.3 cm, pubescent, sparsely stipitate glandular. Pedicel 1–3 cm in diam. Calyx purplish red, abaxially pubescent, sparsely stipitate glandular; tube pelviform, with slender prickles; sepals triangular-lanceolate, 8–11 × 3–5 mm, apex long caudate. Petals purplish red. Stamens many; filaments linear. Pistils numerous; ovary glabrous. Aggregate fruit subglobose, glabrous. Fl. summer, fr. Aug–Sep.

Mountainous regions; below 3800 m. S Xizang (Cona Xian) [Bhutan, Sikkim].

54. *Rubus pungens* Cambessèdes in Jacquemont, Voy. Inde 4(Bot.): 48. 1844.

针刺悬钩子 *zhen ci xuan gou zi*

Shrubs to 3 m tall. Branchlets brownish to reddish brown, terete, pubescent, gradually glabrescent, glabrous when young, usually with needle-like prickles. Leaves imparipinnate, (3–)5–7(–9)-foliolate; petiole (2–)3–6 cm, petiolule of terminal leaflet 0.5–1 cm, lateral leaflets subsessile, petiolule and rachis pubescent or subglabrous, with sparse, minute prickles and with glandular hairs; stipules linear, 4–7 mm, pubescent; blade of leaflets ovate, triangular-ovate, or ovate-lanceolate, (1–)2–5(–6) × 1–3 cm, both surfaces pubescent especially along midvein

and veins abaxially, base rounded to subcordate, margin sharply or incised doubly serrate, terminal leaflet often pinnately lobed, apex acute to shortly acuminate, but usually acuminate on terminal leaflet. Inflorescences terminal or axillary, 1-flowered, rarely corymbose and 2–4-flowered; rachis and pedicels pubescent, with minute prickles or with sparse, glandular hairs; bracts linear, 4–6 mm, pubescent. Pedicel 2–3.5 cm. Flowers 1–2 cm in diam. Calyx abaxially pubescent, with glandular hairs, with needle-like prickles or nearly unarmed; tube semiglobose; sepals erect, rarely reflexed, linear to lanceolate or triangular-lanceolate, 0.8–1.2(–2) cm × 2–4 mm, apex long acuminate. Petals white, oblong, obovate, or suborbicular, 7–9 × 5–6 mm, much shorter than sepals, glabrous, base clawed. Stamens many, unequal in length, longer ones longer than petals, shorter ones nearly as long as or slightly shorter than petals; filaments somewhat broadened and flattened basally. Pistils numerous; ovary soft hairy or subglabrous; styles glabrous or sparsely soft hairy basally. Aggregate fruit red, subglobose, 1–1.5 cm in diam., pubescent or subglabrous; pyrenes ovoid-globose, 2–3 mm, conspicuously rugose. Fl. Apr–May, fr. Jul–Aug. *2n* = 14.

Forests, forest margins, grassy slopes, river sides, semishaded wet places in montane valleys, thickets, roadsides; 600–3900 m. Fujian, Gansu, Guizhou, Henan, Hubei, Jiangxi, Jilin, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, NW India, Japan, Kashmir, Korea, N Myanmar, Nepal, Sikkim; SW Asia].

- 1a. Branchlets and abaxial surface of calyx with dense, needle-like prickles.
- 2a. Flower bearing branchlets, petioles, pedicel, and abaxial surface of calyx usually without stalked glands 54a. var. *pungens*
- 2b. Flower bearing branchlets, petioles, pedicel, and abaxial surface of calyx often with conspicuous stalked glands.
 - 3a. Leaflets 5–7, 1–3 cm 54b. var. *villosus*
 - 3b. Leaflets often 3, rarely 5, 2.5–6 cm 54c. var. *ternatus*
- 1b. Branchlets and abaxial surface of calyx nearly unarmed or ± with needle-like prickles.
 - 4a. Flower bearing branchlets, petioles, pedicel, and abaxial surface of calyx without or partly with sparse, shortly stipitate glands; sepals ovate-triangular or narrowly ovate-lanceolate, 1–1.5 cm 54d. var. *oldhamii*
 - 4b. Flower bearing branchlets, petioles, pedicel, and abaxial surface of calyx with prominent stipitate glands; sepals linear or linear-lanceolate, to 2 cm 54e. var. *linearisepalus*

54a. *Rubus pungens* var. *pungens*

针刺悬钩子(原变种) *zhen ci xuan gou zi* (yuan bian zhong)

Rubus pungens var. *discolor* Prochanov; *R. pungens* var. *fargesii* Cardot.

Branchlets and abaxial surface of calyx with dense, needle-like prickles. Flower bearing branchlets, petioles, pedicel, and abaxial surface of calyx without stalked glands.

Forested slopes, forest margins, river sides; 2200–3300 m. Gansu, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, NW India, Japan, Kashmir, Korea, N Myanmar, Nepal, Sikkim; SW Asia].

54b. *Rubus pungens* var. *villosus* Cardot, Notul. Syst. (Paris) 3: 307. 1914.

柔毛针刺悬钩子 *rou mao zhen ci xuan gou zi*

Branchlets and abaxial surface of calyx with dense, needle-like prickles. Flower bearing branchlets, petioles, pedicel, and abaxial surface of calyx with conspicuous stalked glands. Leaflets 5–7, 1–3 cm.

- Grassy slopes; below 2600 m. Hubei, Shaanxi, Sichuan.

54c. *Rubus pungens* var. *ternatus* Cardot, Notul. Syst. (Paris) 3: 407. 1914.

三叶针刺悬钩子 *san ye zhen ci xuan gou zi*

Branchlets and abaxial surface of calyx with dense, needle-like prickles. Flower bearing branchlets, petioles, pedicel, and abaxial surface of calyx with prominent stalked glands. Leaflets 3, rarely 5, 2.5–6 cm.

- Mixed forests and forest margins along roadsides; below 3400 m. Sichuan, Yunnan.

54d. *Rubus pungens* var. *oldhamii* (Miquel) Maximowicz, Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Pétersbourg 8: 386. 1872.

香莓 *xiang mei*

Rubus oldhamii Miquel, Prolus. Fl. Jap. 34. 1867; *R. hayatae* Nemoto; *R. hirsutopungens* Hayata; *R. okamotoanus* Koidzumi; *R. parvipungens* Hayata; *R. pungens* var. *indefensus* Focke; *R. rosifolius* Smith var. *hirsutus* Hayata.

Branchlets and abaxial surface of calyx nearly unarmed or ± with needle-like prickles. Flower bearing branchlets, petioles, pedicel, and abaxial surface of calyx without or partly with sparse, shortly stipitate glands. Sepals ovate-triangular or narrowly ovate-lanceolate, 1–1.5 cm.

Semishaded wet places in montane valleys, forested slopes, thickets; 600–3900 m. Fujian, Gansu, Guizhou, Henan, Hubei, Jiangxi, Jilin, Shaanxi, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].

54e. *Rubus pungens* var. *linearisepalus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 302. 1982.

线萼针刺悬钩子 *xian e zhen ci xuan gou zi*

Branchlets and abaxial surface of calyx nearly unarmed or ± with needle-like prickles. Flower bearing branchlets, petioles, pedicel, and abaxial surface of calyx with prominent stipitate glands. Sepals linear or linear-lanceolate, to 2 cm.

- Mixed forests, roadsides; below 3400 m. NW Yunnan (Weixi Xian).

55. *Rubus macilentus* Cambessèdes in Jacquemont, Voy. Inde 4(Bot.): 49. 1844.

细瘦悬钩子 *xi shou xuan gou zi*

Shrubs 1–2 m tall. Branchlets brown or reddish brown,

terete, villous, with unequal long complanate prickles. Leaves imparipinnate, 3-foliolate, rarely simple; petiole 0.8–1(–1.5) cm, petiolule of terminal leaflet 0.5–1 cm, lateral leaflets subsessile, pubescent, with minute prickles; stipules linear or linear-lanceolate, 4–6 mm, soft hairy; blade of leaflets lanceolate, ovate-lanceolate, or ovate, terminal leaflet much longer than lateral leaflets, 3–5 × 1–2.5 cm, lateral leaflets 1–2 × 0.7–1.4 cm, both surfaces glabrous or slightly soft hairy, abaxially with sparse, minute prickles only along veins, base rounded or broadly cuneate, margin sharply serrate, apex acute, rarely obtuse, often shortly acuminate on terminal leaflet. Inflorescences terminal on short lateral branchlets, 1–3-flowered; bracts lanceolate or linear-lanceolate, somewhat smaller than stipules, soft hairy. Pedicel 6–10 mm, villous, sometimes with sparse, minute prickles. Flowers ca. 1 cm in diam. Calyx abaxially villous; sepals erect, rarely spreading, lanceolate or triangular-lanceolate, 6–8 × 2–3(–4) mm, apex shortly caudate. Petals white, broadly ovate to oblong, slightly longer than or nearly as long as sepals, both surfaces soft hairy, base clawed. Stamens many, shorter than sepals; filaments broad, complanate. Pistils many, slightly shorter than stamens; apical part of ovary and base of style sparsely villous. Aggregate fruit orange or red, subglobose, glabrous or somewhat soft hairy, enclosed in calyx; pyrenes globose, deeply reticulate. Fl. Apr–May, fr. Jul–Aug.

Slopes, roadsides, near water courses, forest margins; 900–3300 m. Sichuan, Xizang, Yunnan [Bhutan, N India, Kashmir, Nepal, Sikkim].

- 1a. Branchlets not angled 55a. var. *macilentus*
- 1b. Branchlets prominently angled 55b. var. *angulatus*

55a. *Rubus macilentus* var. *macilentus*

细瘦悬钩子(原变种) *xi shou xuan gou zi* (yuan bian zhong)

Rubus minensis Pax & K. Hoffmann; *R. trichopetalus* Handel-Mazzetti.

Branchlets not angled.

Slopes, roadsides, near water courses, forest margins; 900–3300 m. Sichuan, Xizang, Yunnan [Bhutan, N India, Kashmir, Nepal, Sikkim].

55b. *Rubus macilentus* var. *angulatus* Franchet, Pl. Delavay. 205. 1890.

棱枝细瘦悬钩子 *leng zhi xi shou xuan gou zi*

Branchlets prominently angled.

- Roadsides; below 2000 m. NW Yunnan.

56. *Rubus xanthocarpus* Bureau & Franchet, J. Bot. (Morot) 5: 46. 1891.

黄果悬钩子 *huang guo xuan gou zi*

Rubus sitiens Focke; *R. tibetanus* Focke (1909), not Franchet (1886); *R. xanthocarpus* var. *tibetanus* (Focke) Cardot.

Subshrubs low, 15–50 cm tall. Rhizomes creeping, woody; stems usually upright, yellowish brown, herbaceous, branched or not branched, obtusely angled, densely pubescent when young, subglabrescent, with sparse, long needle-like prickles. Leaves imparipinnate, 3-foliolate, sometimes 5-foliolate; peti-

ole (2–)3–8 cm, petiolule of terminal leaflet 1–2.5 cm, lateral leaflets subsessile, petiolule and rachis pilose, with straight prickles; stipules lanceolate or linear-lanceolate, 1–1.5 cm, margin entire or shallowly lacinate; lobes linear to lanceolate, pubescent; blade of leaflets oblong or elliptic-lanceolate, rarely ovate-lanceolate, terminal leaflet 5–10 × 1.5–3 cm, base often 2-lobed, lateral leaflets smaller, 2–5 × 1–2 cm, both surfaces glabrous or pubescent only along veins, abaxially with slender prickles along veins, base broadly cuneate to subrounded, margin irregularly serrate, apex acute or obtuse. Inflorescences terminal or axillary, corymbose, 2–3 cm, several flowered, rarely flowers solitary; rachis and pedicels pubescent, with sparse, needle-like prickles; bracts lanceolate or linear, margin entire or lacinate, pubescent. Pedicel 1–2.5 cm. Flowers 1–2.5 cm in diam. Calyx abaxially with dense needle-like prickles, pubescent; sepals narrowly ovate to ovate-lanceolate, 7–10 × 3–6 mm, apex caudate or subulate-acuminate. Petals white, obovate to spatulate, 1–1.3 cm × 5–7 mm, longer than sepals, puberulous, base long clawed, margin entire or incised. Stamens many, shorter than petals; filaments broad, complanate. Pistils shorter than stamens; ovary pubescent near apex; styles glabrous. Aggregate fruit orange-yellow, compressed globose, 1–1.2 cm in diam., glabrous; pyrenes rugose. Fl. May–Jun, fr. Aug. $2n = 14^*$.

• Roadsides, slopes, forests, rocky ravines; 600–3200 m. Anhui, Gansu, Shaanxi, Sichuan, Yunnan.

The fruit are eaten fresh and used for making jam, jelly, and wine. Whole, young plants are used in medicine.

57. *Rubus simplex* Focke, Hooker's Icon. Pl., ser. 3, 10: t. 1948. 1890.

单茎悬钩子 dan jing xuan gou zi

Subshrubs low, 40–60 cm tall. Stems erect, brownish, woody, not branched, glabrous, rarely puberulous, with sparse, short curved prickles; flower bearing branchlets arising from creeping roots. Leaves imparipinnate, 3-foliolate; petiole 5–10 cm, petiolule of terminal leaflet to 1 cm; lateral leaflets subsessile or shortly petiolulate, puberulous, with sparse, curved prickles; stipules lanceolate or linear-lanceolate, 6–9 mm, puberulent, margin entire; blade of leaflets ovate to ovate-lanceolate, 6–9.5 × 2.5–5 cm, terminal leaflet slightly longer than lateral leaflets, abaxially pilose or with sparse, minute prickles only along veins, adaxially sparsely appressed pubescent, base subrounded, margin irregularly shortly serrate, apex acuminate. Inflorescences terminal or axillary, 3- or 4-flowered, rarely flowers solitary; bracts linear to lanceolate, 5–9 mm, puberulous. Pedicel 6–12 mm, puberulous, with curved minute prickles. Flowers 1.5–2 cm in diam. Calyx abaxially with sparse, curved minute prickles, finely pubescent; sepals narrowly triangular to ovate, 6–10 × 3–5 mm, margin tomentose, apex subulate-acuminate. Petals white, obovate, 4–6 mm in diam., nearly as long as sepals, finely pubescent, base shortly clawed. Stamens many, erect, shorter than petals; filaments broad, complanate. Pistils slightly shorter than stamens; apex of ovary and base of style pubescent. Aggregate fruit orange-red, globose, 7–9 mm in diam., often glabrous, with many drupelets; pyrenes rugose. Fl. May–Jun, fr. Aug–Sep. $2n = 14^*$.

• Slopes, roadsides, forests; 1500–2500 m. Gansu, Hubei, Jiangsu, Shaanxi, Sichuan.

58. *Rubus sumatranus* Miquel, Fl. Ned. India, Eerste Bijv. 307. 1860.

红腺悬钩子 hong xiao xuan gou zi

Rubus asper Wallich ex G. Don var. *myriadenus* (H. Léveillé & Vaniot) Focke; *R. asper* var. *myriadenus* (H. Léveillé & Vaniot) Focke subvar. *grandifoliolatus* (H. Léveillé) Focke; *R. asper* var. *pekanianus* Focke; *R. dolichocephalus* Hayata; *R. indotibetanus* Koidzumi; *R. myriadenus* H. Léveillé & Vaniot; *R. myriadenus* var. *grandifoliolatus* H. Léveillé; *R. rosifolius* Smith subsp. *sumatranus* (Miquel) Focke; *R. somae* Hayata; *R. sorbifolius* Maximowicz; *R. takasagoensis* Koidzumi.

Shrubs erect or scandent. Branchlets brownish to dark reddish brown, cylindric, with long soft hairs, usually with scattered setose purplish red glandular hairs and curved prickles; glandular hairs and prickles unequal in length, glandular hairs to 4–5 mm, prickles to 8 mm. Leaves imparipinnate, to 15 cm, 5–7-foliolate, rarely 3-foliolate; petiole 3–5 cm, petiolule of terminal leaflet to 1 cm, lateral leaflets shortly petiolulate, petiolule and rachis soft hairy, with intermixed glandular hairs, with curved minute prickles; stipules lanceolate or linear-lanceolate, 6–8 mm, with soft hairs and intermixed glandular hairs; blade of leaflets ovate-lanceolate to lanceolate, 3–8 × 1.5–3 cm, abaxially villous, with gland-tipped hairs and small prickles along midvein, adaxially villous especially along midvein, base rounded, margin irregularly sharply serrate to doubly serrate, sometimes 3-lobed on terminal leaflet, apex acuminate. Inflorescences terminal, corymbose, 4–7 cm, 3- to several flowered, rarely flowers solitary; rachis and pedicels villous, with intermixed glandular hairs, with minute prickles; bracts lanceolate or linear, 5–7 mm, with soft hairs and intermixed glandular hairs. Pedicel 2–3 cm. Flowers 1–2 cm in diam. Calyx abaxially with soft hairs, with intermixed unequal long gland-tipped hairs; sepals reflexed in fruit, lanceolate or oblong-lanceolate, 7–12 × 2–4 mm; apex long caudate. Petals white, narrowly obovate or spatulate, slightly shorter than sepals, base clawed. Stamens many, shorter than petals. Pistils to 400; style and ovary glabrous; torus raised, oblong, base shortly stalked. Aggregate fruit orange-red, oblong, 1.2–1.8 cm × 7–11 mm, glabrous; pyrenes reticulate. Fl. Apr–Jun, fr. Jul–Aug. $2n = 14$.

Forests, forest margins, thickets, bamboo forests, grasslands; 700–2500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, Cambodia, N India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Nepal, Sikkim, Thailand, Vietnam].

59. *Rubus croceacanthus* H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 33. 1912.

薄瓣悬钩子 bao ban xuan gou zi

Shrubs low, to 1 m tall. Branchlets dark brown to dark reddish brown, slender, pubescent, with intermixed dense glandular hairs, or glabrous, with sparse, straight to curved prickles to 4 mm. Leaves imparipinnate, to 20 cm, papery, usually 5–7-foliolate, sometimes 3-foliolate on flower bearing branchlets;

petiole 2–4 cm, petiolule of terminal leaflet 0.8–1.5 cm, lateral leaflets subsessile, petiolule and rachis densely soft hairy or glabrous, with intermixed glandular hairs and sparse, minute prickles; stipules lanceolate, 5–10 mm, pubescent, with intermixed glandular hairs; blade of leaflets variable in shape, terminal leaflet ovate-elliptic to ovate-lanceolate, 4–7 × 2–5 cm, apex acute to shortly acuminate, lateral leaflets elliptic or ovate, 2–5 × 1.5–3 cm, both surfaces with dense spreading soft hairs, glabrescent, usually with some small prickles along midvein abaxially, base cuneate or rounded to subcordate, apex obtuse or acute, lateral leaflets often oblique basally, margin unevenly serrate to doubly serrate, sometimes with glandular hairs. Inflorescences terminal on short lateral branchlets, corymbose, 1- to several flowered; pedicel and abaxial surface of calyx with glandular hairs, soft hairy or glabrous; bracts lanceolate, 4–8 mm, puberulous, with glandular hairs. Pedicel 2–3 cm, with few small prickles. Flowers 2–3 cm in diam. Calyx tube pelviform; sepals triangular-oblong or triangular-lanceolate, 0.7–1.5 cm × 4–6 mm, inner sepals tomentose at margin, margin entire, rarely divided, apex long caudate. Petals white, nearly orbicular or broadly ovate-elliptic, 0.8–1.4 × 0.7–1.3 cm, abaxially shortly hairy. Stamens many, shorter than petals; filaments linear. Pistils numerous, shorter than stamens; ovary to 1 mm, with sparse, soft hairs especially apically, usually with some stalked glands; styles ca. 1.5 mm. Aggregate fruit red at maturity, subglobose or ovoid, rarely ellipsoid, 1–1.5 cm in diam., with few glandular hairs; pyrenes foveolate. Fl. Mar–Apr, fr. May–Jun.

Forest clearings, forest margins, roadsides, landslides, grasslands, river banks; sea level to medium elevations. Taiwan [Cambodia, India, Japan (Ryukyu Islands), Laos, Myanmar, Thailand, Vietnam].

- 1a. Branchlets, petioles, inflorescences, and abaxial surface of calyx soft hairy 59a. var. *croceacanthus*
 1b. Branchlets, petioles, inflorescences, and abaxial surface of calyx glabrous 59b. var. *glaber*

59a. *Rubus croceacanthus* var. *croceacanthus*

薄瓣悬钩子(原变种) bao ban xuan gou zi (yuan bian zhong)

Rubus cardotii Koidzumi; *R. euphlebophyllus* Hayata; *R. piptopetalus* Hayata ex Koidzumi; *R. rosifolius* Smith var. *formosanus* Cardot; *R. sphaerocephalus* Hayata.

Branchlets, petioles, inflorescences, and abaxial surface of calyx with soft hairs. $2n = 14^*$.

Forest clearings, forest margins, roadsides, landslides, grasslands, river banks; sea level to medium elevations. Taiwan [Cambodia, India, Japan (Ryukyu Islands), Laos, Myanmar, Thailand, Vietnam].

59b. *Rubus croceacanthus* var. *glaber* Koidzumi, Fl. Symb. Orient.-Asiat. 65. 1930.

秃悬钩子 tu xuan gou zi

Rubus asper Wallich ex D. Don var. *glaber* (Koidzumi) C. F. Hsieh; *R. rubroangustifolius* Sasaki.

Branchlets, petioles, inflorescences, and abaxial surface of calyx glabrous. $2n = 14^*$.

- E and N Taiwan.

60. *Rubus hirsutus* Thunberg, Diss. Bot.-Med. de Rubo 7. 1813.

蓬蘽 peng lei

Shrubs 1–2 m tall. Branchlets reddish brown or brown, terete, with soft hairs, stalked glands, and sparse, curved prickles. Leaves imparipinnate, 3–5-foliolate; petiole (0.5–)2–10 cm, petiolule of terminal leaflet to 2 cm, lateral leaflets shortly petiolulate, petiolule and rachis pubescent, with stalked glands and sparse prickles; stipules lanceolate or ovate-lanceolate, 6–10 × 2–3 mm, both surfaces pubescent, margin entire; blade of leaflets ovate or broadly ovate, 3–7 × 2–3.5 cm, both surfaces sparsely soft hairy, base broadly cuneate to rounded, margin irregularly sharply doubly serrate, apex acute, acuminate, or caudate. Inflorescences terminal or axillary, often 1-flowered; bracts lanceolate or linear, 4–7 mm, pubescent. Pedicel (1.5–)3–6 cm, pubescent, with stalked glands, or with few small needle-like prickles. Flowers 3–4 cm in diam. Calyx abaxially with dense soft hairs and stalked glands; sepals reflexed after anthesis, ovate-lanceolate or triangular-lanceolate, 1–1.5 cm × 4–5 mm, margin gray tomentose, apex long caudate. Petals white, obovate or suborbicular, 1.2–1.8 cm × 7–12 mm, glabrous, base clawed. Stamens numerous, much shorter than petals. Pistils shorter than stamens; style and ovary glabrous. Aggregate fruit subglobose, 1–2 cm in diam., glabrous. Fl. Apr, fr. May–Jun. $2n = 14$.

Slopes, roadsides, waste places, thickets, forested slopes; 900–3200 m. Anhui, Fujian, Guangdong, Henan, Hubei, Jiangsu, Jiangxi, Taiwan, Yunnan, Zhejiang [Japan, Korea].

The young plants and roots are used in medicine.

- 1a. Pedicel (2–)3–6 cm; petiole 2–3 cm, petiolule of terminal leaflet to 1 cm; apex of terminal leaflet acuminate, apex of lateral leaflets acute 60a. var. *hirsutus*
 1b. Pedicel 1.5–3 cm; petiole 5–10 cm, petiolule of terminal leaflet to 2 cm; apex of terminal and lateral leaflets acuminate to caudate 60b. var. *brevipedicellus*

60a. *Rubus hirsutus* var. *hirsutus*

蓬蘽(原变种) peng lei (yuan bian zhong)

Rubus argyi H. Léveillé; *R. hirsutus* var. *argyi* (H. Léveillé) Nakai; *R. stephanandria* H. Léveillé; *R. talaikiaensis* H. Léveillé; *R. thunbergii* Siebold & Zuccarini; *R. thunbergii* var. *argyi* (H. Léveillé) Focke; *R. thunbergii* var. *talaikiensis* (H. Léveillé) Focke.

Petiole 2–3 cm; petiolule of terminal leaflet to 1 cm; apex of terminal leaflet acuminate, apex of lateral leaflets acute. Pedicel (2–)3–6 cm.

Slopes, roadsides, waste places, thickets; 1500–3200 m. Anhui, Fujian, Guangdong, Henan, Hubei, Jiangsu, Jiangxi, Taiwan, Yunnan, Zhejiang [Japan, Korea].

60b. *Rubus hirsutus* var. *brevipedicellus* Z. M. Wu, Guihaia 8: 237. 1988.

短梗蓬蘽 duan geng peng lei

Petiole 5–10 cm, petiolule of terminal leaflet to 2 cm; apex of terminal and lateral leaflets acuminate to caudate. Pedicel 1.5–3 cm.

- Forested slopes; 900–1300 m. SE Anhui (Jixi Xian).

61. *Rubus glandulosocalycinus* Hayata, Icon. Pl. Formosan. 5: 42. 1915.

腺萼悬钩子 *xian e xuan gou zi*

Rubus hayatanus Koidzumi.

Subshrubs to 50 cm tall. Branchlets brownish to reddish brown, slender, pilose, glabrescent, with sparse, sharp prickles, with dense, purplish red stalked glands 2–5 mm. Leaves imparipinnate, 3–7-foliolate; petiole 2–3 cm, petiolule of terminal leaflet 5–10 mm, lateral leaflets subsessile, petiolule and rachis glabrous or sparsely pilose, with purplish red stalked glands and sparse prickles; stipules lanceolate or linear, 6–9 mm, margin with glandular hairs, sparsely pilose; blade of leaflets ovate-oblong or ovate-lanceolate, terminal leaflet 5–6 × 0.8–1.5 cm, lateral leaflets 1.5–3 × 0.6–1 cm, abaxially subglabrous, pilose, with stalked glands and with minute prickles along veins, adaxially sparsely pilose, base rounded to truncate, lateral leaflets oblique basally, margin incised-doubly serrate, apex acute to acuminate. Inflorescences terminal, corymbose, 3–5 cm, 1-flowered, rarely 2–5-flowered; rachis and pedicels subglabrous, with purplish red stalked glands and sparse, small prickles; bracts linear, 5–7 mm, subglabrous, margin with sparse, stalked glands. Pedicel 2–4 cm. Flowers 2–3 cm in diam. Calyx purplish red, subglabrous, with dense stalked glands and bristles abaxially; sepals narrowly triangular or triangular-lanceolate, 1.1–1.5 cm × 4–6 mm, inner sepals with tomentose margin, apex long caudate. Petals ovate, 1–1.4 cm × 7–9 mm, glabrous, base shortly clawed, apex obtuse. Stamens shorter than petals; filaments linear, somewhat broader basally. Pistils numerous, slightly shorter than stamens; style and ovary often glabrous. Aggregate fruit red, subglobose, 0.9–1.1 cm in diam., glabrous. Fl. Apr, fr. May–Jun. $2n = 14^*$.

- Roadsides, grasslands; medium elevations. C and N Taiwan.

62. *Rubus tsangii* Merrill, Lingnan Sci. J. 13: 28. 1934.

光滑悬钩子 *guang hua xuan gou zi*

Shrubs scandent, ca. 1 m tall. Branchlets brownish, dark brown, or reddish brown, terete, slightly angled, glabrous, with sparse prickles and stalked glands 1–2 mm. Leaves imparipinnate, (5–)7–9(–11)-foliolate, sometimes with 5 leaflets on flower bearing branchlets; petiole 4–7 cm, petiolule of terminal leaflet to 1 cm, lateral leaflets shortly petiolulate or subsessile, petiolule and rachis glabrous, with sparse, stalked glands and minute prickles; stipules lanceolate, 1–1.4 cm, glabrous or puberulous, sometimes with sparse, shortly stalked glands; blade of leaflets lanceolate or ovate-lanceolate, 4–7 × 0.8–2 cm, both surfaces slightly pubescent when young, gradually glabrescent, abaxially with sparse, small prickles along midvein, base rounded, margin irregularly tenuously sharply serrate to doubly serrate, apex acuminate. Inflorescences terminal, corymbose, 4–6 cm, 3–5-flowered, rarely flowers solitary; rachis and pedicels

glabrous, with unequal long stalked glands; bracts lanceolate, 6–10 mm, glabrous. Pedicel 2–4 cm. Flowers 3–4 cm in diam. Calyx abaxially glabrous; tube pelviform, ca. 1 cm in diam., with sparse, glandular hairs; sepals erect at anthesis, reflexed in fruit, oblong-lanceolate or narrowly ovate-lanceolate, 0.9–1.5 cm × 4–6 mm, inner sepals with gray tomentose margin, apex long caudate. Petals white, narrowly obovate or oblong, 0.9–1.4 cm × 6–8 mm, base clawed. Stamens unequally long, shorter than petals; filaments somewhat broadened and flattened. Pistils many, more than 100, shorter than stamens; style and ovary glabrous. Aggregate fruit red, subglobose, to 1.5 cm in diam., glabrous or with glandular hairs. Fl. Apr–May, fr. Jun–Jul. $2n = 14^*$.

- Slopes, foothills, river banks, forests, forest margins; 800–2500 m. Fujian, Guangdong, Guangxi, Guizhou, N Jiangxi, Sichuan, Yunnan, Zhejiang.

- 1a. Leaves 7–9(–11)-foliolate, abaxially without gland-tipped hairs along veins; ovary and aggregate fruit usually without glandular hairs 62a. var. *tsangii*
- 1b. Leaves 5–7(–11)-foliolate, abaxially with gland-tipped hairs along veins; ovary and aggregate fruit often with glandular hairs 62b. var. *yanshanensis*

62a. *Rubus tsangii* var. *tsangii*

光滑悬钩子(原变种) *guang hua xuan gou zi* (yuan bian zhong)

Rubus kwangtungensis H. L. Li; *Rubus linearifoliolus* Hayata; *R. rosifolius* Smith var. *linearifoliolus* (Hayata) H. L. Li; *R. tsangii* var. *linearifoliolus* (Hayata) T. T. Yu & L. T. Lu.

Leaves 7–9(–11)-foliolate, abaxially without gland-tipped hairs along veins. Ovary and aggregate fruit usually without glandular hairs.

- Forests in valleys, slopes, foothills, river banks; 800–2500 m. Fujian, Guangdong, Guangxi, Guizhou, Sichuan, Yunnan, Zhejiang.

62b. *Rubus tsangii* var. *yanshanensis* (Z. X. Yu & W. T. Ji) L. T. Lu, Acta Phytotax. Sin. 38: 280. 2000.

铅山悬钩子 *yan shan xuan gou zi*

Rubus yanshanensis Z. X. Yu & W. T. Ji, Acta Bot. Yunnan. 13: 255. 1991.

Leaves 5–7(–11)-foliolate, abaxially with gland-tipped hairs along veins. Ovary and aggregate fruit often with glandular hairs.

- Forests, forest margins, foothills; 1100–1800 m. N Jiangxi (Nanchang Xian, Yanshan Xian).

63. *Rubus glandulosocarpus* M. X. Nie, Bull. Bot. Res., Harbin 9(3): 43. 1989.

腺果悬钩子 *xian guo xuan gou zi*

Subshrubs erect, 20–45 cm tall. Stems cylindrical, slightly angled, not or few branched, unarmed, with sparse, glandular hairs. Leaves imparipinnate, 5–7-foliolate, rarely 3-foliolate;

petiole 3–5 cm, petiolule of terminal leaflet 1–1.5 cm, petiolule of lateral leaflets ca. 3 mm, petiolule and rachis pilose, glabrescent, with glandular hairs, sometimes with small prickles; stipules lanceolate, margin with sparse, short glandular hairs, entire; blade of leaflets ovate or ovate-oblong, rarely ovate-lanceolate, 2–6.5 × 1.7–3.5 cm, abaxially glabrous or pilose along veins, with pale glands, adaxially pilose, base obliquely subrounded, margin doubly serrate, apex acute to acuminate. Inflorescences terminal on lateral branchlets, sometimes corymbose, 2–4-flowered, rarely flowers solitary in leaf axils; rachis and pedicels with glandular hairs; bracts lanceolate, margin entire, or sparsely shortly glandular. Flowers 3–4 cm in diam. Calyx abaxially glabrous, with gland-tipped hairs; sepals 5(–7), lanceolate or ovate-lanceolate, margin tomentose and entire, apex long caudate. Petals 5(–7), white, oblong, broadly ovate, or broadly obovate, glabrous. Stamens many, shorter than petals. Pistils ca. 80–100; ovary glabrous, with sparse, glandular hairs; torus villous, base with ca. 3 mm stalk. Aggregate fruit subglobose, less than 1 cm in diam., with sparse, gland-tipped hairs; pyrenes foveolate. Fl. Apr–May, fr. Jun–Jul.

- Mountainous regions; 1600–1700 m. W Jiangxi (Jinggangshan).

64. *Rubus rosifolius* Smith, Pl. Icon. Ined. 3: 60. 1791.

空心泡 kong xin pao

Shrubs erect or climbing, 2–3 m tall. Branchlets grayish brown or dark reddish brown, terete, soft hairy or subglabrous, with straight to curved prickles and yellowish glands. Leaves imparipinnate, usually 5–7-foliolate; petiole 2–3 cm, petiolule of terminal leaflet 0.8–1.5 cm, lateral leaflets subsessile, petiolule and rachis with soft hairs and sparse, minute prickles, sometimes subglabrous, with yellowish glands; stipules linear or lanceolate to ovate-lanceolate, 0.8–1.2 cm × 1.5–3.5 mm, sparsely soft hairy; blade of leaflets ovate or ovate-elliptic to lanceolate, 4–7(–10) × 1.5–5 cm, both surfaces pilose, subglabrescent, with yellow glands, abaxially with sparse, minute prickles along midvein, base rounded, margin sharply incised doubly serrate or coarsely doubly serrate, apex acuminate. Inflorescences terminal or in leaf axils, 1- or 2-flowered; bracts linear or lanceolate, 5–9 mm, puberulous. Pedicel (1–)2–3.5 cm, with ± soft hairs and sparse, minute prickles, sometimes glandular. Flowers 2–3(–5) cm in diam. Calyx abaxially soft hairy and glandular; sepals erect before anthesis, reflexed after anthesis, triangular-lanceolate or ovate-lanceolate, 0.8–1.2(–1.4) cm × 4–6 mm, apex long caudate. Petals white, oblong, narrowly obovate, or suborbicular, 0.8–1.5 × 0.8–1.2 cm, abaxially shortly hairy, base clawed, apex obtuse. Stamens many, shorter than petals; filaments broad. Pistils to 2 mm, shorter than stamens; ovary glabrous, sometimes glandular; styles glabrous; torus shortly stalked. Aggregate fruit red, ovoid-globose or narrowly obovoid to oblong, 1–1.5 × 0.8–1.2 cm, glabrous, with few glands; pyrenes deeply foveolate. Fl. Mar–May, fr. Jun–Jul. 2*n* = 14*.

Mixed forests, grassy slopes, roadsides, landslides; low to medium elevations. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Philippines, Sikkim, Thailand, Vietnam; Africa, Australia].

- 1a. Flowers double; branchlets, petioles, and pedicel ± prickly 64c. var. *coronarius*
- 1b. Flowers single; branchlets, petioles, and pedicel ± or unarmed.
 - 2a. Branchlets, petioles, and pedicel ± prickly 64a. var. *rosifolius*
 - 2b. Branchlets, petioles, and pedicel unarmed 64b. var. *inermis*

64a. *Rubus rosifolius* var. *rosifolius*

空心泡(原变种) kong xin pao (yuan bian zhong)

Rubus glandulosopunctatus Hayata; *R. hirsutus* Thunberg var. *glabellus* (Focke) Wuzhi; *R. hopingensis* Y. C. Liu & F. Y. Lu; *R. minusculus* H. Léveillé & Vaniot; *R. parvirosifolius* Hayata; *R. rosifolius* var. *polyphyllarius* Cardot; *R. tagallus* Chamisso & Schlechtendal; *R. taiwanianus* Matsumura; *R. thunbergii* Siebold & Zuccarini var. *glabellus* Focke.

Branchlets, petioles, and pedicel ± prickly. Flowers single.

Mixed forests, grassy slopes, roadsides, landslides; low to medium elevations. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, NE India, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam; Africa, Australia].

64b. *Rubus rosifolius* var. *inermis* Z. X. Yu, Bull. Bot. Res., Harbin 8(2): 139. 1988.

无刺空心泡 wu ci kong xin pao

Branchlets, petioles, and pedicel unarmed. Flowers single.

- Roadsides; 900–1000 m. E Jiangxi (Wuyi Shan).

64c. *Rubus rosifolius* var. *coronarius* (Sims) Focke, Biblioth. Bot. 17(Heft 72): 155. 1911.

重瓣空心泡 chong ban kong xin pao

Rubus coronarius Sims, Bot. Mag. (Curtis) 43: t. 1783. 1815; *R. rosifolius* f. *coronarius* (Sims) Kuntze; *R. rosifolius* var. *wuyishanensis* Z. X. Yu.

Branchlets, petioles, and pedicel ± prickly. Flowers double, fragrant, 3–5 cm in diam.

Naturalized in Jiangxi, Shaanxi, Yunnan, and likely elsewhere [native to India, Indonesia, Malaysia, Nepal, Sikkim].

This variety, originally described from cultivated plants in England, is now occasionally cultivated for ornamental use throughout SE Asia (Fl. Bhutan 1(3): 562. 1987).

65. *Rubus pararosifolius* F. P. Metcalf, Lingnan Sci. J. 19(1): 30. 1940.

矮空心泡 ai kong xin pao

Subshrubs low, 0.4–1 m tall. Branchlets brown or reddish brown, soft hairy when young, gradually glabrescent, glandular, unarmed or with few small prickles. Leaves imparipinnate, 5-foliolate, rarely 7- or 3-foliolate; petiole 1–2.5(–3.5) cm, petiolule of terminal leaflet 4–6 mm, lateral leaflets subsessile, petiolule and rachis puberulent, with sparse, minute prickles, glandu-

lar; stipules linear or lanceolate, 5–7 mm, sparsely glandular; blade of leaflets ovate-oblong or ovate-lanceolate, 1–3 × 0.7–1.2 cm, terminal leaflet larger than lateral leaflets, abaxially sparsely pubescent, glandular, adaxially dark green, sparsely strigose, especially along midvein, base cuneate to subrounded, margin coarsely incised-doubly serrate, apex acuminate on terminal leaflet, acute on lateral leaflets. Inflorescences terminal or lateral, 1-flowered; bracts lanceolate or linear, 2–4 mm, puberulent. Pedicel 2–3 cm, puberulent, sparsely glandular. Flowers 1.5–1.8 cm in diam. Calyx pubescent, glandular; tube pelviform; sepals reflexed, narrowly lanceolate, 5–8 × 2–3 mm, margin tomentose, apex acuminate. Flowers unknown. Aggregate fruit red, globose, small, 5–7 mm in diam., pubescent when young, glabrescent, glandular; pyrenes small, shallowly foveolate. Fl. spring, fr. Jun–Jul.

- Thickets along roadsides; 1000–1600 m. Fujian.

66. *Rubus lanyuensis* Chang, Forest J. Taiwan Prov. Pingtung. Inst. Agr. 19: 11. 1977.

兰屿悬钩子 lan yu xuan gou zi

Rubus tagallus Chamisso & Schlechtendal var. *lanyuensis* (Chang) S. S. Ying.

Shrubs erect. Branches glabrous, with short prickles. Leaves imparipinnate, usually 3–5-foliolate; petiole 3–4 cm, sparsely villous, prickly; stipules linear-lanceolate, 0.8–1.2 cm, sparsely pilose; blade of leaflets ovate, 3–5 × 3–4 cm, veins raised abaxially, impressed adaxially, both surfaces glabrous or nearly so except sparsely villous at base, abaxially glandular, base cuneate to rounded, margin doubly serrate, apex acute. Inflorescences axillary racemes, few flowered. Pedicel 1–1.5 cm, glabrous. Flowers ca. 2 cm in diam. Calyx abaxially glabrous, glandular; tube cupular, 1.5–1.8 cm in diam.; sepals narrowly triangular, ca. 8 mm, apex shortly caudate. Petals white, orbicular-ovate, 6–7 mm. Filaments glabrous. Apex of ovary with few hairs. Fruit unknown.

- Near sea level. Taiwan (Lan Yu).

67. *Rubus eustephanos* Focke, Bot. Jahrb. Syst. 36(Beibl. 82): 54. 1905.

大红泡 da hong pao

Shrubs 0.5–2 m tall. Branchlets brownish or grayish brown, angled, glabrous, with sparse, curved prickles. Leaves imparipinnate, 3–5(–7)-foliolate; petiole 1.5–2(–4) cm, petiole of terminal leaflet 1–1.5 cm, lateral leaflets sessile or shortly petiolulate, petiole and rachis glabrous or pilose when young, with sparse, minute prickles; stipules lanceolate, 6–10 × 1.5–2.5 mm, margin pilose initially, glabrescent; blade of leaflets ovate or elliptic, rarely ovate-lanceolate, 2–5(–7) × 1–3 cm, both surfaces pilose when young, abaxially sparsely pilose only along veins in age, with minute prickles along midvein, base rounded, margin sharply incised doubly serrate, apex acuminate to long acuminate. Inflorescences usually terminal on lateral branchlets, 1-flowered, rarely 2- or 3-flowered; bracts lanceolate, 6–8 × 1.5–2 mm, puberulous, glabrescent. Pedicel 2.5–5 cm, glabrous or with gland-tipped hairs, with sparse, small prickles. Flowers 3–4 cm in diam. Calyx abaxially glabrous;

tube pelviform; sepals reflexed in fruit, oblong-lanceolate or triangular-lanceolate, 0.9–1.2 cm × 3–5 mm, apex subulate-acuminate, inner sepals with tomentose margin. Petals white, elliptic or broadly ovate, 1.2–1.5 cm × 8–11 mm, glabrous, base shortly clawed, margin entire or undulate, apex obtuse. Stamens many, shorter than petals; filaments linear. Style and ovary glabrous. Aggregate fruit red, subglobose, 0.9–1.1 cm in diam., glabrous; pyrenes smooth or slightly rugulose. Fl. Apr–May, fr. Jun–Jul.

- Foothills, forests, slopes, thickets, river banks; 500–2300 m. Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Zhejiang.

- 1a. Flower bearing branchlets or pedicel without gland-tipped hairs 67a. var. *eustephanos*
- 1b. Flower bearing branchlets or pedicel ± with gland-tipped hairs 67b. var. *glanduliger*

67a. *Rubus eustephanos* var. *eustephanos*

大红泡(原变种) da hong pao (yuan bian zhong)

Flower bearing branchlets or pedicel without gland-tipped hairs.

- Foothills, densely forested slopes, thickets, river banks; 500–2300 m. Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Zhejiang.

67b. *Rubus eustephanos* var. *glanduliger* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 303. 1982.

腺毛大红泡 xian mao da hong pao

Flower bearing branchlets or pedicel ± with glandular hairs.

- Slopes, forests, thickets; 700–2300 m. Sichuan.

68. *Rubus fraxinifolius* Hayata, Icon. Pl. Formosan. 5: 46. 1915.

椴叶悬钩子 cen ye xuan gou zi

Rubus parvifraxinifolius Hayata; *R. suzukianus* Y. C. Liu & Yang.

Shrubs scandent. Branchlets brownish to reddish brown, flexuous, glabrous, with sparse, recurved prickles 3–4 mm. Leaves imparipinnate, 3–5(–7)-foliolate; petiole 3–4 cm, petiole of terminal leaflet 5–10 mm, petiole of lateral leaflets 2–3 mm, petiole and rachis glabrous or nearly so, with sparse, minute prickles; stipules linear to linear-lanceolate, 5–10 mm, glabrous, margin entire; blade of leaflets lanceolate to ovate-lanceolate, 3–9 × 1.5–3 cm, papery, terminal leaflet usually longer and wider than lateral leaflets, lateral leaflets often ± oblique, lateral veins 8 or 9 per side, both surfaces glabrous, abaxially with sparse, minute prickles along midvein, adaxially sometimes slightly hirsute along veins, base rounded to subtruncate, margin unevenly serrate to doubly serrate, apex acute to acuminate. Inflorescences terminal or axillary, 1- or 2-flowered. Pedicel (1.5–)2–2.5 cm, glabrous or subglabrous. Flowers 2.3–4 cm in diam. Calyx cupular, ca. 8 mm in diam., glabrous, with few brown glands abaxially; sepals narrowly triangular, 1–1.3 cm × 5–7 mm, margin tomentose, apex caudate. Petals white, obovate, 1.2–1.9 × 1–1.5 cm, base clawed. Stamens many, shorter than petals; filaments broadened and flattened. Pistils numerous, slightly shorter than stamens when young; style and

ovary glabrous. Aggregate fruit ellipsoid to globose, to 1.5 cm in diam. Fl. Jun–Jan, fr. Jun–Feb.

- Along trails in broad-leaved forests, river valleys; 100–1900 m. E Taiwan.

69. *Rubus delavayi* Franchet, Pl. Delavay. 205. 1890.

三叶悬钩子 san ye xuan gou zi

Rubus duclouxii H. Léveillé.

Shrubs erect, low, 0.4–1 m tall. Branchlets brownish or reddish brown, cylindrical, glabrous, with short curved prickles. Leaves imparipinnate, usually 3-foliolate; petiole 2–3 cm, petiolule of terminal leaflet 5–8 mm, lateral leaflets sessile or subsessile, glabrous or pilose, with sparse, small prickles; stipules linear, 4–7 mm, puberulous when young, glabrescent; blade of leaflets lanceolate to narrowly lanceolate, 3–7 × 1–2 cm, both surfaces glabrous or abaxially with sparse, soft hairs and with minute prickles along midvein, base broadly cuneate to rounded, margin irregularly coarsely serrate, apex acuminate. Inflorescences terminal or axillary, 1-flowered, or with flowers in clusters of 2 or 3; bracts linear, smaller than stipules, puberulous or glabrescent. Pedicel 1–2 cm, puberulent or subglabrous, with sparse, minute prickles. Flowers ca. 1 cm in diam. Calyx abaxially puberulous and with sparse, minute prickles; tube short, broad; sepals erect in fruit, triangular-lanceolate, 6–8(–10) × 2–3 mm, apex long caudate. Petals white, obovate, shorter than sepals, puberulent, base prominently clawed. Stamens many, shorter than petals; filaments short, broad, puberulent. Pistils shorter than stamens; style and ovary glabrous. Aggregate fruit orange-red, globose, ca. 1 cm in diam.; pyrenes small, rugulose. Fl. May–Jun, fr. Jun–Jul.

- Mixed forested slopes; 2000–3400 m. Yunnan.

The dried fruit, seeds, and leaves are used in traditional Chinese medicine.

70. *Rubus leucanthus* Hance, Ann. Bot. Syst. 2: 468. 1852.

白花悬钩子 bai hua xuan gou zi

Rubus glaberrimus Champion ex Benth; *R. leucanthus* var. *paradoxus* (S. Moore) F. P. Metcalf; *R. leucanthus* var. *villosulus* Cardot; *R. paradoxus* S. Moore.

Shrubs climbing, 1–3 m tall. Branchlets brown to purplish brown, glabrous, with sparse, curved prickles. Leaves imparipinnate, 3-foliolate, sometimes simple apically on branchlets or basally in inflorescences; petioles 2–6 cm, petiolule of terminal leaflet 1.5–2 cm, lateral leaflets shortly petiolulate, glabrous, with curved minute prickles; stipules subulate, 4–6 mm, glabrous; blade of leaflets ovate or ovate-elliptic, 4–8 × 2–4 cm, terminal leaflet slightly longer than or nearly as long as lateral leaflets, leathery, lateral veins 5–8 pairs, raised abaxially, impressed adaxially, both surfaces glabrous or adaxially slightly soft hairy, base rounded, margin sharply coarsely serrate, apex acuminate to caudate. Inflorescences terminal on lateral short branchlets, corymbose, 3–5 cm, 3–8-flowered, rarely flowers solitary in leaf axils; rachis and pedicels glabrous; bracts subulate, 3–5 mm, glabrous. Pedicel 0.8–1.5 cm. Flowers 1–1.5 cm in diam. Calyx abaxially glabrous; sepals erect, ovate, 4–7 × 3–5 mm, apex acute, shortly pointed, inner sepals with tomentose margin. Petals white, narrowly ovate or suborbicular, nearly as

long as or slightly longer than sepals, base puberulous, clawed. Stamens many, somewhat shorter than petals; filaments broadened and flattened. Pistils usually 70–80, sometimes to 100 or more; style and ovary glabrous or pilose only at ovary apex and style base; torus basally subsessile or sessile. Aggregate fruit red, subglobose, 1–1.5 cm in diam., glabrous, enclosed in calyx; pyrenes foveolate. Fl. Apr–May, fr. Jun–Jul.

Sparse forests, waste places; 1000–2500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Yunnan [Cambodia, Laos, Thailand, Vietnam].

The edible fruit and roots are used medicinally.

71. *Rubus zhaogoshanensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 303. 1982.

草果山悬钩子 cao guo shan xuan gou zi

Shrubs 0.8–1 m tall. Branchlets brown, glabrous, rarely angled, with sparse, curved prickles. Leaves imparipinnate, 3–5-foliolate; petiole 5–8 cm, petiolule of terminal leaflet (0.5–)1–2 cm, lateral leaflets shortly petiolulate, glabrous or sparsely pilose, with small curved prickles; stipules lanceolate or linear-lanceolate, 7–10 mm, glabrous or slightly soft hairy; blade of leaflets narrowly elliptic to elliptic-lanceolate, 6–9 × 2–3 cm, terminal leaflet slightly longer than lateral leaflets, subherbaceous, both surfaces glabrous, base cuneate, rarely subrounded, margin irregularly densely sharply minute serrate to incised-doubly serrate, apex acuminate to caudate. Inflorescences terminal or axillary, clusters of 2 or 3(–5) flowers, rarely flowers solitary in leaf axils; bracts lanceolate or linear-lanceolate, 6–8 mm, glabrous or slightly pilose. Pedicel 1.5–2.5 cm, glabrous. Flowers 1.3–1.5 cm in diam. Calyx abaxially glabrous; tube short, broad; sepals spreading or reflexed in fruit, ovate-lanceolate, 7–9 × 2–3.5 mm, inner sepals slightly tomentose marginally, apex long caudate. Petals white, oblong or elliptic, much shorter than sepals, base clawed. Stamens many; filaments linear, basally slightly broader. Pistils shorter than stamens; style and ovary glabrous. Aggregate fruit ovoid-globose, 7–10 mm in diam., glabrous; pyrenes densely rugulose. Fl. Apr–May, fr. Jun–Jul.

- Broad-leaved evergreen forests; below 1600 m. SE Yunnan (Xichou Xian).

72. *Rubus columellaris* Tutcher, Rep. Bot. Dept. Hong Kong 1914: 31. 1915.

小柱悬钩子 xiao zhu xuan gou zi

Shrubs scandent, 1–2.5 m tall. Branchlets brown or reddish brown, glabrous or villous, with sparse, curved prickles. Leaves imparipinnate, usually 3-foliolate, those below inflorescences sometimes simple; petiole 2–4 cm, petiolule of terminal leaflet 1–2 cm, lateral leaflets variable, shortly petiolulate or subsessile, glabrous or slightly soft hairy when young, with sparse, minute prickles; stipules lanceolate or linear, 6–8 mm, glabrous, rarely puberulous; blade of leaflets elliptic to ovate-lanceolate, 3–10(–16) × 1.5–5(–6) cm, terminal leaflet much longer than lateral leaflets, subleathery, both surfaces glabrous or adaxially sparsely appressed pubescent, base rounded or subcordate, margin unevenly densely coarsely serrate, apex acuminate. Inflorescences terminal or axillary, corymbose, 6–8 cm, 3–7-flowered, sometimes flowers solitary in leaf axils at bases;

rachis and pedicels glabrous, rarely puberulent, with sparse, small prickles; bracts linear-lanceolate, 5–7 mm, often glabrous. Pedicel 1–2 cm, glabrous or densely villous. Flowers 3–4 cm in diam. Calyx abaxially glabrous or villous; sepals reflexed after anthesis, ovate-lanceolate or lanceolate, 6–10 × 4–6 mm, apex acute, abruptly subulate-pointed, inner sepals yellowish gray tomentose at margin. Petals white, spatulate-oblong or narrowly obovate, 5–7 mm in diam., much longer than sepals, puberulous, base clawed. Stamens numerous in several whorls, shorter than petals, with somewhat broader filaments. Pistils to 300 or more, glabrous; torus with stalks to 5 mm. Aggregate fruit orange-red or brown-yellow, subglobose or slightly oblong, 1.5–1.7 cm in diam., glabrous; pyrenes shallowly rugose. Fl. Apr–May, fr. Jun–Jul.

Slopes, valleys, mixed and sparse forests, roadsides, water courses; 300–2200 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Yunnan [Vietnam].

- 1a. Branchlets, petioles, pedicel, and abaxial surface of calyx usually glabrous 72a. var. *columellaris*
 1b. Branchlets, petioles, pedicel, and abaxial surface of calyx villous 72b. var. *villosus*

72a. *Rubus columellaris* var. *columellaris*

小柱悬钩子(原变种) xiao zhu xuan gou zi (yuan bian zhong)

Rubus columellaris var. *etropicus* (Handel-Mazzetti) F. P. Metcalf; *R. etropicus* (Handel-Mazzetti) Thuan; *R. leucanthus* Hance var. *etropicus* Handel-Mazzetti.

Branchlets, petioles, pedicels, and abaxial surface of calyx usually glabrous.

Slopes, valleys, mixed forests; 700–2200 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Yunnan [Vietnam].

72b. *Rubus columellaris* var. *villosus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 304. 1982.

柔毛小柱悬钩子 rou mao xiao zhu xuan gou zi

Branchlets, petiole, pedicel, and abaxial surface of calyx villous.

• Slopes, montane valleys, roadsides, water courses, sparse forests; 300–400 m. N Guangdong (Lianshan Xian).

73. *Rubus paucidentatus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 304. 1982.

少齿悬钩子 shao chi xuan gou zi

Subshrubs lianoid. Branchlets dark brown, cylindric, slender, glabrous, with sparse, curved prickles or nearly unarmed. Leaves imparipinnate, usually 3-foliolate, sometimes simple on flower bearing branchlets; petiole 1.5–2.5 cm, petiolule of terminal leaflet ca. 1 cm, lateral leaflets subsessile or shortly petiolulate, glabrous, with sparse, minute prickles; stipules linear, small, glabrous; blade of leaflets narrowly lanceolate or oblong-elliptic to elliptic, terminal leaflet 7–14 cm, nearly 4 × as long as lateral leaflets, lateral leaflets (1.5–)2–6 × 1–2.5 cm, both surfaces glabrous, base rounded, margin inconspicuously shallowly minute serrate or nearly entire, apex acuminate. Inflorescences often terminal, 1-flowered or flowers in clusters of 2 or

3; bracts linear, minute, glabrous. Pedicel 1–1.5 cm, glabrous. Flowers 1.5–2 cm in diam. Calyx abaxially glabrous; sepals erect after anthesis, ovate-lanceolate or triangular-lanceolate, inner sepals yellowish gray tomentose at margin, apex acuminate or acute. Petals white, broadly obovate, shorter than sepals, adaxially puberulous, base shortly clawed. Stamens numerous, in many whorls, unequal in length; filaments broader. Pistils many, shorter than stamens; ovary soft hairy apically; torus shortly stalked basally. Fl. May–Jun.

• Mountainous areas, forests, valleys, water courses; below 1200 m. N Guangdong, S Guangxi.

- 1a. Blade of leaflets narrowly lanceolate, terminal leaflet nearly 4 × as long as lateral leaflets, margin remotely shallowly minute serrate 73a. var. *paucidentatus*
 1b. Blade of leaflets oblong-elliptic or elliptic, terminal leaflet slightly longer than lateral leaflets, margin nearly entire 73b. var. *guangxiensis*

73a. *Rubus paucidentatus* var. *paucidentatus*

少齿悬钩子(原变种) shao chi xuan gou zi (yuan bian zhong)

Blade of leaflets narrowly lanceolate, terminal leaflet nearly 4 × as long as lateral leaflets, margin remotely shallowly minute serrate.

• Mountainous areas, dense forests in valleys, water courses; below 1200 m. N Guangdong (Ruyuan Xian, Yangshan Xian).

73b. *Rubus paucidentatus* var. *guangxiensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 304. 1982.

广西少齿悬钩子 guang xi shao chi xuan gou zi

Blade of leaflets oblong-elliptic to elliptic, terminal leaflet slightly longer than lateral leaflets, margin nearly entire.

• Montane valleys, dense forests along stream sides; ca. 800 m. S Guangxi (Shiwan Dashan).

74. *Rubus impressinervus* F. P. Metcalf, Lingnan. Sci. J. 11: 12. 1932.

陷脉悬钩子 xian mai xuan gou zi

Herbs 0.5–1 m tall. Stems brown or reddish brown, cylindric, glabrous, with sparse, small prickles. Leaves simple; stipules linear, 8–10 mm, glabrous, margin entire; blade lanceolate or oblong-lanceolate, 10–22 × 2–5 cm, veins 9–12 pairs, raised abaxially, impressed adaxially, both surfaces glabrous, adaxially with sparse, small prickles along midvein, base rounded, margin sparsely sharply serrate, apex acuminate to caudate. Inflorescences terminal or axillary, 1-flowered. Pedicel 1.5–2.5 cm, glabrous, unarmed. Flowers to 1.5 cm in diam. Calyx abaxially glabrous; sepals erect after anthesis, ovate or lanceolate, 1–1.3 cm × 6–9 mm, apex abruptly pointed, inner sepals with yellowish gray tomentose margin. Petals white, 1.1–1.4 cm × 6–10 mm. Stamens many, shorter than petals; filaments broadened and flattened. Pistils nearly as long as stamens; ovary slightly soft hairy; torus basally with ca. 5 mm stalk; styles glabrous. Aggregate fruit brownish red, subglobose, ca. 2 cm in diam., glabrous; pyrenes 1–2 mm, deeply foveolate. Fl. Jun–Jul,

fr. Aug–Sep.

• Montane valleys, dense forests, grasslands, wet waste places; 1300–1500 m. Fujian, Guangdong, Hunan, Jiangxi, Zhejiang.

75. *Rubus lasiostylus* Focke, Hooker's Icon. Pl., ser. 3, 10: t. 1951. 1891.

绵果悬钩子 *mian guo xuan gou zi*

Shrubs to 2 m tall. Branchlets brown or reddish brown, glabrous or sparsely pubescent when young, glabrescent, ± with needle-like to curved prickles, sometimes glaucous. Leaves imparipinnate, 3(–7)-foliolate; petiole 5–10 cm, petiolule of terminal leaflet 2–3.5 cm, lateral leaflets subsessile, glabrous or sparsely pilose, with sparse, minute prickles; stipules ovate-lanceolate to ovate, 0.8–1.6 cm × (4–)6–10 mm, brownish, glabrous, apex acuminate; blade of leaflets ovate, broadly ovate, or elliptic, 3–10 × 2.5–9 cm, abaxially densely gray tomentose, with sparse, minute prickles along veins, adaxially sparsely thinly pubescent, base rounded to shallowly cordate, margin unevenly coarsely doubly serrate, usually 2- or 3-lobed on terminal leaflet, apex acuminate or acute. Inflorescences terminal, corymbose, 4–6 cm, several flowered, sometimes axillary and 1- or 2-flowered; bracts brownish, ovate-lanceolate to ovate, 0.8–1.6 cm × 5–10 mm, glabrous. Pedicel 2–4 cm, glabrous or hairy, ± with minute prickles. Flowers 2–3 cm in diam. Calyx purplish red, abaxially glabrous or hairy; sepals erect, rarely reflexed in fruit, broadly ovate, 1.2–1.8 cm × 6–10 mm, inner sepals with margin gray tomentose, apex acuminate. Petals red, suborbicular, 6–9 mm in diam., shorter than sepals, base narrowly clawed, margin erose or coarsely dentate. Stamens somewhat shorter than petals. Pistils many; apical part of ovary and basal part of style densely gray or grayish yellow long tomentose. Aggregate fruit red, globose, 1.5–2 cm in diam., densely long tomentose or not and soft hairy, with persistent styles. Fl. May–Jun, fr. Jul–Aug.

• Slopes, thickets, forests in valleys, forest margins, roadsides; 1000–3000 m. Hubei, Shaanxi, Sichuan, Yunnan.

- 1a. Aggregate fruit soft hairy, not tomentose 75e. var. *hubeiensis*
 1b. Aggregate fruit densely long tomentose.
 2a. Abaxial surface of calyx and pedicel glabrous.
 3a. Leaves 3(–5)-foliolate; stipules and bracts 8–16 × 5–10 mm 75a. var. *lasiostylus*
 3b. Leaves 5(–7)-foliolate; stipules and bracts 8–10 × 4–5 mm 75b. var. *dizygos*
 2b. Abaxial surface of calyx and pedicel hairy.
 4a. Abaxial surface of calyx pubescent and with sparse, minute prickles; pedicel pubescent, glandular, with sparse, minute prickles 75c. var. *eglandulosus*
 4b. Abaxial surface of calyx densely long tomentose, unarmed; pedicel long tomentose, with sparse,

minute prickles 75d. var. *tomentosus*

75a. *Rubus lasiostylus* var. *lasiostylus*

绵果悬钩子(原变种) *mian guo xuan gou zi* (*yuan bian zhong*)

Rubus lasiostylus f. *glabratus* Focke.

Leaves 3(–5)-foliolate; stipules and bracts 0.8–1.6 cm × 5–10 mm. Abaxial surface of calyx and pedicel glabrous.

• Thickets on slopes, forests in valleys; 1000–2500 m. Hubei, Shaanxi, Sichuan, Yunnan.

75b. *Rubus lasiostylus* var. *dizygos* Focke in Sargent, Pl. Wilson. 1: 53. 1911.

五叶绵果悬钩子 *wu ye mian guo xuan gou zi*

Rubus pileatus Focke var. *canotomentosus* Focke.

Leaves 5(–7)-foliolate; stipules and bracts 8–10 × 4–5 mm. Abaxial surface of calyx and pedicel glabrous.

• Thickets in valleys, forest margins, grassy slopes; 2600–3000 m. Hubei, Sichuan.

75c. *Rubus lasiostylus* var. *eglandulosus* Focke, Hooker's Icon. Pl., ser. 3, 10: t. 1951. 1891.

腺梗绵果悬钩子 *xian geng mian guo xuan gou zi*

Pedicel pubescent, glandular, with sparse, minute prickles. Abaxial surface of calyx pubescent, with sparse, minute prickles.

• Thickets, roadsides. Hubei.

75d. *Rubus lasiostylus* var. *tomentosus* Focke, Hooker's Icon. Pl., ser. 3, 10: t. 1951. 1891.

绒毛绵果悬钩子 *rong mao mian guo xuan gou zi*

Pedicel long tomentose, with sparse, minute prickles. Abaxial surface of calyx densely long tomentose, unarmed.

• Slopes, roadsides. Hubei.

75e. *Rubus lasiostylus* var. *hubeiensis* T. T. Yu et al., J. Arnold Arbor. 64: 58. 1983.

鄂西绵果悬钩子 *e xi mian guo xuan gou zi*

Aggregate fruit soft hairy, not long tomentose.

• Slopes; 2700–2900. W Hubei.

76. *Rubus wushanensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 305. 1982.

巫山悬钩子 *wu shan xuan gou zi*

Shrubs to 2 m tall. Branchlets brownish, cylindrical, glabrous, with sparse prickles. Leaves imparipinnate, 5(–7)-foliolate; petiole 8–10 cm, petiolule of terminal leaflet 2–3 cm, lateral leaflets subsessile, petiolule and rachis glabrous or sparsely pubescent, with sparse, small prickles; stipules purplish, suborbicular or broadly ovate, 1.2–1.8 × 1.2–1.9 cm, membranous, glabrous; blade of leaflets elliptic, oblong, or ovate-lanceolate, 10–12 × 3.5–7 cm, abaxially densely gray tomentose, adaxially glabrous, base rounded, obliquely rounded on lateral leaflets, margin irregularly coarsely serrate, apex acuminate. Inflorescences terminal, corymbose, several flowered; bracts broadly

ovate or suborbicular, nearly as large as or slightly larger than stipules, membranous. Pedicel 2–3 cm, glabrous, unarmed. Calyx reddish brown, abaxially glabrous; sepals erect, broadly ovate or ovate-lanceolate, only inner sepals with gray tomentose margin, apex shortly acuminate. Petals narrowly obovate, shorter than sepals, base shortly clawed. Stamens many; filaments linear, base slightly broader. Pistils longer than stamens; apical part of ovary and basal part of style densely long gray tomentose. Aggregate fruit subglobose, ca. 1.5 cm in diam., densely long gray tomentose, with persistent styles. Fl. May–Jun, fr. Jul–Aug.

- Mountainous areas; below 2000 m. Chongqing (Wushan Xian).

77. *Rubus pentagonus* Wallich ex Focke, *Biblioth. Bot.* 17(Heft 72): 145. 1911.

掌叶悬钩子 *zhang ye xuan gou zi*

Shrubs scrambling, 1.5–3 m tall. Branchlets climbing, brownish to dark brown, slightly pubescent when young, later glabrous, with sparse prickles, often with stalked glands. Leaves palmately 3- or 5-foliolate; petiole 2–4 cm, sparsely pubescent, with stalked glands and minute prickles, rarely without stalked glands, leaflets sessile; stipules linear-lanceolate, 7–10 mm, puberulous, margin with shortly stalked glands, margin entire or deeply 2-laciniate; blade of leaflets rhombic-lanceolate, 3–8(–11) × 1.5–4 cm, abaxially sparsely pubescent, adaxially pilose along veins, base cuneate, margin incised coarsely doubly serrate, apex acuminate to caudate. Inflorescences terminal, corymbose, 2–3 cm, 2- or 3-flowered or with flowers solitary in leaf axils; bracts linear-lanceolate, 6–9 mm, often with stalked glands, margin entire or 2- or 3-laciniate. Pedicel 1.5–2.5 cm, glabrous, with sparse, gland-tipped hairs and small prickles. Flowers to 2 cm in diam. Calyx glabrous, abaxially glandular pubescent, with minute prickles; sepals erect, spreading, lanceolate or ovate-lanceolate, 0.8–1.2(–3) cm × 5–8 mm, margin entire or 3-laciniate, inner sepals with tomentose margin, apex acuminate or caudate. Petals white, elliptic or oblong, much shorter than sepals, base shortly clawed. Stamens many; filaments broad. Pistils 10–15, slightly shorter than stamens; style and ovary glabrous. Aggregate fruit red or orange-red, subglobose, to 2 cm in diam., glabrous, enclosed in calyx; pyrenes reniform, to 4 mm, rugose. Fl. Apr–May, fr. Jun–Jul.

Forests, forest margins on slopes, thickets, valleys, roadsides; 1300–3600 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, NW India, N Myanmar, Nepal, Sikkim, Vietnam].

- 1a. Plants with stalked glands and minute or needle-like prickles *77a. var. pentagonus*
- 1b. Plants usually without stalked glands, unarmed, rarely with few stalked glands or needle-like prickles.
 - 2a. Flowers more than 1.5 cm in diam.; sepals 2–3 cm, apically long caudate; leaves palmately 3-foliolate *77d. var. longisepalus*
 - 2b. Flowers less than 1.5 cm in diam.; sepals not more than 2 cm, apically acuminate; leaves 3- or 5-foliolate.

- 3a. Leaves palmately 3-foliolate *77b. var. modestus*
- 3b. Leaves palmately 5-foliolate *77c. var. eglandulosus*

77a. *Rubus pentagonus* var. *pentagonus*

掌叶悬钩子(原变种) *zhang ye xuan gou zi* (*yuan bian zhong*)

Rubus tridactylus Focke.

Plants with stalked glands and minute or needle-like prickles. Flowers 1.5–2 cm in diam.

Evergreen forests, mixed forests, thickets; 1300–3600 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, NW India, N Myanmar, Nepal, Sikkim, Vietnam].

77b. *Rubus pentagonus* var. *modestus* (Focke) T. T. Yu & L. T. Lu, *Fl. Reipubl. Popularis Sin.* 37: 111. 1985.

无刺掌叶悬钩子 *wu ci zhang ye xuan gou zi*

Rubus modestus Focke, *Abh. Naturwiss. Vereine Bremen* 14: 296. 1897; *R. modicus* Focke.

Leaves palmately 3-foliolate. Flowers less than 1.5 cm in diam. Sepals not more than 2 cm.

- Forest margins on slopes, thickets, valleys; 1600–2800 m. Guizhou, Sichuan, Yunnan.

77c. *Rubus pentagonus* var. *eglandulosus* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 306. 1982.

无腺掌叶悬钩子 *wu xian zhang ye xuan gou zi*

Leaves palmately 5-foliolate. Flowers less than 1.5 cm in diam. Sepals not more than 2 cm.

- Forests; 2000–2400 m. SE Xizang (Médog Xian).

77d. *Rubus pentagonus* var. *longisepalus* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 305. 1982.

长萼掌叶悬钩子 *chang e zhang ye xuan gou zi*

Leaves palmately 3-foliolate. Flowers more than 1.5 cm in diam. Sepals 2–3 cm, apex long caudate.

- Mixed forests on slopes, roadsides; 1500–2000 m. SE Yunnan (Pingbian Xian, Wenshan Xian).

78. *Rubus quinquefoliolatus* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 306. 1982.

五叶悬钩子 *wu ye xuan gou zi*

Shrubs scandent, ca. 1.5 m tall. Branchlets reddish brown to purplish brown when young, grayish brown in age, terete, soft hairy, glabrescent, with sparse prickles. Leaves palmately 5-foliolate; petiole 2–4 cm; leaflets sessile or subsessile, soft hairy; stipules linear-lanceolate, 4–6 mm, puberulous, usually undivided; blade of leaflets elliptic-lanceolate or rhombic-lanceolate, 3–7 × 1–2.4 cm, terminal leaflet slightly longer than lateral leaflets, both surfaces soft hairy along veins, base cuneate, margin coarsely sharply serrate and doubly serrate, apex acuminate to caudate. Inflorescences terminal on lateral branchlets, 1-flowered; bracts linear-lanceolate, 3–5 mm, puberulous, margin entire. Pedicel 2–3.5 cm, glabrous. Flowers 1.5–2 cm in diam. Calyx abaxially glabrous, unarmed or with sparse, nee-

dle-like prickles; tube broadly pelviform; sepals erect, spreading, ovate-lanceolate or triangular-lanceolate, 8–10 mm, margin entire, rarely apically shallowly 2- or 3-laciniate, inner sepals tomentose at margin, apex caudate. Petals white, ovate or elliptic, much shorter than sepals, puberulous, base slightly clawed. Stamens many, uniseriate; filaments broad, complanate. Pistils 10–15; ovary and base of style yellowish villous. Aggregate fruit red, semiglobose, 1–1.5 cm in diam., together with persistent styles villous, enclosed in calyx; pyrenes to 4 mm, rugose. Fl. Apr–May, fr. May–Jun.

• Slopes, stream side forests, mixed forests on low ridges; 1600–2500 m. SW Guizhou (Anlong Xian), SW Yunnan (Shuangjiang Xian).

79. *Rubus peltatus* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, ser. 3, 17: 154. 1872.

盾叶莓 *dun ye mei*

Shrubs upright or climbing, 1–2 m tall. Branchlets reddish brown or brownish, cylindrical, glabrous, with sparse prickles; prickles broad, flat, glaucous. Leaves simple; petiole 4–8 cm, glabrous, with minute prickles; stipules brownish, ovate or ovate-lanceolate, 1–1.5 cm × 7–10 mm, membranous, glabrous, margin entire; blade peltate, ovate-orbicular, 7–17 × 6–15 cm, both surfaces appressed villous, abaxially with more dense small prickles along midvein, base cordate, margin palmately 3–5-lobed; lobes triangular-ovate, terminal lobe slightly longer than or as long as lateral leaflets, irregularly tenuous-serrate, apex acute to shortly acuminate. Inflorescences ca. 5 cm or more in diam., 1-flowered; bracts ovate or ovate-lanceolate, 7–12 × 4–7 mm, glabrous. Pedicel 2.5–4.5 cm, glabrous. Calyx tube pelviform, glabrous; sepals ovate-lanceolate, 1–1.4 cm × 6–8 mm, soft hairy, margin usually dentate, or apically lacinate; lobes linear. Petals white, suborbicular, 1.8–2.5 cm in diam., longer than sepals. Stamens numerous, unequal in length, much shorter than petals; filaments subulate or linear. Pistils to 100 or slightly more, soft hairy. Aggregate fruit orange-red, terete or cylindrical, 3–4.5 × 1–1.5 cm, densely soft hairy; pyrenes rugose. Fl. Apr–May, fr. Jun–Jul. 2n = 14.

Slopes, foothills, forest margins, ravines, moist waste places; 300–1500 m. Anhui, Guizhou, Hubei, Jiangxi, Sichuan, Zhejiang [Japan].

The edible fruit are used in medicine.

80. *Rubus glabricarpus* W. C. Cheng, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. 10: 147. 1936.

光果悬钩子 *guang guo xuan gou zi*

Shrubs to 3 m tall. Branchlets brown or reddish brown, terete, slender, prickly; prickles basally broadened and flattened; young shoots brown-yellow to purplish red, with soft hairs and intermixed glandular hairs or glabrous. Leaves simple; petiole 1–2 cm, slender, with soft hairs and intermixed glandular hairs or glabrous, with minute prickles; stipules linear, 5–8 mm, pilose, with intermixed glandular hairs; blade narrowly ovate to ovate-lanceolate, 4–7 × 2–4.5 cm, both surfaces soft hairy, more densely so or with glandular hairs along veins, sparsely pilose in age, base somewhat cordate or subtruncate, margin 3-, rarely 5-lobed or incised-lobed, irregularly doubly serrate or incised-serrate, with stalked glands, apex acuminate. Inflorescences terminal or axillary, 1-flowered, ca. 1.5 cm in diam.

Pedicel 5–10(–15) mm, soft hairy or glabrous, with stalked glands. Calyx soft hairy, abaxially with stalked glands; tube campanulate; sepals lanceolate, 7–10 × 2–4 mm, apex caudate. Petals white, ovate-oblong or oblong, 8–10 × 4–7 mm, nearly as long as sepals, glabrous, apex obtuse or subacute. Stamens many, shorter than petals; filaments broad, complanate. Pistils shorter than stamens; ovary glabrous, with sparse, glandular hairs. Aggregate fruit red, ovoid-globose, 1(–2) cm in diam., glabrous or with sparse, stalked glands; pyrenes rugose. Fl. Mar–May, fr. May–Jun.

• Slopes, bases of mountains, river banks, forests; low to medium elevations. Fujian, Jiangsu, Zhejiang.

- 1a. Branchlets, petioles, and pedicel with soft hairs and stalked glands; aggregate fruit ca. 1 cm in diam. 80a. var. *glabricarpus*
- 1b. Branchlets, petioles, and pedicel glabrous, with sparse, stalked glands; aggregate fruit 1.5–2 cm in diam. 80b. var. *glabratus*

80a. *Rubus glabricarpus* var. *glabricarpus*

光果悬钩子(原变种) *guang guo xuan gou zi* (yuan bian zhong)

Rubus corchorifolius Linnaeus f. var. *neillioides* Focke; *R. neillioides* (Focke) Migo.

Branchlets, petioles, and pedicel soft hairy, with stalked glands. Aggregate fruit ca. 1 cm in diam.

• Slopes, bases of mountains, river banks, mixed forests; low to medium elevations. Fujian, Jiangsu, Zhejiang.

80b. *Rubus glabricarpus* var. *glabratus* C. Z. Zheng & Y. Y. Fang, J. Hangzhou Univ., Nat. Sci. Ed. 15(2): 198. 1988.

无毛光果悬钩子 *wu mao guang guo xuan gou zi*

Rubus jiangxiensis Z. X. Yu et al.

Branchlets, petioles, and pedicel glabrous, with sparse, stalked glands. Aggregate fruit 1.5–2 cm in diam. or slightly larger.

• Forests on slopes; ca. 1100 m. Zhejiang (Suichang Xian).

81. *Rubus corchorifolius* Linnaeus f., Suppl. Pl. 263. 1782.

山莓 *shan mei*

Rubus althaeoides Hance; *R. arisanensis* Hayata; *R. arisanensis* var. *horishaensis* Hayata; *R. corchorifolius* var. *glaber* Matsumura; *R. corchorifolius* var. *oliveri* (Miquel) Focke; *R. corchorifolius* f. *roseolus* Z. X. Yu; *R. involucratulus* Focke; *R. kerrifolius* H. Léveillé & Vaniot; *R. oliveri* Miquel; *R. otophorus* Franchet; *R. shinkoensis* Hayata; *R. suishaensis* Hayata; *R. vaniotii* H. Léveillé & Vaniot; *R. villosus* Thunberg.

Shrubs erect, 1–3 m tall. Branchlets brownish or dark brown to blackish brown, cylindrical, prickly, finely hairy, glabrescent. Leaves simple; petiole 1–2 cm, with dense fine, soft hairs when young, with sparse, minute prickles; stipules linear-lanceolate or linear, 5–7 mm, soft hairy; blade ovate to ovate-lanceolate, 5–12 × 2.5–5 cm, abaxially somewhat dark, densely finely pubescent when young, gradually glabrescent, subglabrescent, with sparse, small prickles along midvein, adaxially pale,

finely pubescent along veins, base somewhat cordate, sometimes subtruncate or subrounded, margin undivided or 3-lobed, usually 3-divided on sterile branches, irregularly sharply serrate to doubly serrate, apex acuminate. Inflorescences 1-flowered or few flowers terminal on short lateral branchlets. Pedicel (0.6–) 1–2 cm, finely pubescent. Flowers 1.5–2(–3) cm in diam. Calyx abaxially densely finely pubescent, unarmed; sepals ovate or triangular-ovate, 5–8 × 2.5–4 mm, apex acute to shortly acuminate. Petals white or pinkish, oblong or elliptic, 0.9–1.2 cm × 6–8 mm, longer than sepals, glabrous, base clawed, apex obtuse. Stamens much shorter than petals; filaments short, complanate. Pistils many, slightly shorter than stamens; ovary pubescent. Aggregate fruit of many drupelets, red, subglobose or ovoid-globose, 1–1.2 cm in diam., densely finely pubescent; pyrenes rugose. Fl. Feb–Apr, fr. Apr–Jun. $2n = 14$.

Sunny slopes, stream sides, montane valleys, thickets, waste places; 200–2600 m. Anhui, Fujian, Gansu (except NE), Guizhou, Guangdong, Guangxi, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shandong, Shanxi, S Shaanxi (Qin Ling), Sichuan, Yunnan, Zhejiang, Xizang [Japan, Korea, Myanmar, Vietnam].

The fresh fruit are used for making jam, drinks, and wine. The fruit, seeds, and roots are used in medicine. The stems and roots are a source of tannin.

A form with semidouble or double flowers has been named *Rubus corchorifolius* f. *semiplenus* Z. X. Yu. It occurs in Jiangxi and grows on thickets on slopes of hills at about 50 m in elevation.

82. *Rubus kwangsiensis* H. L. Li, J. Arnold Arbor. 26(1): 63. 1945.

广西悬钩子 *guang xi xuan gou zi*

Rubus peii R. H. Miao.

Shrubs climbing. Branchlets brown to grayish brown, slightly angled, glabrous, with sparse, curved prickles. Leaves simple; petiole 1.5–3 cm, glabrous, with sparse, curved prickles; stipules lanceolate, 6–8 mm, glabrous; blade narrowly obovate, 7–12 × 4–6 cm, lateral veins 7 or 8 pairs, abaxially glabrous, adaxially glabrous except slightly pubescent along veins, base subcordate, margin unevenly coarsely sharply serrate to doubly serrate, apex acuminate. Inflorescence terminal or axillary, 1-flowered. Pedicel ca. 1 cm, glabrous. Flowers ca. 2 cm in diam. Calyx abaxially glabrous; sepals triangular-lanceolate, 1–1.5 cm, margin slightly tomentose, apex acuminate to caudate. Petals red, obovate, 7–8 × 6–7 mm, glabrous or basally puberulous. Stamens shorter than petals; filaments linear. Pistils many; soft hairy apically on apex of ovary and basally on style. Fruit unknown. Fl. Apr–May.

• Forests at mountain summits. Guangdong, NE Guangxi (Ziyuan Xian).

83. *Rubus taitoensis* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 96. 1911.

台东刺花悬钩子 *tai dong ci hua xuan gou zi*

Shrubs scandent, 1–2 m tall. Branchlets brownish to dark reddish brown, cylindrical, slightly pubescent, with sparse prickles, glabrous or nearly so in age. Leaves simple; petiole 1–2(–4)

cm, pubescent, with minute prickles; stipules linear-lanceolate, 6–9 mm, slightly pubescent; blade broadly ovate or triangular-ovate, 6–8(–10) × 3–5.5(–7) cm, papery, 3–5-veined, abaxially pale, pubescent, with small prickles along veins, adaxially thinly pubescent especially along veins, finally glabrous, base slightly cordate to truncate, margin incised-serrate to doubly serrate, 3-parted near middle or not lobed, central lobe contracted and becoming entire toward base, apex acuminate, lateral leaflets ovate, apex acute. Inflorescences terminal or axillary, 1-flowered or flowers in clusters of 2 or 3; bracts linear, 5–7 mm, slightly pubescent. Pedicel 1–2 cm, pubescent. Flowers 1.8–2.8 cm in diam. Calyx campanulate, abaxially pubescent, with sparse, needle-like prickles; sepals triangular-lanceolate, 7–12 × 3–5 mm, apex long caudate. Petals white, broadly ovate, 7–9 × 6–8 mm, glabrous, base clawed. Stamens numerous, shorter than petals; filaments broad, complanate. Pistils shorter than stamens; styles to 4 mm, base long hairy. Aggregate fruit red at maturity, globose, 0.9–1.2 cm in diam., sparsely pubescent, finally glabrous; pyrenes rugulose. Fl. May–Jun, fr. Jul–Aug. $2n = 14^*$.

• Mountainous regions; 1500–2800 m. Taiwan.

1a. Leaves 3-parted; petioles 1–2 cm 83a. var. *taitoensis*
1b. Leaves not lobed; petioles 2–4 cm

..... 83b. var. *aculeatiflorus*

83a. *Rubus taitoensis* var. *taitoensis*

台东刺花悬钩子(原变种) *tai dong ci hua xuan gou zi* (yuan bian zhong)

Rubus aculeatiflorus Hayata var. *taitoensis* (Hayata) Y. C. Liu & Yang, nom. illeg.

Leaves deeply 3-lobed; petioles 1–2 cm.

• Mountainous regions; 1500–2500 m. Taiwan.

83b. *Rubus taitoensis* var. *aculeatiflorus* (Hayata) H. Ohashi & C. F. Hsieh, Fl. Taiwan, ed. 2, 3: 143. 1993.

刺花悬钩子 *ci hua xuan gou zi*

Rubus aculeatiflorus Hayata, Icon. Pl. Formosan. 5: 39. 1915; *R. mingsetsensis* Hayata; *R. mingsetsensis* var. *taitoensis* (Hayata) Y. C. Liu & Yang.

Leaves not lobed; petioles 2–4 cm.

• Mountains; 1500–2800 m. Taiwan.

84. *Rubus trianthus* Focke, Biblioth. Bot. 17(Heft 72): 140. 1911.

三花悬钩子 *san hua xuan gou zi*

Rubus conduplicatus Duthie ex Hayata; *R. incisus* Thunberg var. *conduplicatus* (Duthie ex Hayata) Koidzumi; *R. incisus* var. *formosanus* (Cardot) Masamune; *R. incisus* subsp. *koehneanus* (Focke) Koidzumi; *R. koehneanus* Focke; *R. koehneanus* var. *formosanus* Cardot; *R. retusipetalus* Hayata.

Shrubs scandent, 0.5–2 m tall. Branchlets brown or dark purplish to purplish black, terete, slender, glabrous, with few prickles to 5 mm and glaucous bloom. Leaves simple; petiole

1–3(–4) cm, glabrous, with sparse, minute prickles; stipules lanceolate or linear, 7–9 mm, glabrous; blade ovate-lanceolate to oblong-lanceolate, 4–9 × 2–5 cm, papery, both surfaces glabrous, abaxially usually pale or whitish, base cordate, rarely subtruncate, margin 3-lobed or not, usually deeply 3-lobed on sterile branchlets, terminal lobe ovate-lanceolate, unevenly incised-serrate to doubly serrate, apex acuminate. Inflorescences terminal or axillary, flowers in clusters of 3 or in short few flowered racemes, 3–5 cm; bracts lanceolate or linear, 5–7 mm, glabrous. Pedicel 1–2.5 cm, glabrous. Flowers 1–1.7 cm in diam. Calyx cupular, abaxially glabrous; sepals triangular-ovate to lanceolate, 5–8 × 2.5–4 mm, apex acuminate to long caudate. Petals white, oblong or elliptic, rarely obovate, longer than sepals, both surfaces glabrous or slightly pubescent becoming glabrous, base clawed. Stamens many, shorter than petals; filaments broad, complanate. Pistils ca. 10–50, shorter than stamens; ovary glabrous. Aggregate fruit red at maturity, subglobose, ca. 1 cm in diam., glabrous; pyrenes rugose. Fl. Apr–May, fr. May–Jun.

Mixed forests on slopes, forest margins, grassy slopes, roadsides, stream sides, montane valleys; 500–2800 m. Anhui, Fujian, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Vietnam].

Further study is required to determine the identity of *Rubus glabricarpus* W. C. Cheng var. *eglandulosus* Y. Gu & W. L. Li (Bull. Bot. Res., Harbin 20: 122. 2000), described from Yunnan, which might be synonymous with *R. trianthus*.

85. *Rubus grayanus* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, ser. 3, 7: 152. 1872.

中南悬钩子 *zhong nan xuan gou zi*

Shrubs 0.5–2 m tall. Branchlets brownish to purplish brown, slightly angled, glabrous, nearly unarmed or with sparse prickles. Leaves simple; petiole 2–3 cm, slender, glabrous, with sparse, minute prickles; stipules linear, 5–7 mm, glabrous; blade ovate to elliptic, 7–10 × 3–6 cm, both surfaces glabrous, or with few soft hairs only along veins, abaxially with sparse, minute prickles along midvein, base truncate to cordate, margin often undivided, sometimes 3–5-lobed, unevenly coarsely sharply serrate to doubly serrate, apex acuminate to caudate. Inflorescences terminal on short branchlets, 1-flowered. Pedicel 1–2.5 cm, glabrous, occasionally with sparse, glandular hairs. Flowers to 2 cm in diam. Calyx abaxially glabrous; tube pelviform; sepals spreading or reflexed in fruit, ovate-triangular, 0.8–1.4 cm × 3–5 mm, margin tomentose, apex caudate. Petals red, 0.8–1.4 cm in diam., nearly as long as or slightly longer than sepals, glabrous, base shortly clawed. Stamens many; filaments and anthers purplish red. Pistils numerous, more than 100, shorter than stamens; ovary purplish red, glabrous; styles glabrous. Aggregate fruit yellowish red, ovoid-globose, 1–1.2 cm in diam., glabrous; pyrenes reniform, small, foveolate. Fl. Apr–May, fr. Jun–Jul. $2n = 14$.

Slopes, sunny areas, montane valleys, thickets, mixed forests along water courses; 300–1100 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang [Japan].

- 1a. Leaves often not divided 85a. var. *grayanus*
 1b. Leaves usually 3-divided 85b. var. *trilobatus*

85a. *Rubus grayanus* var. *grayanus*

中南悬钩子(原变种) *zhong nan xuan gou zi* (yuan bian zhong)

Leaves often undivided, sometimes 3–5-lobed only on sterile branchlets.

Slopes, sunny areas, montane valleys, thickets, mixed forests along water courses; 500–1100 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang [Japan].

85b. *Rubus grayanus* var. *trilobatus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 307. 1982.

三裂中南悬钩子 *san lie zhong nan xuan gou zi*

Leaves usually 3-lobed; lobes triangular-ovate, terminal lobe ca. more than 2 × as long as lateral leaflets.

• Slopes; 300–700 m. C and N Fujian (Chong'an Xian, Sha Xian), Zhejiang.

86. *Rubus yanyunii* Y. T. Chang & L. Y. Chen, Guihaia 15(1): 1. 1995.

九仙莓 *jiu xian mei*

Shrubs scrambling or suberect, 1–2(–3) m tall. Branches brown or dark brown, glabrous; anntinous branchlets brownish, glabrous, with sparse, curved prickles. Leaves simple; petiole 1.5–2.5 cm, glabrous, sometimes with sparse, small stalked glands; stipule linear or linear-lanceolate, 6–8 mm, glabrous; blade ovate or oblong to oblong-lanceolate, 6–12(–14) × 3.5–4.5(–6) cm, abaxially pale gray or somewhat purplish red, sometimes with sparse, slender prickles along midvein, adaxially usually green, glabrous except puberulous at base of midvein, base cordate to deeply cordate, basal incision sometimes narrow and deep forming overlapped incised margin, margin serrate, apex acuminate or abruptly with a 1–2 cm point. Inflorescences terminal or axillary, 1-flowered; bracts similar to stipules, but smaller. Pedicel 0.8–1.8 cm, glabrous. Calyx abaxially glabrous; sepals triangular-lanceolate, 6–8 mm, glabrous or with sparse, minute stalked glands, apex caudate. Petals spreading, white, longer than sepals. Stamens many. Pistils numerous, densely gray tomentose. Aggregate fruit pale golden, subglobose; pyrenes reniform, ca. 1.5 mm, alveolate. Fl. spring, fr. spring–summer.

• Thickets at forest margins; 700–1600 m. S Fujian (Dehua Xian, Shanghang Xian).

87. *Rubus crataegifolius* Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 2: 98. 1835.

牛叠肚 *niu die du*

Rubus ampelophyllus H. Léveillé; *R. crataegifolius* f. *flavescens* Skvortsov; *R. davidianus* Kuntze; *R. ouensanensis* H. Léveillé & Vaniot; *R. wrightii* A. Gray.

Shrubs erect, 1–2(–3) m tall. Branchlets brown or reddish brown, angular, thinly pubescent when young, gradually glabrescent, with slightly curved prickles. Leaves simple; petiole 2–5 cm, pilose, with minute prickles, stipules linear, 6–8 mm, thinly pubescent or subglabrous; blade ovate to narrowly ovate, 5–12 × 5–8 cm, palmately 5-veined, abaxially pubescent and with

minute prickles along veins, adaxially subglabrous, base cordate or subtruncate, margin palmately 3–5-lobed; lobes ovate or narrowly obovate, terminal lobe usually acuminate, lateral leaflets acute, irregularly incised-serrate. Inflorescences terminal, rarely axillary, short racemes or flowers several in cluster, 3–5 cm; bracts linear, 4–7 mm, slightly pubescent. Pedicel 5–10 mm, pubescent. Flowers 1–1.5 cm in diam. Calyx abaxially thinly pubescent, subglabrous in fruit; sepals ovate-triangular or ovate, 6–9 × 3–5 mm, apex acuminate. Petals white, elliptic or oblong, 7–9 × 4–5 mm, base puberulous and long clawed, margin erose or slightly undulate. Stamens erect, much shorter than petals; filaments broad, complanate. Pistils numerous, slightly shorter than stamens; style and ovary glabrous. Aggregate fruit yellow to dark red, subglobose, ca. 1 cm in diam., glabrous, lustrous; pyrenes rugose. Fl. May–Jun, fr. Jul–Sep. $2n = 14^*$, 21^* , 28^* .

Sunny thickets on slopes, forest margins, ravines, roadsides; 300–2500 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Shandong, Shanxi [Japan, Korea, E Russia].

88. *Rubus chingii* H. H. Hu, J. Arnold Arbor. 6: 141. 1925.

掌叶覆盆子 zhang ye fu pen zi

Shrubs lianoid, 1.5–3 m tall. Branchlets green when young, reddish brown in age, cylindric, slender, glabrous, with sparse prickles 5–6 mm and glaucous bloom. Leaves simple; petiole green, 2–4 cm, slightly pubescent or glabrous, with sparse prickles 5–6 mm; stipules green, linear-lanceolate, 7–10 mm, puberulous or glabrous; blade suborbicular, 5–11(–16) × 5–13(–18) cm, palmately (3–)5–7-veined, both surfaces pubescent or subglabrous, base cordate, margin usually palmately (3–)5(–8)-lobed; lobes elliptic to rhombic-lanceolate, terminal lobe slightly longer than lateral lobes, lobes contracted toward base, doubly serrate, apex acuminate to caudate. Inflorescences terminal on short branchlets, 1-flowered. Pedicel 2–3.5(–4) cm, usually glabrous. Flowers 2.5–4(–5) cm in diam. Calyx somewhat green or purplish red, abaxially densely pubescent; tube broadly pelviform; sepals narrowly ovate to ovate-oblong, 7–10 × 4–6 mm, apex acute to shortly acuminate, abruptly long pointed. Petals white, elliptic or ovate-oblong, rarely obovate, 1–1.5(–2.5) × 0.7–1.5 cm, glabrous, base shortly clawed, apex obtuse. Stamens many in 3 whorls, unequal in length, shorter than petals; filaments broad, complanate. Pistils numerous, shorter than longer stamens, nearly as long as shorter ones; ovary densely gray pubescent. Aggregate fruit red, subglobose, 1.5–2 cm in diam., densely gray pubescent; pyrenes rugose. Fl. Mar–Apr, fr. May–Jun. $2n = 14$.

Slopes, broad-leaved evergreen forests on hills, coniferous forests, thickets, roadsides; below 500–1000 m. Anhui, Fujian, Guangxi, Jiangsu, Jiangxi, Zhejiang [Japan].

The specific epithet honors the collector of the type specimen, R. C. Ching, although it was misspelled “*chungii*” in the protologue. Hu later corrected it to “*chingii*” (J. Arnold. Arbor. 7: 70. 1926).

The very sweet fruit are eaten fresh and are also used for making jam, jelly, and various drinks, including wine. The fruit, roots, and leaves are used in medicine.

1a. Leaves palmately 5-parted, rarely 3- or 7-parted; flowers 2.5–4 cm in diam.;

petals 1–1.5(–2) cm 88a. var. *chingii*

1b. Leaves palmately 5–7-parted, rarely 6- or 8-parted; flowers 3–5 cm in diam.;

petals 1.4–2.5 cm 88b. var. *suavissimus*

88a. *Rubus chingii* var. *chingii*

掌叶覆盆子(原变种) zhang ye fu pen zi (yuan bian zhong)

Rubus officinalis Koidzumi; *R. palmatus* Hemsley (1887), not Thunberg (1784).

Leaves palmately 5-parted, rarely 3- or 7-parted. Flowers 2.5–4 cm in diam. Petals 1–1.5(–2) cm.

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Slopes, shaded thickets, roadsides; low to medium elevations. Anhui, Fujian, Guangxi, Jiangsu, Jiangxi, Zhejiang [Japan].

Further study is required to determine the identity of *Rubus septemlobus* H. L. Li (J. Arnold Arbor. 26: 62. 1945), described from Guangxi, which might be synonymous with *R. chingii* var. *chingii*.

88b. *Rubus chingii* var. *suavissimus* (S. Lee) L. T. Lu, Acta Phytotax. Sin. 38: 280. 2000.

甜茶 tian cha

Rubus suavissimus S. Lee, Guihaia 1(4): 17. 1981.

Leaves palmately 5–7-parted, rarely 6- or 8-parted. Flowers 3–5 cm in diam. Petals 1.4–2.5 cm.

• Broad-leaved evergreen forests on hills, coniferous forests, thickets; 500–1000 m. EC Guangxi (Guiping Xian, Jinxiu Xian).

The leaves are rich in sugar and are used to make a sweet tea in S China.

2. *Rubus* sect. *Lampobatus* Focke in Engler & Prantl, Nat. Pflanzenfam. 3(3): 31. 1888.

掌绿莓组 chang lu mei zu

Shrubs evergreen, prickly. Leaves usually ternate, sometimes pedately or palmately quinately compound, rarely simple, leathery; stipules mostly adnate to base of petiole, rarely free and on twig near petiole base. Flowers bisexual, forming large cymose panicles. Aggregate fruit separating from torus, or adnate to torus and separating from base of torus at maturity, hollow or not.

One species in China.

89. *Rubus lucens* Focke, Abh. Naturwiss. Vereine Bremen 4: 199. 1874.

光亮悬钩子 guang liang xuan gou zi

Shrubs evergreen, scandent, ca. 4 m tall. Branchlets thinly pubescent or subglabrous, becoming glabrescent, with minute prickles. Leaves ternately-pinnately compound, 3-foliolate; petiole 4–10(–15) cm, petiolule of terminal leaflet 1.5–3 cm, lateral leaflets shortly petiolulate, thinly pubescent or subglabrescent, with sparse prickles; stipules caducous, linear or lanceolate, 5–7 mm, thinly pubescent; blade of leaflets ovate, broadly elliptic, or ovate-lanceolate, 8–13 × 4–7 cm, leathery, lateral veins 8–10 pairs, adaxially shiny, both surfaces glabrous or thinly pubescent only along veins, base rounded or broadly cuneate, margin sparsely shallowly sharply serrate, apex cau

date. Inflorescences terminal or axillary, cymose panicles, terminal ones 15–30 cm, lateral ones shorter; rachis and pedicels thinly pubescent; bracts linear or lanceolate, 4–6 mm, puberulous. Pedicel ca. 1 cm. Calyx abaxially thinly soft hairy; tube pelviform; sepals erect in fruit, oblong, 4–6 × 2–3 mm, margin thinly gray tomentose, apex obtuse, abruptly pointed. Petals white or pink, obovate, nearly as long as sepals. Stamens usually 20–40, sometimes to more than 70, shorter than petals; filaments linear. Pistils 10 to more than 20, shorter than stamens; ovary soft hairy. Aggregate fruit subglobose, less than 1 cm in diam., glabrous or slightly soft hairy, enclosed in calyx; pyrenes coarsely rugose. Fl. Jun–Aug, fr. Oct–Dec.

Montane valleys, ravines, forests, thickets; 600–3000 m. S Yunnan [India, Indonesia, Philippines].

3. *Rubus* sect. *Rubus*

悬钩子组 xuan gou zi zu

Shrubs deciduous, usually prickly. Leaves ternate, papery, pedately or palmately quinately compound, rarely septernately compound, occasionally simple; stipules persistent, mostly adnate to base of petiole, rarely free and on twig near petiole base, narrow, undivided. Flowers bisexual, forming cymose panicles and subracemes, or several in clusters, or solitary. Aggregate fruit adnate to torus, separating from base of torus, rarely separating from torus at maturity, not or rarely hollow.

One species in China.

90. *Rubus caesius* Linnaeus, Sp. P. 1: 493. 1753.

欧洲木莓 ou zhou mu mei

Shrubs scandent, to 1.5 m tall. Branchlets yellow-green to brownish, glabrous or puberulous, glaucous and with unequal long prickles. Leaves ternately-pinnately compound; petiole 4–7 cm, petiolule of terminal leaflet 1–2.5 cm, lateral leaflets subsessile, thinly pubescent, with minute prickles, sometimes with intermixed shortly stipitate glands; stipules lanceolate or elliptic-lanceolate, 6–10 × 2–3 mm, pubescent, margin sparsely stipitate glandular; blade broadly ovate or rhombic-ovate, 4–7 × 3–7 cm, both surfaces puberulous, base rounded to truncate, margin incised, coarsely sharp doubly serrate, often 3-lobed,

apex acute. Inflorescences terminal or axillary, corymbose or short racemes, several to more than 10-flowered, terminal ones to 14 cm, with more flowers, axillary ones shorter, few flowered; rachis and pedicels pubescent, with minute prickles, sometimes with intermixed shortly stipitate glands; bracts broadly lanceolate, 5–8 × 1–2 mm, pubescent or shortly stipitate gland

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ular. Pedicel 1–1.5 cm. Flowers to 2 cm in diam. Calyx abaxially pubescent, with minute prickles; tube short, pelviform; sepals usually erect, ovate-lanceolate, 6–8 × 3–5 mm, apex acuminate. Petals white, broadly elliptic or broadly oblong, nearly as long as or slightly longer than sepals, glabrous, base shortly clawed. Stamens many, shorter than petals; filaments linear.

Pistils nearly as long as or slightly shorter than stamens; style and ovary glabrous. Aggregate fruit black, subglobose, ca. 1 cm in diam., glabrous. Fl. Jun–Jul, fr. Aug.

Forests in montane valleys, ravines, river banks; 1000–1500 m. Xinjiang [Russia; SW Asia, Europe, North America].

4. Rubus sect. **Malachobatus** Focke, Abh. Naturwiss. Vereine Bremen 4: 187. 1874.

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Shrubs, rarely subshrubs or herbs, often prickly. Leaves simple, rarely palmately or pedately compound, 3–5-foliolate; stipules caducous or persistent, free, on twig near base of petiole, broader, rarely narrower, serrate, lobed or dissected, occasionally not divided. Flowers usually bisexual, rarely unisexual, in cymose panicles, subracemes, or corymbs, rarely flowers several in clusters or solitary. Aggregate fruit adnate to torus, separating from base of torus at maturity, not hollow.

Ninety-two species (71 endemic) in China.

- 1a. Terminal inflorescences simple racemes or flowers solitary.
- 2a. Flowers solitary, rarely in clusters of 2 or 3, terminal or axillary.
- 3a. Leaves compound, 3-foliolate, both surfaces sparsely soft hairy.
 - 4a. Plants with stalked glands; lateral leaflets suborbicular or ovate; flowers 3–4 cm in diam.; pedicel 3–4 cm; pistils numerous 179. *R. wardii*
 - 4b. Plants without stalked glands; lateral leaflets ovate or elliptic; flowers 1–1.5 cm in diam.; pedicel ca. 1 cm; pistils not numerous 180. *R. metoensis*
- 3b. Leaves simple, glabrous or adaxially sparsely pubescent and abaxially tomentose.
 - 5a. Leaves leathery, both surfaces glabrous, margin subentire or sparsely serrulate, base rounded to subtruncate; petioles 0.5–1 cm; aggregate fruit ovoid-globose, densely thinly gray pubescent 181. *R. jambosoides*
 - 5b. Leaves not leathery, adaxially sparsely pubescent, abaxially tomentose, margin aristate-serrate, base deeply cordate to subauriculate; petioles 2–2.5 cm; aggregate fruit globose, glabrous at maturity 182. *R. lohfauiensis*
- 2b. Terminal inflorescences simple racemes; leaves palmately compound, 3–5-foliolate, or simple.
 - 6a. Leaves palmately compound, 3–5-foliolate.
 - 7a. Stipules and bracts palmately parted; leaflets sharply serrate; soft hairs of stamens deciduous in age 160. *R. playfairianus*
 - 7b. Stipules and bracts usually entire or only apically serrate; leaflets sparsely minute serrate; soft hairs of stamens persistent in age 161. *R. bambusarum*
 - 6b. Leaves simple.
 - 8a. Leaves deeply divided.
 - 9a. Leaves lobes lanceolate or narrowly oblong, margin sparsely minute sharply serrate; inflorescences and calyx without glandular hairs, or only abaxial surface of calyx with sparse, glandular hairs; aggregate fruit black 162. *R. henryi*
 - 9b. Leaf lobes elliptic or oblong, margin densely coarsely sharply serrate; inflorescences and calyx with sparse, glandular hairs; aggregate fruit red 163. *R. huangpingensis*
 - 8b. Leaves undivided or lobed.
 - 10a. Inflorescences stipitate glandular.
 - 11a. Stipules and bracts palmatipartite nearly to base, late caducous; inflorescences and abaxial surface of calyx villous, with sparse, glandular hairs, without needle-like prickles 170. *R. refractus*
 - 11b. Stipules and bracts entire or toothed, caducous; inflorescence and calyx with stipitate glands and needle-like prickles.
 - 12a. Leaves leathery, undivided, abaxially yellowish brown to rust colored tomentose; inflorescences and calyx with stipitate glands, with intermixed needle-like prickles 164. *R. dunnii*
 - 12b. Leaves not leathery, undivided or lobed, abaxially gray to rust colored tomentose; inflorescences and calyx with unequal stipitate glands and needle-like prickles.
 - 13a. Abaxial surface of leaves rust colored tomentose.
 - 14a. Leaves lanceolate to elliptic-lanceolate, base rounded to truncate, rarely shallowly cordate, not divided; abaxial surface of calyx tomentose; aggregate fruit dark red 168. *R. gressittii*
 - 14b. Leaves ovate to ovate-lanceolate, base cordate, lobed or undulate; abaxial surface of calyx tomentose-villous; aggregate fruit black 169. *R. lichuanensis*
 - 13b. Abaxial surface of leaves gray to yellowish gray tomentose.
 - 15a. Leaves cordate at base, broadly ovate, lobed; inflorescences and abaxial surface of calyx with glandular hairs 2–4 mm, with needle-like prickles 167. *R. hanceanus*

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- 15b. Leaves rounded or truncate to shallowly cordate at base, undivided; inflorescences and calyx with glandular hairs 1–2 cm, unarmed.
- 16a. Hairs of leaves of fruiting branchlets deciduous in age; sepals ovate or triangular-ovate 165. *R. swinhoei*
- 16b. Hairs of leaves of fruiting branchlets persistent in age; sepals lanceolate or triangular-lanceolate 166. *R. doyonensis*
- 10b. Inflorescences not stipitate glandular.
- 17a. Abaxial surface of leaves glabrous, or slightly hairy only along veins; terminal inflorescences corymbose racemes 178. *R. kawakamii*
- 17b. Abaxial surface of leaves tomentose; terminal inflorescences racemes.
- 18a. Leaves not leathery, abaxially gray or yellowish gray tomentose, coarsely sharply serrate.
- 19a. Aggregate fruit red; pedicel 1.5–3.5 cm; outer sepals apically lacinate, inner sepals entire; leaves basally subtruncate to shallowly cordate; stamens with few hairs only on anthers 175. *R. hemithyrus*
- 19b. Aggregate fruit purplish black; pedicel 0.7–1.5 cm; outer and inner sepals entire; leaves basally subrounded to subtruncate; stamens villous or glabrous.
- 20a. Leaves narrowly obovate or broadly ovate-lanceolate to narrowly lanceolate, base rounded to subtruncate; stamens glabrous or anthers slightly villous; styles ca. as long as or slightly longer than stamens 176. *R. preptanthus*
- 20b. Leaves elliptic or oblong-elliptic, base subrounded; stamens villous; styles much longer than stamens 177. *R. malifolius*
- 18b. Leaves leathery, abaxially densely yellowish to rust colored tomentose, minutely shallowly serrate.
- 21a. Pedicel and abaxial surface of calyx with dense, needle-like prickles; leaves abaxially yellowish brown tomentose 171. *R. fujianensis*
- 21b. Pedicel and abaxial surface of calyx unarmed; leaves abaxially rust colored or yellowish tomentose.
- 22a. Aggregate fruit black at maturity; leaves abaxially rust colored tomentellate, lateral veins 5–8 pairs; style villous 174. *R. caudifolius*
- 22b. Aggregate fruit red at maturity; leaves abaxially densely yellowish or yellowish brown tomentose, lateral veins 7–11 pairs; styles glabrous or villous.
- 23a. Leaves densely yellowish tomentose abaxially, lateral veins 8–11 pairs; petioles 0.8–1.5 cm; styles and ovary glabrous 172. *R. oblongus*
- 23b. Leaves densely yellowish brown tomentose abaxially, lateral veins 7–9 pairs; petioles 1.5–3 cm; styles and apex of ovary hairy 173. *R. liui*
- 1b. Terminal inflorescences cymose panicles or subracemes, rarely corymbs, or flowers several or solitary.
- 24a. Leaves palmately compound, 3–5-foliolate, rarely simple.
- 25a. Leaflets pinnately veined with (20–)30–50 pairs of lateral veins, abaxially densely sericeous; stipules and bracts not lobed 91. *R. lineatus*
- 25b. Leaflets reticulately veined, lateral veins few; abaxially tomentose or pilose; stipules and bracts palmately divided or not.
- 26a. Abaxial surface of leaflets tomentose; stipules and bracts 5–10 mm, palmately divided 92. *R. cochinchinensis*
- 26b. Abaxial surface of leaflets pilose; stipules and bracts leaflike, 20–35 mm, not divided, serrate 93. *R. foliaceistipulatus*
- 24b. Leaves simple.
- 27a. Stipules and bracts broader, usually 2–5 × 1–2 cm, rarely smaller, divided or serrate.
- 28a. Leaves abaxially glabrous except soft hairy along veins, lobed; stipules broadly to narrowly ovate, 2–3 cm 159. *R. wangii*
- 28b. Leaves abaxially densely tomentose or sericeous-villous, undulate, inconspicuously lobed or lobed; stipules oblong lanceolate, suborbicular, broadly ovate, to oblong, 1.5–5 cm.
- 29a. Leaves abaxially densely sericeous-villous, undulate or 3–5-lobed; flowers solitary or in clusters of 2 or 3 158. *R. crassifolius*
- 29b. Leaves abaxially tomentose, with narrow caudate lobes above middle or with broad obtuse or acute lobes; terminal inflorescences narrow cymose panicles or subracemes.
- 30a. Stipules oblong-lanceolate, 2–4(–5) cm; leaves elliptic or ovate-elliptic, rarely suborbicular, with irregular narrow caudate lobes above middle; inflorescences and calyx gray tomentose 154. *R. yiwuanus*
- 30b. Stipules broadly ovate or oblong, 1.5–3 cm; leaves suborbicular or broadly ovate to narrowly ovate, with broad obtuse or acute lobes; inflorescences and calyx villous or tomentose.
- 31a. Leaves broadly ovate to narrowly ovate, abaxially gray tomentose, apically acuminate, margin inconspicuously lobed; inflorescences and calyx with soft hairs 157. *R. pacificus*
- 31b. Leaves suborbicular or broadly ovate, abaxially with gray, yellowish gray, or yellowish brown hairs, apically acute or obtuse, margin undulate to lobed; inflorescences villous or tomentose.

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- 32a. Stipules broadly ovate or broadly oblong, 1.5–2 cm; leaves 5–7-lobed, lobes acute apically; inflorescences and calyx villous 155. *R. stipulosus*
- 32b. Stipules oblong, 2–3 cm; leaves undulate or inconspicuously lobed, lobes obtuse apically, rarely acute; inflorescences and calyx tomentose 156. *R. irenaeus*
- 27b. Stipules and bracts narrower, less than 2×1 cm, rarely broader, divided and entire.
- 33a. Leaves abaxially \pm soft hairy, rarely glabrous.
- 34a. Subshrubs, nearly creeping, villous; inflorescences subracemes, several-flowered; leaves cordate at base 153. *R. hypopitys*
- 34b. Shrubs climbing or upright, taller; inflorescences cymose panicles or subracemes, many flowered, rarely few flowered; leaves rounded, subtruncate, or cordate at base.
- 35a. Leaves rounded or subtruncate, rarely shallowly cordate at base.
- 36a. Plants densely yellow glandular; inflorescences minutely soft hairy; abaxial surface of calyx subglabrous 138. *R. taronensis*
- 36b. Plant without glands; inflorescences pubescent or glabrous; abaxial surface of calyx pubescent or glabrous.
- 37a. Leaves basally truncate to subcordate.
- 38a. Leaves, inflorescences, and abaxial surface of calyx thinly pubescent; leaves elliptic or oblong, margin coarsely obtusely dentate 142. *R. yunanicus*
- 38b. Leaves, inflorescences, and abaxial surface of calyx yellowish sericeous-villous; leaves oblong or ovate-oblong to elliptic, margin minutely sharply serrate 143. *R. poliophyllus*
- 37b. Leaves basally rounded.
- 39a. Petioles to 1 cm; inflorescences and abaxial surface of calyx pubescent; carpels 5–10(–17) 139. *R. pirifolius*
- 39b. Petioles (0.7–)1–2 cm; inflorescences and abaxial surface of calyx glabrous or soft hairy; carpels more, usually more than 10, to many.
- 40a. Petioles 1–2 cm; leaves ovate-oblong or lanceolate, margin sparsely minute sharply serrate; inflorescences and abaxial surface of calyx glabrous 140. *R. acuminatus*
- 40b. Petioles 0.7–1 cm; leaves oblong-lanceolate, margin coarsely sharply serrate; inflorescences and abaxial surface of calyx soft hairy 141. *R. brevipetiolatus*
- 35b. Leaves cordate at base.
- 41a. Terminal inflorescences large lax cymose panicles.
- 42a. Plants glandular; leaves broadly ovate or narrowly obovate; sepals undivided; petals soft hairy on both surfaces 144. *R. forrestianus*
- 42b. Plants not glandular; leaves narrowly to broadly ovate; sepals undivided or pinnately laciniate; petals slightly pubescent or glabrous.
- 43a. Leaves narrowly ovate; pedicel 1–2 cm; sepals ovate or ovate-triangular, outer sepals pinnately laciniate; petals slightly pubescent 145. *R. laxus*
- 43b. Leaves broadly ovate, rarely oblong-ovate; pedicel 0.5–1 cm; sepals ovate-lanceolate or triangular-lanceolate, undivided; petals glabrous 146. *R. lambertianus*
- 41b. Terminal inflorescences narrow cymose panicles or subracemes.
- 44a. Abaxial surface of calyx with needle-like prickles.
- 45a. Leaves $6-9 \times 5-7$ cm; pedicel less than 1 cm; sepals broadly ovate, outer sepals pinnately divided; aggregate fruit 1–1.2 cm in diam. 147. *R. calycacanthus*
- 45b. Leaves $10-17 \times 15-20$ cm; pedicel 1.5–2.5 cm; sepals lanceolate or ovate-lanceolate, outer sepals apically 2- or 3-lacinate; aggregate fruit 1.4–1.8 cm in diam. 148. *R. gongshanensis*
- 44b. Abaxial surface of calyx without needle-like prickles.
- 46a. Plants usually without stalked glands, villous; leaves oblong to ovate-oblong; stipules 6–9 mm, deeply divided 152. *R. howii*
- 46b. Plants usually with stalked glands, soft hairy or glabrous; leaves lanceolate to ovate or broadly oblong.
- 47a. Plants with stalked glands, soft hairs, and bristles; leaves narrowly ovate or broadly oblong; petiole 2–3 cm; stipules deeply pinnate-lacinate 149. *R. menglaensis*
- 47b. Plants soft hairy or glabrous, with sparse, stalked glands; leaves lanceolate, ovate-lanceolate or oblong-lanceolate; petiole 1–4 cm; stipules subulate or linear-lanceolate to oblong-lanceolate, margin entire and palmatifid.
- 48a. Leaves ovate-lanceolate, base deeply cordate, basal incision broad; stipules subulate or linear-lanceolate, margin entire 150. *R. ichangensis*
- 48b. Leaves lanceolate or oblong-lanceolate, base cordate-auriculate, basal incision narrow; stipules oblong-lanceolate or ovate-lanceolate, palmatifid 151. *R. latoauriculatus*

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- 33b. Leaves abaxially densely tomentose.
- 49a. Leaves narrow, ovate-oblong or ovate-lanceolate to lanceolate, not divided, rarely lobed basally, pinnately veined; petioles 0.5–2(–4) cm.
- 50a. Leaves basally rounded to shallowly cordate; petioles 0.5–1.5 cm; plants with or without stalked glands.
- 51a. Plants without stalked glands; petioles 1–1.5 cm; leaves oblong-lanceolate, abaxially densely yellow or grayish yellow tomentose 96. *R. xichouensis*
- 51b. Plants wholly or partly with stalked glands; petioles 0.5–0.8 cm; leaves lanceolate or oblong, abaxially densely gray tomentose.
- 52a. Stipules and bracts palmately divided above middle; leaves subleathery, lanceolate; branchlets, petioles, and inflorescences glabrous, stalked glands not present; abaxial surface of calyx tomentose, with stalked glands 94. *R. dolichophyllus*
- 52b. Stipules and bracts deeply divided to below middle or to base; leaves papery, lanceolate or oblong; branchlets, petioles, inflorescences, and abaxial surface of calyx yellowish villous, with sparse, glandular hairs 95. *R. raopingensis*
- 50b. Leaves basally deeply cordate; petioles 0.5–3.5 cm; plants with stalked glands.
- 53a. Stipules and bracts linear or lanceolate, entire; terminal inflorescences narrow cymose panicles or short subracemes; petioles 1–1.5 cm 99. *R. angustibracteatus*
- 53b. Stipules and bracts palmate-laciniate; terminal inflorescences broad cymose panicles; petioles 0.5–3.5 cm.
- 54a. Adaxial surface of leaves appressed villous, basal incision shallow, broad, 2 basal short lobes not touching; petioles often 0.5–1 cm, rarely longer; sepals 0.5–1 cm, shortly acuminate 97. *R. parkeri*
- 54b. Adaxial surface of leaves hairy only along veins, basal incision narrow, to 2 cm deep, 2 basal long lobes touching; petioles 2–3.5 cm; sepals 1–1.5 cm, apex subulate or long caudate 98. *R. panduratus*
- 49b. Leaves broad, suborbicular, broadly ovate, or elliptic to oblong, not divided or lobed, palmately 5-veined from base; petioles more than 2 cm, rarely shorter.
- 55a. Leaves abaxially densely rusty yellow or rust colored, rarely rufous tomentose; terminal inflorescences short subracemes, rarely cymose panicles, with few flowers.
- 56a. Leaf base cuneate to rounded, undivided.
- 57a. Leaves narrowly ovate, rarely elliptic, with 8–10 pairs of lateral veins; terminal inflorescences lax cymose panicles, many flowered 131. *R. penduliflorus*
- 57b. Leaves ovate, with 4 or 5 pairs of lateral veins; terminal inflorescences short subracemes, few flowered 132. *R. malipoensis*
- 56b. Leaf base cordate, divided, or undivided.
- 58a. Leaves not divided or 2-lobed basally.
- 59a. Leaves ovate or narrowly ovate, undivided or somewhat undulate; stipules and bracts only apically palmately lobed; anthers and styles glabrous 136. *R. flagelliflorus*
- 59b. Leaves oblong-lanceolate or ovate-lanceolate, usually with 2 distinct lobes near base; stipules and bracts palmately parted basally; anthers and styles sericeous-villous 137. *R. hastifolius*
- 58b. Leaves divided or undulate.
- 60a. Leaves narrowly ovate, 3–5(–7)-lobed; stipules and bracts broadly obovate, 1–1.4 × 0.9–1.3 cm, pectinately or palmately divided; terminal inflorescences short subracemes, densely rust colored villous; abaxial surface of calyx rust colored villous, tomentose 135. *R. reflexus*
- 60b. Leaves ovate to suborbicular, lobed or undulate; stipules oblong, oblong-lanceolate to ovate-lanceolate, pinnate-laciniate or only apically palmately lobed; terminal inflorescence compact panicle or short subraceme; abaxial surface of calyx densely rust colored sericeous or yellow sericeous-villous or tomentose.
- 61a. Leaves 12–20 × 8–16 cm; stipules oblong-lanceolate, to 1.5 cm, pinnate-laciniate; terminal panicles compact, many flowered; calyx densely rust colored tomentose 133. *R. fuscifolius*
- 61b. Leaves 8–11 × 5–9 cm; stipules oblong or ovate-lanceolate, less than 1 cm, only apically palmately lobed; terminal inflorescences short subracemes, few flowered; abaxial surface of calyx yellow sericeous-villous, margin of sepals tomentose 134. *R. shihae*
- 55b. Leaves abaxially densely gray or yellowish gray tomentose.
- 62a. Leaves ovate, narrowly ovate, or ovate-lanceolate to oblong, rarely broadly ovate or suborbicular, undivided or lobed, apically acuminate, rarely acute or obtuse; terminal inflorescences large broad cymose panicles, to 27 cm, rarely racemose.
- 63a. Plants with glandular hairs or bristles.
- 64a. Plants tomentose, bristly; leaves suborbicular, abaxially densely gray tomentose; fruit purplish black 103. *R. tephrodes*

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- 64b. Plants pubescent, not bristly; leaves ovate or orbicular-ovate to narrowly ovate; fruit red, purplish red or purplish black.
- 65a. Leaves subleathery, broadly ovate or orbicular-ovate, abaxially yellowish tomentose; plants with stipitate glands ca. 1 mm; abaxial surface of calyx tomentose 102. *R. luchunensis*
- 65b. Leaves not leathery, narrowly to broadly ovate or orbicular-ovate, abaxially gray tomentose; plants with stipitate glands 2–3 mm; abaxial surface of calyx villous.
- 66a. Leaves ovate to narrowly ovate, apically obtuse to acute, margin undulate-lobed, lobes obtuse; sepals undivided 100. *R. feddei*
- 66b. Leaves broadly ovate or orbicular-ovate, apically acuminate, margin divided, lobes acute; sepals lacinate 101. *R. salwinensis*
- 63b. Plants without glandular hairs, rarely pedicel and abaxial surface of calyx with stalked glands.
- 67a. Leaves distinctly lobed, base cordate; petioles 3–7 cm 104. *R. lobophyllus*
- 67b. Leaves undivided, sometimes lobed, base rounded or cordate; petioles 0.5–10 cm.
- 68a. Leaves basally rounded, rarely subtruncate, oblong, ovate-oblong, or elliptic; petioles 0.5–1 cm 105. *R. assamensis*
- 68b. Leaves basally truncate to cordate, rarely suborbicular; petioles usually more than 2 cm.
- 69a. Leaves basally truncate, broadly triangular-ovate 106. *R. tinifolius*
- 69b. Leaves basally cordate, rarely subrounded, suborbicular, broadly ovate.
- 70a. Inflorescences and abaxial surface of calyx sericeous-villous.
- 71a. Leaves suborbicular or broadly ovate.
- 72a. Leaves thickly papery, base cordate, margin sharply serrate; terminal cymose panicles large, broad; flowers apetalous 107. *R. chroosepalus*
- 72b. Leaves leathery, base truncate to shallowly cordate, margin shallowly obtusely serrate; terminal cymose panicles small, narrow; flowers petalous 108. *R. mallotifolius*
- 71b. Leaves narrowly ovate or ovate-lanceolate.
- 73a. Shrubs deciduous; leaves 7–10 cm, lobed; petioles 2–4 cm, sparsely villous; pedicel and abaxial surface of calyx with sparse, minute stalked glands 109. *R. fuscrobens*
- 73b. Shrubs evergreen; leaves 11–22 cm, not divided or shallowly undulate; petioles 5–10 cm, glabrous; pedicel and abaxial surface of calyx without stalked glands 110. *R. jianensis*
- 70b. Inflorescences and abaxial surface of calyx tomentose or tomentose-villous.
- 74a. Leaf base rounded to shallowly cordate; flowers 6–8 mm in diam.; abaxial surface of calyx tomentose; flowers petalous or apetalous.
- 75a. Leaves broadly ovate, rarely ovate-oblong, undivided; petioles glabrous; abaxial surface of calyx gray tomentose; flowers apetalous; aggregate fruit black 111. *R. cinclidodictyus*
- 75b. Leaves narrowly ovate to ovate-lanceolate, lobed; petioles tomentose; abaxial surface of calyx tomentose, gray tomentose on sepal margin; flowers petalous; aggregate fruit dark red 112. *R. xanthoneurus*
- 74b. Leaf base cordate; flowers 8–18 mm in diam.; abaxial surface of calyx tomentose and villous; flowers petalous.
- 76a. Leaves ovate to narrowly ovate, apically acuminate; petioles 2–4 cm; flowers to 18 mm in diam.; terminal cymose panicles broad, lax 113. *R. paniculatus*
- 76b. Leaves broadly ovate to suborbicular, rarely narrowly ovate, apically acute; petioles 1–2.5 cm; flowers 8–10 mm in diam.; terminal cymose panicles short, compact 114. *R. neoviburnifolius*
- 62b. Leaves suborbicular, broadly ovate to broadly oblong, lobed, apically obtuse or acute, rarely acuminate; terminal inflorescences always narrow cymose panicles or racemose, less than 17 cm.
- 77a. Stipules and bracts pinnately or palmately parted or irregularly lacerate nearly to base.
- 78a. Plants with dense, large stipitate glands; leaves suborbicular or broadly ovate, 4–6 cm; petioles 1–2 cm; sepals triangular-ovate, not divided 115. *R. nagasawanus*
- 78b. Plants without stipitate glands; leaves suborbicular to broadly ovate, 6–16 cm; petioles (2–)3–5(–8) cm; sepals apically 2- or 3-laciniate, with 3 bristles at apex or palmately to pinnately lacinate.
- 79a. Leaves broadly ovate, undivided or slightly undulate, abaxially hairs deciduous at maturity; terminal inflorescences narrow panicles or racemose; sepals lanceolate, outer sepals apically 2- or 3-laciniate 120. *R. chrysobotrys*

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- 79b. Leaves suborbicular or broadly ovate, distinctly 3–7-divided, abaxially persistently tomentose; terminal inflorescences short subracemes or cymose panicles; outer sepals entire with 3 bristles only at apex or palmately to pinnately laciniate.
- 80a. Terminal inflorescences short subracemes, 3–6-flowered; sepals long obovate, outer sepals entire, with 3 bristles only at apex; adaxial surface of leaves not distinctly bullate between veins 119. *R. yuliensis*
- 80b. Terminal cymose panicles or subracemes, many flowered; sepals broadly ovate or triangular-ovate, outer sepals palmately to pinnately laciniate; adaxial surface of leaves prominently bullate or not.
- 81a. Adaxial surface of leaves prominently bullate between veins; terminal inflorescences narrow cymose panicles or subracemes 116. *R. alceifolius*
- 81b. Adaxial surface of leaves not prominently bullate between veins; terminal inflorescences broad cymose panicles.
- 82a. Branchlets, petioles, and inflorescences yellowish villous; pedicel 5–8 cm; petals and ovary pubescent 117. *R. platysepalus*
- 82b. Branchlets, petioles, and inflorescences grayish tomentose; pedicel 0.8–2 cm; petals pubescent; ovary glabrous 118. *R. arachnoideus*
- 77b. Stipules and bracts palmately or pinnately lobed, rarely parted.
- 83a. Plants with brownish bristles; leaves suborbicular, apically acute to caudate.
- 84a. Stipules and bracts 1.5–2 × 1.2–1.5 cm, parted, late caducous; flowers ca. 1 cm in diam.; sepals broadly ovate or ovate-lanceolate, apically caudate 121. *R. rufus*
- 84b. Stipules and bracts 1–1.2 × 0.7–1 cm, lobed, caducous; flowers 1.2–1.7 cm in diam.; sepals lanceolate or ovate-lanceolate, apically acute to shortly acuminate 122. *R. lasiotrichos*
- 83b. Plants without bristles; leaves suborbicular or broadly ovate, truncate, apically obtuse or acute.
- 85a. Shrubs low, climbing or prostrate; leaves abaxially glabrescent.
- 86a. Branchlets, petioles, and inflorescences thinly pubescent; leaf lobes acute; abaxial surface of calyx gray to yellowish gray pubescent, intermixed tomentose; sepals broadly ovate, outer sepals pinnate-laciniate on margin 129. *R. humanensis*
- 86b. Branchlets, petioles, and inflorescences tomentose-villous; leaf lobes often obtuse; abaxial surface of calyx densely yellowish villous, intermixed tomentose; sepals lanceolate or ovate-lanceolate, outer sepals only apically lobed 130. *R. buergeri*
- 85b. Shrubs larger, climbing; leaves abaxially persistently tomentose.
- 87a. Terminal inflorescences short subracemes, few flowered; stipules and bracts broadly flabellate or broadly ovate to broadly oblong, 1–1.5(–2) × (0.6–)1–1.5 cm, pinnately or palmately parted to base.
- 88a. Leaves 3–5-lobed, lobes acute, rarely obtuse; stipules and bracts broadly ovate to broadly oblong; pedicel 3–4 mm; sepals triangular to ovate, outer sepals entire or only apically lobed 127. *R. formosensis*
- 88b. Leaves 5–7-lobed, lobes obtuse or acute; stipules and bracts broadly flabellate; pedicel 7–10(–15) mm; sepals narrowly ovate or ovate-lanceolate, outer sepals pinnately parted 128. *R. pinnatisepalus*
- 87b. Terminal inflorescences narrow cymose panicles or subracemes, many flowered; stipules and bracts subflabellate, obovate or ovate to ovate-lanceolate, 0.7–1.8 cm, pectinately to palmately divided or laciniate.
- 89a. Stipules and bracts subflabellate, broadly elliptic, or broadly obovate, 1–1.8 cm and ca. as broad, pectinately to palmately divided.
- 90a. Leaves palmately 7–9-lobed, terminal lobe obtuse or subtruncate, rarely acute; lobes of stipules usually undivided; pedicel 1–1.5 cm; flowers white, 1.5–2.5 cm in diam. 123. *R. pluribracteatus*
- 90b. Leaves usually 5-lobed, terminal lobe acute; lobes of stipules divided again; pedicel 1.5–3(–4) cm; flowers yellowish white or white, 1–1.5 cm in diam. 124. *R. reticulatus*
- 89b. Stipules and bracts ovate or ovate-lanceolate, rarely narrowly obovate, 0.7–1.1 cm and nearly as broad, apex palmate-laciniate.
- 91a. Leaves 5–7-lobed, lobes obtuse, rarely acute, sepals ovate-lanceolate, apically caudate; flowers purplish red; aggregate fruit black 125. *R. setchuenensis*
- 91b. Leaves 7–11-lobed, lobes acute; sepals broadly ovate, apically acute; flowers white; aggregate fruit red 126. *R. faberi*

Shrubs 1–2 m tall, much branched. Branchlets brownish to grayish brown, terete, with sparse, minute prickles, with dense appressed silvery-gray or yellowish gray silky hairs, glabrescent. Leaves palmately compound, 3–5-foliolate; petiole 2–5 cm, lateral leaflets sessile or subsessile, sericeous; stipules caducous, free, lanceolate or ovate-oblong, 1.2–2 cm, sometimes to 2–3 cm on sterile branchlets, often broad, membranous, abaxially densely sericeous, not divided; blade of leaflets oblong or lanceolate to oblanceolate, 8–12 × 1.5–3.5 cm, pinnately veined with (20–)30–50 pairs of parallel lateral veins terminating at margin, midvein and lateral veins prominent abaxially, impressed adaxially, abaxially densely silvery-gray or yellowish gray appressed-sericeous, adaxially glabrous or long hairy along midvein, base cuneate, margin sharply serrate to doubly serrate, apex acuminate to caudate. Inflorescences terminal and in axils of apical leaves, cymose panicles, ca. 15–20-flowered, sometimes flowers in clusters in leaf axils; rachis and pedicels sericeous or glabrescent; bracts lanceolate or ovate-oblong, smaller than stipules, sericeous. Pedicel 1–2 cm. Flowers ca. 1.5 cm in diam. Calyx abaxially densely silvery-gray or yellowish gray sericeous or glabrescent; sepals ovate-triangular to ovate-lanceolate, 6–12 × 3–7 mm, margin entire, apex acuminate to caudate. Petals white or greenish white, elliptic or obovate, much smaller than sepals, glabrous, base not distinctly clawed. Stamens ca. 50–150, glabrous, somewhat shorter than or subequaling petals. Pistils ca. 80–100 or more, shorter than stamens; apical part of ovary and basal part of style long hairy. Aggregate fruit orange to red at maturity, semiglobose or globose-ovoid, 7–10 mm in diam., sericeous when young, glabrescent; pyrenes distinctly rugose. Fl. Jul–Aug, fr. Sep–Oct.

Slopes, valleys, forests, forest margins, fallow fields; 1400–3000 m. Xizang, Yunnan [Bhutan, NE India, Indonesia, Malaysia, Myanmar, Nepal, Sikkim, N Vietnam].

- 1a. Pedicel and abaxial surface of calyx with deciduous sericeous hairs 91c. var. *glabrescens*
 1b. Pedicel and abaxial surface of calyx with dense, persistent sericeous hairs.
 2a. Blade of leaflets oblong or lanceolate to oblanceolate 91a. var. *lineatus*
 2b. Blade of leaflets narrowly lanceolate 91b. var. *angustifolius*

91a. *Rubus lineatus* var. *lineatus*

绢毛悬钩子(原变种) juan mao xuan gou zi (yuan bian zhong)

Rubus pulcherrimus Hooker.

Pedicel and abaxial surface of calyx densely persistently sericeous. Blade of leaflets oblong or lanceolate to oblanceolate.

Slopes, valleys, forest understories, forest margins, fallow fields; 1400–3000 m. Xizang, Yunnan [Bhutan, NE India, Indonesia, Malaysia, Myanmar, Nepal, Sikkim, N Vietnam].

91b. *Rubus lineatus* var. *angustifolius* J. D. Hooker, Fl. Brit. India 2: 333. 1878.

狭叶绢毛悬钩子 xia ye juan mao xuan gou zi

Pedicel and abaxial surface of calyx with dense, persistent

silvery hairs. Blade of leaflets narrowly lanceolate.

- Mixed forests; 1800–2800 m. NW Yunnan.

91c. *Rubus lineatus* var. *glabrescens* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 307. 1982.

光秃绢毛悬钩子 guang tu juan mao xuan gou zi

Pedicel and abaxial surface of calyx sericeous when young, glabrescent.

- Moist montane valleys, sparse forests; 1700–2000 m. SE Yunnan.

92. *Rubus cochinchinensis* Trattinnick, Rosac. Monogr. 3: 97. 1823.

蛇泡筋 she pao jin

Rubus fruticosus Loureiro (1790), not Linnaeus (1753); *R. playfairii* Hemsley.

Shrubs climbing. Branchlets brown to purplish brown, yellow tomentose when young, gradually glabrescent, with sparse, curved small prickles. Leaves palmately compound, 5-foliolate, sometimes 3-foliolate; petiole 4–5 cm, petiolule of leaflets 3–6 mm, tomentose when young, glabrate in age, with sparse, curved minute prickles; stipules flabellate, 5–7 mm, broader, tomentose initially, glabrate in age, palmately divided, lobes lanceolate; blade of leaflets elliptic, obovate-elliptic, or elliptic-lanceolate, 5–10(–15) × 2–3.5(–5) cm, central leaflet slightly larger than lateral leaflets, abaxially densely brown-yellow tomentose and with minute prickles along midvein, adaxially glabrous, base cuneate, margin irregularly sharply serrate, apex shortly acuminate. Inflorescences terminal ones cymose paniculate, axillary ones subracemes, sometimes flowers several in clusters in leaf axils; rachis and pedicels densely yellow tomentose, with sparse, curved small prickles; bracts caducous, 4–6 mm, narrow, palmately or pectinately divided, tomentose when young. Pedicel 4–10 mm. Flowers 0.8–1.2 cm in diam. Calyx campanulate, densely tomentose, unarmed abaxially; sepals ovate-orbicular, 4–6 × 3–5 mm, apex acuminate, outer sepals apically 3-lobed. Petals white, suborbicular, shorter than sepals. Stamens many, shorter than petals; filaments subulate, glabrous. Pistils 30–40, longer than petals, glabrous. Aggregate fruit red when immature, black at maturity, globose, 8–11 mm in diam., glabrous; pyrenes conspicuously rugose. Fl. Mar–May, fr. Jul–Aug.

Thickets, roadsides, slopes; low to medium elevations. Guangdong, Guangxi, Hainan, Sichuan, Yunnan [Cambodia, Laos, Thailand, Vietnam].

The fruit and roots are used in medicine.

93. *Rubus foliaceistipulatus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 307. 1982.

托叶悬钩子 tuo ye xuan gou zi

Shrubs to 2 m tall. Branchlets brownish to dark reddish brown, glabrous, with sparse prickles. Leaves palmately compound, 3-foliolate; petiole reddish brown, 1.5–3 cm, lateral leaflets subsessile, soft hairy when young, gradually glabrescent,

with sparse prickles; stipules free, leaflike, ovate or narrowly ovate, 2–3.5 × 1–2 cm, herbaceous, glabrous, margin unevenly coarsely serrate, apex acuminate; blade of leaflets elliptic or oblong-elliptic, 6–14 × 2.5–5 cm, lateral veins 10–15 pairs, middle leaflet much longer than lateral leaflets, abaxially glabrous except puberulous along veins, adaxially glabrous or sparsely pubescent only along midvein, base broadly cuneate to rounded, margin irregularly coarsely sharply serrate, apex acuminate. Inflorescences terminal on lateral short branchlets, short racemes, flowers usually in clusters of 3–5; rachis and pedicels glabrous; bracts ovate or broadly triangular-ovate, slightly smaller than stipules, glabrous, margin unevenly serrate, apex acuminate. Pedicel 1–2 cm. Flowers 2–3 cm in diam. Calyx reddish brown, abaxially glabrous; sepals broadly ovate or triangular-ovate to ovate-lanceolate, 1.2–2 cm, apex long caudate; outer sepals broader, margin shallowly lacinate above middle or at apex, inner sepals entire, with tomentose margin. Petals erect after anthesis, white, elliptic or spatulate, 0.7–1.4 cm × 5–7 mm, glabrous. Stamens many, unequal in length, shorter than petals; filaments broad, complanate. Pistils numerous; style and ovary glabrous. Fruit unknown. Fl. May–Jun.

- Bamboo forests on slopes, *Rhododendron* thickets; 2800–3000 m. W Yunnan (Tengchong Xian).

94. *Rubus dolichophyllus* Handel-Mazzetti, *Sinensia* 3: 186. 1933.

长叶悬钩子 *chang ye xuan gou zi*

Shrubs lianoid, to 7 m tall. Branchlets brown or purplish brown, glabrous, with sparse, curved minute prickles, glaucous. Leaves simple; petiole 5–7 mm, adaxially puberulous; stipules free, 6–9 mm, glabrous, palmately divided above middle, lobes lanceolate; blade lanceolate, 7–16 × 1.5–3 cm, lateral veins 8–11 pairs, raised abaxially, impressed adaxially, subleathery, abaxially densely gray tomentose, adaxially glabrous, base rounded to shallowly cordate, margin with shallow sharp minute teeth, apex long acuminate. Inflorescences terminal or axillary, large cymose panicles, 14–20 cm, axillary ones shorter; rachis and pedicels glabrous or pubescent; bracts smaller than stipules, apex palmately lobed; lobes linear or nearly subulate, glabrous. Pedicel 1–1.4 cm. Flowers 6–9 mm in diam. Calyx purplish red, abaxially densely gray tomentose, with sparse, intermixed glandular hairs; tube pelviform; sepals lanceolate, 6–9 × 2–3 mm, margin entire, apex subulate-acuminate or caudate. Petals absent. Stamens shorter than sepals; filaments red, linear, glabrous. Pistils few; ovary glabrous; styles purplish red, ca. 4 mm, rarely as long as stamens. Aggregate fruit purplish black, with few drupelets, glabrous; pyrenes large, coarsely rugose. Fl. May–Jun, fr. Jul–Aug.

- Slopes, thickets in montane valleys, dense forests; 1000–3400 m. Guangxi, Guizhou.

- 1a. Rachis and pedicels glabrous; sepals reflexed in fruit 94a. var. *dolichophyllus*
- 1b. Rachis and pedicels pubescent; sepals erect in fruit 94b. var. *pubescens*

94a. *Rubus dolichophyllus* var. *dolichophyllus*

长叶悬钩子(原变种) *chang ye xuan gou zi (yuan bian zhong)*

Rubus chingianus Handel-Mazzetti.

Rachis and pedicels glabrous. Sepals reflexed in fruit.

- Slopes, thickets in montane valleys, dense forests; 1000–3400 m. Guangxi, Guizhou.

94b. *Rubus dolichophyllus* var. *pubescens* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 309. 1982.

毛梗长叶悬钩子 *mao geng chang ye xuan gou zi*

Rachis and pedicels pubescent. Sepals erect in fruit.

- Thickets in montane valleys; below 2100 m. SW Guizhou (Panxian Tequ).

95. *Rubus raopingensis* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 309. 1982.

饶平悬钩子 *rao ping xuan gou zi*

Shrubs scandent. Branchlets brown or dark purplish brown, terete, yellowish villous, with sparse, stipitate glandular hairs and sparse, curved prickles. Leaves simple; petiole 6–8 mm, yellowish villous, sparsely stipitate glandular; stipules caducous, free, deeply palmately divided nearly to base, lobes linear, villous, stipitate glandular; blade lanceolate or oblong-lanceolate, 7–12 × 2–4.5 cm, veins 6–8 pairs, slightly raised abaxially, papery, abaxially gray tomentose and with yellowish long hairs along veins, sometimes glabrescent, adaxially pubescent only along veins, base rounded to shallowly cordate, margin irregularly serrate, apex acuminate. Inflorescences terminal or axillary, cymose panicles, large, lax, many flowered; rachis and pedicels yellowish villous, stipitate glandular; bracts smaller than stipules, sparsely villous, with stalked glands. Pedicels unequal in length, longer ones to 2 cm, shorter ones 6–7 mm. Flowers not more than 1 cm in diam. Calyx purplish red, yellowish villous, with stalked glands; sepals erect in fruit, ovate-lanceolate, 5–7 × 3–5 mm, margin entire, apex caudate. Petals absent. Stamens many; filaments linear. Pistils few, longer than stamens; style and ovary glabrous. Aggregate fruit black, small, glabrous, with few drupelets, enclosed in calyx; pyrenes rugose. Fl. Apr–May, fr. Jul–Aug.

- Stream sides, roadsides, rockslides, montane valleys, forest margins; 600–700 m. S Fujian, E Guangdong.

- 1a. Leaves not glabrescent, margin densely sharply serrate 95a. var. *raopingensis*
- 1b. Leaves gradually glabrescent, margin minute obtusely serrate 95b. var. *obtusidentatus*

95a. *Rubus raopingensis* var. *raopingensis*

饶平悬钩子(原变种) *rao ping xuan gou zi (yuan bian zhong)*

Leaves tomentose abaxially, not glabrescent, margin densely sharply serrate.

- Stream sides, roadsides, rockslides, montane valleys, forest margins; low elevations. E Guangdong (Raoping Xian).

95b. *Rubus raopingensis* var. *obtusidentatus* T. T. Yu & L.

T. Lu, Acta Phytotax. Sin. 20: 310. 1982.

钝齿悬钩子 *dun chi xuan gou zi*

Leaves tomentose abaxially, gradually glabrescent, margin minutely obtusely serrate.

• Stream sides, forest margins; 600–700 m. S Fujian (Nanjing Xian).

96. *Rubus xichouensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 310. 1982.

西畴悬钩子 *xi chou xuan gou zi*

Shrubs climbing, 0.5–1 m tall. Branchlets brownish to reddish brown, yellowish sericeous-villous when young, glabrescent, unarmed or with sparse, minute prickles. Leaves simple; petiole reddish brown, 1–1.5 cm, yellowish sericeous-villous when young; stipules caducous, free, narrowly oblong, but broader near apex, to 1 cm, palmately divided, lobes linear, soft hairy; blade oblong-lanceolate, 11–19 × 2.5–5 cm, lateral veins 7–10 pairs, subleathery, abaxially densely yellow or grayish yellow tomentose, with sparse, intermixed long soft hairs along veins, adaxially glabrous or slightly pubescent only along veins, base rounded, margin irregularly sharply serrate, teeth abruptly pointed, apex caudate. Inflorescences terminal or axillary, terminal ones short cymose panicles, 4–6 cm, few flowered, axillary ones short racemes or shortly subcorymbose, sometimes flowers fewer, in clusters; rachis and pedicels densely yellow sericeous-villous; bracts narrowly oblong, less than 1 cm, palmately lobed; lobes linear, yellow sericeous-villous. Pedicel 5–10 mm. Flowers to 1 cm in diam. Calyx abaxially densely yellow sericeous-villous; sepals erect after anthesis, broadly ovate, margin tomentose, entire or outer sepals shallowly lacinate apically, apex acute or shortly acuminate. Petals white, suborbicular or broadly obovate, nearly as long as sepals, glabrous. Stamens many, glabrous; filaments linear. Pistils 30–40, longer than stamens; style glabrous. Fruit unknown. Fl. Apr–May.

• Sparse forests on slopes, broad-leaved evergreen forests; medium elevations. SE Yunnan.

97. *Rubus parkeri* Hance, J. Bot. 20: 260. 1882.

乌泡子 *wu pao zi*

Rubus parkeri var. *brevisetosus* Focke; *R. parkeri* var. *longisetosus* Focke; *R. tsangsihensis* K. S. Hao.

Shrubs scandent. Branchlets brown to dark reddish brown, slender, densely gray-villous, with sparse, intermixed purplish red glandular hairs and slightly curved prickles. Leaves simple; petiole 5–10 mm, rarely to 2 cm, densely villous, with sparse, intermixed glandular hairs, with minute prickles; stipules 8–11 mm, palmately lacinate, lobes linear, villous; blade ovate-lanceolate or ovate-oblong, 7–16 × 3.5–6 cm, lateral veins 5 or 6 pairs, raised abaxially, abaxially densely gray tomentose, intermixed villous, with sparse, minute prickles along veins, adaxially appressed villous, more densely so along veins, base cordate, basal incision shallow, broad, basal 2 lobes short, not touching, margin tenuously serrate, lobed, apex acuminate. Cymose panicles, large, 12–24 cm; rachis and pedicels densely villous, with unequal long purplish red stipitate glandular hairs and sparse, minute prickles; bracts 6–9 mm, palmately lacini-

ate; lobes linear, villous, stipitate glandular. Pedicel 0.8–1.2 cm. Flowers ca. 8 mm in diam. Calyx purplish red, abaxially densely villous, purplish red stipitate glandular; sepals ovate-lanceolate, 5–10 × 2.5–5 mm, margin entire, apex shortly acuminate. Petals white, sometimes absent. Stamens many, shorter than sepals; filaments linear. Pistils relatively few, shorter than stamens, glabrous. Aggregate fruit purplish black, globose, 4–6 mm in diam., glabrous. Fl. May–Jun, fr. Jul–Aug.

• Sparse or dense forests in mountainous regions, stream sides, rocky places in valleys; below 1000 m. Guizhou, Hubei, Jiangsu, Shaanxi, Sichuan, Yunnan.

98. *Rubus panduratus* Handel-Mazzetti, Symb. Sin. 7: 490. 1933.

琴叶悬钩子 *qin ye xuan gou zi*

Shrubs scandent, to 5 m tall. Branchlets slender, villous, with sparse, curved prickles, purplish red, with stalked glands. Leaves simple; petiole 2–3.5 cm, hirsute, purplish red, with stalked glands; stipules free, small, palmately lacinate, lobes linear, hirsute, stipitate glandular or not; blade ovate-lanceolate, 10–18 × 4–9 cm, abaxially densely gray tomentose and sparsely hirsute along veins, adaxially glabrous except hirsute or with sparse, stalked glands on veins, base deeply cordate, basal incision narrow, to 2 cm deep, basal lobes long, touching, margin irregularly sharply serrate, with shallow lobes above base, apex acuminate. Inflorescences terminal, cymose panicles, basal branches spreading; rachis, pedicels, and abaxial surface of calyx hirsute, with dense, purplish red or blackish purple stalked glands; bracts palmate-lacinate; lobes linear, hirsute, with stalked glands. Pedicel to 1 cm. Flowers to 1 cm in diam. Calyx reddish purple; sepals narrowly triangular-lanceolate, 1–1.5 cm, apex subulate or long caudate. Petals often absent or small and reduced. Stamens many, much shorter than sepals; filaments linear; anthers purple. Pistils few, glabrous. Aggregate fruit dark red or purplish black, small, dry at maturity; pyrenes rugose. Fl. Jun–Jul, fr. Jul–Aug.

• Forests, montane valleys; low to medium elevations. Guangdong, Guangxi, Guizhou, Hunan.

- 1a. Leaf blade densely gray tomentose abaxially 98a. var. *panduratus*
 1b. Leaf blade not tomentose, sparsely hirsute only along veins abaxially 98b. var. *etomentosus*

98a. *Rubus panduratus* var. *panduratus*

琴叶悬钩子(原变种) *qin ye xuan gou zi* (yuan bian zhong)

Leaf blade densely gray tomentose abaxially.

• Sparse forests, montane valleys; low to medium elevations. Guangdong, Guangxi, Guizhou.

98b. *Rubus panduratus* var. *etomentosus* Handel-Mazzetti, Sinensia 5: 1. 1934.

脱毛琴叶悬钩子 *tuo mao qin ye xuan gou zi*

Leaf blade not tomentose, sparsely hirsute only along veins abaxially.

• Forests; ca. 800 m. Guangdong, Guangxi, Guizhou, Hunan.

99. *Rubus angustibracteatus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 453. 1982.

狭苞悬钩子 xia bao xuan gou zi

Shrubs scandent. Branchlets grayish brown or purplish brown, pubescent, with intermixed glandular hairs initially, gradually glabrescent, with sparse, curved prickles. Leaves simple; petiole 1–1.5 cm, sparsely villous, with intermixed glandular hairs, with minute prickles; stipules caducous, free, linear or lanceolate, margin entire, villous, with intermixed glandular hairs; blade ovate-lanceolate or oblong-lanceolate, 7–12 × 2–4 cm, abaxially densely yellowish tomentose, intermixed villous along veins, with small curved prickles along midvein, adaxially glabrous, rarely slightly soft hairy along midvein, base deeply cordate, margin unevenly sharply serrate, undivided, apex acuminate. Inflorescences terminal or axillary, narrowly cymose-paniculate or short subracemes; rachis and pedicels villous, with glandular hairs, sometimes with minute prickles; bracts linear, villous, with intermixed glandular hairs, margin entire. Pedicel 5–8 mm. Flowers not more than 1 cm in diam. Calyx abaxially densely tomentose, intermixed yellowish villous and with purplish red glandular hairs; sepals erect in fruit, ovate or ovate-lanceolate, margin entire, apex acuminate. Petals suborbicular, small, much shorter than sepals, puberulous. Stamens numerous; filaments short, basally broadened and flattened. Pistils 20; apex of ovary and base of style soft hairy. Aggregate fruit with few drupelets, enclosed in calyx. Fl. May–Jun, fr. Jul–Aug.

- Forests in mountainous areas; 1900–2200 m. W Sichuan.

100. *Rubus feddei* H. Léveillé & Vaniot, Repert. Spec. Nov. Regni Veg. 8: 549. 1910.

黔桂悬钩子 qian gui xuan gou zi

Shrubs climbing. Branchlets grayish brown to purplish brown, villous, with sparse, slightly curved small prickles, sometimes with glandular hairs. Leaves simple; petiole 3–4(–6) cm, villous, with intermixed long glandular hairs and sparse, slightly curved minute prickles; stipules caducous, free, small, 4–6 mm, margin lacinate, lobes linear, with soft hairs and intermixed glandular hairs; blade ovate to narrowly ovate, 6–8 × 2–5 cm, palmately 5-veined, lateral veins 4 or 5 pairs, abaxially densely gray tomentose, with intermixed long soft hairs and glandular hairs to 2–3 mm along veins, adaxially villous, with intermixed glandular hairs along veins, base cordate, margin undulate-lobed, lobes obtuse, irregularly coarsely sharply serrate, apex obtuse to acute. Inflorescences terminal, cymose panicles, sometimes subcorymbose, to 25 cm; rachis and pedicels densely villous, with intermixed brownish purple long glandular hairs; bracts 3–5 mm, lacinate, villous, with intermixed glandular hairs. Pedicel 5–10 mm. Flowers 1–1.2 cm in diam. Calyx brownish red, villous, with long brownish purple glandular hairs; tube shallowly cupular; sepals erect in fruit, ovate to ovate-lanceolate, 8–11 × 2–5 mm, margin entire, apex acuminate to caudate. Petals white, small, inconspicuous, much shorter than sepals, narrow. Stamens many, longer than petals and shorter than sepals; filaments yellowish, linear. Pistils ca. 15–20, shorter than stamens, glabrous. Aggregate fruit red

when immature, purplish black at maturity, 7–10 mm in diam., with few drupelets. Fl. Jun–Aug, fr. Sep–Oct.

Slopes, forests, thickets, roadsides; low elevations. Guangxi, Guizhou, Yunnan [Vietnam].

This species is used medicinally. The fruit are edible.

101. *Rubus salwinensis* Handel-Mazzetti, Symb. Sin. 7: 491. 1933.

怒江悬钩子 nu jiang xuan gou zi

Shrubs scandent, to 2 m tall. Branchlets brown to grayish brown, terete, yellowish villous, with sparse, curved minute prickles, with sparse, stipitate glands to 2 mm. Leaves simple; petiole 3–5 cm, yellowish villous, sparsely stipitate glandular, with sparse, curved minute prickles; stipules caducous, free, to 1 cm, sparsely villous and stipitate glandular, apex lacinate, lobes linear or lanceolate; blade broadly ovate or orbicular-ovate, 8–13 × 7–10 cm, lateral veins 4–6 pairs, abaxially densely gray tomentose, yellowish villous along veins, adaxially sparsely villous, base cordate, margin distinctly lobed; lobes with dense sharp serrations, apex acute to acuminate. Inflorescences terminal, pyramidal cymose panicles, with spreading branches, 10–25 cm, many flowered; rachis and pedicels densely yellowish villous, sparsely stipitate glandular; bracts 6–8 mm, margin lacinate; lobes linear, villous, stipitate glandular. Pedicel 1–1.5 cm. Flowers ca. 1 cm in diam. Calyx abaxially densely yellowish villous, with sparse, stalked glands; tube short, ca. 7 mm; sepals triangular-lanceolate, 8–11 × 4–5 mm, margin usually lacinate, caudate; lobes lanceolate to linear-lanceolate, erect in fruit. Petals white, oblong, 3–6 × 2–3.5 mm, glabrous, base shortly clawed, apex dentate or not. Stamens many, shorter than sepals, glabrous; filaments linear. Pistils nearly as long as stamens; style and ovary glabrous. Aggregate fruit red, glabrous, with few drupelets, enclosed in calyx; pyrenes rugose, reticulate. Fl. Jun–Jul, fr. Aug–Sep.

- Ravines, forest margins; 1800–2500 m. Yunnan.

102. *Rubus luchunensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 456. 1982.

绿春悬钩子 lu chun xuan gou zi

Shrubs scandent. Branchlets purplish brown, yellowish villous, with short glandular hairs, with sparse, curved prickles. Leaves simple; petiole 2.5–4 cm, yellowish tomentose, with intermixed short glandular hairs and sparse, curved prickles; stipules caducous, 5–8 mm, palmately lobed, lobes linear, with soft hairs and intermixed short glandular hairs; blade broadly ovate to orbicular-ovate, 7–11 × 6–8 cm, palmately 5-veined, lateral veins 4 or 5 pairs, thickly leathery or subleathery, abaxially densely yellowish tomentose, intermixed villous along veins, adaxially sparsely villous, with intermixed short glandular hairs, glandular hairs deciduous in age, base cordate, margin undivided or undulate, unevenly sharply serrate, teeth abruptly pointed, to 1–2 mm, apex acute to shortly acuminate or obtuse. Inflorescences terminal, pyramidal cymose panicles with spreading branches, to 20 cm, many flowered; rachis and pedicels yellowish villous, with intermixed short glandular hairs; bracts 4–6 mm, with soft hairs and intermixed short

glandular hairs, apex lobed; lobes linear. Pedicel 1–2 cm. Flowers not more than 1 cm in diam. Calyx abaxially densely yellowish tomentose, with intermixed short glandular hairs; tube pelviform; sepals erect after anthesis, lanceolate, 6–10 mm, margin entire, apex acuminate. Petals elliptic, small, much shorter than sepals, glabrous, base clawed, apex acute. Stamens numerous, slightly shorter than or nearly as long as petals; filaments linear. Pistils 10–16, slightly longer than or nearly as long as stamens, glabrous. Aggregate fruit purplish red, less than 1 cm in diam., glabrous, with few drupelets. Fl. Apr–May, fr. Jun–Jul.

• Broad-leaved evergreen forest margins, moist places along roadsides, thickets on sunny slopes; 1700–2000 m. S Yunnan.

- 1a. Leaf blade subleathery, apex acute to shortly acuminate; cymose panicles 15–20 cm; sepals lanceolate 102a. var. *luchunensis*
 1b. Leaf blade thickly leathery, apex acute or obtuse; cymose panicles less than 10 cm; sepals ovate 102b. var. *coriaceus*

102a. *Rubus luchunensis* var. *luchunensis*

绿春悬钩子(原变种) *lu chun xuan gou zi* (*yuan bian zhong*)

Leaf blade subleathery, apex acute to shortly acuminate. Cymose panicles 15–20 cm. Sepals lanceolate.

• Broad-leaved evergreen forest margins; ca. 1700 m. S Yunnan (Lüchun Xian).

102b. *Rubus luchunensis* var. *coriaceus* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 456. 1982.

硬叶绿春悬钩子 *ying ye lu chun xuan gou zi*

Leaf blade thickly leathery, apex acute or obtuse. Cymose panicles less than 10 cm. Sepals ovate.

• Moist places along roadsides, thickets on sunny slopes; below 2000 m. S Yunnan (Jinping Xian).

103. *Rubus tephrodes* Hance, *J. Bot.* 12: 260. 1874.

灰白毛莓 *hui bai mao mei*

Shrubs scandent, to 3–4 m tall. Branchlets brown or purplish brown, densely gray tomentose, with sparse, curved prickles, ± with unequal long glandular hairs and bristles 1–3(–5) mm or without bristles. Leaves simple; petiole 1–3 cm, tomentose, with sparse, minute prickles or glandular hairs, bristly; stipules caducous, free, 5–8 mm, margin lacinate or pectinately parted, tomentose-villous; blade suborbicular, 5–11 × 5–10 cm, palmately 5-veined, lateral veins 3 or 4 pairs, abaxially densely gray tomentose, with sparse, small prickles and bristles along midvein, adaxially pilose or with sparse, glandular hairs, base cordate, margin 5–7-lobed, irregularly serrate, apex acute or obtuse. Inflorescences terminal, cymose panicles, 10–16 cm, many flowered; rachis and pedicels tomentose-villous, with sparse, glandular hairs and bristles; bracts 5–7 mm, pectinately lobed; lobes linear, tomentose-villous. Pedicel 4–10 mm. Flowers ca. 1 cm in diam. Calyx densely gray tomentose, usually without glandular hairs and bristles; sepals ovate, 4–7 × 3–5 mm, margin entire, apex acute. Petals white, suborbicular to oblong, slightly shorter than or nearly as long as sepals, pilose, base

shortly clawed. Stamens many, ca. as long as petals; filaments slightly broadened toward base. Pistils 30–50, longer than stamens; style and ovary glabrous. Aggregate fruit purplish black, globose, 1–1.5 cm in diam., glabrous, with many drupelets; pyrenes rugose. Fl. Jun–Aug, fr. Aug–Oct. *2n* = 28*.

• Mountainous regions and summits, foothills, slopes, roadsides, thickets, montane valleys; below 1500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Taiwan, Zhejiang.

The name *Rubus megalothyrsus* needs to be lectotypified in order to place the name into the synonymy of either *R. tephrodes* var. *tephrodes* or var. *ampliflorus*.

- 1a. Plants without glandular hairs and bristles or sometimes only partly sparsely stipitate glandular or bristly 103d. var. *ampliflorus*
 1b. Plants with glandular hairs or bristly.
 2a. Plants only with glandular hairs 1–1.5 mm, without bristles 103c. var. *holadenus*
 2b. Plants with glandular hairs and bristles.
 3a. Plants ± with short glandular hairs less than 3 mm and bristles 1–3 mm 103a. var. *tephrodes*
 3b. Plants with dense long glandular hairs and bristles to 5 mm 103b. var. *setosissimus*

103a. *Rubus tephrodes* var. *tephrodes*

灰白毛莓(原变种) *hui bai mao mei* (*yuan bian zhong*)

Rubus megalothyrsus Cardot, p.p. (excluding specimen “Lienchow River, Kwangtung,” *Ford 74*); *R. paniculatus* Smith var. *brevifolius* Kuntze.

Plants ± with short glandular hairs and bristles 1–3 mm.

• Slopes, roadsides, thickets; below 1500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Taiwan.

103b. *Rubus tephrodes* var. *setosissimus* Handel-Mazzetti, *Symb. Sin.* 7: 492. 1933.

长腺灰白毛莓 *chang xian hui bai mao mei*

Rubus farinaceus Cardot.

Plants with long dense glandular hairs and bristles to 5 mm.

• Mountain summits, foothills, montane valleys; below 1500 m. Guangdong, Guizhou, Hunan, Jiangxi.

103c. *Rubus tephrodes* var. *holadenus* (H. Lévillé) L. T. Lu, *Acta Phytotax. Sin.* 38: 281. 2000.

硬腺灰白毛莓 *ying xian hui bai mao mei*

Rubus holadenus H. Lévillé, *Repert. Spec. Nov. Regni Veg.* 12: 536. 1913.

Plants only with glandular hairs 1–1.5 mm, without bristles.

• Slopes; below 1500 m. Guizhou.

103d. *Rubus tephrodes* var. *ampliflorus* (H. Léveillé & Vaniot) Handel-Mazzetti, Symb. Sin. 7: 492. 1933.

无腺灰白毛莓 wu xian hui bai mao mei

Rubus ampliflorus H. Léveillé & Vaniot, Bull. Soc. Bot. France 51: 218. 1904; *R. megalothyrsus* Cardot, p.p. (excluding specimen "Lienchow River, Kwangtung," Ford 73); *R. schindleri* Focke; *R. tephrodes* var. *eglandulosus* Cheng; *R. tephrodes* var. *schindleri* (Focke) Handel-Mazzetti.

Plants without glandular hairs and bristles, rarely only partly sparsely stipitate glandular or bristly.

• Mountainous regions; low elevations. Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Zhejiang.

104. *Rubus lobophyllus* Y. K. Shih ex F. P. Metcalf, Lingnan Sci. J. 19: 29. 1940.

角裂悬钩子 jiao lie xuan gou zi

Shrubs scandent, to 3 m tall. Branchlets grayish brown, terete, soft hairy, glabrescent, with sparse, curved prickles. Leaves simple; petiole 3–7 cm, densely villous, with sparse, curved minute prickles; stipules free, 1–1.4 cm, pilose, pinnately or palmately lobed; lobes lanceolate or linear; blade ovate to narrowly ovate, 8–14 × 5–12 cm, lateral veins 4 or 5 pairs, abaxially densely gray to yellowish gray tomentose and villous along veins, adaxially glabrous except villous along veins, base cordate, margin distinctly lobed, terminal lobe triangular-lanceolate, much larger and longer than lateral triangular ones, irregularly abruptly sharply serrate, apex acuminate. Inflorescences terminal or axillary, terminal ones narrow cymose panicles or subracemes, axillary ones subcorymbose or flowers several in a cluster; rachis and pedicels yellowish villous; bracts 0.8–1.2 cm, villous, pinnately or palmately lobed; lobes linear or lanceolate. Pedicel 1–1.5 cm. Flowers 6–8 mm in diam. Calyx abaxially densely yellowish villous and intermixed tomentose; sepals ovate, 6–8 × 3–5 mm, apex acute, outer sepals palmately or pinnately lacinate; lobes linear, erect in fruit. Petals white, suborbicular or obovate, slightly longer than or nearly as long as sepals. Stamens numerous, in 2 whorls; filaments linear, glabrous. Pistils many, much longer than stamens; ovary glabrous. Aggregate fruit red, subglobose, 7–9 mm in diam., glabrous, enclosed in calyx; pyrenes rugose. Fl. May–Jul, fr. Aug–Sep.

• Montane valleys, shrubby hillsides, forests on shaded slopes, ravines; 500–2100 m. Guizhou, Guangdong, Guangxi, Hunan, Yunnan.

105. *Rubus assamensis* Focke, Abh. Naturwiss. Vereine Bremen 4: 197. 1874.

西南悬钩子 xi nan xuan gou zi

Rubus bahanensis Handel-Mazzetti; *R. qinglongensis* Q. H. Chen & T. L. Xu; *R. sepalanthus* Focke.

Shrubs climbing. Branchlets brownish to purplish brown, terete, yellowish gray villous, with curved minute prickles. Leaves simple; petiole 5–10 mm, gray or yellowish gray villous; stipules caducous, free, broadly obovate or flabellate, 0.9–1.1 cm, palmately lacinate lobed, lobes linear to linear-lan-

ceolate, villous; blade oblong, ovate-oblong, or elliptic, 6–11 × 3.5–6 cm, lateral veins 5 or 6 pairs, abaxially densely gray or yellowish gray tomentose and villous along veins, adaxially villous, more densely so along veins, base rounded, rarely subtruncate, margin unevenly serrate, serrations apiculate, sometimes divided basally, apex acuminate. Inflorescences terminal or axillary, cymose panicles, 10–20 cm, many flowered; rachis and pedicels gray or yellowish gray villous, occasionally with sparse, minute glandular hairs; bracts obovate or subflabellate, 6–9 mm, villous, deeply lobed; lobes linear or lanceolate. Pedicel 7–11 mm. Calyx densely gray or yellowish gray tomentose and villous; sepals erect in fruit, ovate, 4–6 × 3–4 mm, apex long acuminate. Petals usually absent. Stamens many, somewhat shorter than or nearly as long as sepals; filaments linear. Pistils 10–15(–20), shorter than stamens, often glabrous. Aggregate fruit red when immature, black at maturity, subglobose, ca. 8 mm in diam., with several drupelets; pyrenes slightly rugose. Fl. Jun–Jul, fr. Aug–Sep.

Mixed forests, forest margins; 1400–3000 m. Guangxi, Guizhou, Sichuan, Xizang, Yunnan [NE India, NE Myanmar].

106. *Rubus tinifolius* C. Y. Wu ex T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 454. 1982.

截叶悬钩子 jie ye xuan gou zi

Shrubs erect or scandent, to 2 m tall. Branchlets grayish brown or reddish brown, densely yellowish tomentose-villous, with sparse, curved minute prickles. Leaves simple; petiole 2–4 cm, densely yellowish tomentose-villous, with sparse, curved minute prickles; stipules free, broadly obovate, 0.8–1.4 × 0.8–1.4 cm, villous, palmately lobed, lobes lanceolate; blade broadly triangular-ovate, 7–14 × 4.5–11 cm, lateral veins 4 or 5 pairs, abaxially densely gray or yellowish tomentose and intermixed villous along veins, adaxially villous along veins, base truncate, margin undivided, rarely shallowly undulate, irregularly serrate, apex acuminate. Inflorescences terminal or axillary, narrow panicles or subracemes, axillary ones subcorymbose or flowers few in clusters; rachis and pedicels yellowish tomentose-villous; bracts broadly obovate, 7–13 × 6–12 mm, villous, palmately lobed; lobes lanceolate. Pedicel ca. 1 cm. Flowers ca. 1 cm in diam. Calyx abaxially densely yellowish villous, intermixed tomentose; sepals ovate, 5–7 × 3–5 mm, apex acute, outer sepals often divided apically; lobes linear or lanceolate, inner sepals entire, erect in fruit. Petals white, suborbicular, base shortly clawed. Stamens many; filaments linear, glabrous. Pistils much longer than stamens; style and ovary glabrous. Aggregate fruit small, enclosed in calyx; pyrenes rugose, alveolate. Fl. May–Jun, fr. Jul–Aug.

• Ravines, roadsides, montane valleys, forests; 1400–2100 m. SE Yunnan.

107. *Rubus chroosepalus* Focke, Hooker's Icon. Pl., ser. 3, 10: t. 1952. 1891.

毛萼莓 mao e mei

Shrubs scandent, semievergreen. Branchlets brownish or dark brown to blackish brown, soft hairy when young, glabrescent, with sparse, curved prickles. Leaves simple; petiole 4–7 cm, glabrous or hairy, with sparse, slightly curved prickles;

stipules caducous, free, lanceolate, to 1.8 cm, sericeous-villous or arachnoid hairy, undivided or apically lobed; blade suborbicular to broadly ovate, 5–10.5 cm in diam., palmately 5-veined, lateral veins 5 or 6 pairs, raised abaxially, impressed adaxially, thickly papery, abaxially densely gray or yellowish white tomentose or arachnoid hairy, sparsely pilose along veins, adaxially glabrous, base cordate, margin inconspicuously undulate, with uneven sharp teeth, apex shortly acuminate. Inflorescences terminal, cymose panicles, 17–27 cm; rachis and pedicels sericeous-villous or arachnoid hairy; bracts caducous, lanceolate, shorter than stipules, both surfaces sericeous-villous or arachnoid hairy, margin entire or 3-lobed apically. Pedicel 3–7 mm. Flowers 1–1.5 cm in diam. Calyx abaxially densely gray or yellowish white sericeous-villous; tube shallowly cupular; sepals ovate or ovate-lanceolate, 5–7 × 3–4 mm, margin tomentose, entire, apex acuminate. Petals absent. Stamens many, shorter than sepals; filaments subulate. Pistils ca. 15, longer than stamens, glabrous. Aggregate fruit purplish black or black, globose, ca. 1 cm in diam., glabrous; pyrenes rugose. Fl. May–Jun, fr. Jul–Aug.

Thickets on slopes, forest margins; 300–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan [Vietnam].

- 1a. Branchlets pubescent when young, glabrescent; petioles glabrous; leaves abaxially gray or yellowish white tomentose; inflorescences sericeous-villous 107a. var. *chroosepalus*
 1b. Branchlets, petioles, leaves abaxially and inflorescences densely yellowish arachnoid hairy 107b. var. *araneosus*

107a. *Rubus chroosepalus* var. *chroosepalus*

毛萼莓(原变种) mao e mei (yuan bian zhong)

Rubus chroosepalus var. *omeiensis* Matsuda; *R. mouyou-sensis* H. Léveillé; *R. petaloideus* H. Léveillé.

Branchlets soft hairy when young, glabrescent. Petioles glabrous; leaves gray or yellowish white tomentose abaxially. Inflorescences sericeous-villous.

Thickets on slopes, forest margins; 300–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan [Vietnam].

107b. *Rubus chroosepalus* var. *araneosus* Q. H. Chen & T. L. Xu, Acta Bot. Yunnan. 15: 363. 1993.

蛛丝毛萼莓 zhu si mao e mei

Branchlets, petioles, leaves abaxially, and inflorescences densely yellowish arachnoid hairy.

- Thickets; below 1000 m. Guizhou (Sishui).

108. *Rubus mallotifolius* C. Y. Wu ex T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 454. 1982.

楸叶悬钩子 qiu ye xuan gou zi

Shrubs scandent. Branchlets purplish brown, soft hairy when young, subglabrescent, with sparse, curved minute prick-

les. Leaves simple; petiole 4–6 cm, soft hairy when young, glabrescent, with sparse, minute prickles; stipules caducous, free; blade triangularly broadly ovate to suborbicular, 9–12 cm, palmately 5-veined, lateral veins 3–5 pairs, prominent abaxially, impressed adaxially, leathery, abaxially densely yellowish gray tomentose, villous along veins, adaxially glabrous, lustrous, base truncate to shallowly cordate, margin unevenly shallowly obtusely serrate, apex acute or abruptly shortly pointed. Inflorescences terminal or axillary, lax narrow cymose panicles, 10–16 cm, axillary inflorescences sometimes racemes; rachis and pedicels yellow sericeous-villous; bracts suborbicular or broadly oblong, densely yellow sericeous-villous, apex palmately or pectinately lobed; lobes lanceolate. Pedicel 4–6 mm. Flowers 7–9 mm in diam. Calyx abaxially densely yellow sericeous-villous; sepals erect after anthesis, broadly ovate or suborbicular, 6–7 × 3–5 mm, margin entire, inner sepals usually with tomentose margin, apex obtuse. Petals white, suborbicular, glabrous. Stamens many; filaments short, broad, complanate. Pistils slightly longer than stamens; style and ovary glabrous. Fruit unknown. Fl. Jun–Jul.

- Montane valleys, dense forests; 1200–2000 m. SE Yunnan.

109. *Rubus fusciorubens* Focke in Sargent, Pl. Wilson. 1: 50. 1911.

黄毛悬钩子 huang mao xuan gou zi

Shrubs deciduous. Branchlets brownish to dark brown, tomentose-villous, gradually glabrescent, with sparse, slightly curved prickles. Leaves simple; petiole 2–4 cm, villous when young, glabrate in age, with sparse, curved small prickles; stipules caducous, free, 5–9 mm, deeply divided to base, lobes linear, villous; blade narrowly ovate, 7–10 × 4–6.5 cm, palmately 5-veined, lateral veins 4 or 5 pairs, thickly papery, abaxially densely gray tomentose, adaxially pilose along veins, base cordate, margin shallowly lobed, thinly sharply serrate, apex acuminate. Inflorescences often terminal, cymose panicles, 10–20 cm; rachis and pedicels yellowish sericeous-villous; bracts 5–7 mm, villous, divided above middle; lobes linear. Pedicel 3–6 mm, with sparse, glandular hairs. Flowers ca. 1 cm in diam. Calyx densely yellowish sericeous-villous, sometimes with sparse, intermixed glandular hairs; sepals ovate, 5–6 × 2.5–4 mm, puberulous, margin entire, apex long acuminate. Petals much shorter than sepals or absent. Stamens many, shorter than sepals; filaments linear. Pistils not more than 20, shorter than stamens; style and ovary glabrous. Aggregate fruit black, subglobose, with few drupelets. Fl. May–Jun, fr. Jul–Aug.

- Mountainous areas; 400–1200 m. Hubei.

110. *Rubus jianensis* L. T. Lu & Boufford, nom. nov.

常绿悬钩子 chang lu xuan gou zi

Replaced synonym: *Rubus sempervirens* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 455. 1982, not Bigelow (1824).

Shrubs evergreen, 1–3 m tall. Branchlets reddish brown, terete, glabrous, with curved prickles. Leaves simple; petiole 5–10 cm, glabrous, with curved prickles; stipules caducous; blade narrowly ovate or broadly ovate-lanceolate, 11–22 × 5.5–11 cm, palmately 5-veined, lateral veins 8–10 pairs, leathery, abax-

ially densely gray or grayish yellow tomentose, slightly villous along veins, adaxially glabrous, base cordate, margin undivided or shallowly undulate, irregularly coarsely sharply serrate, apex acuminate. Inflorescences terminal, cymose panicles; rachis and pedicels yellowish sericeous-villous; bracts similar to stipules, apex deeply lobed; lobes lanceolate, sericeous-villous. Pedicel 1–1.4 cm. Flowers 1–1.4 cm in diam. Calyx abaxially densely yellowish sericeous-villous, usually without glandular hairs; sepals ovate or ovate-lanceolate, margin entire, apex acute to acuminate. Petals absent. Stamens many; filaments linear. Pistils ca. 14–20; ovary glabrous. Aggregate fruit red, semiglobose, 1 cm or less in diam., glabrous, enclosed in calyx; pyrenes reniform, distinctly rugose. Fl. May–Jun, fr. Jul–Aug.

• Slopes, foothills, montane valleys; 700–900 m. C and SW Jiangxi.

111. *Rubus cinclidictyus* Cardot, Notul. Syst. (Paris) 3: 295. 1914.

网纹悬钩子 wang wen xuan gou zi

Shrubs climbing, to 2 m tall, long stoloniferous. Branches grayish brown to dark reddish brown, glabrous, with sparse, somewhat curved prickles or nearly unarmed. Leaves simple; petiole 1–4 cm, shortly petiolate at bases of inflorescences, glabrous, with sparse, slightly curved prickles; stipules caducous, free, oblong or liguliform, 1–1.4 cm, glabrous or subglabrous, apex divided; blade broadly ovate, rarely ovate-oblong, 9–12 × 6–9 cm, palmately veined from base, abaxially densely gray tomentose, adaxially glabrous, base rounded to shallowly cordate, margin irregularly coarsely sharply serrate, apex shortly caudate. Inflorescences terminal, cymose panicles, much branched, pyramidal, to 10–22 cm; rachis and pedicels tomentose; bracts oblong or liguliform, rarely ovate, 1–1.2 cm, tomentose, apex divided. Pedicel 0.7–1.5 cm. Flowers 6–8 mm in diam. Calyx purple, abaxially densely gray tomentose; tube shorter, shallowly pelviform; sepals erect or reflexed after anthesis, ovate or ovate-lanceolate, 4–6(–7) × 2–3 mm, margin entire, rarely with 2 or 3 teeth, apex acuminate. Petals usually absent. Stamens many, in 1 whorl, shorter than sepals; filaments linear, glabrous. Pistils slightly shorter than stamens, glabrous. Aggregate fruit black at maturity, subglobose, less than 1 cm in diam., glabrous. Fl. Jun–Jul, fr. Aug–Sep.

• Slopes, forests, forest margins, river banks; 1200–3300 m. Sichuan, Yunnan.

112. *Rubus xanthoneurus* Focke, Bot. Jahrb. Syst. 29: 392. 1900.

黄脉莓 huang mai mei

Shrubs climbing, to 3 m tall. Branchlets grayish brown, gray or yellowish gray tomentose, gradually glabrescent, with sparse, minute prickles. Leaves simple; petiole (1–)2–3 cm, tomentose, with sparse, minute prickles; stipules free, ovate to ovate-lanceolate, 7–9(–25) mm, soft hairy, margin and apex deeply lacinate, lobes linear; blades narrowly ovate to ovate-lanceolate, 7–12 × 4–7 cm, lateral veins 7 or 8 pairs, brownish yellow, prominently raised abaxially, abaxially densely gray or yellowish white tomentose, adaxially villous along veins, base truncate to shallowly cordate, margin often lobed, with irregular, rough, sharp teeth, apex acuminate. Inflorescences termi-

nal and axillary, cymose panicles, 12–24 cm; rachis and pedicels tomentose; bracts lanceolate or ovate-lanceolate, 5–7(–25) mm, apex and margin deeply lobed; lobes linear, soft hairy. Pedicel to 1.2 cm. Flowers less than 1 cm in diam. Calyx abaxially tomentose, gradually glabrescent; tube pelviform; sepals ovate, 6–7 × 3–5 mm, apex acuminate, outer sepals shallowly lobed, margin scarios, persistently tomentose. Petals white, obovate, 3–4 × 2.5–3.5 mm, shorter than sepals, puberulous, base clawed. Stamens many, nearly as long as petals; filaments linear. Pistils 10–35, slightly longer than stamens, glabrous. Aggregate fruit dark red, subglobose, glabrous; pyrenes rugulose. Fl. Jun–Jul, fr. Aug–Sep.

Forests, mountainous areas, montane valleys, ravines, roadsides, fallow fields; 500–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Yunnan [Thailand].

- 1a. Petioles 2–3 cm; stipules and bracts less than 1 cm; pedicel and abaxial surface of calyx without glandular hairs 112a. var. *xanthoneurus*
- 1b. Petioles 1–2.5 cm; stipules and bracts 1–2.5 cm; pedicel and abaxial surface of calyx with glandular hairs or not.
 - 2a. Pedicel and abaxial surface of calyx with glandular hairs 112b. var. *glandulosus*
 - 2b. Pedicel and abaxial surface of calyx without glandular hairs 112c. var. *brevipetiolatus*

112a. *Rubus xanthoneurus* var. *xanthoneurus*

黄脉莓(原变种) huang mai mei (yuan bian zhong)

Rubus dielsianus Focke; *R. gentilianus* H. Léveillé & Vaniot; *R. lambertianus* Seringe subsp. *xanthoneurus* (Focke) Focke; *R. lambertianus* var. *xanthoneurus* Focke; *R. spinipes* Hemsley.

Petiole 2–3 cm; stipules and bracts less than 1 cm. Pedicel and abaxial surface of calyx without glandular hairs.

Forests on slopes, ravines, roadsides, fallow fields; 1300–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Yunnan [Thailand].

112b. *Rubus xanthoneurus* var. *glandulosus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 455. 1982.

腺毛黄脉莓 xian mao huang mai mei

Petiole 1–2.5 cm; stipules and bracts 1–2.5 cm. Pedicel and abaxial surface of calyx with glandular hairs.

• Forests, mountainous areas, roadsides; 800–1100 m. Guangxi, Guizhou.

112c. *Rubus xanthoneurus* var. *brevipetiolatus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 455. 1982.

短柄黄脉莓 duan bing huang mai mei

Petiole ca. 1 cm; stipules and bracts longer than petioles. Pedicel and abaxial surface of calyx without glandular hairs.

• Montane valleys, mixed forests; 500–1500 m. Guizhou.

113. *Rubus paniculatus* Smith in Rees, Cycl. 30: *Rubus* no. 41. 1819.

圆锥悬钩子 yuan zhui xuan gou zi

Shrubs scandent, to 3 m tall. Branchlets brownish to reddish brown, terete, yellowish gray tomentose-villous, gradually glabrescent, with sparse, minute prickles. Leaves simple; petiole 2–4 cm, yellowish gray or gray tomentose-villous, usually unarmed; stipules oblong or ovate-lanceolate, to 8–11 mm, villous, margin lacinate lobed above middle, lobes linear; blade ovate to narrowly ovate, 9–15 × 6–10 cm, lateral veins 5–7 pairs, abaxially densely yellowish gray to gray tomentose, villous along veins or glabrescent, adaxially villous, more densely so along veins, base cordate, margin undulate or inconspicuously lobed, irregularly coarsely serrate to doubly serrate, apex acuminate. Inflorescences terminal or axillary, terminal ones cymose panicles, laxly spreading, 10–24 cm, axillary inflorescences smaller, subracemes; rachis and pedicels yellowish gray or gray tomentose-villous; bracts elliptic or oblong to lanceolate, 7–9 mm, villous, apex lobed or not divided. Pedicel to 1.5 cm. Flowers to 1.8 cm in diam. Calyx abaxially tomentose and villous; sepals ovate to lanceolate, 5–7 × 2–4 mm, apex acute to caudate-acuminate, outer sepals lobed, inner sepals entire. Petals white to yellowish white, oblong, 6–8 mm in diam. Stamens many, shorter than petals; filaments linear, glabrous. Pistils longer than stamens, glabrous. Aggregate fruit dark red to blackish purple, globose, glabrous; pyrenes distinctly rugose. Fl. Jun–Aug, fr. Sep–Oct.

Forests, ravines, stream sides; 1500–3200 m. Xizang, Yunnan [Bhutan, N India, Kashmir, Nepal, Sikkim].

- 1a. Leaves abaxially persistently tomentose, margin coarsely serrate 113a. var. *paniculatus*
 1b. Leaves abaxially tomentose when young, glabrescent in age, margin sharply serrate 113b. var. *glabrescens*

113a. *Rubus paniculatus* var. *paniculatus*

圆锥悬钩子(原变种) yuan zhui xuan gou zi (yuan bian zhong)

Rubus paniculatus f. *tiliaceus* (Smith) H. Hara; *R. tiliaceus* Smith.

Leaves abaxially persistently tomentose, margin coarsely serrate.

Mixed forests on slopes, ravines, stream sides; 1500–3200 m. Xizang, Yunnan [Bhutan, N India, Kashmir, Nepal, Sikkim].

113b. *Rubus paniculatus* var. *glabrescens* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 456. 1982.

脱毛圆锥悬钩子 tuo mao yuan zhui xuan gou zi

Leaves abaxially tomentose when young, glabrescent in age, margin sharply serrate.

- Forests; ca. 1700 m. NW Yunnan.

114. *Rubus neoviburnifolius* L. T. Lu & Boufford, **nom. nov.**

莢蒾叶悬钩子 jia mi ye xuan gou zi

Replaced synonym: *Rubus viburnifolius* Focke, Biblioth. Bot. 17(Heft 72): 75. 1910, not Franchet (1895), nor (Greene) Rydberg (1913); *R. evadens* Focke; *R. nanopetalus* Cardot; *R. viburnifolius* Focke var. *apetalus* Y. Gu & W. L. Li.

Shrubs climbing. Branches brownish to dark brown, terete, robust, gray to yellowish gray tomentose, with sparse, somewhat curved prickles. Leaves simple; petiole 1–2.5 cm, gray to grayish yellow tomentose-villous, with sparse, minute prickles; stipules caducous, lanceolate, 5–7 mm, deeply lobed, lobes linear, villous; blade broadly ovate to suborbicular, rarely narrowly ovate, 6–11 × 5–9.5 cm, lateral veins usually 5 pairs, abaxially gray to yellowish gray tomentose and villous along veins, adaxially pilose, more densely so along veins, base truncate to subcordate, margin undulate or inconspicuously 3-lobed, irregularly abruptly pointed-serrate, apex acute or shortly pointed. Inflorescences terminal or axillary, terminal ones cymose panicles, short, 7–14 cm, compact, many flowered, axillary ones subracemes, shorter, sometimes flowers few in clusters; rachis and pedicels densely gray to grayish yellow tomentose-villous; bracts unequal in length, those in basal part of inflorescence 5–8 mm, parted nearly to base; lobes linear or lanceolate, villous, those in apical part of inflorescence smaller, linear-lanceolate, 3-divided. Pedicel 0.8–1.5 cm. Flowers 8–10 mm in diam. Calyx yellowish tomentose and villous; sepals ovate-lanceolate, 5–8 × 3–5 mm, often undivided. Petals white, spatulate or elliptic, smaller than sepals, glabrous, base clawed. Stamens many, somewhat longer than petals; filaments linear. Pistils fewer than stamens, slightly longer than or ca. as long as stamens, glabrous. Aggregate fruit red, 6–8 mm in diam., glabrous, with few drupelets; pyrenes rugose. Fl. late spring–summer, fr. summer–autumn.

- Dry slopes, mixed forests; 1200–3000 m. S Yunnan.

115. *Rubus nagasawanus* Koidzumi, Acta Phytotax. Geobot. 8: 108. 1939.

高砂悬钩子 gao sha xuan gou zi

Rubus alceifolius Poir. var. *emigratus* Koidzumi (1913), not Focke (1904); *R. formosensis* Matsumura (1901), not Kuntze (1879); *R. polyanthus* H. L. Li; *R. tephrodes* Hance var. *setosissimus* Koidzumi (1939), not Handel-Mazzetti (1933).

Shrubs scrambling. Branches robust, grayish soft hairy and tomentose, with reddish glandular hairs 2–3 mm and few prickles; prickles ca. 2 mm, curved, base dilated; petiole 1–2 cm, tomentose, with minute prickles and glandular hairs; stipules free, 8–10 mm, margin lacerate to pinnatifid; lobes linear, with soft hairs and intermixed sparse, glandular hairs; blade suborbicular or broadly ovate, 4–6 × 4.5–7 cm, 5-veined, veins prominent abaxially, slightly impressed adaxially, abaxially gray or grayish yellow tomentose, adaxially dark and slightly hirsute especially along veins, base broadly to deeply cordate, margin 5-lobed, unevenly sharply serrate, apex acute or obtuse. Inflorescences terminal, cymose panicles, much branched, 8–15(–20) cm, many flowered; rachis and pedicels densely tomentose; bracts 5–8 mm, margin lacerate to pinnatifid; lobes linear to linear-lanceolate, puberulous, with few glandular hairs. Pedicel 1–2 cm. Flowers ca. 1 cm in diam. Calyx yellowish tomentose, with sparse, intermixed glandular hairs; tube

cupular, ca. 3 mm, unarmed; sepals triangular-ovate, 6–7 × 3–4 mm, apex acute to acuminate, usually undivided. Petals white, spatulate-orbicular to obovate, 3–4 × 2–3 mm, pubescent, base shortly clawed. Stamens many; filaments 3–4 mm, glabrous. Pistils 4–5 mm, glabrous. Aggregate fruit subglobose, 7–9 mm in diam., glabrous, enclosed in calyx; pyrenes 2–3 mm, slightly foveolate. Fl. summer, fr. autumn. $2n = 28^*$.

Thickets; 700–2500 m. E Taiwan [Indonesia (Java, Sumatra), Philippines].

116. *Rubus alceifolius* Poir. in Lamarck, Encycl. Meth. 6: 247. 1804.

粗叶悬钩子 *cu ye xuan gou zi*

Rubus alceifolius var. *diversilobatus* (Merrill & Chun) T. T. Yu & L. T. Lu; *R. bullatifolius* Merrill; *R. fimbriiferus* Focke; *R. fimbriiferus* var. *diversilobatus* Merrill & Chun; *R. gilvus* Focke; *R. hainanensis* Focke; *R. laciniatostipulatus* Hayata ex Koidzumi; *R. monguillonii* H. Léveillé & Vaniot; *R. multibracteatus* H. Léveillé & Vaniot var. *demangei* H. Léveillé.

Shrubs scandent, to 5 m tall, with arching or climbing branches. Branchlets brown or reddish brown, densely spreading straight tomentose-villous, with sparse, recurved prickles to 5 mm; petiole 3–4.5 cm, yellowish gray to rust colored tomentose-villous, with sparse, minute prickles; stipules oblong to orbicular, 1–1.5(–2) cm, margin deeply digitately or pinnately divided, lobes linear or linear-lanceolate, hairy; blade sub-orbicular or broadly ovate, 6–16 × 5–14 cm, usually palmately 5-veined, thinly leathery, abaxially yellowish gray to rust colored tomentose, villous along veins, adaxially sparsely villous and distinctly bullate between veins, base cordate with basal incision to 3 or 4 cm deep, margin shallowly 5–7-lobed; lobes apically obtuse or acute, unevenly coarsely serrate. Inflorescences terminal, narrow cymose panicles or subracemes, 6–11 cm, sometimes flowers few in axillary clusters, rarely flowers solitary; rachis and pedicels tomentose-villous, with minute recurved prickles; bracts 1–1.4 cm, pinnatifid to pinnatipartite; lobes linear or lanceolate. Pedicel 5–10(–15) mm. Flowers 1–1.6 cm in diam. Calyx abaxially tomentose-villous; tube cupular; sepals broadly ovate to triangular-ovate, 6–9 × 5–8 mm, apex and margin of outer sepals palmately or pinnately lacinate, rarely undivided, inner sepals entire, shortly pointed, abaxially tomentose, intermixed villous. Petals white, suborbicular to broadly obovate, 5–9 × 4–9 mm, base clawed. Stamens many, shorter than petals; filaments to 5 mm, broad, complanate; anthers with few long hairs. Pistils numerous, longer than stamens; ovary and style glabrous. Aggregate fruit red, subglobose, to 1.8 cm in diam.; pyrenes rugose. Fl. Jul–Sep. fr. Oct–Nov. $2n = 42^*$.

Sunny slopes, mixed forests in valleys, boggy thickets, roadsides, rock crevices; 500–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangsu, Jiangxi, Taiwan, Yunnan, Zhejiang [Cambodia, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

The fruit are juicy and edible. The roots and leaves are used medicinally.

117. *Rubus platysepalus* Handel-Mazzetti, Symb. Sin. 7: 493. 1933.

武冈悬钩子 *wu gang xuan gou zi*

Rubus platysepalus var. *gracilior* Handel-Mazzetti.

Shrubs, to 2 m tall. Branchlets brown or reddish brown, terete, yellowish villous, with sparse, broad-based, recurved prickles. Leaves simple; petiole 3–4.5 cm, yellowish villous, with sparse, recurved minute prickles; stipules caducous, free, to 1 cm, villous, pinnatipartite or palmatipartite nearly to base, lobes linear or lanceolate; blade broadly ovate, 6–10 × 5–8.5 cm, palmately 5-veined, papery, abaxially yellowish gray tomentose, villous along brown to rust colored veins, with sparse, minute prickles along midvein, adaxially appressed strigose-pilose, base deeply cordate, margin 5–7-lobed; lobes apically acute or obtuse, terminal lobe longer than lateral lobes, irregularly coarsely serrate. Inflorescences terminal or axillary, terminal ones cymose panicles, 10–20 cm or more, loosely flowered; axillary inflorescences subracemes, shorter; rachis and pedicels yellowish villous, with sparse, curved minute prickles; bracts 7–9 mm, palmatipartite or pinnatipartite; lobes linear or linear-lanceolate, villous. Pedicel 5–8 mm. Flowers 8–10 mm in diam. Calyx abaxially yellowish villous; tube 4–5 mm; sepals broadly ovate or broadly triangular-ovate, 5–8 × 3–5 mm, apex shortly acuminate, outer sepals apically lacinate, inner sepals entire, abaxially with tomentose margin. Petals white, broadly obovate, 4–5.5 mm and ca. as broad, pubescent, base clawed, apex obtuse. Stamens many, slightly shorter than or nearly as long as petals; filaments linear, dilated toward base, glabrous or with few long hairs at apex of anthers. Pistils numerous, longer than stamens; ovary whitish pubescent; styles glabrous. Fruit unknown. Fl. Jun–Aug.

• Thickets, roadsides; low elevations. Guangxi, W Hunan (Wu-gang Xian).

118. *Rubus arachnoideus* Y. C. Liu & F. Y. Lu, Quart. J. Chin. Forest. 9: 129. 1976.

灰叶悬钩子 *hui ye xuan gou zi*

Rubus nagasawanus Koidzumi var. *arachnoideus* (Y. C. Liu & F. Y. Lu) S. S. Ying.

Subshrubs. Branchlets densely grayish appressed tomentose, with few small prickles. Leaves simple; petiole 1.5–2 cm, grayish tomentose; stipules 4–6 mm, much lacerate, grayish tomentose; blade ovate to broadly ovate, 5–7 × 4–6 cm, palmately 5-veined, veins raised abaxially, slightly impressed adaxially, abaxially densely grayish appressed tomentose, adaxially dark brownish, glabrous or slightly pubescent along veins, base broadly cordate, margin unevenly dentate, 3–5-lobed, terminal lobe 3–4 × 3–3.5 cm, lateral lobes smaller, apex obtuse or acute. Inflorescences terminal, cymose panicles, much branched, to 17 × 13 cm; rachis and pedicels grayish tomentose. Pedicel 0.8–2 cm, bracts linear or linear-lanceolate, slightly lacerate, grayish tomentose. Calyx cupular, 5–6 mm in diam., abaxially grayish tomentose; sepals triangular or triangular-ovate, 4–6 × 2–3 mm, apex acute. Petals white, broadly obovate or obovate-spatulate, 4–5 × 3–4 mm, both surfaces sparsely pubescent, base shortly clawed; torus densely villous. Stamens many; filaments free or connate at base, ca. 3 mm, glabrous. Pistils glabrous; styles 3–4 mm. Fruit not seen. Fl. Jul–Sep(–Dec).

• Broad-leaved forests; (300–)1500–1800 m. E Taiwan.

No specimens have been seen by the present authors. Specimens under this name at HAST have been annotated by Naohiro Naruhashi as *Rubus tephrodes* (Ching-I Peng, pers. comm.).

119. *Rubus yuliensis* Y. C. Liu & F. Y. Lu, Quart. J. Chin. Forest. 9(2): 135. 1976.

玉里悬钩子 *yu li xuan gou zi*

Shrubs. Branchlets pilose, densely prickly; prickles to 4 mm, slender, somewhat curved. Leaves simple; petiole 5–8 cm, densely hirsute and prickly; stipules ovate to ovate-oblong, 6–12 mm, pinnatifid or deeply lacinate; lobes linear, 7–8 mm, abaxially sparsely hirsute, adaxially glabrous; blade broadly cordate-orbicular, 5–8 × 4.5–9 cm, thinly leathery, 5-veined, veins prominent abaxially, slightly impressed to flat adaxially, abaxially yellowish brown, tomentose, with intermixed long hairs, adaxially nearly glabrous except hirsute along veins, base broadly cordate, margin unevenly serrate, shallowly 5-lobed, terminal lobe 1.7–3.5 × 1.5–3.5 cm, longer than lateral lobes, apex obtuse to shortly acute. Inflorescences subracemes, short, 3–6-flowered; rachis and pedicels densely hirsute, prickly; bracts orbicular-ovate, lacinate, abaxially puberulent, adaxially glabrous. Pedicel ca. 5 mm. Calyx cupular, abaxially densely tomentose and hirsute; sepals long ovate, 5–8 mm, margin entire, apex with 1–3 bristles. Petals orbicular, ca. 5 mm, glabrous. Stamens many; filaments glabrous. Pistils glabrous, styles ca. 7 mm. Fruit unknown. Fl. Jun–Jul(–Oct).

- 1000–1400 m. E Taiwan.

No specimens have been seen by the present authors. Specimens under this name at HAST have been annotated by Naohiro Naruhashi as *Rubus rufus* (Ching-I Peng, pers. comm.).

120. *Rubus chrysobotrys* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 183. 1923.

黄穗悬钩子 *huang sui xuan gou zi*

Shrubs 2–3 m tall. Branchlets brownish to dark brown, terete, densely yellowish villous, with sparse, curved small prickles. Leaves simple; petiole 3.5–7 cm, densely yellowish villous, with sparse, curved minute prickles; stipules caducous, free, brown, 1–1.7 cm, villous, pinnatifid nearly to midvein, lobes linear; blade broadly ovate, 7–15 × 6–12 cm, palmately 5-veined, lateral veins 2 or 3 pairs, abaxially densely yellow tomentose, with intermixed long hairs along veins, glabrescent, with only sparse long hairs along veins in age, adaxially villous, base cordate, margin undivided, 5-divided, or somewhat undulate, irregularly coarsely sharply doubly serrate, apex abruptly long pointed or shortly acuminate. Inflorescences terminal or axillary, narrow cymose panicles or subracemes, terminal ones 12–26 cm, axillary ones shorter; rachis and pedicels densely yellow villous, with sparse, minute prickles; bracts 0.8–1.5(–2.3) cm, deeply lobed; lobes lanceolate or linear-lanceolate, villous. Pedicel 5–10 mm. Flowers 1–1.5 cm in diam. Calyx abaxially densely yellow villous, intermixed tomentose; sepals often erect in fruit, lanceolate, 1–1.2 cm × 3–6 mm, apex shortly caudate, outer sepals apically shallowly 2- or 3-lacinate. Petals white, suborbicular or obovate, 8–11 × 4–6 mm, base long clawed. Stamens many, slightly shorter than petals; filaments slightly

broad at base. Pistils numerous, longer than stamens, glabrous. Aggregate fruit semiglobose, 8–10 mm in diam., glabrous, enclosed in calyx; pyrenes rugulose. Fl. Jun–Jul, fr. Aug–Sep.

- Mixed forests on slopes, ravines, mountainous regions; 1700–2500 m. W Yunnan.

- 1a. Leaves undivided or sometimes undulate; bracts 8–15 mm 120a. var. *chrysobotrys*
- 1b. Leaves often undulately 5-divided; bracts to 23 mm 120b. var. *lobophyllus*

120a. *Rubus chrysobotrys* var. *chrysobotrys*

黄穗悬钩子(原变种) *huang sui xuan gou zi* (*yuan bian zhong*)

Leaves undivided or sometimes undulate. Bracts 0.8–1.5 cm.

- Mixed forests on slopes, ravines; 1700–2500 m. NW Yunnan.

120b. *Rubus chrysobotrys* var. *lobophyllus* Handel-Mazzetti, Symb. Sin. 7: 495. 1933.

裂叶黄穗悬钩子 *lie ye huang sui xuan gou zi*

Leaves often undulately 5-divided. Bracts to 2.3 cm.

- Mountainous regions; 2000–2400 m. SW Yunnan.

121. *Rubus rufus* Focke, Biblioth. Bot. 17(Heft 72): 108. 1910.

棕红悬钩子 *zong hong xuan gou zi*

Shrubs scandent, to 3 m tall. Branchlets brownish to reddish brown, cylindrical, with soft hairs, brownish bristles, and sparse, needle-like prickles. Leaves simple; petiole 7–11 cm, brownish, with soft hairs, brownish soft bristles, and slightly needle-like prickles; stipules 1.5–2 cm, palmately 5-veined, pectinately or palmately lobed; lobes pinnately divided again into linear or linear-lanceolate lobules, soft hairy, bristly; blade suborbicular, 0.9–1.5 cm in diam., abaxially brownish tomentose, with intermixed reddish brown long hairs and sparse, needle-like prickles along veins, adaxially villous only along veins, base cordate, margin 5-lobed; lobes triangular-lanceolate or oblong-lanceolate to narrowly elliptic-lanceolate, apex acute, terminal lobe longest, lobes near base shorter, triangular, irregularly sharply serrate. Inflorescences terminal, narrow panicles or subracemes, 6–8(–10) cm, few flowered, or flowers in clusters in leaf axils; rachis and pedicels with dense soft hairs, brownish bristles, and sparse, needle-like prickles; bracts to 1.5 cm, palmatifid; lobes linear or linear-lanceolate, soft hairy, bristly. Pedicel 0.7–1(–2.5) cm. Flowers ca. 1 cm in diam. or more. Calyx abaxially brownish tomentose and bristly; tube shallowly cupular; sepals erect in fruit, broadly ovate or ovate-lanceolate, 0.8–1.2 cm × 5–7 mm, apex caudate, outer sepals apically shallowly lacinate, inner sepals entire. Petals white, broadly elliptic or suborbicular, 5–7 mm in diam., glabrous, base shortly clawed, apex somewhat undulate or erose. Stamens many, longer than or nearly as long as petals; filaments linear or with slightly broadened bases. Pistils 30–40, longer than stamens; style and ovary glabrous. Aggregate fruit orange-red, with few drupelets, glabrous, enclosed in calyx; pyrenes distinctly rugulose. Fl. Jun–Aug, fr. Sep–Oct. $2n = 28^*$.

Forests, thickets on slopes, valleys, ravines, near water courses; 900–2500 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang [Thailand, Vietnam].

- 1a. Leaves deeply divided, lobes oblong-lanceolate or narrowly elliptic-lanceolate 121c. var. *palmatifidus*
 1b. Leaves shallowly 5-divided, lobes triangular-lanceolate or triangular.
 2a. Pedicel 0.7–1 cm; flowers ca. 1 cm in diam. 121a. var. *rufus*
 2b. Pedicel 1.5–2.5 cm; flowers more than 1 cm in diam. 121b. var. *longipedicellatus*

121a. *Rubus rufus* var. *rufus*

棕红悬钩子(原变种) zong hong xuan gou zi (yuan bian zhong)

Leaves shallowly 5-divided, lobes triangular-lanceolate or triangular. Pedicel 7–10 mm. Flowers ca. 1 cm in diam.

Dense forests, thickets on slopes, valleys; 1000–2500 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan [Thailand, Vietnam].

121b. *Rubus rufus* var. *longipedicellatus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 457. 1982.

长梗棕红悬钩子 chang geng zong hong xuan gou zi

Leaves shallowly 5-divided, lobes triangular-lanceolate or triangular. Pedicel 1.5–2.5 cm. Flowers more than 1 cm in diam.

- Forests; below 2800 m. Yunnan.

121c. *Rubus rufus* var. *palmatifidus* Cardot, Notul. Syst. (Paris) 3: 304. 1914.

掌裂棕红悬钩子 zhang lie zong hong xuan gou zi

Leaves deeply lobed; lobes oblong-lanceolate or narrowly elliptic-lanceolate. Pedicel 7–10 mm. Flowers more than 1 cm in diam.

- Ravines in dense forests, near water courses; 900–1100 m. S Guizhou.

122. *Rubus lasiotrichos* Focke, Biblioth. Bot. 17(Heft 72): 109. 1910.

多毛悬钩子 duo mao xuan gou zi

Shrubs scandent. Branchlets brownish to reddish brown, terete, with soft hairs, bristles, and curved prickles. Leaves simple; petiole 6–8(–10) cm, with soft hairs, brownish bristles, and sparse, curved prickles; stipules caducous, free, brown, 1–1.2 × 0.7–1 cm, apex pectinately lobed, lobes lanceolate, soft hairy, bristly; blade suborbicular, 9–14 cm in diam., palmately 5-veined, abaxially densely brownish tomentose, with intermixed long hairs and sparse, curved small prickles along veins, adaxially villous along veins, base cordate, margin 5-lobed; lobes broadly triangular to triangular-lanceolate, terminal lobe larger, apex acute to acuminate, irregularly sharply serrate. Inflorescences few flowered, clusters in leaf axils, or terminal and short subracemes, to 6–9 cm; rachis and pedicels with dense soft hairs,

brownish bristles, and sparse, minute prickles; bracts to 1.2 cm, apex lobed; lobes lanceolate, soft hairy, bristly. Pedicel 5–10 mm. Flowers 1.2–1.7 cm in diam. Calyx abaxially densely brownish tomentose and bristly; sepals narrowly lanceolate to lanceolate or ovate-lanceolate, 6–10 × 4–7 mm, apex acute or shortly acuminate to caudate, outer sepals often lacinate above middle; lobes linear, inner sepals entire. Petals white, suborbicular or broadly elliptic, slightly shorter than or nearly as long as sepals, glabrous, base shortly clawed. Stamens many, somewhat shorter than petals; filaments linear. Pistils slightly longer than stamens; style and ovary glabrous. Aggregate fruit red, subglobose, glabrous, with many drupelets, enclosed in calyx; pyrenes prominently rugulose. Fl. Jul–Aug, fr. Sep–Oct.

Dry slopes, rocky mountains, sparse forests, thickets; 1800–2700 m. S Guizhou, Sichuan, Yunnan [Thailand, Vietnam].

- 1a. Sepals lanceolate to ovate-lanceolate, apex acute to shortly acuminate 122a. var. *lasiotrichos*
 1b. Sepals narrowly lanceolate, apex acuminate to caudate 122b. var. *blinii*

122a. *Rubus lasiotrichos* var. *lasiotrichos*

多毛悬钩子(原变种) duo mao xuan gou zi (yuan bian zhong)

Rubus rufus Focke var. *hederifolius* Cardot; *R. hederifolius* (Cardot) Thuan.

Sepals lanceolate to ovate-lanceolate, apex acute to shortly acuminate.

Dry slopes, rocky mountains, sparse forests; 1800–2700 m. Sichuan, Yunnan [Thailand, Vietnam].

122b. *Rubus lasiotrichos* var. *blinii* (H. Léveillé) L. T. Lu, Acta Phytotax. Sin. 38: 281. 2000.

狭萼多毛悬钩子 xia e duo mao xuan gou zi

Rubus blinii H. Léveillé, Repert. Spec. Nov. Regni Veg. 7: 258. 1909.

Sepals narrowly lanceolate, apex acuminate to caudate.

- Thickets. S Guizhou.

123. *Rubus pluribracteatus* L. T. Lu & Boufford, **nom. nov.**

大乌泡 da wu pao

Replaced synonym: *Rubus multibracteatus* H. Léveillé & Vaniot, Bull. Soc. Étud. Sci. Angers 11: 99. 1902, not Boulay & Pierret ex Rouy & Camus (1900).

Shrubs to 3 m tall. Branchlets brownish to purplish brown, terete, stout, yellow tomentose and with sparse, curved small prickles. Leaves simple; petiole 3–6 cm, densely yellow tomentose, with sparse, minute prickles; stipules broadly elliptic to broadly obovate, 1–1.8 cm, apex pectinately lobed; lobes undivided, lanceolate or linear-lanceolate, tomentose-villous; blade suborbicular, 7–16 cm in diam., 5-veined, veins prominent abaxially, abaxially densely yellowish gray or yellow tomentose, villous along veins, adaxially soft hairy, densely bullate, base cordate, margin 7–9-lobed, terminal lobe obtuse or subtruncate, inconspicuously 3-lobed, unevenly coarsely serrate, apex ob-

tuse or acute. Inflorescences terminal and axillary, terminal ones narrow cymose panicles or subracemes, 7–14 cm, axillary ones racemes or flowers few in clusters in leaf axils; rachis and pedicels densely yellow or yellowish white sericeous-villous; bracts similar to stipules in shape, 1–1.5 cm, palmately lacinate; lobes lanceolate. Pedicel 1–1.5 cm, rarely longer. Flowers 1.5–2.5 cm in diam. Calyx abaxially densely yellow or yellowish white sericeous-villous; tube broadly pelviform; sepals erect in fruit, broadly ovate, 0.9–1.5(–2.4) cm × 4–7 mm, margin sometimes slightly tomentose, apex acuminate; outer sepals larger, palmately to pinnately divided, rarely undivided, inner sepals narrower, not or occasionally lobed. Petals white, obovate or spatulate, 0.8–1.4 cm × 5–8 mm, glabrous, base clawed. Stamens many; filaments broad, complanate; anthers with few long hairs. Pistils numerous, longer than stamens; ovary glabrous. Aggregate fruit red, globose, to 2 cm in diam.; pyrenes prominently rugose. Fl. Mar–Jun, fr. Aug–Sep.

Slopes, river valleys, roadsides, forests, forest margins; 300–2700 m. Guangdong, Guangxi, Guizhou, Yunnan [Cambodia, Laos, Thailand, Vietnam].

- 1a. Sepals to 1.5 cm, palmately to pinnately divided, lobes usually undivided 123a. var. *pluribracteatus*
 1b. Sepals to 2.4 cm, palmatifid above middle, lanceolate lobes divided again 123b. var. *lobatisepalus*

123a. *Rubus pluribracteatus* var. *pluribracteatus*

大乌泡(原变种) da wu pao (yuan bian zhong)

Rubus andropogon H. Léveillé; *R. clincephalus* Focke; *R. major* Focke; *R. mallodes* Focke.

Sepals to 1.5 cm, palmately to pinnately lobed; lobes usually undivided.

Slopes, river valleys, roadsides, forests; 300–2700 m. Guangdong, Guangxi, Guizhou, Yunnan [Cambodia, Laos, Thailand, Vietnam].

123b. *Rubus pluribracteatus* var. *lobatisepalus* (T. T. Yu & L. T. Lu) L. T. Lu & Boufford, **comb. nov.**

裂萼大乌泡 lie e da wu pao

Basionym: *Rubus multibracteatus* H. Léveillé & Vaniot var. *lobatisepalus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 458. 1982.

Sepals to 2.4 cm, palmatifid above middle; lobes lanceolate, divided again.

- Forest margins; below 2500 m. W Yunnan.

124. *Rubus reticulatus* Wallich ex J. D. Hooker, Fl. Brit. India 2: 331. 1878.

网脉悬钩子 wang mai xuan gou zi

Shrubs scandent, to 1 cm tall. Branchlets brown, gray to yellowish gray tomentose, with soft hairs and sparse, curved minute prickles, rarely unarmed. Leaves simple; petiole 4–9 cm, gray to yellowish gray tomentose, with soft hairs and sparse, minute prickles; stipules subflabellate, pectinately lob-

ed; lobes divided again, with lanceolate lobules, tomentose, soft hairy; blade broadly ovate to suborbicular, 12–20 × 10–18 cm, palmately 5-veined, lateral veins 5–7 pairs, prominent abaxially, abaxially densely yellowish gray tomentose, with long hairs along veins, adaxially pilose, densely so along veins, base cordate, margin distinctly 5-lobed, lobes apically acute or ± obtuse, unevenly densely serrate. Inflorescences terminal and axillary, terminal ones narrow cymose panicles or subracemes, axillary ones subracemes or flowers in clusters in leaf axils; rachis and pedicels densely gray or yellowish brown tomentose and villous; proximal bracts subflabellate, those on pedicel elliptic, margin entire or apically divided, thinly tomentose, soft hairy. Pedicel 1.5–3(–4) cm. Flowers 1–1.5 cm in diam. Calyx densely tomentose and villous; sepals broadly ovate, 4.5–5 mm, about as broad as long, margin entire or slightly lobed, apex acuminate. Petals white or yellowish white, obovate to suborbicular, ca. 5 mm, about as broad as long. Stamens many, glabrous; filaments linear. Pistils numerous; style and ovary glabrous. Aggregate fruit red, globose, 1–1.5 cm in diam. Fl. Jul–Aug, fr. Sep–Oct.

Broad-leaved evergreen forests in montane valleys, ravines, thickets on slopes; 600–2100 m. SE Xizang [NW India, Nepal, Sikkim].

125. *Rubus setchuenensis* Bureau & Franchet, J. Bot. (Morot) 5: 46. 1891.

川莓 chuan mei

Rubus cavaleriei H. Léveillé & Vaniot; *R. clemens* Focke; *R. lyi* H. Léveillé; *R. omeiensis* Rolfe; *R. pacatus* Focke; *R. pacatus* var. *alpinus* Focke; *R. setchuenensis* var. *omeiensis* (Rolfe) Handel-Mazzetti; *R. singulifolius* Focke.

Shrubs 2–5 m tall. Branchlets yellowish brown when young, brown or reddish brown in age, terete, densely yellowish tomentose-villous, gradually glabrescent, unarmed. Leaves simple; petiole 5–7 cm, yellowish tomentose-villous, often unarmed; stipules caducous, free, ovate or ovate-lanceolate, rarely narrowly ovate, 7–11 mm and nearly as broad, tomentose-villous, apex palmately lacinate; blade suborbicular or broadly ovate, 7–15 cm in diam., palmately 5-veined, lateral veins 2 or 3 pairs, raised abaxially, abaxially densely gray tomentose, sometimes hairs gradually deciduous, adaxially scabrous, glabrous or soft hairy along veins, base cordate, margin 5–7-lobed; lobes shallowly divided again, apex obtuse, rarely acute, unevenly shallowly obtusely dentate. Inflorescences terminal or axillary, narrow cymose panicles, 8–14 cm, to 20 cm in fruit, axillary inflorescences smaller, sometimes flowers few in clusters in leaf axils; rachis and pedicels densely yellowish tomentose-villous; bracts similar to stipules in shape, 5–9 × 3–5 mm, tomentose-villous, apex palmate-lacinate. Pedicel ca. 1 cm. Flowers 1–1.5 cm in diam. Calyx abaxially yellowish tomentose, intermixed soft hairy; sepals erect in fruit, rarely reflexed, ovate-lanceolate, margin entire or outer sepals shallowly lacinate apically, apex caudate. Petals purplish red, obovate or suborbicular, 4–6 mm in diam., much shorter than sepals, glabrous, base clawed. Stamens many, shorter than petals; filaments linear, glabrous. Pistils longer than stamens; style and ovary glabrous. Aggregate fruit black, semiglobose, ca. 1 cm in diam., glabrous, often enclosed in persistent calyx; pyrenes small, smooth. Fl. Jul–Aug, fr. Sep–Oct. $2n = 28^*$.

• Slopes, roadsides, forest margins, thickets; 500–3000 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan, Yunnan.

This species often forms dense, impenetrable thickets on deforested slopes.

126. *Rubus faberi* Focke, *Biblioth. Bot.* 17(Heft 72): 53. 1910.

峨眉悬钩子 *e mei xuan gou zi*

Shrubs. Branchlets brown to purplish brown, terete, densely tomentose-villous, usually unarmed. Leaves simple; petiole 4–9 cm, tomentose, unarmed or with few small prickles; stipules caducous, free; blade broadly ovate, rarely suborbicular, 10–18 × 8–17 cm, palmately 5-veined, lateral veins 3 or 4 pairs, prominent abaxially, leathery, abaxially densely yellowish tomentose, soft hairy along veins, adaxially scabrous, glabrous, base cordate, margin 7–11-lobed; lobes triangular, margin irregularly sharply serrate, apex acute. Inflorescences terminal and axillary, cymose panicles, axillary ones smaller; rachis and pedicels densely yellowish tomentose-villous; bracts caducous, narrowly obovate, tomentose-villous, palmatipartite above middle, lobes lanceolate. Pedicel ca. 1 cm. Flowers 1–1.5 cm in diam. Calyx abaxially densely yellowish tomentose and soft hairy; sepals erect after anthesis, broadly ovate, apex acute, margins of outer sepals often pinnately lacinate; lobes linear. Petals white, narrowly obovate, slightly longer than or nearly as long as sepals, glabrous, base clawed. Stamens many; filaments broader toward base, glabrous. Pistils glabrous. Aggregate fruit red, subglobose, 0.8–1.2 cm in diam., glabrous, enclosed in persistent calyx; pyrenes conspicuously rugulose. Fl. Jun–Jul, fr. Aug–Sep.

• Mountains; low to medium elevations. W Sichuan.

127. *Rubus formosensis* Kuntze, *Meth. Sp.-Besch. Rubus*, 73. 1879.

台湾悬钩子 *tai wan xuan gou zi*

Rubus formosanus Maximowicz ex Focke; *R. nantoensis* Hayata; *R. randaiensis* Hayata; *R. rubibracteatus* F. P. Metcalf; *R. rugosissimus* Hayata.

Shrubs erect or somewhat scrambling. Branchlets terete, densely yellowish brown tomentose-villous, unarmed or with sparse, curved minute prickles. Leaves simple; petiole 3–5 mm, densely yellowish brown tomentose villous, usually unarmed; stipules free, brownish, broadly ovate to oblong, 1–1.5(–2) × 0.6–1(–1.5) cm, margin entire to pinnatipartite or palmatipartite; lobes linear or linear-lanceolate, slightly tomentose-villous; blade broadly ovate or suborbicular, 6–12 × 7–13 cm, 5-veined, reticulate veins raised and prominent abaxially, impressed adaxially, abaxially yellowish gray tomentose, soft hairy along veins, adaxially rugose, soft hairy when young, base cordate, margin 3–5-lobed; lobes ovate-triangular, terminal one largest, margin unevenly coarsely serrate, apex acute, rarely obtuse. Inflorescences terminal, short subracemes, 3–5 cm, several flowered, or flowers solitary in leaf axils; rachis and pedicels densely yellow brown tomentose-villous; bracts reddish brown, broadly ovate to oblong, 8–11(–15) × 6–9(–12) mm, often palmatipartite or pinnatipartite; lobes linear or linear-lanceolate, slightly hairy. Pedicel 3–4 mm, rarely longer. Flowers ca. 1.5 cm in diam. or slightly longer. Calyx abaxially densely yellow-

ish brown villous and tomentose; tube cupular; sepals triangular to ovate, 6–9 × 4–6 mm, margin entire or outer sepals apically lobed or with few teeth, apex acute to shortly acuminate. Petals white, broadly ovate or suborbicular, 5–8 × 4–7 mm, abaxially glabrous or with few hairs, base clawed, margin sometimes erose. Stamens many, shorter than sepals; filaments 3–4 mm, linear, with few long hairs at apex of anthers. Pistils shorter than stamens; ovary with few hairs. Aggregate fruit red, globose or broadly ovoid, 8–10 mm in diam., glabrous. Fl. Jun–Jul, fr. Aug–Sep. $2n = 28^*$.

• Dry places, rocks, stream sides, sparse forests in valleys; low to high elevations. Guangdong, Guangxi, Taiwan.

128. *Rubus pinnatisepalus* Hemsley, *J. Linn. Soc., Bot.* 29. 305. 1892.

羽萼悬钩子 *yu e xuan gou zi*

Shrubs lianoid, to 2 m tall, stoloniferous. Branchlets brown to purplish brown, tomentose-villous, with curved minute prickles, sometimes with glandular hairs. Leaves simple; petiole 3–7 cm, tomentose-villous, with minute prickles; stipules broadly flabellate, 1–1.5(–2) cm, membranous, pectinately or palmately parted nearly to base; lobes lanceolate or linear, villous; blade orbicular to broadly ovate, 7–14 cm in diam., 5-veined, veins distinctly raised abaxially, slightly impressed adaxially, papery, abaxially densely gray tomentose and villous, with minute needle-like prickles along veins, adaxially prominently rugose, sparsely villous, base cordate, margin 5–7-lobed; lobes irregularly coarsely serrate to doubly serrate, apex obtuse or acute. Inflorescences terminal and axillary, short subracemes, 3–5 cm, 1- or few flowered, or flowers several in clusters in leaf axils; rachis and pedicels gray or yellowish tomentose-villous; bracts narrower than stipules, 1–1.5 cm, villous, deeply divided similar to stipules; lobes linear to lanceolate. Pedicel 7–10(–15) mm. Flowers ca. 1.5 cm in diam. Calyx gray or yellowish tomentose and villous; sepals narrowly ovate or ovate-lanceolate, unequal in length, longer sepals to 1.5 cm, shorter sepals 6–8 mm, apex acuminate; outer sepals pinnatipartite, lobes lanceolate, inner sepals entire, occasionally with minute glandular hairs. Petals white, broadly obovate or suborbicular, 5–7 mm in diam., shorter than sepals, base broadly clawed. Stamens many, shorter than petals; filaments broadened, flattened, soft hairy. Pistils many, slightly shorter than or nearly as long as stamens; ovary glabrous or slightly soft hairy. Aggregate fruit red, subglobose, ca. 1 cm in diam., glabrous. Fl. Jun–Jul, fr. Sep–Oct.

• Stream sides, roadsides, mixed forests, moist slopes, thickets in ravines; 1500–3100 m. Guizhou, Sichuan, Taiwan, Yunnan.

- 1a. Branchlets, petioles, and abaxial surface of calyx often without glandular hairs 128a. var. *pinnatisepalus*
- 1b. Branchlets, petioles, and abaxial surface of calyx with dense, unequal glandular hairs 128b. var. *glandulosus*

128a. *Rubus pinnatisepalus* var. *pinnatisepalus*

羽萼悬钩子(原变种) *yu e xuan gou zi* (*yuan bian zhong*)

Rubus acuaris Focke; *R. calycacanthus* H. Léveillé var.

buergeri H. Léveillé; *R. darrisii* H. Léveillé; *R. laciniato-stipulatus* Hayata ex Koidzumi.

Branchlets, petioles, and abaxial surface of calyx usually without glandular hairs.

- Stream sides, roadsides, mixed forests; below 3000 m. Guizhou, Sichuan, Taiwan, Yunnan.

128b. *Rubus pinnatisepalus* var. ***glandulosus*** T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 458. 1982.

密腺羽萼悬钩子 mi xian yu e xuan gou zi

Branchlets, petioles, and abaxial surface of calyx with dense, unequal long glandular hairs.

- Moist slopes, thickets in ravines; 1500–3100 m. Sichuan, Yunnan.

129. *Rubus humanensis* Handel-Mazzetti, *Symb. Sin.* 7: 497. 1933.

湖南悬钩子 hu nan xuan gou zi

Rubus buergeri Miquel var. *viridifolius* Handel-Mazzetti.

Shrubs climbing, 0.3–2 m tall. Branchlets slender, densely thinly pubescent, with sparse, curved minute prickles. Leaves simple; petiole 6–9 cm, densely thinly pubescent, with sparse, curved minute prickles; stipules free, brown, to 1 cm, stipules caducous or partly persistent, on sterile branchlets to 1.8 cm, nearly palmately or pinnately lobed, lobes linear, thinly pubescent; blade suborbicular or broadly ovate, 8–13 cm in diam., palmately 5-veined, lateral veins 2 or 3 pairs, raised abaxially, abaxially tomentose, intermixed thinly pubescent, hairs gradually deciduous, adaxially thinly pubescent when young, both surfaces subglabrescent, base deeply cordate, margin 5–7-lobed; lobes unevenly sharply serrate, apex acute, rarely obtuse. Inflorescences terminal, short subracemes, or several flowers in leaf axils; rachis and pedicels densely gray thinly pubescent; bracts similar to stipules, but smaller. Pedicel 5–10 mm. Flowers 7–10 mm in diam. Calyx abaxially densely gray to yellowish gray pubescent and tomentose; sepals erect after anthesis, broadly ovate, 6–8 × 4–7 mm, apex acute to shortly acuminate; outer sepals larger, pinnately laciniate, lobes linear-lanceolate, inner sepals smaller, usually undivided. Petals white, obovate, glabrous. Stamens shorter; filaments linear, glabrous. Pistils nearly as long as stamens, glabrous. Aggregate fruit yellowish red, semiglobose, glabrous, enclosed in persistent calyx; pyrenes rugulose. Fl. Jul–Aug, fr. Sep–Oct.

- Montane valleys, forests, grasslands; 300–2500 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang.

Further study is required to determine the identity of *Rubus pseudoacer* Makino var. *flexuosus* Y. C. Liu & F. Y. Lu (*Quart. J. Chin. Forest.* 9(2): 133. 1976; *R. pseudoacer* subsp. *flexuosus* (T. S. Liu & F. Y. Lu) H. Ohashi & C. F. Hsieh), described from Taiwan, which might be synonymous with *R. humanensis*.

130. *Rubus buergeri* Miquel, *Ann. Mus. Bot. Lugduno-Batavi* 3: 36. 1867.

寒莓 han mei

Rubus bodinieri H. Léveillé & Vaniot; *R. buergeri* var. *pseudobuergeri* (Sasaki) Y. C. Liu & Yang; *R. pseudobuergeri* Sasaki; *R. shimadae* Hayata.

Shrubs erect to creeping. Stems often rooting at nodes; stolons to 2 m, brownish to reddish brown, stolons and flowering branchlets densely tomentose-villous, unarmed or with sparse, minute prickles. Leaves simple; petiole 4–9 cm, densely tomentose-villous, sometimes with sparse prickles; stipules caducous, free, 7–10 mm, palmatipartite or pinnatipartite, lobes linear or linear-lanceolate, soft hairy; blade ovate to suborbicular, 5–11 cm in diam., palmately 5-veined, lateral veins 2 or 3 pairs, prominently raised abaxially, abaxially densely tomentose, with soft hairs along veins when young, hairs deciduous in age, adaxially slightly soft hairy or only hairy along veins, base cordate, margin 5–7-lobed, lobes unevenly sharply serrate, apex obtuse, rarely acute. Inflorescences terminal or axillary, short subracemes, 4–6 cm, few flowered, or flowers several in clusters in leaf axils; rachis and pedicels densely tomentose-villous, with sparse prickles or not; bracts 7–9 mm, palmatipartite or pinnatipartite; lobes linear, villous. Pedicel 5–9 mm. Flowers 6–10 mm in diam. Calyx abaxially yellowish villous and tomentose; sepals erect in fruit, rarely reflexed, lanceolate or ovate-lanceolate, 5–9 × 3–5 mm, apex acuminate; outer sepals often lobed apically, inner sepals entire. Petals white, obovate, nearly as long as or slightly longer than sepals, glabrous, apex erose. Stamens many, shorter than petals; filaments linear, glabrous. Pistils glabrous, longer than stamens. Aggregate fruit purplish black, subglobose, 6–10 mm in diam., glabrous; pyrenes coarsely rugose. Fl. Jul–Aug, fr. Sep–Oct. $2n = 42^*$, 56^* .

Broad-leaved forests, mixed forests in mountainous regions; low to medium elevations. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].

131. *Rubus penduliflorus* C. Y. Wu ex T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 458. 1982.

河口悬钩子 he kou xuan gou zi

Shrubs erect or climbing, to 3 m tall. Branchlets brown or reddish brown, yellow sericeous-villous, gradually glabrescent, with sparse, curved minute prickles. Leaves simple; petiole 2–3 cm, densely yellow sericeous-villous, with sparse, curved prickles; stipules caducous, broadly ovate to oblong, 6–8 mm, abaxially yellow sericeous-villous, laciniate, lobes lanceolate; blade narrowly ovate, rarely elliptic, 10–13 × 6–8 cm, lateral veins 8–10 pairs, raised abaxially, abaxially densely rusty yellow tomentose, with long silky rusty yellow hairs along veins, adaxially glabrous, base rounded, margin undivided, sparsely shallowly sharply serrate, apex acuminate. Inflorescences terminal and axillary, terminal ones cymose panicles, loose, 10–18 cm, many flowered, axillary ones subracemes, shorter; rachis and pedicels rusty yellow sericeous-villous, with sparse, minute prickles; bracts broadly ovate to oblong, 5–7 mm, yellow sericeous-villous, margin laciniate; lobes lanceolate. Pedicel not more than 1 cm. Flowers 1–1.4 cm in diam. Calyx abaxially densely rusty yellow sericeous-villous; sepals erect after anthesis, narrowly ovate to ovate-lanceolate, 6–8 × 4–5 mm, apex acute, outer sepals divided, inner sepals entire, margin tomentose. Petals white, suborbicular to broadly obovate, shorter than

sepals, base shortly clawed. Stamens many; filaments linear; anthers villous. Pistils numerous, longer than stamens, glabrous. Fruit unknown. Fl. Jun–Jul.

• Slopes, sunny valleys, roadsides, thickets, waste places; low elevations. S Yunnan.

132. *Rubus malipoensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 459. 1982.

麻栗坡悬钩子 ma li po xuan gou zi

Shrubs to 2 m tall. Branchlets dark brown to purplish brown, sparsely pubescent when young, glabrescent, with sparse, curved small prickles. Leaves simple; petiole 2.5–4 cm, sparsely pubescent, with minute prickles; stipules caducous, free, narrowly obovate, yellowish villous, apex palmatipartite, lobes lanceolate or linear-lanceolate; blade ovate, 6–11 × 3–6 cm, lateral veins 4 or 5 pairs, raised abaxially, slightly impressed adaxially, abaxially densely rusty yellow tomentose, with long hairs along veins, adaxially glabrous, base cuneate to rounded, margin undivided, sharply serrulate, apex caudate. Inflorescences terminal and axillary, short subracemes, to 8 cm, few flowered, sometimes flowers several in clusters or flowers solitary in leaf axils; rachis and pedicels yellowish villous; bracts narrowly obovate or broadly obovate, palmatipartite apically; lobes lanceolate or linear-lanceolate. Pedicel 1–1.5 cm. Flowers ca. 1 cm in diam. Calyx abaxially yellow-villous; sepals erect in fruit, lanceolate, 7–8 × 3–4 mm, margin entire or outer sepals lacinate, tomentose, apex acuminate. Petals suborbicular, much shorter than sepals, glabrous, base shortly clawed. Stamens slightly shorter than or nearly as long as petals; filaments broad, complanate. Pistils 10–20 or slightly more, glabrous; styles much longer than stamens. Aggregate fruit small, with few drupelets, enclosed in persistent calyx; pyrenes prominently rugose. Fl. Jul–Sep. fr. Oct–Dec.

• Foothills, rocky mountains, forest clearings; 1100–1500 m. SE Yunnan.

133. *Rubus fuscifolius* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 459. 1982.

锈叶悬钩子 xiu ye xuan gou zi

Shrubs more than 1 m tall. Branchlets brownish to dark brown, terete, densely rust colored tomentose, with sparse, minute prickles. Leaves simple; petiole 4–6.5 cm, densely rust-brown tomentose, with sparse, minute prickles; stipules free, oblong-lanceolate, to 1.5 cm, densely rust-brown tomentose, margin pinnately lacinate; lobes linear or linear-lanceolate; blade broadly ovate, 12–20 × 8–16 cm, thick, lateral veins 4 or 5 pairs, prominently raised abaxially, impressed adaxially, abaxially rust-brown tomentose, adaxially so only along veins, base cordate, margin unevenly sharply doubly serrate, apex acuminate. Inflorescences terminal or axillary, cymose-subpaniculate, compact, many flowered, terminal ones 5–10 cm, axillary ones 4–6 cm; rachis, pedicels, and abaxial surface of calyx densely rust-brown tomentose; bracts 1.3–1.5 cm, tomentose, margin lacinate or undivided. Pedicel ca. 1 cm. Flowers 7–10 mm in diam. Sepals erect after anthesis, ovate to ovate-lanceolate, 5–8 mm, apex acute to acuminate; outer sepals usually divided apically, inner sepals entire. Petals broadly

obovate or suborbicular, shorter than sepals, glabrous, base shortly clawed, apex premorse. Stamens often short, rarely nearly as long as petals; filaments linear. Pistils numerous, longer than stamens; ovary glabrous. Fruit unknown. Fl. Jul–Aug.

• Forest margins; 1300–2000 m. NW and S Yunnan.

134. *Rubus shihae* F. P. Metcalf, Lingnan Sci. J. 19: 31. 1940.

桂滇悬钩子 gui dian xuan gou zi

Rubus liboensis T. L. Xu.

Shrubs scandent, to 5 m tall. Branchlets brown or reddish brown, terete, soft hairy when young, glabrescent, with sparse, curved minute prickles. Leaves simple; petiole 2–4 cm, villous when young, glabrescent, with sparse, minute prickles; stipules caducous, free, oblong or ovate-lanceolate, 6–9 mm, yellow tomentose-villous, apex palmately lobed, lobes lanceolate; blade ovate to broadly ovate, rarely suborbicular, 8–11 × 5–9 cm, lateral veins 4–6 pairs, raised abaxially, abaxially densely rusty yellow tomentose, with long hairs along veins, adaxially glabrous, base truncate to shallowly cordate, margin undulate or slightly lobed, irregularly coarsely abruptly pointed-serrate, apex acute to shortly acuminate. Inflorescences terminal and axillary, short subracemes, loose, few flowered, sometimes flowers several in clusters in leaf axils or solitary; rachis and pedicels densely yellow tomentose-villous; bracts broadly obovate to oblong, 5–8 mm, yellow tomentose-villous, apex palmately lobed; lobes lanceolate. Pedicel 3–7 mm. Flowers 6–9 mm in diam. Calyx abaxially densely yellow sericeous-villous; sepals erect in fruit, lanceolate, 5–8 × 2.5–4 mm, margin tomentose, apex acuminate; outer sepals apically often lobed, inner sepals entire. Petals suborbicular or obovate, 4–6 × 3.5–5 mm, shorter than sepals, puberulous, base shortly clawed, apex incised. Stamens many, shorter than petals; filaments broader toward base. Pistils longer than stamens; ovary and style glabrous. Aggregate fruit red, glabrous, with few drupelets, enclosed in persistent calyx; pyrenes shallowly rugose. Fl. Jun–Jul, fr. Aug–Sep.

• Forests, hills, montane valleys; below 900 m. W Guangxi, S Guizhou, Yunnan.

135. *Rubus reflexus* Ker Gawler, Bot. Reg. 6: 461. 1820.

锈毛莓 xiu mao mei

Shrubs scandent, to 2 m tall. Branchlets brown to dark reddish brown, rust colored tomentose, with sparse, minute prickles. Leaves simple; petiole 2.5–5 cm, tomentose-villous, with sparse, minute prickles; stipules broadly obovate, 1–1.4(–2.5) × 0.9–1.3 cm, villous, margin pectinately or irregularly palmately lobed, lobes lanceolate or linear-lanceolate; blade narrowly or broadly ovate to suborbicular, 7–14(–20) × 5–11(–19) cm, abaxially rust colored tomentose, with long hairs along veins, adaxially glabrous or sparsely soft hairy along veins, prominently rugose, base cordate, margin 3–5(–7)-lobed or -parted; terminal lobe longer, larger, lanceolate or ovate-lanceolate, much longer than or nearly as long as lateral lobes, margin unevenly coarsely serrate to doubly serrate, apex obtuse or acute. Inflorescences terminal, short subracemes, 5–8 cm, or flowers

several in clusters in leaf axils; rachis and pedicels rusty villous; bracts obovate, 6–12 × 7–11 mm, villous, pectinately or palmately lobed; lobes linear or linear-lanceolate. Pedicel 3–6 mm. Flowers 1–1.5 cm in diam. Calyx abaxially densely rusty villous; sepals ovate-orbicular or ovate-lanceolate to lanceolate, 6–8 × 4–7 mm, outer sepals apically often palmately lobed; lobes lanceolate, inner sepals entire, margin tomentose. Petals white, oblong to suborbicular, nearly as long as sepals, glabrous, base shortly clawed. Stamens shorter than petals; filaments broad, complanate; anthers glabrous or apically hairy. Pistils longer than stamens, glabrous. Aggregate fruit dark red, subglobose, 7–10 mm in diam.; pyrenes rugose. Fl. Jun–Jul, fr. Aug–Sep.

• Mountainous regions, slopes, sparse forests, thickets, valleys, stream sides, moist places, near water courses; 300–1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Taiwan, Yunnan, Zhejiang.

- 1a. Leaf blade narrowly ovate, margin lobed or slightly undulate, terminal lobe much longer than lateral lobes.
 2a. Leaf blade prominently lobed; stipules and bracts to 1.4 cm; sepals ovate-orbicular 135a. var. *reflexus*
 2b. Leaf blade slightly undulate or inconspicuously lobed; stipules and bracts to 2.5 cm; sepals lanceolate to ovate-lanceolate 135b. var. *orogenes*
 1b. Leaf blade broadly ovate to suborbicular, margin prominently lobed to parted, terminal lobe only slightly longer than or nearly as long as lateral lobes.
 3a. Leaf blade 5–7-parted, segments lanceolate to oblong-lanceolate 135e. var. *lanceolobus*
 3b. Leaf blade 3–5-lobed.
 4a. Leaf blade 8–13 × 7–12 cm 135c. var. *hui*
 4b. Leaf blade 14–20 × 12–19 cm 135d. var. *macrophyllus*

135a. *Rubus reflexus* var. *reflexus*

锈毛莓(原变种) xiu mao mei (yuan bian zhong)

Rubus esquirolii H. Léveillé.

Leaf blade prominently lobed; stipules and bracts to 1.4 cm. Sepals ovate-orbicular.

• Slopes, thickets in valleys, sparse forests; 300–1000 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Yunnan, Zhejiang.

135b. *Rubus reflexus* var. *orogenes* Handel-Mazzetti, Symb. Sin. 7: 496. 1933.

长叶锈毛莓 chang ye xiu mao mei

Rubus irenaeus Focke var. *orogenes* (Handel-Mazzetti) F. P. Metcalf.

Leaf blade slightly undulate or inconspicuously lobed; stipules and bracts to 2.5 cm. Sepals lanceolate to ovate-lanceolate.

• Mountainous regions, forests in valleys; low elevations. Guangxi, Guizhou, Hubei, Hunan, Jiangxi.

135c. *Rubus reflexus* var. *hui* (Diels ex Hu) F. P. Metcalf, Lingnan Sci. J. 11: 6. 1932.

浅裂锈毛莓 qian lie xiu mao mei

Rubus hui Diels ex Hu, Contr. Biol. Lab. Sci. Soc. China 7: 608. 1922; *R. axilliflorens* Cardot; *R. gilvus* Focke.

Leaf blade 8–13 × 7–12 cm, margin 3–5-lobed. $2n = 42^*$.

• Thickets on slopes, moist places in sparse forests, stream sides in montane valleys; 300–1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Taiwan, Yunnan, Zhejiang.

135d. *Rubus reflexus* var. *macrophyllus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 460. 1982.

大叶锈毛莓 da ye xiu mao mei

Leaf blade 14–20 × 12–19 cm, margin 3–5-lobed.

• Montane valleys; below 1300 m. SE Yunnan (Pingbian Xian).

135e. *Rubus reflexus* var. *lanceolobus* F. P. Metcalf, Lingnan Sci. J. 11: 7. 1932.

深裂悬钩子 shen lie xuan gou zi

Leaf blade 5–7-lobed, lobes lanceolate or oblong-lanceolate.

• Valleys, near water courses, sparse forests; low elevations. Fujian, Guangdong, Guangxi, Hunan.

136. *Rubus flagelliflorus* Focke, Bot. Jahrb. Syst. 29: 393. 1900.

攀枝莓 pan zhi mei

Rubus maschalanthus Cardot.

Shrubs scandent or creeping. Branchlets brown or reddish brown, densely gray tomentose when young, glabrescent, with sparse, curved minute prickles. Leaves simple; petiole 3–6 cm, densely gray tomentose when young, glabrescent, with sparse, curved minute prickles; stipules caducous, free, brown, 7–12 mm, yellow tomentose-villous, apex palmately lobed, lobes lanceolate; blade ovate or narrowly ovate, 7–15 × 5–9 cm, palmately 5-veined, lateral veins 4 or 5 pairs, raised abaxially, papery, abaxially densely rusty yellow tomentose, adaxially glabrous, base deeply cordate, margin often undivided or slightly undulate, unevenly obtusely serrate, apex acute to shortly acuminate. Inflorescences short racemes, 2.5–5 cm, few flowered, or flowers several in clusters; rachis and pedicels densely yellow tomentose-villous; bracts brown, 6–11 mm, tomentose-villous, palmately divided apically; lobes lanceolate. Pedicel 1–2 cm. Flowers 1–1.2 cm in diam. Calyx abaxially densely yellow tomentose-villous; tube cupular; sepals reflexed after anthesis, ovate-lanceolate, 5–8 × 3–5 mm, apex shortly acuminate to acuminate; outer sepals broader than inner sepals, margin 2- or 3-lobed, inner sepals with entire margin. Petals white, suborbicular, much shorter than sepals, basally puberulous. Stamens many, glabrous or slightly pilose; filaments somewhat longer than petals, apex subulate; anthers glabrous. Pistils slightly

longer than stamens; styles and ovaries often glabrous. Aggregate fruit black at maturity, semiglobose, 1–1.3 cm in diam., glabrous; pyrenes smooth or slightly rugose. Fl. May–Jun, fr. Jul–Aug.

• Waste places on hills, rock cliffs, slopes, valleys; 900–1500 m. Fujian, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Taiwan (Lan Yu).

137. *Rubus hastifolius* H. Léveillé & Vaniot, Bull. Soc. Bot. France 51: 218. 1904.

戟叶悬钩子 *ji ye xuan gou zi*

Rubus rufolanatus H. T. Chang.

Shrubs evergreen, scandent, to 12 m tall. Branches grayish brown, terete, long flagelliform; branchlets brownish, densely gray tomentose, glabrescent, with sparse, short prickles; petiole 2–5 mm, densely tomentose, unarmed or occasionally with minute prickles; stipules caducous, free, oblong, 6–9 mm, palmatipartite nearly to base, lobes linear-lanceolate, soft hairy; blade oblong-lanceolate or ovate-lanceolate, 6–12 × 2.5–4 cm, lateral veins 5–8 pairs, prominent abaxially, subleathery, abaxially densely reddish brown tomentose, adaxially dark green, glabrous, base deeply cordate, margin usually with 2 distinct lobes near base; lobes serrulate, apex obtuse or acute. Inflorescences terminal or axillary, short racemes or corymbose, 3–5 cm, 3–8-flowered; rachis and pedicels densely reddish brown sericeous-villous; bracts caducous, oblong, 5–8 mm, soft hairy, palmatipartite nearly to base, but bracts apically on inflorescences often shorter, divided into 2 or 3 linear lobes. Pedicel 0.8–1.5 cm. Flowers ca. 1.5 cm in diam. Calyx abaxially densely reddish brown sericeous-villous; tube pelviform; sepals reflexed after anthesis, ovate-lanceolate, 5–8 × 3–6 mm, margin undivided or outer sepals apically shallowly laciniate, apex shortly acuminate or acute. Petals white, obovate, ca. 5 mm, glabrous, base shortly clawed. Stamens many in 2 or 3 whorls, shorter than petals; filaments broad, complanate, glabrous; anthers yellowish, slightly sericeous-villous. Pistils nearly as long as or slightly longer than stamens; styles sparsely sericeous-villous; ovary glabrous. Aggregate fruit red when immature, purplish black at maturity, subglobose, slightly compressed, 1–1.2 cm in diam., glabrous, fleshy; pyrenes shallowly foveolate. Fl. Mar–May, fr. Jun–Jul.

Shaded slopes, ravines, sparse forests, thickets; 300–1500 m. Guangdong, Guizhou, Hunan, Jiangxi, Yunnan [Thailand, Vietnam].

This species is commonly used medicinally in N Guangdong.

138. *Rubus taronensis* C. Y. Wu ex T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 308. 1982.

独龙悬钩子 *du long xuan gou zi*

Shrubs scandent. Branchlets grayish brown or brown, terete, slender, with thin soft hairs, sparse, yellow glands, and small curved prickles. Leaves simple; petiole 1–2 cm, with thin soft hairs, sparse, yellow glands, and minute prickles; stipules caducous, lanceolate, 5–7 mm, margin entire or divided; blade ovate-lanceolate, 8–12 × 3–5 cm, lateral veins 7 or 8 pairs, raised abaxially, impressed adaxially, both surfaces yellow glandular, soft hairy only along veins, base rounded to subtruncate, margin with irregular long pointed sharp serrations, apex long caudate. Inflorescences terminal and axillary, terminal

ones narrow cymose panicles, 8–14 cm, axillary ones subracemes, shorter; rachis and pedicels yellow glandular, thinly soft hairy; bracts lanceolate or linear, margin entire or divided. Pedicel ca. 1 cm. Flowers 6–8 mm in diam. Calyx abaxially subglabrous, yellow glandular; sepals triangular-ovate, 4–6 × 1.5–3 mm, margin entire, apex acuminate to shortly caudate. Petals greenish, oblong, shorter than sepals, apex obtuse. Stamens numerous, shorter than petals; filaments broad, complanate, glabrous. Pistils ca. 15–20, shorter than or nearly as long as stamens; ovary and style glabrous. Fruit unknown. Fl. Jun–Jul.

• Dense forests; ca. 1700 m. NW Yunnan.

139. *Rubus pirifolius* Smith, Pl. Icon. Ined. 3: t. 61. 1791.

梨叶悬钩子 *li ye xuan gou zi*

Shrubs climbing, to 8 m tall. Branches grayish brown to dark purplish brown, terete; branchlets brown or reddish brown, soft hairy, glabrescent, with few complanate curved prickles. Leaves simple; petiole to 1 cm, hairy, with sparse prickles; stipules caducous, free, linear-lanceolate, 7–8 mm, hairy, apex lacinate into 3–5 lobes; blade ovate, ovate-oblong, or elliptic-oblong, 6–11 × 3.5–5.5 cm, venation pinnate, lateral veins 5–8 pairs, prominent abaxially, slightly impressed adaxially, papery, both surfaces nearly glabrous except densely hairy along midvein and lateral veins, hairs deciduous in age, base rounded or shallowly cordate, margin unevenly coarsely serrate, apex acute to acuminate. Inflorescences terminal and axillary, terminal ones cymose panicles, 10–14 cm, axillary ones panicles or subracemes, smaller; rachis and pedicels densely grayish yellow pubescent or subglabrous, unarmed or with few small prickles; bracts early caducous, linear-lanceolate, 6–7 mm, hairy, apex divided into 3 or 4 lobes. Pedicel 4–12 mm. Flowers 1–1.5 cm in diam. Calyx abaxially pubescent or subglabrous; tube shallowly cupular; sepals triangular-lanceolate or ovate-lanceolate, 6–8 × 2–3.5 mm, margin entire or apically 2- or 3-lacinate. Petals white, elliptic to obovate, 3–5(–7) mm, shorter than sepals, glabrous. Stamens many, slightly longer than petals; filaments linear. Pistils 5–10(–17); ovary often with many long hairs abaxially, rarely glabrous; styles to 6(–8) mm, glabrous, rarely with some hairs basally. Aggregate fruit red, 1–1.5 cm in diam., with several drupelets, usually glabrous; drupelets 4–6 × 3–5 mm; pyrenes rugose. Fl. Apr–Jul, fr. Aug–Oct. $2n = 42^*$.

Mountainous regions, sheltered sites on mountains, forests, forest margins, stream sides; below 2100 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, Indonesia, Laos, Malaysia, Philippines, Thailand, Vietnam].

This species is used medicinally.

- 1a. Leaf base shallowly cordate; inflorescences and abaxial surface of calyx subglabrous or sparsely hairy 139d. var. *cordatus*
- 1b. Leaf base rounded; inflorescences and abaxial surface of calyx densely hairy.
 - 2a. Leaf blade adaxially and sepals abaxially tomentose 139c. var. *tomentosus*
 - 2b. Leaf blade hairy adaxially; sepals abaxially densely hairy.
 - 3a. Leaf blade hairy only along

- veins adaxially, glabrate
in age 139a. var. *pirifolius*
3b. Leaf blade densely hairy
adaxially, especially more
densely so along veins 139b. var. *permollis*

139a. *Rubus pirifolius* var. *pirifolius*

梨叶悬钩子(原变种) li ye xuan gou zi (yuan bian zhong)

Rubus brevipetalus Elmer; *R. floribundopaniculatus* Hayata; *R. parvipetalus* Odashima; *R. philippinensis* Focke ex Elmer; *R. rotundifolius* Reinwardt ex Miquel.

Leaf base rounded; blade hairy only along veins adaxially, glabrate in age. Inflorescences and abaxial surface of calyx densely hairy.

Sheltered sites on mountains, forests, forest margins; low to medium elevations. Fujian, Guangdong, Guangxi, Guizhou, Sichuan, Taiwan, Yunnan [Cambodia, Indonesia, Laos, Malaysia, Philippines, Thailand, Vietnam].

139b. *Rubus pirifolius* var. *permollis* Merrill, *Lingnan Sci. J.* 11: 44. 1932.

柔毛梨叶悬钩子 rou mao li ye xuan gou zi

Leaf base rounded; blade densely hairy adaxially, especially more densely so along veins. Inflorescences and abaxial surface of calyx densely hairy.

- Stream sides in montane valley forests. Guangxi, Hainan.

139c. *Rubus pirifolius* var. *tomentosus* Kuntze ex Franchet, *Nouv. Arch. Mus. Hist. Nat.*, ser. 2, 8: 219. 1885.

绒毛梨叶悬钩子 rong mao li ye xuan gou zi

Leaf base rounded; blade adaxially and sepals abaxially tomentose. Inflorescences densely hairy.

- C Sichuan (Baoping Xian).

139d. *Rubus pirifolius* var. *cordatus* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 22: 308. 1982.

心状梨叶悬钩子 xin zhuang li ye xuan gou zi

Leaf base shallowly cordate. Inflorescences and abaxial surface of calyx subglabrous or sparsely hairy.

- Forest margins, mountainous regions; 1500–2100 m. SE Yunnan.

140. *Rubus acuminatus* Smith in Rees, *Cycl.* 30: *Rubus* no. 43. 1819.

尖叶悬钩子 jian ye xuan gou zi

Shrubs scandent, to 8 m tall. Branchlets brown or reddish brown, slightly angled, thinly pubescent, glabrescent, with sparse, minute prickles. Leaves simple; petiole 1–2 cm, slightly puberulous, with sparse, minute prickles; stipules usually caducous, free, linear or lanceolate, 4–6 cm, margin entire or toothed; blade ovate-oblong or lanceolate, 7–11 × 3–4 cm, lateral veins 6–8 pairs, slightly raised abaxially, both surfaces glabrous or sparsely pubescent only along veins abaxially, base rounded, margin irregularly serrate, apex caudate. Inflorescences terminal or axillary, terminal ones narrow cymose panicles (8–)10–

15 cm, axillary ones subracemes, sometimes subcorymbose, less than 8 cm; rachis and pedicels usually glabrous, occasionally sparsely pubescent; bracts linear or lanceolate, 3–5 mm, margin entire or dentate. Pedicel 1–2 cm. Flowers ca. 1 cm in diam. Calyx abaxially glabrous; tube shallowly cupular; sepals erect in fruit, ovate, 4–6 × 2–4 mm, inner sepals tomentose marginally, margin undivided, apex shortly acuminate. Petals white, broadly elliptic or oblong, 4–5 × 2–3 mm, glabrous, base shortly clawed. Stamens many; filaments slightly broadened basally, shorter than petals. Pistils ca. 10–20, shorter than stamens; ovary glabrous. Aggregate fruit red, glabrous, with few larger drupelets, enclosed in persistent calyx; pyrenes rugose. Fl. Jul–Sep, fr. Oct–Nov. $2n = 28$.

Thickets, bamboo thickets, sparsely forested slopes, stream sides, roadsides; 1000–3000 m. Guizhou, Yunnan [Bhutan, India, Nepal, Sikkim, Vietnam].

- 1a. Pedicel and abaxial surface of calyx usually glabrous; leaf margin sharply serrulate 140a. var. *acuminatus*
1b. Pedicel and abaxial surface of calyx puberulous; leaf margin coarsely serrate 140b. var. *puberulus*

140a. *Rubus acuminatus* var. *acuminatus*

尖叶悬钩子(原变种) jian ye xuan gou zi (yuan bian zhong)

Rubus betulinus D. Don.

Pedicel and abaxial surface of calyx often glabrous. Leaf margin sharply serrulate.

Bamboo thickets, stream sides, roadsides; below 3000 m. Yunnan [Bhutan, India, Nepal, Sikkim, Vietnam].

140b. *Rubus acuminatus* var. *puberulus* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 308. 1982.

柔毛尖叶悬钩子 rou mao jian ye xuan gou zi

Pedicel and abaxial surface of calyx puberulous. Leaf margin coarsely serrate.

- Thickets, sparsely forested slopes; 1000–1500 m. Guizhou.

141. *Rubus brevipetiolatus* T. T. Yu & L. T. Lu, *Acta Phytotax. Sin.* 20: 453. 1982.

短柄悬钩子 duan bing xuan gou zi

Shrubs. Branchlets brownish to dark brown, terete, pubescent, glabrescent, with sparse, curved minute prickles. Leaves simple; petiole 7–10 mm, pubescent, with sparse, curved minute prickles; stipules free, brown, oblong-lanceolate or elliptic-lanceolate, 1–1.4 cm × 3–5 mm, margin entire or sparsely shallowly serrate; blade oblong-lanceolate, 7–13 × 2–3 cm, lateral veins 8–11 pairs, prominent abaxially, abaxially sparsely pubescent only along veins, with remote curved minute prickles along midvein, adaxially glabrous except pubescent along midvein, base rounded, margin coarsely sharply serrate, apex acuminate. Inflorescences terminal or axillary, narrow cymose panicles, few flowered, axillary ones shorter, or flowers few in clusters; rachis and pedicels pubescent, with sparse, curved minute prickles; bracts similar to stipules but sometimes apically lobed; lobes linear to lanceolate, apex acuminate. Pedi-

cel 5–8 mm. Flowers 7–9 mm in diam. Calyx abaxially pubescent; sepals ovate-lanceolate, margin tomentose, apex acuminate; outer sepals often lacinate at apex, lobes lanceolate or linear, inner sepals entire. Petals elliptic or spatulate, shorter than sepals, base narrowly long clawed. Stamens many, unequal in length; filaments linear. Pistils ca. 10–15, nearly as long as stamens; style and ovary glabrous. Fl. summer, fr. unknown.

- Thickets; low elevations. Guangxi.

142. *Rubus yunanicus* Kuntze, Meth. Sp.-Besch. *Rubus*, 71. 1879.

云南悬钩子 yun nan xuan gou zi

Shrubs. Branchlets purplish brown, terete, glabrous, with sparse, curved prickles. Leaves simple; petiole 1–2 cm, thinly pubescent, with remote, curved minute prickles; stipules early caducous, 6–8 mm, pubescent, margin lacinate, lobes linear or lanceolate; blade elliptic or oblong, 6–12 × 3–7 cm, lateral veins 7 or 8 pairs, slightly raised abaxially, glabrous except veins on both surfaces pubescent, base subtruncate to slightly cordate, margin unevenly coarsely obtusely dentate, apex shortly acuminate. Inflorescences terminal or axillary, terminal ones narrow cymose panicles, 10–14 cm, many flowered, axillary ones subracemes, shorter; rachis and pedicels thinly pubescent; bracts caducous, lanceolate, 5–7 mm, pubescent, apex lacinate, lobes linear or lanceolate. Pedicel ca. 1 cm. Flowers 7–10 mm in diam. Calyx abaxially thinly pubescent; sepals ovate or triangular-ovate, 2.5–3.5 × 2–3 mm, margin tomentose, undivided, apex obtuse, rarely acute. Petals obovate or oblong, 3–4 × 2.5–3.5 mm, thinly pubescent basally, base clawed. Stamens many, nearly as long as or slightly shorter than petals; filaments linear, broader toward base. Pistils ca. 10–15, longer than stamens; style and ovary glabrous. Fruit unknown.

- Mountainous regions; low elevations. NW Yunnan.

143. *Rubus poliophyllus* Kuntze, Meth. Sp.-Besch. *Rubus*, 68. 1879.

毛叶悬钩子 mao ye xuan gou zi

Shrubs scandent, 2–5 m tall. Branchlets brownish to purplish brown, yellowish sericeous-villous, glabrescent, with remote complanate curved prickles. Leaves simple; petiole 0.4–1 cm, longer on old branches, yellowish sericeous-villous when young, glabrate in age; stipules free, 8–10 mm, pinnate-lacinate; lobes lanceolate or linear, sericeous-villous; blade oblong, ovate-oblong, or elliptic, 8–14 × 4–6.5 cm, lateral veins 7 or 8 pairs, veins brown, raised abaxially, impressed adaxially, thick, abaxially yellowish sericeous-villous, glabrescent, adaxially sericeous-villous only along veins, base subtruncate to shallowly cordate, margin with unequal sharp teeth, apex acuminate. Inflorescences terminal and axillary, cymose panicles, 12–25(–27) cm, many flowered, axillary ones shorter, racemose; rachis and pedicels densely yellowish sericeous-villous; bracts 5–9 mm, margin lacinate above middle, lobes linear to lanceolate, sericeous-villous. Pedicel (0.3–)1–2 cm. Flowers 0.7–1.5 cm in diam. Calyx abaxially densely yellowish sericeous-villous; tube shallowly cupular; sepals 5 or 6, ovate or ovate-lanceolate, 4–6 × 3–5 mm, margin tomentose and entire, apex

acuminate to caudate. Petals white, ovate to elliptic, 4–5 mm, puberulent, apex acute. Stamens numerous, slightly shorter than or nearly as long as petals; filaments linear, basally pubescent. Pistils 20–25(–42), somewhat longer than stamens, glabrous. Aggregate fruit red, subglobose, 8–10 mm in diam., glabrous, with few drupelets, persistent sepals green; pyrenes coarsely rugose. Fl. Mar–Apr, fr. Apr–Jun.

Sunny slopes, sparse mixed forests, roadsides; 600–1500 m. Yunnan [Sikkim].

Rubus poliophyllus is treated as a synonym of *R. paniculatus* Smith in Fl. Bhutan 1(3): 562. 1987.

- 1a. Petiole ca. 10 mm; pedicel 10–20 mm; flowers ca. 15 mm in diam.; pistils 20–25 143a. var. *poliophyllus*
- 1b. Petiole 4–6 mm; pedicel 3–7 mm; flowers 7–10 mm in diam.; pistils 25–42 143b. var. *ximengensis*

143a. *Rubus poliophyllus* var. *poliophyllus*

毛叶悬钩子(原变种) mao ye xuan zou zi (yuan bian zhong)

Rubus distentus Focke.

Petiole ca. 1 cm. Pedicel 1–2 cm. Flowers ca. 1.5 cm in diam. Pistils 20–25.

Sunny slopes, sparse mixed forests; 600–1500 m. Yunnan [Sikkim].

143b. *Rubus poliophyllus* var. *ximengensis* Y. Y. Qian, Acta Phytotax. Sin. 39: 466. 2001.

西盟悬钩子 xi meng xuan gou zi

Petiole 4–6 mm. Pedicel 3–7 mm. Flowers 7–10 mm in diam. Pistils 25–42.

- Forests on roadsides; ca. 1200 m. SW Yunnan (Ximeng Xian).

144. *Rubus forrestianus* Handel-Mazzetti, Symb. Sin. 7: 490. 1933.

贡山蓬蘽 gong shan peng lei

Shrubs lianoid, to 2 m tall. Branchlets brownish, terete, densely pubescent and glandular, with curved minute prickles. Leaves simple; petiole 2–3.5 cm, densely pubescent and glandular, with sparse, curved minute prickles; stipules caducous, free, to 1 cm, deeply lobed, lobes linear to linear-lanceolate, with short hairs and glands; blade broadly ovate or oblong-ovate, 5–12 × 4–9 cm, both surfaces sparsely pubescent and densely glandular, abaxially with sparse, curved small prickles along midvein, base cordate, margin 3–5-lobed or slightly undulate, densely sharply serrate, apex shortly acuminate. Inflorescences terminal and axillary, terminal ones cymose panicles, 7–12 cm, axillary ones subracemes, sometimes flowers several in clusters in leaf axils; rachis and pedicels densely pubescent and glandular; bracts 6–8 mm, lobed; lobes linear to linear-lanceolate, pubescent, glandular. Pedicel 4–8 mm. Flowers 6–8 mm in diam. Calyx tube shallowly campanulate; sepals triangular-lanceolate or ovate-lanceolate, 5–7 × 2–3 mm, margin entire, apex caudate. Petals white, spatulate or rhombic-elliptic,

4–6 × 3–4 mm, both surfaces pubescent, base broadly shortly clawed, apex obtuse to ± acute. Stamens many, slightly shorter than petals; filaments broad, complanate. Pistils few, slightly shorter than or ca. as long as stamens; style and ovary usually glabrous. Aggregate fruit red, subglobose, 5–7 mm when immature, glabrous, with few drupelets; pyrenes 1.5–2 mm, rugulose. Fl. May–Jun, fr. Jul–Aug.

- River valleys; 1000–2000 m. W Yunnan.

145. *Rubus laxus* Focke, *Biblioth. Bot.* 17(Heft 72): 68. 1910.

疏松悬钩子 *shu song xuan gou zi*

Shrubs climbing. Branchlets brownish to purplish black, tomentose-villous, nearly unarmed or with sparse, curved minute prickles. Leaves simple; petiole 3–5 cm, tomentose-villous, with sparse, minute prickles; stipules caducous, narrower, margin deeply lacinate, lobes linear, hairy; blade narrowly ovate, 7–11 × 4–7 cm, lateral veins 6 or 7 pairs, abaxially densely pilose, adaxially less densely so, base cordate, margin undivided or 3–5-lobed, irregularly thinly serrate, apex acute to shortly acuminate. Inflorescences usually terminal, cymose panicles, lax, to 20 cm; rachis and pedicels tomentose-villous; bracts caducous, margin lacinate, lobes lanceolate or linear, hairy. Pedicel 1–2 cm. Flowers ca. 1 cm in diam. Calyx abaxially tomentose-villous; sepals ovate or ovate-triangular, 4–6 mm and nearly as broad, apex acute to shortly acuminate; outer sepals pinnately lacinate, lobes linear to lanceolate, inner sepals usually entire. Petals white, obovate to elliptic, slightly longer than sepals, base slightly pubescent and shortly clawed. Stamens many, slightly shorter than petals; filaments linear, hairy in basal part. Pistils to 50, somewhat shorter than stamens; ovary glabrous. Aggregate fruit small, enclosed in persistent calyx. Fl. Jul–Aug, fr. Sep–Oct.

- Montane valleys, slopes, sparse forests; 800–1800 m. Yunnan.

146. *Rubus lambertianus* Seringe in Candolle, *Prodr.* 2: 567. 1825.

高粱泡 *gao liang pao*

Shrubs lianoid, semideciduous, to 3 m tall. Branchlets brown or reddish brown, terete, thinly pubescent or subglabrous, with sparse, curved minute prickles. Leaves simple; petiole 2–4(–5) cm, thinly pubescent or subglabrous, with sparse, minute prickles; stipules caducous, free, to 1 cm, lacinate-parted nearly to base, lobes linear to lanceolate, thinly pubescent or subglabrous; blade broadly ovate, rarely oblong-ovate, 5–10(–12) × 4–8 cm, 5-veined, abaxially pilose, more densely so along veins, rarely glabrous, with sparse, minute prickles along midvein, adaxially pilose or hairy only along veins, base cordate, margin distinctly 3–5-lobed or undulate, serrulate, apex acuminate. Inflorescences terminal or axillary, terminal ones usually cymose panicles, 10–15 cm, axillary ones often subracemes, shorter, sometimes flowers few in clusters in leaf axils; rachis and pedicels thinly pubescent, subglabrous, or glabrous; bracts 6–9 mm, margin lacinate lobed; lobes linear, puberulous. Pedicel 5–10 mm. Flowers 7–9 mm in diam. Calyx abaxially thinly pubescent; sepals ovate-lanceolate or triangular-lanceolate, 5–8 × 2.5–4 mm, margin entire, apex acuminate,

margin of inner sepals gray tomentose. Petals white, obovate, glabrous, slightly shorter than or nearly as long as sepals, base clawed. Stamens many, somewhat shorter than petals; filaments broad, complanate. Pistils ca. 15–20, slightly shorter than or ca. as long as stamens, glabrous. Aggregate fruit red at maturity, subglobose, 6–8 mm in diam., glabrous, with many drupelets; pyrenes small, ca. 2 mm, prominently rugose. Fl. Jul–Aug, fr. Sep–Nov. $2n = 28$.

Slopes, roadsides, montane valleys, stony ravines, grasslands, thickets, sparse forests, forest margins, moist places; 200–2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Thailand].

Rubus urophyllus Y. C. Liu & F. Y. Lu (*Quart. J. Chin. Forest.* 9(2): 133. 1976) was treated in Fl. Taiwan as an uncertain species that might be only varietally distinct from *R. lambertianus*.

- 1a. Leaf blade and inflorescences thinly pilose.
 - 2a. Branchlets, petioles, inflorescences, and abaxial surface of calyx without glandular hairs and bristles 146a. var. *lambertianus*
 - 2b. Branchlets, petioles, inflorescences, and abaxial surface of calyx with glandular hairs or bristles 146b. var. *paykouangensis*
- 1b. Leaf blade glabrous or slightly pilose only along veins adaxially; inflorescences glabrous or subglabrous.
 - 3a. Inflorescences without glandular hairs 146c. var. *glaber*
 - 3b. Inflorescences wholly or partly, or abaxial surface of calyx with minute glandular hairs 146d. var. *glandulosus*

146a. *Rubus lambertianus* var. *lambertianus*

高粱泡(原变种) *gao liang pao* (*yuan bian zhong*)

Rubus ochlanthus Hance; *R. pycnanthus* Focke.

Leaf blade and inflorescences thinly pubescent. Branchlets, petioles, inflorescences, and abaxial surface of calyx without glandular hairs and bristles.

Slopes, roadsides, montane valleys, grasslands, thickets, forest margins; low to medium elevations. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Taiwan, Yunnan, Zhejiang [Japan].

146b. *Rubus lambertianus* var. *paykouangensis* (H. Léveillé) Handel-Mazzetti, *Symb. Sin.* 7: 489. 1933.

毛叶高粱泡 *mao ye gao liang pao*

Rubus paykouangensis H. Léveillé, *Repert. Spec. Nov. Regni Veg.* 4: 333. 1907; *R. viscidus* Focke.

Leaf blade and inflorescences thinly pubescent. Branchlets, petioles, inflorescences, and abaxial surface of calyx with glandular hairs or with intermixed bristles.

Thickets on slopes; 300–2200 m. Guangxi, Guizhou, Hunan, Yunnan [Thailand].

146c. *Rubus lambertianus* var. *glaber* Hemsley, J. Linn. Soc., Bot. 23: 233. 1887.

光滑高粱泡 *guang hua gao liang pao*

Rubus ampelinus Focke; *R. hakonensis* Franchet & Savatier; *R. lambertianus* subsp. *hakonensis* (Franchet & Savatier) Focke; *R. lambertianus* var. *hakonensis* (Franchet & Savatier) Rehder.

Leaf blade glabrous or slightly pilose only along veins adaxially. Inflorescences glabrous or subglabrous, without glandular hairs.

Slopes, stony ravines, forest margins; 200–2500 m. Gansu, Guizhou, Hubei, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang [Japan].

146d. *Rubus lambertianus* var. *glandulosus* Cardot, Notul. Syst. (Paris) 3: 293. 1914.

腺毛高粱泡 *xian mao gao liang pao*

Rubus adenothyrsus Cardot; *R. gelatinosus* Sasaki; *R. lambertianus* var. *mekongensis* Handel-Mazzetti; *R. lambertianus* var. *minimiflorus* (H. Léveillé) Cardot; *R. lambertianus* var. *morii* (Hayata) S. S. Ying; *R. minimiflorus* H. Léveillé; *R. morii* Hayata; *R. tiponensis* Hosokawa.

Leaf blade glabrous or slightly pilose only along veins adaxially. Inflorescences wholly or partly glabrous or subglabrous. Abaxial surface of calyx with minute glandular hairs. $2n = 28^*$.

Sparse forests in valleys, moist places in thickets; mostly below 2000 m. Guizhou, Hubei, Sichuan, Taiwan, Yunnan [Japan].

147. *Rubus calycacanthus* H. Léveillé, Repert. Spec. Nov. Regni Veg. 8: 58. 1910.

猬莓 *wei mei*

Rubus echinoides F. P. Metcalf; *R. labbei* H. Léveillé & Vaniot.

Shrubs scandent, 0.5–1.5 cm tall. Branchlets grayish brown or brownish, with soft hairs and curved minute prickles, sometimes with sparse, short glandular hairs. Leaves simple; petiole 2–4 cm, soft villous, with sparse, short glandular hairs; stipules narrower, 0.8–1.2 cm, margin fimbriately to pinnately lobed; lobes linear-lanceolate, soft villous, with sparse, short glandular hairs; blade ovate-orbicular, rarely ovate, 6–9 × 5–7 cm, lateral veins 5 pairs, raised abaxially, slightly impressed adaxially, abaxially soft villous, more densely so along veins, adaxially sparsely soft hairy, base deeply cordate, margin 3–5-lobed, rarely undulate, coarsely serrate, apex triangular-acute, rarely obtuse. Inflorescences terminal or axillary, narrow cymose panicles or subracemes, 6–12 cm, sometimes flowers several in leaf axils or solitary; rachis and pedicels tomentose-villous, with sparse, short glandular hairs; bracts 7–10 mm, fimbriately to pinnately lobed; lobes linear, soft villous, with sparse, short glandular hairs. Pedicel 5–8 mm. Flowers 1–1.5 cm in diam. Calyx abaxially tomentose-villous and with dense, short needle-like prickles; sepals broadly ovate, 6–8 × 3–5(–6) mm, apex acuminate; outer sepals pinnately divided, lobes lanceolate, inner sepals entire or only apically slightly lobed. Petals

white, spatulate-obovate, 7–9 × 5–6 mm, base soft hairy, clawed. Stamens many, shorter than petals; filaments broadened and flattened, villous; anthers glabrous. Pistils numerous, shorter than or nearly as long as stamens; style and ovary glabrous. Aggregate fruit red, subglobose, 1–1.2 cm in diam. Fl. Jun–Aug, fr. Sep–Oct.

• Slopes, montane valleys, dense forests, thickets; 1000–1500 m. Guangxi, Guizhou, Yunnan.

148. *Rubus gongshanensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 457. 1982.

贡山悬钩子 *gong shan xuan gou zi*

Shrubs 1–1.5 m tall, stipitate glandular or not. Branchlets dark brown to purplish brown, slightly angled, pubescent, with minute prickles. Leaves simple; petiole 5–11 cm, pubescent, with minute prickles; stipules and bracts early caducous; blades ovate-orbicular, 10–17 × 15–20 cm, lateral veins 3 or 4 pairs, prominent abaxially, impressed adaxially, both surfaces pubescent, more densely so along veins, base deeply cordate, margin lobed; lobes triangular, margin irregularly coarsely serrate, apex acute. Inflorescences terminal or sometimes axillary, narrow cymose panicles or subracemes, to 18 cm, densely or sparsely flowered, axillary flowers usually several in clusters; rachis and pedicels pubescent, with needle-like prickles or not. Pedicel 1.5–2.5 cm. Calyx abaxially densely gray pubescent, with needle-like prickles or not; tube pelviform or shallowly cupular; sepals erect after anthesis, lanceolate or ovate-lanceolate, 8–10(–12) × 4–5(–6) mm, apex caudate; outer sepals apically shallowly 2- or 3-laciniate, inner sepals entire. Aggregate fruit red, subglobose, 1.4–1.8 cm in diam., glabrous, enclosed in persistent calyx. Fl. summer, fr. Sep–Oct.

• Bamboo thickets on slopes, forested slopes; below 3500 m. NW and SE Yunnan.

- 1a. Plants not stipitate glandular 148c. var. *eglandulosus*
- 1b. Plants stipitate glandular.
 - 2a. Rachis, pedicels, and abaxial surface of calyx pubescent, with needle-like prickles 148a. var. *gongshanensis*
 - 2b. Rachis, pedicels, and abaxial surface of calyx pubescent, without needle-like prickles 148b. var. *qiujiangensis*

148a. *Rubus gongshanensis* var. *gongshanensis*

贡山悬钩子(原变种) *gong shan xuan gou zi* (yuan bian zhong)

Plants stipitate glandular. Rachis, pedicels, and abaxial surface of calyx pubescent, with needle-like prickles.

• Bamboo thickets on slopes; below 3500 m. NW Yunnan.

148b. *Rubus gongshanensis* var. *qiujiangensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 457. 1982.

无刺贡山悬钩子 *wu ci gong shan xuan gou zi*

Plants stipitate glandular. Rachis, pedicels, and abaxial surface of calyx pubescent, without needle-like prickles.

- Forested slopes; below 3500 m. NW Yunnan.

148c. *Rubus gongshanensis* var. *eglandulosus* Y. Gu & W. L. Li, Bull. Bot. Res., Harbin 20: 122. 2000.

无腺贡山悬钩子 *wu xian gong shan xuan gou zi*

Plants not stipitate glandular.

- Slopes; 1800–2000 m. SE Yunnan.

149. *Rubus menglaensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 456. 1982.

勐腊悬钩子 *meng la xuan gou zi*

Shrubs ca. 1 m tall. Branchlets grayish brown or reddish brown, cylindrical, brownish yellow pubescent, soft bristly, with sparse, curved minute prickles and glandular hairs; petiole 2–3 cm, pubescent, soft bristly, with sparse, curved minute prickles and glandular hairs; stipules free, brownish, to 1 cm, pubescent, soft bristly, deeply pinnate-laciniate; lobes linear; blade narrowly ovate or broadly oblong, 7–13 × 5–8 cm, lateral veins 5 or 6 pairs, both surfaces pubescent, soft bristly, with sparse, curved minute prickles along veins, base deeply cordate, margin undivided or somewhat undulate, densely thin sharply serrate, apex acute. Inflorescences terminal or axillary, subracemes or narrow panicles, 6–10 cm, few flowered; rachis and pedicels densely pubescent, sparsely soft bristly, with glandular hairs; bracts less than 1 cm, pubescent, soft bristly, deeply pinnate-laciniate; lobes linear. Pedicel 1–1.5 cm. Flowers 1–1.5 cm in diam. Calyx densely brownish yellow soft bristly, pubescent, with sparse, intermixed glandular hairs; tube pelviform; sepals ovate-lanceolate, 6–8 × 3–5 mm, apex caudate; outer sepals apically often shallowly laciniate. Petals suborbicular, 5–6 mm in diam., shorter than sepals, adaxially puberulous, base shortly clawed, margin crenate. Stamens many, shorter than petals; filaments broad, complanate, glabrous. Pistils ca. 40 or slightly more, longer than stamens; ovary pubescent. Aggregate fruit red, subglobose. Fl. May–Jul, fr. Aug–Sep.

- Disturbed places on mountains; 500–600 m. S Yunnan.

150. *Rubus ichangensis* Hemsley & Kuntze, J. Linn. Soc., Bot. 23: 231. 1887.

宜昌悬钩子 *yi chang xuan gou zi*

Rubus eugenius Focke; *R. ichangensis* var. *latifolius* Cardot; *R. papyrus* H. Léveillé.

Shrubs scandent, deciduous or semievergreen, to 3 m tall. Branchlets greenish to greenish brown, terete, glabrous or subglabrous, with glandular hairs when young, glabrescent, with sparse, curved short prickles. Leaves simple; petiole 2–4 cm, glabrous, usually with sparse, glandular hairs and short prickles; stipules caducous, subulate or linear-lanceolate, 4–8 mm, glabrous, with sparse, short glandular hairs marginally, margin entire or only apically shallowly laciniate; blade ovate-lanceolate, 8–15 × 3–6 cm, subleathery, both surfaces glabrous, abaxially with sparse, small prickles along midvein, base deeply cordate, with broad basal incision, margin shallowly undulate or lobulate near base, sparsely serrulate, apex acuminate. Inflorescences terminal and axillary, terminal ones narrow cymose panicles, 15–25 cm, axillary ones subracemes, shorter; rachis

and pedicels sparsely pubescent, with glandular hairs, sometimes intermixed with small prickles; bracts subulate to linear-lanceolate, 4–6 mm, margin entire or apically laciniate, with sparse, glandular hairs. Pedicel 3–6 mm. Flowers 6–8 mm in diam. Calyx abaxially sparsely pubescent, with glandular hairs; sepals ovate, 3–5 × 2–3 mm, margin sometimes gray pubescent, apex acute to shortly acuminate. Petals white, elliptic, shorter than or nearly as long as sepals. Stamens many, shorter than petals; filaments somewhat broadened and flattened. Pistils 12–30, slightly shorter than or ca. as long as stamens, glabrous. Aggregate fruit red, subglobose, 6–8 mm in diam., glabrous; pyrenes rugulose. Fl. Jul–Aug, fr. Sep–Oct. $2n = 28^*$.

- Slopes, fallow fields, dense forests in valleys, thickets; 800–2500 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Yunnan.

The fruit are sweet and edible, the roots are used in medicine, and tannin is extracted from the roots and stems.

151. *Rubus latoauriculatus* F. P. Metcalf, Lingnan Sci. J. 19: 27. 1940.

耳叶悬钩子 *er ye xuan gou zi*

Shrubs to 2 m tall. Branchlets dark purplish brown when young, later grayish brown, terete, with sparse, curved prickles. Leaves simple; petiole 1–2 cm, glabrous or slightly pubescent along groove, with sparse, minute prickles; stipules caducous, free, oblong-lanceolate or ovate-lanceolate, 7–9 mm, glabrous, palmatifid, lobes linear; blade lanceolate or oblong-lanceolate, 8–14 × 1.8–3.5 cm, lateral veins 7–10 pairs, prominent adaxially, abaxially glabrous, with sparse, curved small prickles along midvein, adaxially glabrous except slightly hairy along veins, base cordate-auriculate, basal incision narrow, margin thinly sharply serrate, apex acuminate. Inflorescences terminal, narrow cymose panicles, 7–11 cm; rachis and pedicels glabrous; bracts oblong-lanceolate or ovate-lanceolate, 5–8 mm, glabrous, palmatifid; lobes linear. Pedicel 5–10 mm. Flowers 6–8 mm in diam. Calyx abaxially glabrous except sparsely stipitate glandular; sepals erect in fruit, lanceolate or ovate-lanceolate, 6–10 mm, glabrous, margin entire or lobed, sometimes inner sepals with gray tomentose margin, apex caudate. Petals suborbicular, basally pubescent adaxially, apex abruptly pointed. Stamens many; filaments short, slender. Pistils glabrous. Aggregate fruit red, less than 1 cm in diam., glabrous; pyrenes rugose. Fl. Jun–Jul, fr. Jul–Sep.

- Montane valleys, mountain summits, near water courses, dense forests; below 1000 m. S Guangxi.

152. *Rubus howii* Merrill & Chun, Sunyatsenia 5: 71. 1940.

裂叶悬钩子 *lie ye xuan gou zi*

Shrubs scandent. Branchlets brown or reddish brown, terete, densely yellowish brown villous, with curved minute prickles. Leaves simple; petiole 1–2 cm, densely yellowish brown villous, with few small prickles; stipules caducous, free, 6–9 mm, deeply lobed, lobes linear, yellowish brown villous; blade oblong to ovate-oblong, 7–14 × 2–5 cm, lateral veins 6–8 pairs, prominent abaxially, impressed adaxially, both surfaces yellowish brown villous along veins, abaxially with sparse, minute prickles along midvein, base cordate, margin irregularly coarse-

ly serrate, with 1 or 2 broadly ovate shallow lobes on each side below middle; lobes unequal, longer ones to 1.5 cm, apex acute to shortly acuminate. Inflorescences terminal, subracemes, 5–8 cm, 1- or few flowered, or flowers several in clusters in leaf axils; rachis, pedicels, and abaxial surface of calyx densely yellowish brown villous, with sparse, needle-like prickles; bracts caducous, 5–8 mm; lobes linear, yellowish brown villous. Pedicel ca. 1 cm. Flowers ca. 1 cm in diam. Sepals ovate-lanceolate to oblong-lanceolate, 6–8 mm, margin entire, apex acuminate, outer sepals gray tomentose marginally. Petals yellowish brown, elliptic, 5–7 × 4–5 mm, base shortly clawed, apex obtuse. Stamens many, shorter than petals; filaments glabrous. Pistils glabrous, longer than stamens. Fruit not seen. Fl. Apr–May.

- Mixed forests; medium elevations. Hainan.

153. *Rubus hypopitys* Focke, Notes Roy. Bot. Gard. Edinburgh 5: 72. 1911.

滇藏悬钩子 *dian zang xuan gou zi*

Subshrubs low, nearly creeping. Branchlets reddish brown, slender, villous when young, glabrescent, with sparse, minute needle-like prickles. Leaves simple; petiole reddish brown, 4–6 cm, sparsely villous, with needle-like prickles; stipules free, greenish brown, to 1 cm, palmatifid; lobes linear, villous; blade suborbicular, 5–10 cm in diam., both surfaces villous, more densely so abaxially, sometimes with sparse, needle-like prickles along veins, base cordate, margin 3–5-lobed; lobes coarsely obtusely serrate, apex obtuse or acute. Inflorescences terminal, short subracemes, few flowered, or flowers solitary in leaf axils; rachis and pedicels densely yellowish villous, with sparse, needle-like prickles; bracts greenish brown, less than 1 cm, palmatifid; lobes linear, villous. Pedicel 1.5–2.5 cm. Flowers 2–3 cm in diam. Calyx abaxially densely yellowish villous and tomentose, or with sparse prickles; sepals erect after anthesis, lanceolate or oblong-lanceolate, 1–1.4 cm × 5–8 mm, apex caudate, outer sepals irregularly lacinate above middle; lobes linear or lanceolate. Petals white or reddish, narrowly obovate, 0.9–1.3 cm × 7–10 mm, base slightly villous, shortly clawed. Stamens many, shorter than petals; filaments broader toward base. Pistils nearly as long as stamens, glabrous. Aggregate fruit red, subglobose, to 1 cm in diam., glabrous; pyrenes shallowly rugose. Fl. Jun–Jul, fr. Aug–Sep.

- Foothills, coniferous forests on slopes, thickets, forest margins; 2000–3000 m. S Xizang, W Yunnan.

- 1a. Plants without glandular hairs; leaf lobes obtuse 153a. var. *hypopitys*
 1b. Plants with glandular hairs; leaf lobes acute 153b. var. *hanmiensis*

153a. *Rubus hypopitys* var. *hypopitys*

滇藏悬钩子(原变种) *dian zang xuan gou zi* (*yuan bian zhong*)

Rubus subumbellatus Cardot.

Plants without glandular hairs. Leaf lobes obtuse apically.

- Foothills, coniferous forests on slopes, thickets; 2000–3000 m. S Xizang, W Yunnan.

153b. *Rubus hypopitys* var. *hanmiensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 458. 1982.

汉密悬钩子 *han mi xuan gou zi*

Plants with glandular hairs. Leaf lobes acute apically.

- Forest margins; ca. 2200 m. SE Xizang.

154. *Rubus yiwuanus* W. P. Fang, Acta Phytotax. Sin. 2: 85. 1952.

奕武悬钩子 *yi wu xuan gou zi*

Shrubs 2–3 m tall. Branchlets brownish to reddish brown, gray tomentose initially, finally glabrous, unarmed. Leaves simple; petiole 2–3.5 cm, brown, gray tomentose when young, glabrate in age, unarmed; stipules caducous, free, brown, oblong-lanceolate, 2–4(–5) × 0.5–0.8 cm, tomentose when young, glabrescent, margin sharply serrate apically, or rarely lacinate; blade elliptic or ovate-elliptic, rarely suborbicular, 10–17 × 5–10 cm, palmately 5-veined, lateral veins 2–4 pairs, prominently raised abaxially, impressed adaxially, abaxially densely gray or yellowish gray tomentose, adaxially dark green, glabrous, base broadly cuneate to rounded, margin irregularly narrowly lobed above middle; lobes unevenly sharply serrate, apex caudate. Inflorescences terminal or axillary, terminal ones narrow cymose panicles, to 8 cm, axillary ones subracemes, to 2–3 cm, or flowers several in clusters in leaf axils; rachis and pedicels densely gray tomentose; bracts caducous, oblong-lanceolate, (1–)1.5–2(–3) cm, tomentose when young, later glabrate, margin lacinate apically, or entire. Pedicel 5–9 mm. Flowers ca. 1 cm in diam. Calyx abaxially densely gray tomentose; tube campanulate; sepals triangular or ovate-lanceolate, 6–9 × 3–5 mm, apex acute or shortly acuminate; outer sepals apically divided or serrate, inner sepals entire. Petals white, obovate, 7–9 × 3–4 mm, base clawed and slightly soft hairy, apex acute. Stamens many, shorter than petals; filaments short, broad, complanate. Pistils 30–50, longer than stamens, glabrous. Aggregate fruit reddish brown, subglobose, 7–9 mm in diam., glabrous. Fl. Jun–Jul, fr. Aug–Sep.

- Forest margins by river- and stream sides, shaded valleys; 1000–2200 m. C Sichuan (Emei Shan).

155. *Rubus stipulosus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 460. 1982.

巨托悬钩子 *ju tuo xuan gou zi*

Shrubs climbing. Branchlets dark brown, pubescent, with sparse, short prickles. Leaves simple; petiole 4–8 cm, pubescent, with minute prickles; stipules free, leaflike, broadly ovate or broadly narrowly ovate, 1.5–2 × 1–1.5 cm, palmately 5-veined, abaxially pubescent, margin lobed or serrate; blade suborbicular or broadly ovate, abaxially densely yellowish brown tomentose and pubescent along veins, adaxially glabrous or pubescent only along veins, base cordate, margin irregularly shallowly serrate, teeth abruptly pointed, 5–7-lobed; lobes triangular, terminal one largest, apex acute. Inflorescences terminal, subracemes, few flowered, or flowers in clusters in leaf axils, rarely flowers solitary; rachis and pedicels densely villous; bracts brown, broadly ovate or narrowly ovate, 1–1.8 × 0.9–1.6 cm, soft hairy, margin lobed or serrate above middle.

Pedicle 5–7 mm. Flowers 1–1.5 cm in diam. Calyx to 2 cm, abaxially densely villous; sepals ovate-lanceolate, apex acuminate, outer sepals usually lacinate apically; lobes lanceolate. Petals broadly ovate or suborbicular, glabrous, base shortly clawed, margin undulate or erose, apex abruptly pointed. Stamens many, much shorter than petals; filaments slightly broadened basally. Pistils 50–70 or more, much longer than stamens, glabrous. Fruit unknown. Fl. May–Jun.

• Rocky slopes, shaded places in forests; ca. 1200 m. EC Guangxi (Dayao Shan).

156. *Rubus irenaeus* Focke, Bot. Jahrb. Syst. 29: 394. 1900.

灰毛泡 hui mao pao

Shrubs 0.5–2 m tall, evergreen. Branchlets brownish, reddish brown, or grayish brown, densely gray tomentose-villous; flowering branches arising from rhizomes, sometimes with small prickles. Leaves alternate, simple; petiole 5–10 cm, densely tomentose-villous, unarmed or with sparse, small prickles; stipules leaflike, brownish, oblong, 2–3 × 1–2 cm, tomentose-villous, broader and incised-lacinate near apex; lobes lanceolate; blade suborbicular, 8–14 cm in diam., palmately 5-veined, veins yellowish brown and prominently raised abaxially, impressed adaxially, subleathery, abaxially densely gray or yellowish gray tomentose, with long hairs along veins, adaxially glabrous, base deeply cordate, margin undulate or lobed; lobes unevenly coarsely sharply serrate, apex obtuse or acute. Inflorescences terminal, corymbs or subracemes, (3–)4–6 cm, few flowered, sometimes flowers several in clusters or flowers solitary in leaf axils; rachis and pedicels densely tomentose-villous; bracts oblong, 1.5–2.5 × 1–1.5 cm, tomentose, margin or apex incised-lacinate. Pedicel 1–1.5 cm. Flowers 1.5–2 cm in diam. Calyx abaxially densely tomentose-villous; sepals reflexed in fruit, broadly ovate, 6–10 × (4–)5–7 mm, apex shortly acuminate; outer sepals with margin and apex lacinate; lobes linear-lanceolate, inner sepals entire. Petals white, suborbicular, 7–11 mm in diam., slightly longer than sepals, base clawed. Stamens many, shorter than petals; filaments linear, with slightly broad bases; anthers villous. Pistils 30–60, longer than stamens, glabrous. Aggregate fruit red, globose, 1–1.5 cm in diam., glabrous; pyrenes reticulate. Fl. May–Jun, fr. Aug–Sep.

• Forests, slopes, forest understories with rich humus; 500–1500 m. Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang.

The fresh fruit are used for jam, candy, drinks, and wine. The roots and young plants are used in traditional Chinese medicine.

- 1a. Branchlets unarmed or with sparse, minute prickles; leaf margin undulate or inconspicuously lobed, lobes obtuse, rarely acute 156a. var. *irenaeus*
- 1b. Branchlets with more dense, minute prickles; leaf margin distinctly 3–5-lobed, lobes acute 156b. var. *innoxius*

156a. *Rubus irenaeus* var. *irenaeus*

灰毛泡(原变种) hui mao pao (yuan bian zhong)

Rubus jaminii H. Léveillé & Vaniot.

Branchlets unarmed or with sparse, minute prickles. Leaf margin undulate or inconspicuously lobed; lobes obtuse, rarely acute.

• Forested slopes, forest understories with rich humus; 500–1300 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang.

156b. *Rubus irenaeus* var. *innoxius* (Focke) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 37: 182. 1985.

尖裂灰毛泡 jian lie hui mao pao

Rubus innoxius Focke, Bot. Jahrb. Syst. 29: 395. 1900.

Branchlets with more dense, minute prickles. Leaf margin distinctly 3–5-lobed; lobes acute.

• Sandy slopes, forests; below 1500 m. Chongqing (Jinfo Shan).

157. *Rubus pacificus* Hance, J. Bot. 12: 259. 1874.

太平莓 tai ping mei

Shrubs 40–100 cm tall, evergreen. Branchlets brown or reddish brown, terete, slender, slightly arching, soft hairy, glabrate in age, with sparse, minute prickles. Leaves simple; petiole 4–8 cm, villous when young, glabrescent, with sparse, minute prickles; stipules brownish, oblong, to 2.5 cm, villous, broader and incised-lacinate near apex, lobes lanceolate; blade broadly ovate to narrowly ovate, 8–16 × 5–13 cm, palmately 5-veined, lateral veins 2 or 3 pairs, brownish, distinctly raised abaxially, impressed adaxially, leathery, abaxially densely gray tomentose, adaxially glabrous, base cordate, margin inconspicuously lobed, irregularly abruptly pointed sharply serrate, apex acuminate. Inflorescences terminal, short racemes or corymbose, 3–6-flowered, or flowers solitary in leaf axils; rachis and pedicels densely soft hairy; bracts oblong, to 1.8 cm, villous, apex lobed; lobes lanceolate. Pedicel 1–3 cm. Flowers 1.5–2 cm in diam. Calyx abaxially soft hairy; sepals reflexed in fruit, rarely erect, ovate to ovate-lanceolate, 0.9–1.4 cm × 5–8 mm, apex acuminate; outer sepals apically lacinate, inner sepals entire. Petals white, suborbicular, slightly longer than or nearly as long as sepals, base shortly clawed, apex slightly incised. Stamens shorter than petals; filaments broad, flat; anthers villous. Pistils numerous, somewhat longer than stamens. Aggregate fruit red, globose, 1.2–1.6 cm in diam., glabrous; pyrenes rugose. Fl. Jun–Jul, fr. Aug–Sep.

• Roadsides, mixed forests, mountainous areas; 300–1000 m. Anhui, Fujian, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang.

158. *Rubus crassifolius* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 460. 1982.

厚叶悬钩子 hou ye xuan gou zi

Shrubs scrambling or scandent, to 0.5 m tall. Branchlets dark brown, terete, densely yellowish brown sericeous-villous, unarmed. Leaves simple; petiole 2–3.5 cm, yellowish brown sericeous-villous; stipules free, brownish, suborbicular or broadly ovate, (1–)1.5–2 cm and ca. as broad, sparsely sericeous-villous, margin lacinate, lobes lanceolate; blade suborbicular, 3–7 cm in diam., palmately 5-veined, veins brownish, lateral veins 2 or 3 pairs, prominently raised abaxially, impressed adaxially, thickly leathery, abaxially densely sericeous-villous,

adaxially prominently rugulose, sparsely sericeous-villous, base cordate, margin somewhat undulate or 3–5-lobed; lobes shallowly obtusely serrate, apex obtuse, rarely acute. Inflorescences terminal or axillary, 1-flowered, rarely flowers in clusters of 2 or 3; bracts brownish, suborbicular or broadly ovate, smaller than stipules, with sparse, long silky hairs, margin lacinate; lobes lanceolate. Pedicel ca. 1 cm, yellowish brown sericeous-villous. Flowers 1.5–2 cm in diam. Calyx to 1.5 cm, abaxially yellowish brown sericeous-villous; sepals leaflike, ovate, outer sepals broader, deeply divided or deeply incised-serrate nearly above middle, inner sepals narrower, entire or sparsely serrate, apex acute. Petals broadly ovate, base shortly clawed, margin undulate, apex obtuse or emarginate. Stamens numerous, in 2 or 3 whorls, unequal in length, shorter than petals; filaments linear, slender. Pistils shorter than stamens; style and ovary glabrous. Aggregate fruit red, subglobose, glabrous, with many drupelets, enclosed in leaflike persistent calyx; pyrenes rugose. Fl. Jun–Jul, fr. Aug–Sep.

• Grasslands on mountain summits, margins of dense forests, rock crevices; 1600–2000 m. Guangdong, Guangxi, Hunan, Jiangxi.

159. *Rubus wangii* F. P. Metcalf, Lingnan Sci. J. 19: 35. 1940.

大苞悬钩子 da bao xuan gou zi

Shrubs scandent, to 5 m tall. Branchlets brownish to grayish brown, terete, initially gray tomentose, glabrescent, with sparse, curved minute prickles. Leaves alternate, simple; petiole 3–5 cm, grayish yellow tomentose, with sparse, curved minute prickles; stipules free, leaflike, brown, broadly to narrowly ovate, 2–3 × 1.5–2 cm, thinly tomentose when young, margin entire or sparsely shallowly thin serrate; blade suborbicular, 11–15 cm in diam., palmately 5-veined, veins prominent abaxially, both surfaces glabrous except soft hairy along veins, base cordate, margin lobed; lobes unevenly sharply serrate, apex acute or obtuse. Inflorescences terminal and axillary, terminal ones narrow panicles, 10–15 cm, many flowered, axillary ones subracemes, shorter; rachis and pedicels grayish yellow tomentose, subglabrescent; bracts in basal part of inflorescence broader, broadly ovate or elliptic, 2–2.8 × 1.5–2 cm, those in apical part of inflorescences narrower, elliptic to broadly linear, 1–1.5 × 0.6–1 cm, thinly tomentose, margin entire, shallowly serrate, or lobed apically. Pedicel 0.8–1.5 cm. Flowers ca. 1 cm in diam. Calyx to 1.4 cm, abaxially densely gray tomentose; sepals usually reflexed in fruit, ovate-lanceolate, 5–8 × 2.5–3.5 mm, margin entire, apex acute to shortly acuminate. Petals white, obovate, shorter than sepals. Stamens many, shorter than petals; filaments broad, complanate, glabrous. Pistils 25–50, slightly longer than stamens, glabrous. Aggregate fruit red, subglobose, not more than 1 cm in diam., glabrous; pyrenes rugulose. Fl. Jun–Jul, fr. Aug–Oct.

• Sunny rocky slopes, montane valleys, sparse forests; 900–1500 m. Guangdong, Guangxi.

160. *Rubus playfairianus* Hemsley ex Focke, Biblioth. Bot. 17 (Heft 72): 45. 1910.

五叶鸡爪茶 wu ye ji zhao cha

Rubus cochinchinensis Trattinnick var. *stenophyllus* Franchet; *R. playfairianus* var. *stenophyllus* (Franchet) Cardot.

Shrubs climbing or scrambling, deciduous or semievergreen. Branchlets dark brown to blackish brown, initially tomentose, glabrescent, with sparse, curved minute prickles. Leaves palmately compound, 3–5-foliolate; petiole 2–4 cm, tomentose-villous, with sparse, curved small prickles, terminal leaflet sometimes very shortly petiolulate, lateral leaflets subsessile; stipules caducous, free, oblong, 8–11 mm, tomentose-villous, palmatipartite, lobes lanceolate or linear; blade of leaflets elliptic-lanceolate to oblong-lanceolate, 5–12 × 1–3 cm, terminal leaflet much larger than lateral leaflets, abaxially densely gray or yellowish gray appressed tomentose, adaxially glabrous, base cuneate, margin unevenly sharply serrate, lateral leaflets sometimes 2-lobed basally, apex acuminate. Inflorescences terminal or axillary, racemes, 6–9 cm, to 15 cm in fruit; rachis and pedicels gray or yellowish gray tomentose-villous, with few small prickles; bracts oblong, 6–9 mm, tomentose-villous, palmatipartite; lobes linear to lanceolate. Pedicel 1–2 cm. Flowers 1–1.5 cm in diam. Calyx abaxially densely yellowish gray to gray tomentose-villous; sepals ovate-lanceolate to triangular-lanceolate, 6–10 × 4–6 mm, margin entire, apex acuminate to caudate. Petals ovate, 6–8 × 4–6 mm, apex acute. Stamens many, slightly shorter than petals, soft hairy when young, glabrate in age; filaments not inflated. Pistils ca. 60, slightly longer than or nearly as long as stamens, villous. Aggregate fruit red when immature, black at maturity, subglobose, villous, with many drupelets; pyrenes prominently rugose. Fl. Apr–May, fr. Jun–Jul.

• Slopes, roadsides, stream sides, thickets; 300–2400 m. Guizhou, Hubei, Shaanxi, Sichuan, Yunnan.

161. *Rubus bambusarum* Focke, Hooker's Icon. Pl., ser. 3, 10: sub t. 1952. 1891.

竹叶鸡爪茶 zhu ye ji zhao cha

Rubus henryi Hemsley & Kuntze var. *bambusarum* (Focke) Rehder.

Shrubs scandent, evergreen. Branchlets reddish brown to grayish brown, terete, with slightly curved prickles, tomentose-villous when young, glabrescent, glabrous in age. Leaves palmately compound, 3–5-foliolate; petiole 2.5–5.5 cm, tomentose at first, gradually glabrescent, finally glabrous, leaflets subsessile; stipules early caducous, elliptic or ovate-lanceolate, 1–1.5 cm × 3–5 mm, submembranous, soft hairy, margin usually entire, apex acute to shortly acuminate; blade of leaflets narrowly lanceolate or narrowly elliptic, 7–13 × 1–3 cm; midvein brownish, raised abaxially, leathery, abaxially densely gray or yellowish gray tomentose, adaxially glabrous, base broadly cuneate, margin sparsely inconspicuously serrulate, apex acuminate. Inflorescences terminal or axillary, subracemes, 8–12 × 4–7 cm; rachis and pedicels gray or yellowish gray villous, with sparse, minute prickles, sometimes with intermixed glandular hairs; bracts ovate-lanceolate, 0.8–1.2 cm × 2–4 mm, membranous, soft hairy, margin entire or apically serrate. Pedicel to 1 cm. Calyx densely sericeous-villous; tube campanulate; sepals often reflexed in fruit, ovate-lanceolate or triangular-lanceolate, 7–10 × 3–5 mm, margin entire, apex acuminate to caudate. Flowers 1–2 cm in diam. Petals purplish red to reddish, obovate or broadly elliptic, 5–7 × 4–6 mm, basally puberulous. Stamens many, soft hairy. Pistils 25–40, slightly longer than stamens;

styles villous. Aggregate fruit red to reddish black, subglobose, with persistent villous styles. Fl. May–Jun, fr. Jul–Aug.

• Clearings on hills, forests; 1000–3000 m. Guizhou, Hubei, Shaanxi, Sichuan.

The young leaves are used for tea.

162. *Rubus henryi* Hemsley & Kuntze, J. Linn. Soc., Bot. 23: 231. 1887.

鸡爪茶 *ji zhao cha*

Shrubs climbing, to 6 m tall, evergreen. Branchlets brown or reddish brown, densely tomentose at first, subglabrescent, with sparse, slightly curved small prickles. Leaves simple; petiole 3–6 cm, slender, tomentose; stipules oblong or oblong-lanceolate, free, 1–1.8 cm × 3–7 mm, membranous, villous, margin entire or apically with 2 or 3 teeth, apex acuminate; blade 8–15 × 7–14 cm, leathery, abaxially densely gray or yellowish gray tomentose, sometimes with sparse, minute prickles on raised veins, adaxially lucid-green, glabrous, base broadly cuneate to subrounded or cordate, palmately 3–5-lobed; lobes lanceolate or narrowly oblong to ovate-lanceolate, 7–11 × 1.5–2.5 cm, margin with sparse, coarse or thin sharp serrations, apex acuminate. Inflorescences terminal or axillary, racemes, 7–12 cm, 9–20-flowered; rachis and pedicels densely gray or yellowish white tomentose and villous, with few minute needle-like prickles; bracts oblong or oblong-lanceolate, 1–1.5 cm × 4–7 mm, membranous, villous, margin entire or apically with few teeth, apex acuminate. Pedicel 5–10 mm. Calyx ca. 1.5 cm, gray or yellowish white tomentose and villous, sometimes with intermixed glandular hairs; sepals reflexed after anthesis, narrowly triangular, 6–10 × 3–5 mm, margin entire, apex acuminate to caudate. Petals reddish, narrowly ovate, 7–9 × 3–6 mm, both surfaces pilose, base shortly clawed, margin erose or minutely crenate, apex obtuse. Stamens many, nearly as long as petals, villous. Pistils slightly longer than stamens, villous. Aggregate fruit black, subglobose, 1.3–1.5 cm in diam.; persistent styles reddish, villous; pyrenes somewhat reticulate. Fl. May–Jun, fr. Jul–Aug.

• Slopes, mountainous areas, valleys, forests, thickets; below 2500 m. Guizhou, Hubei, Hunan, Sichuan.

The young leaves are used for tea.

- 1a. Leaf blades palmately 3–5-parted to 2/3 or more, lobes narrower, longer, lanceolate or narrowly oblong, base narrower, broadly cuneate to subrounded, rarely subcordate, margin with thin sharp serrations; calyx sometimes with glandular hairs abaxially 162a. var. *henryi*
- 1b. Leaf blades palmately 3–5-parted to 1/3–1/2, lobes broader, shorter, ovate-lanceolate, base broader, subcuneate to cordate, margin with coarse sharp serrations; calyx without glandular hairs abaxially 162b. var. *sozostylus*

162a. *Rubus henryi* var. *henryi*

鸡爪茶(原变种) *ji zhao cha* (*yuan bian zhong*)

Leaf blades palmately 3–5-parted to 2/3 or more, lobes

narrower, longer, lanceolate or narrowly oblong, base narrower, broadly cuneate to subrounded, rarely subcordate, margin with thin sharp serrations. Calyx abaxially sometimes with glandular hairs.

• Slopes, montane forests; below 2000 m. Hubei, Hunan.

162b. *Rubus henryi* var. *sozostylus* (Focke) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 37: 185. 1985.

大叶鸡爪茶 *da ye ji zhao cha*

Rubus sozostylus Focke, Hooker's Icon. Pl., ser. 3, 10: sub t. 1952. 1891; *R. fargesii* Franchet; *R. sozostylus* var. *fargesii* (Franchet) Cardot.

Leaf blades palmately 3–5-parted to 1/3–1/2, lobes broader, shorter, ovate-lanceolate, base broader, subcuneate to cordate, margin with coarse sharp serrations. Calyx abaxially without glandular hairs.

• Mountainous areas, valleys, sparse forests, thickets; below 2500 m. Guizhou, Hubei, Hunan, Sichuan.

163. *Rubus huangpingensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 461. 1982.

黄平悬钩子 *huang ping xuan gou zi*

Shrubs climbing. Branchlets dark brown, tomentose at first, gradually glabrescent, finally glabrous, with sparse, curved minute prickles. Leaves simple; petiole 3–4 cm, tomentose, sometimes glabrescent; stipules free, oblong or oblong-lanceolate, 1–1.6 cm × 4–6 mm, membranous, glabrous or sparsely puberulous, usually lobed or with few teeth apically; blade 7–11 cm and ca. as broad, subleathery, abaxially densely pale rust colored tomentose, adaxially glabrous, base truncate to cordate, palmately 3-parted to 2/3; lobes elliptic or oblong, 3.5–8 × 2–4 cm, veins raised abaxially, slightly impressed adaxially, margin with uneven coarse sharp serrations, apex acuminate. Inflorescences terminal, racemes; rachis and pedicels densely pubescent, with sparse, intermixed stipitate glands and with small needle-like prickles; bracts oblong or oblong-lanceolate, smaller than stipules, glabrous or slightly puberulous, margin entire or slightly lobed or with few teeth, apex acuminate. Pedicel 1–1.4 cm. Calyx densely pubescent, with sparse, glandular hairs; sepals reflexed, rarely erect in fruit, narrowly triangular or triangular-lanceolate, margin entire, apex shortly acuminate. Stamens many; filaments linear, basally broad and flat. Pistils numerous, longer than stamens; style and ovary villous. Aggregate fruit red, compressed globose, 1–1.4 cm in diam.; persistent styles villous; pyrenes slightly reticulate. Fl. May–Jun, fr. Jul–Aug.

• Thickets at mountain summits. S. Guizhou.

164. *Rubus dunnii* F. P. Metcalf, Lingnan Sci. J. 19: 22. 1940.

闽粤悬钩子 *min yue xuan gou zi*

Shrubs scandent. Branchlets brown or grayish brown, terete, initially yellowish brown tomentose, glabrescent, with sparse, curved minute prickles. Leaves simple; petiole 1–2 cm, tomentose when young, glabrate in age, with sparse, short prickles; stipules caducous, ovate-lanceolate to narrowly elliptic

tic, 6–9 mm, tomentose, apex acuminate; blades broadly ovate, 5–10 × 3–6 cm, lateral veins 7–9 pairs, prominent abaxially, leathery, abaxially densely yellowish brown to rust colored tomentose, adaxially green brown, glabrous, base cordate, margin shallowly obtusely coarsely serrate, apex acuminate. Inflorescences terminal or axillary, racemes, 4–8 cm, few flowered; rachis, pedicels, and calyx yellowish white tomentose-villous, with sparse, needle-like prickles, with intermixed glandular hairs 1.5–2.5 cm; bracts narrowly elliptic or narrowly ovate-lanceolate, abaxially tomentose-villous, with intermixed glandular hairs, adaxially sparsely hairy, margin entire or lobed, apex acuminate. Pedicel 2–4 cm. Sepals erect after anthesis, lanceolate, 7–11 × 3–5(–7) mm, margin entire or 2-lobed, apex acuminate. Petals obovate, 7–10 × 4–6 mm, base tomentose, clawed, apex obtuse. Stamens many, shorter than petals; filaments broad, complanate, glabrous. Pistils much longer than stamens. Aggregate fruit red, subglobose, to 1.5 cm in diam., glabrous; pyrenes smooth or slightly rugose. Fl. Mar–Apr, fr. Jun–Jul.

- Slopes, roadsides, rocks, thickets. Fujian, Guangdong.

- 1a. Leaf blades tomentose abaxially, not glabrescent 164a. var. *dunnii*
 1b. Leaf blades tomentose abaxially when young, glabrescent 164b. var. *glabrescens*

164a. *Rubus dunnii* var. *dunnii*

闽粤悬钩子(原变种) min yue xuan gou zi (yuan bian zhong)

Leaf blades tomentose abaxially, not glabrescent.

- Slopes, roadsides, rocks. Fujian, Guangdong.

164b. *Rubus dunnii* var. *glabrescens* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 461. 1982.

光叶闽粤悬钩子 guang ye min yue xuan gou zi

Leaf blades tomentose abaxially when young, gradually glabrescent.

- Thickets. S Fujian (Zhangzhou Shi).

165. *Rubus swinhoei* Hance, Ann. Sci. Nat. Bot., ser. 5, 5: 211. 1866.

木莓 mu mei

Rubus adenanthus Finet & Franchet; *R. adenotrichopodus* Hayata; *R. hupehensis* Oliver; *R. swinhoei* var. *hupehensis* (Oliver) F. P. Metcalf.

Shrubs scandent, 1–4 m tall, deciduous or semievergreen. Branchlets brown to purplish brown, terete, slender, shortly gray tomentose at first, glabrescent, with few to many curved prickles 1–3 mm. Leaves simple; petiole 5–10(–15) mm, gray tomentose, sometimes with curved minute prickles; stipules caducous, ovate-oblong to ovate-lanceolate, 5–8 × 3–4 mm, membranous, slightly hairy, margin entire or serrate apically; blade ovate to oblong-lanceolate, 5–11 × 2.5–5 cm, veins raised abaxially, slightly impressed adaxially, papery, abaxially gray tomentose, or subglabrous, hairs usually persistent on sterile branchlets, flowering and fruiting branchlets glabrate, with sparse, curved small prickles along midvein, adaxially glabrous except pubescent along midvein, base rounded or truncate to

shallowly cordate, margin unevenly serrate to doubly serrate, rarely incised, apex acuminate. Inflorescences terminal, short racemes, 5–8 cm, (1- or)5–7-flowered, or flowers several in clusters; rachis and pedicels tomentose-villous, with sparse, needle-like prickles, with intermixed purplish brown glandular hairs 1–3 mm; bracts caducous, ovate-lanceolate or lanceolate, 4–6 mm, sparsely villous, margin entire or serrate apically. Pedicel 1–3 cm. Flowers 1–1.5 cm in diam. Calyx abaxially gray tomentose-villous, with intermixed purplish brown glandular hairs 1–3 mm; sepals reflexed in fruit, ovate to triangular-ovate, 5–8 × 2.5–4.5 mm, margin entire, apex acute to shortly acuminate. Petals white, broadly obovate to suborbicular, 5–7 × 4–6 mm, both surfaces thinly pubescent, base shortly clawed, apex obtuse, undulate. Stamens many; filaments inflated basally, glabrous. Pistils much longer than stamens; style and ovary glabrous. Aggregate fruit purplish black at maturity, globose, 1–1.5 cm in diam., with many drupelets, glabrous; pyrenes distinctly rugose. Fl. May–Jun, fr. Jul–Aug. $2n = 28^*$.

Mixed forests, thickets, slopes, valleys, stream sides; 300–1500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Zhejiang [Japan (Ryukyu Islands)].

166. *Rubus doyonensis* Handel-Mazzetti, Symb. Sin. 7: 487. 1933.

白薔 bai ru

Shrubs scandent. Branchlets brownish to dark reddish brown, initially grayish yellow tomentose, glabrescent, with sparse, curved minute prickles; flowering branchlets shortly stipitate glandular. Leaves simple; petiole 1–2 cm, grayish yellow tomentose-villous, glabrescent, with shortly stipitate glands; stipules oblong-lanceolate, 1–1.5 cm × 3–5 mm, membranous, pubescent, margin entire, apex acute or obtuse; blade ovate or broadly ovate to ovate-lanceolate, 6–9 × 4–6 cm; lateral veins 7–9 pairs, slightly raised abaxially, abaxially usually persistently densely gray tomentose, adaxially glabrous except slightly pubescent along midvein, base rounded or truncate to shallowly cordate, margin shallowly undulate, rarely inconspicuously lobed, with irregular minute sharp serrations, apex shortly acuminate to caudate. Inflorescences terminal, rarely axillary, narrow racemes, 6–10 cm, 6–15(–20) flowered; rachis and pedicels tomentose-villous, with shortly stalked glands 1–2 mm; bracts oblong-lanceolate, 0.8–1.4 cm × 3–4 mm, membranous, pubescent, margin entire, apex ± obtuse. Pedicel 1–1.5 cm. Calyx abaxially tomentose-villous, stipitate glandular; sepals often reflexed in fruit, lanceolate or triangular-lanceolate, 1–1.2 cm, margin entire, apex shortly caudate. Petals white, obovate or orbicular, nearly as long as sepals, slightly pubescent, base clawed. Stamens many, shorter than petals; filaments linear or with broad flat base, glabrous or slightly soft hairy only on anthers. Pistils many, slightly longer than stamens; style and ovary glabrous. Aggregate fruit black at maturity, subglobose, ca. 1.5 cm in diam.; pyrenes reticulate. Fl. May–Jul, fr. Aug–Sep.

- Mixed forests, valleys, ravines; 2000–3200 m. N Yunnan.

The seeds are widely used medicinally in Yunnan.

167. *Rubus hanceanus* Kuntze, Meth. Sp.-Besch. *Rubus*, 72. 1879.

华南悬钩子 hua nan xuan gou zi

Rubus fordii Hance; *R. hirtiflorus* Cardot; *R. prandianus* Handel-Mazzetti.

Shrubs lianoid or scandent, ca. 1 m tall. Branchlets brown or reddish brown, terete, densely gray tomentose, glabrescent, with sparse, curved minute prickles or stipitate glands. Leaves simple; petiole 1–2 cm, gray tomentose at first, gradually glabrescent, with sparse, minute prickles; stipules early caducous, free, oblong or elliptic, villous, stipitate glandular, margin entire or apically lacinate; blade broadly ovate, 6–11 × 4–8 cm; veins 5–7 pairs, prominent abaxially, somewhat impressed adaxially, not leathery, abaxially densely gray or yellowish gray tomentose, adaxially dark brown, glabrous except soft hairy along veins, base cordate, margin lobed, unevenly sharply serrate, apex acuminate. Inflorescences terminal, racemes, 6–9 cm, loosely few flowered; rachis and pedicels tomentose-villous, with stipitate glands 2–4 mm and sparse, needle-like prickles; bracts caducous, oblong or elliptic, 5–8 mm, membranous, villous, with sparse, intermixed stipitate glandular hairs, margin entire or apically lobed. Pedicel 1.5–2.5 cm. Flowers 1–1.5 cm in diam. Calyx abaxially densely tomentose-villous, with purplish brown long stalked glands and needle-like prickles; sepals erect, rarely reflexed in fruit, broadly ovate, 1–1.2 cm × 4–6 mm, margin entire, apex caudate. Petals broadly elliptic, 8–11 × 5–7 mm, soft hairy, base shortly clawed, apex obtuse. Stamens many, shorter than petals; filaments short, broad, complanate; anthers slightly villous. Pistils much longer than stamens; style and ovary glabrous. Aggregate fruit black, subglobose, 1–1.5 cm in diam., glabrous; drupelets subreniform or semiglobose; pyrenes somewhat rugose. Fl. Mar–May, fr. Jun–Jul.

• Sparse mixed forests in valleys, bamboo thickets, shaded rocky places; low elevations. Fujian, Guangdong, Guangxi, Hunan.

168. *Rubus gressittii* F. P. Metcalf, Lingnan Sci. J. 19: 25. 1940.

江西悬钩子 *jiang xi xuan gou zi*

Shrubs scandent, 1–3 m tall. Branchlets brownish to reddish brown, slender, gray or yellowish white tomentose when young, finally glabrate, with sparse, slightly curved small prickles. Leaves simple; petiole 1–1.5 cm, tomentose-villous; stipules caducous, lanceolate or ovate-lanceolate, 7–11 mm, soft hairy; blade lanceolate to elliptic-lanceolate, 5–9 × 2.5–4 cm, veins prominent abaxially, slightly impressed adaxially, abaxially densely rusty tomentose, adaxially glabrous, base rounded to truncate, rarely shallowly cordate, margin shallowly obtusely serrate, apex shortly acuminate. Inflorescences terminal or axillary, racemes, 4–8 cm, 4–9-flowered; rachis and pedicels yellowish tomentose-villous, shortly stipitate glandular, with sparse, needle-like prickles; bracts lanceolate to ovate-lanceolate, 5–8 mm, puberulous, without stipitate glands. Pedicel to 2.5 cm. Flowers 0.8–1.2 cm in diam. Calyx densely pale rusty tomentose, sparsely shortly stipitate glandular; sepals erect, rarely reflexed in fruit, ovate to triangular-ovate, 4–7 × 2–4 mm, margin entire, apex acute. Petals white, tinged yellow, ovate or suborbicular, 5–6 × 4.5–5.5 mm, both surfaces thinly pubescent basally, base shortly clawed, apex obtuse. Stamens many, shorter than petals; filaments broad, flat, glabrous. Pistils numerous, longer than stamens; style and ovary glabrous. Aggregate fruit dark red, globose, 8–10 mm in diam, glabrous,

with many drupelets; pyrenes distinctly rugose. Fl. Apr–May, fr. Jun–Jul.

• Thickets on slopes, forest margins, roadsides, grasslands; 500–1200 m. Guangdong, Hunan, Jiangxi.

169. *Rubus lichuanensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 462. 1982.

黎川悬钩子 *li chuan xuan gou zi*

Shrubs climbing, ca. 2 m tall. Branchlets dark brown; young shoots rust colored tomentose, glabrate in age, with sparse, curved prickles. Leaves simple; petiole 1.5–2 cm, rusty tomentose, glabrescent; stipules early caducous, lanceolate to oblong-lanceolate, tomentose-villous; blade ovate to ovate-lanceolate, 5–8 × 3–4 cm, abaxially densely rusty tomentose, adaxially pilose, base cordate, margin lobed or undulate, irregularly obtusely coarsely serrate to doubly serrate, apex acuminate. Inflorescences terminal or axillary, racemes, few flowered; rachis and pedicels rusty tomentose-villous, with short glandular hairs, with sparse, needle-like prickles; bracts caducous, lanceolate to oblong-lanceolate, smaller than stipules, tomentose-villous. Pedicel 2–3 cm. Flowers more than 1 cm in diam. Calyx abaxially densely rusty tomentose-villous; sepals erect, rarely reflexed in fruit, narrowly ovate to triangular-ovate, margin entire, apex acute. Stamens many; filaments broad, flat, glabrous. Pistils numerous. Aggregate fruit black, subglobose, 1–1.6 cm in diam., glabrous, with many drupelets; pyrenes prominently rugose. Fl. Apr–May, fr. Jun–Jul.

• Bamboo forests. E Jiangxi (Lichuan Xian).

170. *Rubus refractus* H. Léveillé, Repert. Spec. Nov. Regni Veg. 4: 332. 1907.

曲萼悬钩子 *qu e xuan gou zi*

Rubus refractus var. *latifolius* Cardot; *R. rocheri* H. Léveillé.

Shrubs scandent, to 3 m tall. Branchlets brown to blackish brown, villous, glabrescent, with curved minute prickles. Leaves simple; petiole 1.5–3 cm, gray or yellowish gray villous, with sparse, slightly curved prickles; stipules obovate, 7–10 × 5–7 mm, membranous, gray or yellowish gray villous, palmatipartite nearly to base; lobes linear to linear-lanceolate; blade narrowly ovate, 6–11 × 3–3.5 cm, abaxially densely gray or yellowish gray tomentose, with intermixed long hairs along veins, adaxially sparsely villous, base deeply cordate, margin lobed, often with 2–4 prominent lobes near base, with uneven coarse sharp serrations to doubly serrate, apex shortly acuminate. Inflorescences terminal and axillary, lax racemes; rachis and pedicels densely gray or yellowish gray villous, with sparse, glandular hairs, unarmed or with few needle-like prickles on pedicel; bracts obovate, 6–9 × 4–6 mm, villous, palmatipartite; lobes linear, margin with sparse, glandular hairs. Pedicel 1–2(–3) cm. Flowers 1–1.5(–2) cm in diam. Calyx densely gray to yellowish gray villous, with sparse, glandular hairs; sepals reflexed in fruit, triangular to ovate-triangular, 8–11 × 4–6 mm, margin entire, apex shortly acuminate. Petals white, broadly ovate to broadly elliptic, 7–10 × 5–8 mm, base shortly clawed, apex obtuse. Stamens many, shorter than petals; filaments broad, complanate, glabrous. Pistils numerous, much longer than stamens, glabrous. Fruit unknown. Fl. Mar–Apr.

- Mixed forests; below 2000 m. Guizhou, Yunnan.

171. *Rubus fujianensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 462. 1982.

福建悬钩子 fu jian xuan gou zi

Shrubs scandent, 2–4 m tall. Branchlets dark brown, terete, glabrous. Leaves simple; petiole 1–1.5 cm, initially rust colored tomentose, glabrescent; stipules caducous, oblong-lanceolate to ovate-lanceolate, 1–1.3 cm, appressed pubescent when young, glabrescent, margin usually entire; blade oblong to oblong-lanceolate, 13–17 × 2.5–4.5 cm, lateral veins 8–10 pairs, raised abaxially, slightly impressed adaxially, leathery, abaxially densely yellowish brown tomentose, adaxially glabrous, base rounded to truncate, margin entire basally, with sparse, shallow small serrations on apical 1/2, apex acuminate. Inflorescences terminal or axillary, short racemes; rachis and pedicels densely yellowish brown tomentose-villous and with needle-like prickles; bracts oblong-lanceolate or ovate-lanceolate, yellowish brown tomentose when young, glabrescent, margin usually entire. Pedicel 1.5–2.5 cm. Flowers to 2 cm in diam. Calyx abaxially yellowish brown tomentose-villous, with needle-like prickles; sepals usually erect in fruit, broadly lanceolate, 1–1.4 cm × 5–7 mm, apex shortly acuminate. Aggregate fruit red, subglobose, 1–1.2 cm in diam., glabrous; pyrenes rugose. Fl. Apr–May, fr. Jul.

- Slopes, mixed forests; ca. 1400 m. N Fujian (Chong'an Xian), Zhejiang.

172. *Rubus oblongus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 462. 1982.

长圆悬钩子 chang yuan xuan gou zi

Shrubs climbing. Branchlets grayish brown or brown, yellowish to grayish yellow tomentose, gradually glabrescent, with sparse, curved small prickles. Leaves simple; petiole 0.8–1.5 cm, yellowish or yellowish gray tomentose, glabrate in age, with sparse, curved minute prickles; stipules oblong-lanceolate, ca. 1 cm in diam., tomentose-villous when young, glabrescent, margin entire, rarely apically lobed; blade narrowly oblong or oblong-lanceolate, 10–15 × 1.5–3(–4) cm, lateral veins 8–11 pairs, prominent abaxially, leathery, abaxially densely yellowish tomentose, base broadly cuneate to rounded, margin with sparse, shallow sharp serrations, apex caudate. Inflorescences terminal and axillary, short racemes, axillary ones 3–4 cm, terminal ones longer; rachis and pedicels densely yellowish tomentose; bracts oblong-lanceolate, 5–9 mm, tomentose-villous, margin entire, rarely lobed. Pedicel 1–1.5 cm. Calyx abaxially densely tomentose-villous; sepals ovate-lanceolate or triangular-lanceolate, 6–9 mm, margin entire, apex acuminate to shortly caudate. Petals suborbicular, shorter than sepals, slightly pubescent basally, claws nearly absent. Stamens many; filaments broad, complanate, soft hairy or long hairy only on anthers. Pistils longer than stamens; style and ovary glabrous. Aggregate fruit red at maturity, subglobose, glabrous; pyrenes rugulose. Fl. May–Jun, fr. Jul–Aug.

- Dense forested slopes, thickets; 1700–2100 m. Guizhou, Yunnan.

173. *Rubus liui* Yuen P. Yang & S. Y. Lu, Quart. J. Chin. For. est. 9(2): 111. 1976.

柳氏悬钩子 liu shi xuan gou zi

Rubus ilanensis Y. C. Liu & F. Y. Lu.

Shrubs scandent. Branchlets brownish green, thinly floccose-tomentose at first, glabrescent, with short retrorse prickles. Leaves simple; petiole 1.5–3 cm, tomentose, with few prickles; stipules oblong-lanceolate, to 1 cm, margin villous, usually apically lacinate; blade oblong-lanceolate to lanceolate, 7–11 × 1.5–2.5 cm, lateral veins 7–9 pairs, midvein distinctly raised and abaxially with prickles, impressed adaxially, thickly papery, abaxially yellowish brown tomentose, adaxially dark, glabrous, base rounded, margin finely remotely serrate, apex acuminate. Inflorescences terminal or axillary, racemes, loosely 7–2-flowered; rachis and pedicels tomentose, prickly; bracts oblong-lanceolate, nearly as long as stipules, with few teeth along margin. Pedicel 1–1.9 cm. Calyx abaxially tomentose; tube cupular; sepals narrowly triangular, 3–4 × 2–3 mm, apex cuspidate. Petals pink, rhombic-orbicular to obovate, 2–3 mm, hairy, apex mucronate. Stamens numerous, shorter than petals; filaments sparsely hairy; anthers with few hairs at apex of connectives. Pistils longer than stamens; styles to 8 mm, hairy; ovaries hairy apically. Aggregate fruit reddish to red at maturity, globose, 8–10 mm in diam., with persistent styles; drupelets reniform, hairy apically. Fl. May–Aug, fr. Jun–Sep. $2n = 28^*$.

- Forests; 1400–1600 m. NE Taiwan.

174. *Rubus caudifolius* Wuzhi, Fl. Hupeh. 2: 188. 1979.

尾叶悬钩子 wei ye xuan gou zi

Shrubs scandent. Branchlets densely grayish yellow to gray tomentose, glabrescent, with sparse, short curved prickles. Leaves simple; petiole 1.5–2.5 cm, grayish yellow to gray tomentose; stipules late caducous, oblong-lanceolate, 1–1.5 cm, membranous, tomentose when young, gradually glabrescent, margin entire, rarely lobed apically; blade oblong-lanceolate to ovate-lanceolate, 7–14 × 3–5 cm, veins 5–8 pairs, raised abaxially, slightly impressed adaxially, leathery, abaxially densely rusty tomentellate, adaxially glabrous, base rounded, margin with shallow minute serrations or coarsely serrate on vegetative branchlets, apex caudate. Inflorescences terminal or axillary, racemes, 8–14 cm; rachis and pedicels densely grayish yellow tomentose-villous; bracts caducous, oblong-lanceolate, 1–1.4 cm, tomentose-villous when young, margin entire, rarely lobed. Pedicel 1–1.5 cm. Flowers 1–1.5 cm in diam. Calyx purplish red, abaxially densely grayish yellow tomentose-villous; tube shallowly cupular; sepals triangular-ovate to triangular-lanceolate, margin entire, apex shortly caudate. Petals red, oblong, slightly shorter than sepals, both surfaces puberulous. Stamens many, slightly pubescent or only anthers sparsely villous. Pistils longer than stamens; styles villous. Aggregate fruit red when immature, black at maturity, compressed globose, glabrous; pyrenes rugose. Fl. May–Jun, fr. Jul–Aug.

- Forested slopes, roadsides, thickets; 800–2200 m. Fujian, Guangxi, Guizhou, Hubei, Hunan, Zhejiang.

175. *Rubus hemithyrus* Handel-Mazzetti, Symb. Sin. 7: 488. 1933.

半锥莓 ban zhui mei

Shrubs scandent, 2–3 m tall. Branchlets brown to grayish brown, terete, tomentose-villous when young, gradually glabrescent, with sparse, curved minute prickles. Leaves simple; petiole ca. 1 cm, tomentose-villous, with sparse, curved small prickles; stipules early caducous, free, brown, ovate-lanceolate, 7–8 mm, membranous, tomentose-villous; blade oblong-ovate, 6–12 × 4–6 cm, lateral veins 8–10 pairs, raised and purplish abaxially, slightly impressed adaxially, papery, abaxially densely gray tomentose, adaxially dark green, glabrous or slightly villous along veins, base subtruncate to shallowly cordate, margin with dense coarse abruptly sharp serrations, apex shortly acuminate. Inflorescences terminal and axillary, racemes, 6–10 cm, few flowered, axillary ones shorter, flowers sometimes several in clusters in leaf axils; rachis and pedicels densely tomentose-villous; bracts brown, ovate-lanceolate, 7–10(–12) mm, subglabrous, margin entire or with few teeth apically. Pedicel 1.5–3.5 cm. Calyx abaxially densely tomentose-villous; tube 6–7 mm in diam.; sepals narrowly ovate or ovate-triangular, 8–11 × 4–6 mm, apex of outer sepals shortly acuminate, lacinate, inner sepals mucronate, entire. Petals white, broadly obovate, 7–9 × 5–7 mm, both surfaces thinly pubescent, base clawed, margin undulate. Stamens many; filaments ca. 5 mm, glabrous; anthers few barbed. Pistils many, glabrous; ovary glabrous; styles ca. 7 mm, slender. Aggregate fruit red. Fl. and fr. summer.

- Forests; 1700–3000 m. W Yunnan.

176. *Rubus preptanthus* Focke, *Biblioth. Bot.* 17(Heft 72): 42. 1910.

早花悬钩子 *zao hua xuan gou zi*

Shrubs scandent. Branchlets brownish to grayish brown, gray tomentose when young, gradually glabrescent, with sparse, curved minute prickles or nearly unarmed. Leaves simple; petiole (0.3–)1–2 cm, tomentose, usually unarmed; stipules caducous, lanceolate or linear-lanceolate, 0.8–1.4 cm × 2.5–5 mm, membranous, appressed villous; blade oblong-ovate or broadly ovate-lanceolate to narrowly lanceolate, 6–12 × (1–)3–5.5 cm, lateral veins 6–9 pairs, prominent abaxially, papery, abaxially densely gray to yellowish gray appressed tomentose, adaxially glabrous, base rounded to subtruncate, margin unevenly incised coarsely sharply serrate or sparsely so, rarely doubly serrate, apex acuminate. Inflorescences terminal, racemes, 4–8 cm, several to more than 10-flowered; rachis and pedicels densely gray to yellowish gray tomentose-villous; bracts caducous, lanceolate to linear-lanceolate, 0.8–1.2 cm × 2–4 mm, membranous, villous. Pedicel 7–10 mm. Calyx abaxially densely gray to yellowish gray tomentose-villous; tube pelviform; sepals triangular-ovate to lanceolate, 8–10 × 3–5 mm, margin entire, apex acuminate. Petals white, obovate, 5–7 × 4–6 mm, both surfaces puberulous. Stamens many, shorter than sepals, glabrous or hairy when young, or only anthers slightly villous; filaments inflated at base. Pistils slightly longer than or nearly as long as stamens; ovary glabrous; style glabrous. Aggregate fruit purplish black at maturity, semiglobose, 8–10 mm in diam., glabrous; pyrenes slightly rugose. Fl. May–Jun, fr. Jul–Aug.

- Forests, bamboo forest margins, thickets, gravelly slopes; 1000–3100 m. Sichuan, Yunnan.

- 1a. Leaf blade oblong-ovate or broadly ovate-lanceolate, 3–5.5 cm wide, margin with dense serrations; petiole 10–20 mm 176a. var. *preptanthus*
- 1b. Leaf blade narrowly lanceolate, 1–2 cm wide, margin with sparse serrations; petiole 3–5 mm 176b. var. *mairei*

176a. *Rubus preptanthus* var. *preptanthus*

早花悬钩子(原变种) *zao hua xuan gou zi* (yuan bian zhong)

Leaf blade oblong-ovate or broadly ovate-lanceolate, 3–5.5 cm wide, margin with dense serrations; petiole 1–2 cm.

- Bamboo forest margins, thickets; 1000–2800 m. Sichuan, Yunnan.

176b. *Rubus preptanthus* var. *mairei* (H. Léveillé) T. T. Yu & L. T. Lu, *Fl. Reipubl. Popularis Sin.* 37: 194. 1985.

狭叶早花悬钩子 *xia ye zao hua xuan gou zi*

Rubus mairei H. Léveillé, *Bull. Acad. Int. Géogr. Bot.* 22: 232. 1912, not H. Léveillé (1913).

Leaf blades narrowly lanceolate, 1–2 cm wide, margin with sparse serrations; petiole 3–5 mm.

- Forests, thickets, gravelly slopes; ca. 3100 m. Sichuan, Yunnan.

177. *Rubus malifolius* Focke, *Hooker's Icon. Pl.*, ser. 3, 10: t. 1947. 1891.

棠叶悬钩子 *tang ye xuan gou zi*

Shrubs scandent, 1.5–3.5 m tall. Branchlets brown to purplish brown, soft hairy when young, glabrate in age, with sparse, somewhat curved prickles. Leaves simple; petiole (0.6–)1–1.5 cm, tomentose-villous at first, later glabrate, sometimes with few small needle-like prickles; stipules caducous, brownish, linear-oblong to ovate-lanceolate, 0.8–1.4 cm, membranous, appressed pubescent when young; blade elliptic or oblong-elliptic, 5–12 × 2.5–5 cm, lateral veins 8–10 pairs, prominent abaxially, abaxially gray appressed tomentose, hairs persistent, but deciduous on fruiting branchlets, adaxially glabrous or pilose along veins, base subrounded, margin inconspicuously shallowly serrate or coarsely serrate, apex acuminate, rarely acute. Inflorescences terminal, racemes, 5–10 cm; rachis and pedicel densely tomentose-villous, gradually glabrescent, finally glabrous; bracts caducous, linear-oblong, 7–11 mm, pubescent initially, apex acute to shortly acuminate. Pedicel 1–1.5 cm. Flowers to 2.5 cm in diam. Calyx abaxially densely tomentose-villous; tube pelviform; sepals ovate to triangular-ovate or lanceolate, 8–12(–25) × 3–6 mm, margin entire, apex acuminate. Petals white or white with pink spots, obovate to suborbicular, 0.8–1.2 cm × 7–10 mm, both surfaces thinly pubescent, base shortly clawed. Stamens many; filaments subulate, broadened basally, slightly villous; anthers hirtose. Pistils much longer than stamens; ovary glabrous; styles glabrous, apex clavate. Aggregate fruit purplish black at maturity, compressed globose, glabrous, with many drupelets; pyrenes slightly rugose or somewhat smooth. Fl. May–Jun, fr. Jul–Aug.

- Slopes, ravines, stream sides, montane valleys, forests, thickets;

400–2200 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Yunnan.

- 1a. Sepals ovate to triangular-ovate,
8–12(–14) mm 177a. var. *malifolius*
1b. Sepals lanceolate or ovate-lanceolate,
to 25 mm 177b. var. *longisepalus*

177a. *Rubus malifolius* var. *malifolius*

棠叶悬钩子(原变种) tang ye xuan gou zi (yuan bian zhong)

Rubus arbor H. Léveillé & Vaniot; *R. limprichtii* Pax & K. Hoffmann.

Sepals ovate to triangular-ovate, 0.8–1.2(–1.4) cm.

• Slopes, ravines, mixed forests, thickets; 400–2200 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Yunnan.

177b. *Rubus malifolius* var. *longisepalus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 463. 1982.

长萼棠叶悬钩子 chang e tang ye xuan gou zi

Sepals lanceolate or ovate-lanceolate, to 2.5 cm.

• Stream sides, montane valleys, forests; low elevations. N Guangxi (Longsheng Xian, Rongshui Xian, Xing'an Xian).

178. *Rubus kawakamii* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 91. 1911.

桑叶悬钩子 sang ye xuan gou zi

Shrubs erect, to 1.5 m tall. Branchlets brownish to reddish brown, terete, tomentose-villous when young, later glabrate, with few small prickles. Leaves simple; petiole 1–2 cm, slender, tomentose-villous when young, glabrate in age, unarmed or with sparse, small prickles; stipules caducous, oblong, 6–10 × 2–4 mm, soft hairy, margin entire or with a few teeth; blade oblong or ovate-oblong, 6–10 × 2.5–5 cm, lateral veins 7–10 pairs, midvein and veins raised abaxially, slightly impressed adaxially, papery, abaxially slightly tomentose-villous along veins, glabrate in age, adaxially glabrous but hirsute along midvein, base broadly cuneate to subcordate, margin undivided, unevenly sharply serrate, apex long acuminate. Inflorescences terminal, corymbose racemes, 3–6 cm, 5–9-flowered; rachis and pedicels tomentose-villous, with small prickles, with few to many shortly stalked glands; bracts narrowly oblong to ovate, 6–9 × 2–4 mm, soft hairy, margin apically divided or with few teeth along margin. Pedicel 1.5–2.5 cm. Flowers 1–1.5 cm in diam. Calyx campanulate, abaxially tomentose, unarmed or with sparse, minute needle-like prickles, sometimes with shortly stalked glands; sepals erect-spreading after anthesis, triangular-ovate, 5–8 × 2–3 mm, margin usually undivided, apex acute. Petals obovate, 5–7 × 5–6 mm, both surfaces soft hairy, base shortly clawed. Stamens numerous, shorter than petals; filaments linear, broadened and flattened basally. Pistils slightly shorter than or nearly as long as stamens; style and ovary glabrous. Aggregate fruit subglobose, 7–10 mm, glabrous; pyrenes reniform, smooth or somewhat shallowly rugose. Fl. Jun–Jul, fr. Aug–Sep. $2n = 28^*$.

• Mountains; 2000–2800 m. C Taiwan.

179. *Rubus wardii* Merrill, Brittonia 4: 84. 1941.

大花悬钩子 da hua xuan gou zi

Rubus gigantiflorus H. Hara; *R. gigantiflorus* var. *chiliocanthus* Handel-Mazzetti; *R. gigantiflorus* var. *pluvialis* Handel-Mazzetti; *R. hookeri* Focke; *R. macrocarpus* King ex C. B. Clarke (1876), not Bentham (1844), nor Gardner (1847).

Shrubs or subshrubs, prostrate, low, ca. 80 cm tall. Branchlets brown or reddish brown, terete, with soft hairs, glandular hairs, and sparse, needle-like or small curved prickles. Leaves compound, 3-foliolate; petiole 4–6 cm, petiolule of terminal leaflet to 1 cm, lateral leaflets shortly petiolulate, with sparse, soft hairs, intermixed glandular hairs and needle-like prickles; stipules free, brown, 8–10 mm, palmatipartite to middle or base; lobes linear-lanceolate, soft hairy, with glandular hairs; blade of leaflets variable, terminal one rhombic-ovate, 6–10 × 4–6 cm, base cuneate, apex acuminate to caudate, lateral leaflets suborbicular or ovate, ca. 1/2 as long and wide as terminal one or smaller, both surfaces soft hairy along veins, abaxially with minute prickles along veins, base obliquely rounded, margin sometimes lobed, unevenly obtusely serrate, apex acute or obtuse. Inflorescences terminal, 1-flowered, rarely flowers in clusters of 2 or 3; bracts 7–9 mm, palmatipartite; lobes linear to linear-lanceolate, with glandular hairs and soft hairs. Pedicel 3–4 cm, with soft hairs, glandular hairs, and needle-like prickles. Flowers 3–4 cm in diam. Calyx abaxially with sparse, soft hairs, glandular hairs, and needle-like prickles; sepals erect, triangular-ovate, 1.5–2(–2.5) cm × 5–8 mm, apex caudate; outer sepals usually apically lacinate; lobes linear, inner sepals sometimes entire. Petals greenish white, suborbicular or obovate, 7–9 mm in diam., much shorter than sepals. Stamens many, much shorter than petals; anthers oblong. Pistils numerous, densely glomerate; ovary densely tomentose-villous. Aggregate fruit somewhat green at maturity, globose, 1.3–2(–2.5) cm in diam., densely brownish yellow tomentose-villous, outer drupelets dry, inner drupelets fleshy; pyrenes furrowed-rugose. Fl. Jun–Jul, fr. Aug–Sep.

Mixed forests, valleys, rocky slopes; 1800–3000 m. SE Xizang, NW Yunnan [Bhutan, N Myanmar, Sikkim].

180. *Rubus metoensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 498. 1980.

墨脱悬钩子 mo tuo xuan gou zi

Shrubs small. Branchlets arching, reddish brown, terete, with soft hairs and needle-like prickles. Leaves compound, 3-foliolate, sometimes simple at apex of flowering branchlets; petiole 2–3.5 cm, terminal leaflet shortly petiolulate, lateral leaflets subsessile, with soft hairs and needle-like prickles; stipules free, deeply lobed; lobes linear-lanceolate, soft hairy; blade of leaflets 3.5–7 × 2–4.5 cm, lateral veins 5–7 pairs, slightly raised abaxially, terminal one rhombic-ovate, apex shortly acuminate, lateral leaflets ovate or elliptic, apex acute, abaxially pubescent and with needle-like prickles along veins, adaxially sparsely appressed pubescent, base cuneate to rounded, margin unevenly coarsely obtusely serrate. Inflorescences axillary, usually 1-flowered in leaf axils; bracts smaller than stipules, deeply lobed; lobes linear-lanceolate, soft hairy. Pedicel ca. 1 cm, pu-

bescent, with needle-like prickles. Flowers 1–1.5 cm in diam. Calyx purplish brown, abaxially sparsely pubescent; tube abaxially with sparse, needle-like prickles; sepals triangular-lanceolate, apex caudate and with 3 linear lobes, outer sepals sometimes entire. Stamens many; filaments linear or slightly broader basally. Pistils few, shorter than stamens; ovary gray tomentose. Fruit not seen. Fl. Jul–Aug.

- Mixed forests, thickets; ca. 2500 m. SE Xizang (Médog Xian).

181. *Rubus jambosoides* Hance, Ann. Sci. Nat. Bot., ser. 4, 15: 222. 1861.

蒲桃叶悬钩子 pu tao ye xuan gou zi

Shrubs scandent, 1–3 m tall. Branchlets brownish or grayish brown, terete, glabrous, with sparse, curved prickles. Leaves simple; petiole robust, 5–10 mm, glabrous; stipules early caducous, ovate or elliptic, glabrous; blade lanceolate, 8–12 × 1.5–3 cm, veins obscure, lateral veins 6–8 pairs, leathery, both surfaces glabrous, abaxially with sparse, curved prickles along midvein, base rounded or subtruncate, margin subentire or with sparse, smaller teeth, apex caudate. Inflorescences axillary, 1-flowered; bracts ovate or elliptic, glabrous, margin entire. Pedicel 5–10 mm, glabrous. Flowers 1–1.8 cm in diam. Calyx greenish red, abaxially glabrous; sepals triangular-lanceolate, 7–11 mm, outer sepals with gray tomentose margin, apex acuminate. Petals white, oblong, longer than sepals, base clawed,

apex obtuse. Stamens shorter than petals; filaments purplish red, broad, complanate. Pistils 50–70 or slightly more, slightly shorter than or nearly as long as stamens; ovary and base of style densely finely pubescent. Aggregate fruit red, ovoid-globose, ca. 1 cm in diam., densely finely gray pubescent; pyrenes smooth or slightly rugulose. Fl. Feb–Mar, fr. Apr–May.

- Roadsides on mountains, ravines; low elevations. Fujian, Guangdong, Hunan.

182. *Rubus lohfauiensis* F. P. Metcalf, Lingnan Sci. J. 19: 29. 1940.

罗浮山悬钩子 luo fu shan xuan gou zi

Shrubs scandent. Branchlets terete, yellowish tomentose, nearly unarmed. Leaves simple; petiole 2–2.5 cm, tomentose; stipules caducous; blade lanceolate, 9–12 × 3–4 cm, lateral veins 8 or 9 pairs, abaxially whitish tomentose, adaxially remotely papillose-pilose, minutely glandular, base deeply cordate to subauriculate, margin aristate-serrate, apex acuminate. Inflorescences 1-flowered, axillary, or terminal at apex of small reduced branchlets. Pedicel ca. 1 cm, tomentose. Calyx abaxially tomentose; sepals ovate. Petals obovoid to oblong, strigose. Aggregate fruit subglobose, ca. 1 cm in diam., with few large drupelets, glabrous. Fl. and fr. Aug.

- Cliffs. Guangdong (Luofu Shan).

This species is incompletely known.

5. *Rubus* sect. *Dalibardastrum* (Focke) T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 463. 1982.

刺毛莓组 ci mao mei zu

Rubus subgen. *Dalibardastrum* Focke, Biblioth. Bot. 17(Heft 72): 39. 1910.

Shrubs or subshrubs, usually densely bristly, less often with needle-like or small prickles. Leaves simple; stipules persistent or caducous, free, on stem near base of petiole, broad, divided. Flowers bisexual, usually in cymose panicles or short subracemes or several in clusters or solitary. Aggregate fruit adnate to torus, falling from base of torus at maturity, not hollow.

Eleven species (ten endemic) in China.

- 1a. Terminal inflorescences large broad cymose panicles with numerous flowers.
 - 2a. Leaves glabrous abaxially, ovate-lanceolate or elliptic-lanceolate, not divided; flowers with petals 185. *R. wuzhianus*
 - 2b. Leaves tomentose or pubescent abaxially, narrowly ovate or suborbicular; flowers with or without petals.
 - 3a. Leaves narrowly ovate, abaxially tomentose, margin undivided or slightly undulate; flowers usually apetalous 183. *R. jinshoshanensis*
 - 3b. Leaves suborbicular, abaxially pubescent, margin 3–5-lobed, lobes triangular; flowers with petals 184. *R. lobatus*
- 1b. Terminal inflorescences subracemes with few flowers or flowers several in clusters or solitary.
 - 4a. Leaves abaxially tomentose.
 - 5a. Leaves 3–5-lobed, suborbicular or broadly ovate, deciduously tomentose, but hairs persistent abaxially in age; stipules broader, 1–1.5 cm, palmately parted 188. *R. tsangorum*
 - 5b. Leaves undivided or lobed, abaxially persistent tomentose; stipules narrowly ovate to ovate-lanceolate, 1.5–2 cm, margin pinnately laciniate lobed.
 - 6a. Leaves ovate to oblong, bristly on both surfaces, not divided or somewhat undulate, coarsely sharply serrate; stipules tomentose, villous; flowers 2–3 cm in diam. 186. *R. tricolor*
 - 6b. Leaves suborbicular to ovate, bristly only abaxially, margin 3–5-lobed, sharply serrulate; stipules tomentose; flowers 1–2 cm in diam. 187. *R. multisetosus*
 - 4b. Leaves abaxially pubescent or subglabrous.
 - 7a. Flowers solitary or in clusters of 2–4, terminal or axillary; leaves broadly ovate, undivided, rarely lobed; outer sepals usually not lobed.
 - 8a. Plants with stalked glands; leaves acute to acuminate apically, both surfaces glabrous or nearly so; pedicel 2–4 cm; sepals triangular-lanceolate, 0.8–1.4 cm 192. *R. ourosepalus*
 - 8b. Plants without stalked glands; leaves obtuse, rarely acute apically, both surfaces sparsely villous; pedicel 5–10 mm; sepals broadly ovate, 7–8 mm 193. *R. polyodontus*

- 7b. Flowers 4–12 in terminal subracemes or several in clusters; leaves suborbicular or broadly narrowly ovate, lobed; outer sepals usually divided.
- 9a. Leaves broadly narrowly ovate, terminal lobe several × as long as lateral lobes, apically shortly acuminate, rarely acute, lateral lobes obtuse; flowers 1–1.5 cm in diam.; stipules deeply laciniate; sepals narrowly lanceolate; outer sepals 2- or 3-lacinate 191. *R. amphidasys*
- 9b. Leaves orbicular or suborbicular, terminal lobe slightly longer than or as long as lateral lobes, acute, obtuse, or rounded; flowers 1.5–2(–2.5) cm in diam.; stipules palmately parted to middle or nearly to base; sepals narrowly ovate, narrowly ovate-lanceolate, or broadly ovate-lanceolate to oblong-ovate; outer sepals leaflike, laciniate, pinnately divided, or dissected apically.
- 10a. Leaves 3–5-lobed, terminal lobe acute apically, lateral lobes obtuse, rarely acute, margin coarsely serrate; stipules palmatipartite nearly to base; sepals narrowly ovate or narrowly ovate-lanceolate; outer sepals leaflike, lacinate or pinnately divided 189. *R. treutleri*
- 10b. Leaves 5(–7)-lobed, lobes obtuse to rounded apically, margin sharply serrate; stipules palmatipartite to middle or ca. 1/3 their length; sepals broadly ovate-lanceolate to oblong-ovate; outer sepals dissected apically 190. *R. fanjingshanensis*

183. *Rubus jinshoshanensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 463. 1982.

金佛山悬钩子 *jin fo shan xuan gou zi*

Shrubs scandent, 2–5 m tall. Branchlets brownish to dark brown, tomentose, bristly, bristles purplish red, sometimes with intermixed glandular hairs. Leaves simple; petiole 2–3.5 cm, tomentose, bristly, bristles purplish red, or with intermixed glandular hairs; stipules caducous, free, lanceolate or ovate-lanceolate, 7–11 mm, margin laciniate, tomentose, bristly; blade narrowly ovate, 8–12 × 5–9 cm, veins yellowish brown, raised abaxially, adaxially densely yellowish gray tomentose, bristly along midvein, adaxially glabrous or soft hairy only along veins, base cordate, margin unevenly coarsely sharply serrate, undivided or slightly undulate, apex shortly acuminate. Inflorescences terminal or axillary, terminal ones cymose panicles, to 24 cm, many flowered, axillary ones smaller; rachis and pedicels bristly, bristles purplish red, tomentose or with glandular hairs; bracts lanceolate, 5–9 mm, margin shallowly lacinate, tomentose, bristly. Pedicel 5–8 mm. Flowers 1–1.5 cm in diam. Petals usually absent. Sepals lanceolate or ovate-lanceolate, 6–9 × 2–4 mm, both surfaces yellowish gray tomentose, margin entire, apex acuminate. Stamens many, shorter than sepals; filaments linear. Pistils less than 20, slightly shorter than or nearly as long as stamens; ovary glabrous. Fruit unknown. Fl. Jun–Jul.

• Rocky slopes, forest margins; 1600–2100 m. Chongqing (Jinshan), SE Yunnan (Hekou Xian).

184. *Rubus lobatus* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 20: 464. 1982.

五裂悬钩子 *wu lie xuan gou zi*

Shrubs scandent, 1–2 m tall. Branchlets brownish, terete, densely villous, bristly, unevenly glandular hairy, with sparse, small basally broad prickles. Leaves simple; petiole 4–8 cm, with reddish purple glandular hairs, bristly, villous; stipules caducous, free, brown, 1–1.5 cm, villous, with glandular hairs, palmatipartite; lobes lanceolate or linear-lanceolate; blade suborbicular, 10–20 cm in diam. and ca. as long, palmately 5-veined, lateral veins 4 or 5 pairs, both surfaces soft hairy, with reddish brown glandular hairs and bristles along veins, base cordate, margin 3–5-lobed; lobes triangular, terminal lobe slightly larger than lateral lobes, irregularly sharply serrate,

apex acute to shortly acuminate. Inflorescences terminal or axillary, terminal ones cymose panicles, large, to 20 cm, axillary ones narrow panicles or subracemes, shorter; rachis, pedicels, and abaxial surface of calyx with dense reddish brown glandular hairs, bristles and long hairs; bracts 1–1.4 cm, villous, with glandular hairs, palmatipartite; lobes lanceolate or linear-lanceolate. Pedicel 0.8–1.5 cm. Flowers 1–1.5 cm in diam. Sepals erect in fruit, narrowly lanceolate, 1–1.5 cm, margin slightly tomentose, apex caudate, outer sepals often shallowly lacinate; lobes linear. Petals white, broadly obovate, shorter than sepals, base clawed. Stamens many; filaments linear; anthers villous. Ovary glabrous; styles longer than stamens. Aggregate fruit subglobose, red, ca. 1 cm in diam., glabrous, enclosed in calyx; pyrenes slightly rugose. Fl. Jun–Jul, fr. Aug–Sep.

• Roadsides in mountains, valleys, thickets; low to medium elevations. Guangdong, Guangxi.

185. *Rubus wuzhianus* L. T. Lu & Boufford, *nom. nov.*

锯叶悬钩子 *ju ye xuan gou zi*

Replaced synonym: *Rubus serrulatus* Wuzhi, Fl. Hupeh. 2: 192. 1979, not Foerster (1878), nor Lindeberg ex Areschoug (1886); *R. serratifolius* T. T. Yu & L. T. Lu (1985), not P. J. Müller & Lefèvre (1859).

Shrubs scrambling, lianoid. Branchlets purplish brown, terete, with dense purplish red long bristles and stalked glands, with sparse, hooked minute prickles. Leaves simple; petiole 1–2 cm, with dense purplish red long bristles and with sparse, small prickles; stipules caducous, free, brown, oblong, 1–1.8 cm, apex entire or with few teeth; blade ovate-lanceolate or elliptic-lanceolate, 12–17 × 5–9 cm, lateral veins 7–9 pairs, both surfaces glabrous, abaxially with minute hooked prickles along veins, base cordate, margin irregularly coarsely sharply serrate, apex caudate. Inflorescences terminal, lax cymose panicles, large; rachis and pedicels with dense purplish red long bristles and stalked glands; bracts oblong or ovate-lanceolate, 1–1.6 cm, margin entire or serrate. Pedicel 2–4 cm. Flowers 1.2–2 cm in diam. Calyx abaxially densely yellowish tomentose, purplish red bristly, with stalked glands; sepals reflexed after anthesis, ovate-lanceolate, to 1 cm, apex caudate, outer sepals apically 2- or 3-lacinate, inner sepals entire. Petals white, suborbicular or broadly elliptic, thinly pubescent, base barely clawed. Stamens

many; filaments linear or somewhat broader basally; anthers sericeous-villous. Pistils nearly as long as or slightly longer than stamens; ovary soft hairy apically, glabrescent. Aggregate fruit reddish black, subglobose, glabrous; pyrenes coarsely rugose. Fl. May–July, fr. July–Aug.

• Montane thickets, forest margins in valleys; 1000–1500 m. Hubei, Hunan.

186. *Rubus tricolor* Focke, Biblioth. Bot. 17(Heft 72): 40. 1910.

三色莓 san se mei

Shrubs 1–4 m tall, with climbing or creeping branches. Branchlets brown to dark reddish brown, terete, tomentose, yellowish brown bristly or with intermixed glandular hairs. Leaves simple; petiole 1.5–3.5 cm, tomentose, bristly, with glandular hairs; stipules persistent, free, ovate-lanceolate to narrowly oblong, 1–2 cm × 4–8 mm, margin pinnate-laciniate; lobes lanceolate, tomentose, with intermixed long hairs along veins, hairs deciduous, sometimes sparsely bristly; blade ovate to oblong, 6–12 × 3–8 cm, veins raised abaxially, abaxially yellowish gray tomentose, yellowish brown bristly along veins, adaxially dark green, glabrous but sparsely bristly between veins, base subrounded to cordate, margin undivided or slightly undulate, unevenly coarsely sharply serrate, apex shortly acuminate. Inflorescences terminal, short subracemes, 3–5 cm, several flowered or flowers solitary in leaf axils; rachis and pedicels tomentose, purplish red bristly, or with glandular hairs; bracts narrowly ovate or ovate-lanceolate, 0.9–1.6 cm × 4–7 mm, pinnate-laciniate; lobes linear to lanceolate, abaxially tomentose-villous, bristly, initially with glandular hairs. Pedicel 5–10 mm. Flowers 2–3 cm in diam. Calyx abaxially yellowish brown tomentose, bristly; sepals lanceolate, 0.8–1.2 cm × 4–6 mm, margin entire or laciniate, apex acuminate. Petals white, obovate or obovate-oblong, 7–9 × 5–7 mm, base shortly clawed, apex emarginate or shortly pointed. Stamens many, shorter than petals. Pistils longer than stamens, glabrous. Aggregate fruit bright red, subglobose, 1.5–1.7 cm in diam.; pyrenes rugose. Fl. Jun–Jul, fr. Aug–Sep. $2n = 28^*$.

• Slopes, forests, thickets; 1800–3600 m. Sichuan, Yunnan.

187. *Rubus multisetosus* T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 37: 201. 1985.

刺毛悬钩子 ci mao xuan gou zi

Rubus polytrichus Franchet (1890), not Progel (1882).

Shrubs low, to 50 cm tall, with creeping branches. Branchlets brown to grayish brown, terete, tomentose, yellowish brown bristly or with intermixed stipitate glands. Leaves simple; petiole 1.5–3 cm, tomentose, bristly, or stipitate glandular; stipules persistent, free, ovate-lanceolate or narrowly ovate, 1–1.6 cm × 5–9 mm, abaxially tomentose, bristly, shallowly pinnate-laciniate; blade ovate to suborbicular, 3–6 × 3–5.5 cm, veins raised abaxially, abaxially densely yellowish white tomentose, yellowish brown bristly along veins, adaxially glabrous, base cordate, margin 3–5-lobed, sharply doubly serrulate, apex acute. Inflorescences terminal, short subracemes, 3–5 cm, several flowered, or flowers solitary in leaf axils; bracts ovate-lanceolate or narrowly ovate, 0.8–1.5 cm × 4–8 mm, tomentose when young,

bristly, laciniate. Pedicel 5–10 mm. Flowers 1–2 cm in diam. Calyx abaxially tomentose, bristly or stipitate glandular; sepals erect at anthesis, later enclosing fruit, lanceolate, 0.9–1.4 cm × 3.5–6 mm, apex acuminate, outer sepals usually laciniate apically, inner sepals entire. Petals white, broadly ovate to oblong, 7–11 × 5–8 mm, abaxially sparsely tomentose, base shortly clawed. Stamens many, shorter than petals; filaments broad, complanate. Pistils slightly shorter than or nearly as long as stamens; ovary glabrous. Aggregate fruit subglobose, glabrous, with many drupelets and persistent styles; pyrenes slightly rugose. Fl. Jun–Jul, fr. Aug–Sep.

• Montane forests and valleys, grasslands, roadsides, near water courses; 2200–3000 m. NW Yunnan.

188. *Rubus tsangorum* Handel-Mazzetti, Symb. Sin. 7: 485. 1933.

东南悬钩子 dong nan xuan gou zi

Shrubs lianoid, low, 0.3–1.5 m tall. Branchlets brownish to dark brown, terete, villous, unevenly with purplish red glandular hairs and bristly, sometimes with sparse, needle-like prickles. Leaves simple; petiole 4–8 cm, villous, with purplish red glandular hairs; stipules free, 1–1.5 cm, palmatipartite; lobes linear or linear-lanceolate, villous, with glandular hairs; blade suborbicular or broadly ovate, 6–14 cm in diam., abaxially thinly tomentose, with intermixed long hairs and sparse, glandular hairs along veins, glabrescent, adaxially villous, with sparse, intermixed glandular hairs along midvein, base deeply cordate, margin distinctly 3–5-lobed, lateral lobes broadly triangular, apex obtuse or acute, terminal lobe slightly larger than lateral lobes, broadly triangular-ovate, margin unevenly coarsely sharply serrate, apex acute or shortly acuminate. Inflorescences terminal or axillary, subracemes, 5–20-flowered, terminal ones 8–13 cm, lateral ones shorter; rachis, pedicels, and abaxial surface of calyx villous and with purplish red glandular hairs; bracts 0.8–1.2 cm, palmatipartite; lobes linear, villous, with glandular hairs. Pedicels unequal in length, longer ones to 2.5 cm, shorter ones 5–6 mm. Flowers 1–2 cm in diam. Calyx tube cupular, ca. 5 mm; sepals erect in fruit, narrowly triangular-lanceolate, 7–12 × 3–5 mm, apex long acuminate and deeply divided into 2 or 3 lanceolate lobes. Petals white, broadly obovate, 6–7 mm, base barely clawed. Stamens ca. 5 mm; filaments linear. Pistils many, much longer than stamens; ovary glabrous. Aggregate fruit red, subglobose, glabrous; pyrenes distinctly rugose. Fl. May–Jul, fr. Aug–Sep.

• Sparse montane forests and thickets; 200–1200 m. Anhui, Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang.

189. *Rubus treutleri* J. D. Hooker, Fl. Brit. India 2: 331. 1878.

滇西北悬钩子 dian xi bei xuan gou zi

Rubus arcuatus Kuntze; *R. rosulans* Kuntze; *R. tongloensis* Kuntze.

Shrubs low, 0.5–1 m tall. Branches grayish brown, brown or blackish brown, villous, purplish red stipitate glandular, with sparse, needle-like prickles. Leaves simple; petiole 2.5–5.5 cm, with dense purplish red stipitate glands, long hairs, and sparse, needle-like prickles; stipules free, 1–1.5 cm, palmatipartite nearly to base; lobes linear to linear-lanceolate, villous, stipitate

glandular; blade suborbicular, 6–12 cm in diam., abaxially densely tomentose-villous when young, glabrate in age, sparsely stipitate glandular along veins, adaxially sparsely villous but more densely so along veins, with sparse, stipitate glands along veins, base deeply cordate, margin 3–5-lobed, terminal lobe slightly larger than lateral lobes, margin irregularly coarsely serrate, apex acute, lateral lobes obtuse, rarely acute. Inflorescences terminal, subracemes, 3–4 cm or slightly longer, several to more than 10-flowered, or flowers few in clusters in leaf axils; rachis, pedicels, and abaxial surface of calyx densely villous, stipitate glandular; bracts 1–1.3 cm, palmatipartite; lobes linear, villous, stipitate glandular. Pedicel 5–10 mm. Flowers 1.5–2(–2.5) cm in diam. Calyx tube cupular, ca. 5 mm; sepals narrowly ovate or narrowly ovate-lanceolate, 0.8–1.5 cm × 5–7 mm, apex acuminate, outer sepals leaflike, margin laciniate or pinnately divided into lanceolate lobes, inner sepals entire. Petals pink, suborbicular, 8–11 mm in diam., barely clawed. Stamens many, shorter than petals; filaments broad, flat. Pistils nearly as long as stamens; ovary and style glabrous. Aggregate fruit red, globose, 8–10 mm in diam., enclosed in calyx; pyrenes densely rugulose. Fl. Jun–Jul, fr. Aug–Sep.

Forests, forest margins; 2300–3400 m. S Xizang (Yadong Xian), NW Yunnan [Bhutan, Nepal, Sikkim].

190. *Rubus fanjingshanensis* L. T. Lu ex Boufford et al., J. Arnold Arbor. 71: 123. 1990.

梵净山悬钩子 fan jing shan xuan gou zi

Shrubs trailing, small. Branchlets brown to brownish, dark brown in age, terete, villous, with thin needle-like prickles slightly dilated at base, with stalked glands. Leaves simple; petiole 4–8 mm, villous, with needle-like prickles, stipitate glandular; stipules free, 1.4–1.8 × 1–1.4 cm, both surfaces villous, with glandular hairs, palmatipartite 1/3–1/2 to base; lobes lanceolate to triangular-lanceolate, 3–7 × 1.3–3 mm; blade orbicular or suborbicular, 7–11 × 6.5–11 cm, veins raised abaxially, abaxially pale, adaxially dark green, both surfaces appressed villous, more densely so abaxially, veins glabrescent, sparsely hairy in age, abaxially with needle-like prickles, sometimes with sparse, intermixed stalked glands, base deeply cordate, margin 5(–7)-lobed; lobes obtuse to rounded, terminal lobe slightly longer than or ca. as long as lateral lobes, margin irregularly sharply serrate. Inflorescences not seen; infructescences terminal, short racemes, 4–5 cm, or clusters in leaf axils; rachis, fruiting pedicel, and abaxial surface of calyx villous, with needle-like prickles, sometimes with sparse, intermixed stipitate glands; bracts similar to stipules, but smaller. Fruiting pedicel 8–11 mm. Calyx tube cupular; sepals 5, broadly ovate-lanceolate to oblong-ovate, 0.8–1.4 cm × 4–6 mm, outer sepals dissected apically; lobes linear to linear-lanceolate, 2–5 × 1–1.5 mm, apex caudate. Stamens many, 3–4 mm; filaments somewhat broadened basally; anthers globose or shortly oblong. Pistils numerous, glabrous; torus raised, long hairy. Aggregate fruit red, subglobose, 7–10 mm in diam., glabrous, with many united drupelets, crowned with persistent calyx; pyrenes subreniform, 1.5–2.5 × 1–1.8 mm, distinctly rugose. Fl. not seen, fr. Aug–Sep.

• Mountains; 2000–2300 m. NE Guizhou (Fanjing Shan, Jiangkou Xian).

191. *Rubus amphidasys* Focke, Bot. Jahrb. Syst. 29: 396. 1900.

周毛悬钩子 zhou mao xuan gou zi

Rubus chaffanjonii H. Léveillé & Vaniot.

Shrubs trailing, small, 0.3–1 m tall. Branchlets reddish brown, with dense reddish brown long stipitate glands, soft bristles, and long yellowish hairs, usually unarmed. Leaves simple; petiole 2–5.5 cm, with reddish brown long glandular hairs, soft bristles and yellowish villous; stipules free, 0.8–1.5 cm, deeply laciniate; lobes lanceolate or linear, with long glandular hairs, villous; blade broadly to narrowly ovate, 5–11 × 3.5–9 cm, both surfaces villous, base cordate, margin 3–5-lobed, terminal lobe much larger and longer than lateral lobes, apex shortly acuminate, rarely acute, lateral lobes obtuse, unevenly sharply serrate. Inflorescences terminal or axillary, subracemes, 6–12 cm, 5–12-flowered, rarely flowers in clusters of 3–5; rachis, pedicels, and abaxial surface of calyx with dense reddish brown long glandular hairs, soft bristles, and yellowish long hairs; bracts 6–9 mm, lobed; lobes linear or lanceolate, villous, stipitate glandular. Pedicel 5–14 mm. Flowers 1–1.5 cm in diam. Calyx tube ca. 5 mm; sepals erect in fruit, narrowly lanceolate, 1–1.7 cm × 3–5 mm, apex caudate, outer sepals usually 2- or 3-lacinate. Petals white, broadly ovate to oblong, 4–7 × 3–5 mm, base barely clawed, margin premorse or coarsely serrate. Stamens many; filaments broad, complanate. Pistils longer than stamens; ovary glabrous. Aggregate fruit dark red, compressed globose, ca. 1 cm in diam., glabrous, enclosed in persistent calyx; pyrenes rugose. Fl. May–Jun, fr. Jul–Aug.

• Slopes, roadsides, shrub and bamboo thickets; 400–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Zhejiang.

192. *Rubus ourosepalus* Cardot, Notul. Syst. (Paris) 3: 290. 1914.

宝兴悬钩子 bao xing xuan gou zi

Shrubs lianoid, small, 0.4–1 m tall. Branchlets brown or reddish brown, with needle-like prickles, glandular hairs, and sparse, soft hairs. Leaves simple; petiole 2.5–5.5 cm, with needle-like prickles, glandular hairs, and soft hairs; stipules free, 7–10 mm, palmatipartite nearly to base; lobes linear-lanceolate or linear, with glandular hairs, intermixed with soft hairs; blade broadly ovate, 5–11 × 3.5–8 cm, both surfaces glabrous or subglabrous, with sparse, needle-like prickles along veins, base cordate, margin undivided, rarely lobed, sharply serrate, with sparse, glandular hairs, apex acute to acuminate. Inflorescences terminal and axillary, 1-flowered or flowers in clusters of 2–4; bracts 5–8 mm, palmatipartite nearly to base; lobes linear or subulate, soft hairy and stipitate glandular. Pedicel 2–4 cm, with needle-like prickles, stipitate glandular and soft hairy. Flowers 1–1.5 cm in diam. Calyx abaxially with needle-shaped prickles, stipitate glands, and soft hairs; tube pelviform; sepals erect in fruit, triangular-lanceolate, 0.8–1.4 cm, margin entire, rarely 2-lobed, apex subulate-acuminate. Petals white, ovate, 5–8 × 4–5 mm, base with claws nearly absent, apex acute. Stamens many, arranged in several whorls; filaments broad, flat. Pistils shorter than stamens; apex of ovary and base of style thinly pubescent when young, gradually glabrescent. Aggregate fruit red, dry,

semiglobose, enclosed in persistent calyx; pyrenes rugose or smooth. Fl. Jun–Jul, fr. Aug–Sep.

- Montane thickets; ca. 3000 m. C Sichuan (Baoping Xian).

193. *Rubus polyodontus* Handel-Mazzetti, Symb. Sin. 7: 484. 1933.

多齿悬钩子 duo chi xuan gou zi

Shrubs low, 20–40 cm tall. Branches grayish brown to dark brown, creeping, rooting at nodes; branchlets sparsely villous, with straight needle-like prickles. Leaves simple; petiole 2–3(–5) cm, villous, with straight needle-like prickles; stipules free, to 8 mm, villous, deeply divided nearly to base; lobes linear to linear-lanceolate; blade broadly ovate, 3–8 × 2.5–6 cm,

both surfaces sparsely villous, abaxially with sparse, needle-like prickles along midvein, base cordate, margin undivided or slightly incised, unevenly serrate, apex obtuse, rarely acute. Inflorescences terminal or axillary, 1-flowered or flowers in clusters of 3 or 4; bracts 5–7 mm, villous, deeply lobed; lobes linear to linear-lanceolate. Pedicel 5–10 mm. Calyx to 1.2 cm, sparsely villous, with needle-like prickles; sepals broadly ovate, 7–8 × 3–5 mm, margin tomentose, entire, apex caudate-acuminate or with leaflike appendages. Petals rose, obovate, 5–6 mm and ca. as broad, glabrous. Stamens ca. 30; filaments ca. 2 mm. Pistils more than 10; ovary soft hairy apically. Aggregate fruit dry, consisting of few drupelets, enclosed in persistent calyx; pyrenes smooth. Fl. Jul–Aug, fr. Sep–Oct.

- Bamboo thickets, forest margins; 2300–3200 m. NW Yunnan.

6. *Rubus* sect. *Chamaebatus* Focke, Abh. Naturwiss. Vereine Bremen 4: 145. 1874.

矮生莓组 ai sheng mei zu

Subshrubs or perennial creeping herbs, with creeping stems, with needle-like prickles or bristles. Leaves simple; stipules persistent, free at junction of stem and petiole, divided or undivided. Flowers bisexual, several in clusters or solitary. Aggregate fruit adnate to torus, falling away from base of torus at maturity, not hollow.

Five species (one endemic) in China.

- 1a. Stipules undivided, margin or apex toothed or entire; leaves orbicular-ovate or suborbicular, abaxially soft hairy.
 - 2a. Plants with soft hairs and needle-like prickles; petiole 5–10 cm; flowers to 3 cm in diam.; sepals leaflike, outer sepals pinnately lobed or incised-serrate, inner sepals serrate or entire 194. *R. calycinus*
 - 2b. Plants with soft hairs and reddish brown bristles; petiole 2–5 cm; flowers 1.5–2.3 cm in diam.; sepals ovate-lanceolate, apex often shallowly lacinate, rarely undivided 195. *R. pectinarioides*
- 1b. Stipules pectinately or pinnately lacinate; leaves broadly ovate to suborbicular.
 - 3a. Leaves abaxially tomentose; stipules pectinately or palmately lacinate; stems, petioles, pedicel, and calyx tomentose and with sparse, needle-like prickles; sepals ovate or triangular-lanceolate, apex often lacinate 196. *R. rolfei*
 - 3b. Leaves abaxially villous; stipules pectinately parted or deeply digitately divided; stems, petioles and pedicel villous and with soft bristles or villous and with sparse, needle-like prickles; abaxial surface of calyx densely minute tomentose and bristly, or with sparse, glandular hairs; sepals lanceolate or broadly lanceolate, entire or with few serrations or deeply divided or incised.
 - 4a. Stipules pectinately parted; stems, petioles, and pedicels villous and with soft bristles; abaxial surface of calyx densely minutely tomentose and bristly, or with sparse, glandular hairs; sepals lanceolate, margin entire 197. *R. pectinarius*
 - 4b. Stipules deeply digitately divided; stems, petioles, pedicel, and calyx villous and with sparse, needle-like prickles; outer sepals broader, deeply divided or incised, inner sepals narrower, margin few-serrate or entire 198. *R. pectinellus*

194. *Rubus calycinus* Wallich ex D. Don, Prodr. Fl. Nepal. 235. 1825.

齿萼悬钩子 chi e xuan gou zi

Dalibarda calycina (Wallich ex D. Don) Seringe.

Herbs creeping, 15–20 cm tall, main stems creeping, to 2–3 m long, rooting at nodes, with erect sparsely branched or unbranched laterals. Stems with sparse, needle-like prickles or nearly unarmed, with sparse hairs. Leaves simple; petiole 5–10 cm, villous, with needle-like prickles; stipules ovate, rarely obovate, 0.8–1.3 cm × 6–11 mm, margin shallowly coarsely serrate, rarely entire; blade orbicular-ovate or suborbicular, 2.5–6 cm in diam., both surfaces pilose when young, gradually glabrescent, hairy only along veins in age, abaxially with needle-like prickles along veins, base deeply cordate, margin undulate

or shallowly 3–5-lobed, irregularly coarsely serrate, apex obtuse or rounded. Inflorescences usually terminal, 1- or 2-flowered; bracts ovate, 6–10 × 5–9 mm, coarsely serrate, very rarely entire. Pedicel 3–5 cm, usually villous, with needle-like prickles. Flowers to 3 cm in diam. Calyx abaxially with soft hairs and straight subulate prickles; tube broadly pelviform, 3.5–5 mm in diam.; sepals leaflike, narrowly ovate to elliptic, 0.8–1.4 cm × 6–11 mm, outer sepals broader, pinnately lobed or incised-serrate, inner sepals narrower, apex or margin coarsely incised-serrate, sometimes entire. Petals white, obovate to elliptic, slightly shorter than sepals, adaxially puberulous, base clawed. Stamens ca. 30–40, shorter than petals; filaments to 6 mm; anthers ca. 1 mm. Pistils ca. 30–50(–70), slightly shorter than stamens; ovary glabrous; styles to 5 mm, glabrous. Aggregate fruit red to dark red, globose, 0.9–1.4 cm in diam., con-

sisting of few drupelets, enclosed in persistent calyx; pyrenes 3–4 mm, rugulose. Fl. May–Jun, fr. Jul–Aug.

Slopes, forests, forest margins; 1200–3000 m. Sichuan, S Xizang, Yunnan [Bhutan, NE India, Indonesia (Java), N Myanmar, Nepal, Sikkim].

195. *Rubus pectinarioides* H. Hara, J. Jap. Bot. 47: 111. 1972.

匍匐悬钩子 pu fu xuan gou zi

Subshrubs creeping, (5–)10–20 cm tall. Stems prostrate, rooting at nodes, soft hairy, bristly, usually unarmed. Leaves simple; petiole 2–5 cm, with soft reddish brown bristles and hairs; stipules ovate to elliptic, free, 8–10 mm, hairy, margin entire or rarely apically with few serrations, apex obtuse or acute; blade orbicular-ovate or suborbicular, 2–4 × 1.5–5 cm, both surfaces pilose, gradually glabrescent, abaxially soft bristly along veins, base deeply cordate, margin undulate or 3–5-lobed, unevenly sharply serrate, apically obtuse or rounded. Inflorescences usually terminal, 1-flowered or flowers in clusters of 2 or 3; bracts usually 2, opposite at middle of pedicel, ovate to elliptic, 5–8 mm, hairy, margin entire or apically lobed. Pedicel 3.5–6 cm, reddish brown bristly and soft hairy. Flowers 1.5–2.3 cm in diam. Calyx abaxially with dense, reddish brown soft bristles and hairs; tube cupular; sepals ovate-lanceolate, 0.8–1.3 cm × 4–5 mm, margin entire or outer sepals apically lobed, apex caudate. Petals pink, suborbicular or broadly obovate, 0.8–1.4 cm × 7–10 mm, base clawed, apex obtuse. Stamens many, shorter than petals; filaments broad, flat. Pistils nearly equal to stamens in length; style and ovary glabrous. Aggregate fruit red, subglobose, 1–1.5 cm in diam., glabrous, enclosed in persistent calyx; pyrenes smooth. Fl. Jul–Aug, fr. Sep–Oct.

Forests on rocky slopes, rocky stream sides in mountains; 2800–3300 m. SE Xizang, NW Yunnan [Bhutan, Sikkim].

196. *Rubus rolfei* S. Vidal, Phan. Cuming. Philipp. 171. 1885.

高山悬钩子 gao shan xuan gou zi

Rubus calycinoides Hayata ex Koidzumi (1913), not Kuntze (1879); *R. calycinoides* Hayata var. *macrophyllus* H. L. Li; *R. elmeri* Focke; *R. hayatae-koidzumii* Naruhashi; *R. pentalobus* Hayata; *R. rolfei* var. *lanatus* Hayata.

Subshrubs low, with creeping stems and ascending leafy shoots. Stems prostrate, rooting at nodes, densely tomentose-villous, with sparse, small prickles, sometimes nearly unarmed, glabrate in age. Leaves simple; petiole nearly as long as leaf blade, tomentose-villous, with sparse, needle-like prickles; stipules free, obovate to ± oblong, 7–12 mm, membranous, margin pectinately or palmately lacinate ca. 1/2 to middle at apex, abaxially hairy, adaxially glabrous; blade broadly ovate to suborbicular, 2–6(–9) × 2–5.5(–9) cm, venation pedate, lateral veins 4 or 5 pairs, raised abaxially, impressed adaxially, leathery, abaxially brownish gray tomentose, with long hairs and sparse, needle-shaped prickles along veins, adaxially dark greenish brown, usually sparsely hairy when young, later glabrous, bullate between veins, base cordate, basal incision to 1 cm deep, margin 3–5-lobed; lobes obtuse, unevenly crenate. Inflorescences terminal and axillary, 1- or few flowered; rachis and pedicels densely tomentose-villous, with sparse, needle-like

prickles; bracts obovate to ± oblong, 8–10 mm, apex palmately or pectinately lacinate, hairy. Pedicel 5–9 mm. Flowers to 2 cm in diam. Calyx 1–1.5 cm, abaxially tomentose-villous; sepals ovate or triangular-lanceolate, 8–10 × 4–7 mm, apex lacinate; lobes linear-lanceolate. Petals white, suborbicular or obovate, 7–10 × 6–8 mm, adaxially puberulous, base clawed. Stamens many; filaments to 5 mm; anthers to 1 mm, with few long hairs, rarely glabrous. Pistils fewer than stamens, glabrous. Aggregate fruit yellow to orange or reddish, globose, 1–1.4 × ca. 1 cm, fleshy, with reddish persistent calyx; drupelets obliquely ellipsoid; pyrenes rugose; seeds reniform. Fl. Jun–Jul, fr. Aug–Sep. $2n = 28^*$, 42^* .

Open places, mixed forests; 1300–3800 m. Taiwan [Philippines].

197. *Rubus pectinarius* Focke, Biblioth. Bot. 17(Heft 72): 21. 1910.

梳齿悬钩子 shu chi xuan gou zi

Rubus allophyllus Hemsley, p.p.

Shrubs creeping, 20–40 cm tall. Stems reddish brown to purplish brown, slender, soft hairy, sometimes sparsely soft bristly. Leaves simple; petiole 3–6 cm, villous or with sparse, intermixed soft bristles; stipules free, broadly ovate, 5–10 × 4–8 mm, sparsely soft hairy, pectinately lobed; lobes lanceolate; blade suborbicular, 3–6 × 3.5–6.5 cm, both surfaces villous, gradually glabrescent, with only sparse hairs along veins in age, base deeply cordate, margin 2- or 3-lobed, crenate or doubly serrate, apex obtuse. Inflorescences terminal, 2–3 cm in diam., 1- or 2-flowered; bracts broadly ovate, 5–8 × 4–6 mm, sparsely soft hairy, pectinately lobed; lobes lanceolate. Pedicel 2–4 cm, villous, soft bristly or stipitate glandular. Calyx abaxially densely minutely tomentose and with rigid bristles, sometimes with intermixed stipitate glands; sepals reflexed after anthesis, lanceolate, 1–1.4 cm × 3–4 mm, margin entire, apex long caudate. Petals white, oblong, slightly shorter than sepals, base long clawed. Stamens many, shorter than petals. Pistils slightly shorter than or nearly as long as stamens, glabrous. Aggregate fruit with few drupelets. Fl. Jun–Jul, fr. Aug–Sep.

• Slopes, forests; 2000–3300 m. C Sichuan (Emei Shan).

198. *Rubus pectinellus* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, ser. 3, 17: 147. 1872.

黄泡 huang pao

Rubus pectinellus var. *trilobus* Koidzumi.

Herbs or subshrubs, 8–20(–30) cm tall. Stems creeping, brown or brownish, rooting at nodes, villous, ± prickly. Leaves simple; petiole 3–6 cm, villous, with needle-like prickles; stipules free, 6–9 mm, villous, deeply digitately lobed; lobes linear-lanceolate; blade suborbicular, 2.5–4.5 × 3–5(–7) cm, venation pedate, lateral veins (1 or) 2 pairs, raised abaxially, both surfaces pilose, abaxially with needle-like prickles along veins, base deeply cordate, margin sometimes undulate-lobed or 3-lobed, unevenly dentate or doubly serrate, apex obtuse. Inflorescences 1-flowered, rarely flowers 2 or 3 in axils of apical leaves; bracts 5–8 mm, villous, palmately lobed; lobes linear-lanceolate. Pedicel 2–4 cm, villous, with needle-like prickles.

ROSACEAE

Flowers to 2 cm in diam. Calyx 1.5–2 cm, abaxially villous and with needle-like prickles; tube ovoid-globose; sepals ovate to ovate-lanceolate, unequal in length, outer sepals broader, 0.9–1.3 cm × 6–9 mm, deeply divided or incised, inner sepals narrower, with few teeth or entire. Petals white, obovate or elliptic, 0.8–1.2 cm × 6–8 mm, glabrous, base clawed. Stamens many, much shorter than petals. Pistils shorter than stamens; apex of

ovary and base of style slightly puberulous, glabrescent. Aggregate fruit red, globose, 1–1.5 cm in diam., glabrous, with reflexed sepals; pyrenes nearly smooth or somewhat rugulose. Fl. May–Jun, fr. Jul–Aug. $2n = 42$.

Montane forests and valleys, river banks; 700–3000 m. Fujian, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Philippines].

7. Rubus sect. Cylactis Focke, Abh. Naturwiss. Vereine Bremen 4: 142. 1874.

匍匐莓组 pu fu mei zu

Herbs perennial, creeping, low or dwarf, unarmed, rarely with needle-like prickles. Leaves compound, 3–5-foliolate; stipules persistent, free, at junction of stem and petiole, broad, occasionally narrow, undivided, rarely divided. Flowers bisexual, several in clusters or solitary. Aggregate fruit adnate to torus, falling away from base of torus at maturity, not hollow.

Nine species (two endemic) in China.

- 1a. Leaves simple, 3–5-lobed to -parted, cordate or reniform-cordate; stems, petioles, and pedicels soft hairy or subglabrous, bristly; petals white 207. *R. humulifolius*
- 1b. Leaves compound, 3–5-foliolate; stems, petioles and pedicels villous, bristly, with glandular hairs or soft hairy or with needle-like prickles or pubescent; petals white or purplish red.
 - 2a. Leaves 5-foliolate, rarely 3-foliolate, lobed or parted; stipules entire.
 - 3a. Leaflets lobed, incised, coarsely sharply serrate, or doubly serrate; sepals ovate-lanceolate; pistils 4–6 199. *R. fragarioides*
 - 3b. Leaflets parted, deeply sharply serrate; sepals broadly ovate; pistils ca. 3 or ca. 24.
 - 4a. Pistils ca. 24; stamens ca. 30 in 2 whorls; petals entire or undulate 200. *R. potentilloides*
 - 4b. Pistils ca. 3; stamens ca. 30 in 1 whorl; petals lobed or coarsely serrate 201. *R. clivicola*
 - 2b. Leaves 3-foliolate, undivided; stipules entire or divided.
 - 5a. Stipules pectinately divided, lobes lanceolate, shallowly 3–5-toothed; leaflets suborbicular; stems, petioles, pedicels, and calyx villous, bristly, with glandular hairs; flowers white, solitary; pistils 10–15 206. *R. rubrisetulosus*
 - 5b. Stipules entire; leaflets suborbicular, broadly ovate to broadly obovate, rhombic, or ovate-rhombic; stems, petioles, and pedicel with soft hairs or needle-like prickles, or pubescent, or bristly.
 - 6a. Leaflets rhombic or ovate-rhombic to oblong-rhombic; stems, petioles, and pedicels with soft hairs or needle-like prickles; flowers purplish red or white.
 - 7a. Leaflets rhombic to obovate-rhombic; stems, petioles, and pedicel pubescent; flowers 1 or 2, purplish red; pistils ca. 20 202. *R. arcticus*
 - 7b. Leaflets ovate-rhombic to oblong-rhombic; stems, petioles, and pedicels sparsely pubescent and with needle-like prickles, sometimes with sparse, intermixed glandular hairs; flowers white, several in clusters or corymbs; pistils 5 or 6 203. *R. saxatilis*
 - 6b. Leaflets suborbicular, broadly ovate or broadly obovate; stems, petioles, and pedicels pubescent or bristly; flowers white.
 - 8a. Stems, petioles, and pedicels only pubescent; abaxial surface of calyx pubescent or sparsely bristly; petals obovate-oblong to linear-oblong; pistils 4–20 204. *R. fockeanus*
 - 8b. Stems, petioles, pedicel, and abaxial surface of calyx villous and reddish brown bristly; petals broadly obovate; pistils 25–70 or more 205. *R. nyalamensis*

199. Rubus fragarioides Bertoloni, Mém. Reale Accad. Sci. Ist. Bologna 12: 236. 1861.

莓叶悬钩子 mei ye xuan gou zi

Herbs low, 6–16 cm tall. Stems greenish brown or brownish, woody, soft hairy. Leaves compound, 5- or 3-foliolate; petiole 3–9 cm, slightly soft hairy; leaflets very shortly petiolulate or subsessile; stipules free, ovate or elliptic, 7–10 × 5–7 mm, apex acute or ± obtuse; blade of leaflets obovate to suborbicular, 2–5 × 1.5–3.5 cm, glabrous or soft hairy, base cuneate, margin usually lobed, incised or coarsely sharply serrate or doubly serrate, apex acute or obtuse. Inflorescences usually terminal, 1–2 cm in diam.; flowering branchlets and pedicels soft

hairy. Pedicel 1–3(–5) cm. Calyx abaxially glabrous or soft hairy; tube shallowly cupular; sepals ovate-lanceolate, 6–10 × 2–4 mm, margin entire, apex long acuminate to caudate. Petals white, obovate, 0.8–1.2 cm × 5–6 mm, apex acute. Stamens many, erect, unequal in length, shorter than petals; filaments dilated in basal part. Pistils 4–6, shorter than stamens; ovary usually glabrous. Aggregate fruit 7–9 mm in diam., with several drupelets, persistent calyx lobes erect; drupelets to 4 mm; pyrenes rugose. Fl. May–Jul, fr. Jul–Sep.

High mountains, grasslands, slopes, forests, forest margins; 3000–4200 m. W Sichuan, Xizang, NW Yunnan [Bhutan, NE India, N. Myanmar, Nepal, Sikkim].

- 1a. Blade of leaflets and abaxial surface of calyx usually glabrous; flowering branchlets and pedicels soft hairy 199a. var. *fragarioides*
- 1b. Blade of leaflets and abaxial surface of calyx soft hairy; flowering branchlets and pedicels with soft hairs, with or without glandular hairs.
- 2a. Flowering branchlets and pedicels with soft hairs, without glandular hairs 199b. var. *pubescens*
- 2b. Flowering branchlets, pedicels, or base of calyx with soft hairs and glandular hairs 199c. var. *adenophorus*

199a. *Rubus fragarioides* var. *fragarioides*

莓叶悬钩子(原变种) *mei ye xuan gou zi (yuan bian zhong)*

Rubus arcticus Linnaeus var. *fragarioides* (Bertoloni) Focke.

Blade of leaflets and abaxial surface of calyx usually glabrous. Flowering branchlets and pedicels soft hairy.

High mountains; 3000–4200 m. Xizang [Bhutan, NE India, N Myanmar, Nepal, Sikkim].

199b. *Rubus fragarioides* var. *pubescens* Franchet, Pl. Delavay. 203. 1890.

柔毛莓叶悬钩子 *rou mao mei ye xuan gou zi*

Blade of leaflets and abaxial surface of calyx soft hairy. Flowering branchlets and pedicels with soft hairs, without glandular hairs.

• Slopes, forests, forest margins; 3300–4000 m. S Xizang, NW Yunnan.

199c. *Rubus fragarioides* var. *adenophorus* Franchet, Pl. Delavay. 203. 1890.

腺毛莓叶悬钩子 *xian mao mei ye xuan gou zi*

Rubus franchetianus H. Léveillé; *R. yui* E. Walker.

Blade of leaflets and abaxial surface of calyx soft hairy. Flowering branchlets, pedicels, or base of calyx with soft hairs and glandular hairs.

• Grasslands on slopes, forests; 3000–4000 m. W Sichuan, SE Xizang, NW Yunnan.

200. *Rubus potentilloides* W. E. Evans, Notes Roy. Bot. Gard. Edinburgh 13: 179. 1921.

委陵悬钩子 *wei ling xuan gou zi*

Herbs perennial, dwarf, 3–8 cm tall. Stems prostrate, rooting at nodes, slender, pubescent when young, glabrescent; flowering branchlets erect, pubescent. Leaves compound, 5-foliolate, rarely 3-foliolate; petiole 1–3 cm, pubescent, petiolule of leaflets 2–4 mm; stipules free, broadly elliptic or suborbicular, 3–4 mm, margin entire, apex obtuse; blade of leaflets suborbicular, 3–8(–12) × 4–10 mm, both surfaces glabrous or puberulous, base cuneate, margin deeply divided nearly to midvein, with 3 distinct lobes; lobes sharply divided again, deeply

sharply serrate, apex obtuse. Inflorescences usually 1-flowered. Pedicel 6–12 mm, pubescent. Flowers 1.5–2 cm in diam. Calyx abaxially pubescent; sepals broadly ovate, rarely narrower, 4–5 × 2–3 mm, apex abruptly acuminate, with blackish tip. Petals white, broadly elliptic, 6–7 × 4–6 mm, margin entire or undulate, rarely lobed, apex obtuse or subtruncate. Stamens 30, in 2 whorls, outer sepals ca. 2 mm, inner sepals shorter; filaments broad, flat; anthers small. Pistils ca. 24; ovary glabrous; styles ca. 2 mm, slender; stigma truncate. Fruit unknown. Fl. Jun–Jul.

Mixed forests in high mountains; 2700–3500 m. NW Yunnan [N Myanmar].

201. *Rubus clivicola* E. Walker, J. Wash. Acad. Sci. 32: 262. 1942.

矮生悬钩子 *ai sheng xuan gou zi*

Herbs perennial, dwarf, 3–10(–12) cm tall. Stems brown or purplish brown, prostrate, slender, rooting at nodes, pubescent. Leaves compound, 5-foliolate, rarely 3-foliolate; petiole 1–2 cm, pubescent, petiolule of leaflets 2–5 mm; stipules free, ovate or suborbicular, 3–4 mm, puberulous, margin entire, apex obtuse; blade of leaflets obovate to suborbicular, 0.5–1.5 cm × 6–11 mm, both surfaces pilose when young, rarely with scattered brown glandular hairs abaxially, base cuneate, margin deeply 3-divided nearly to midvein, with 3 distinct lobes; lobes sharply divided again into deep sharp incised teeth, apex obtuse. Inflorescences 1-flowered. Pedicel 1–2 cm, pubescent. Flowers 1–1.2 cm in diam. Calyx abaxially pubescent; sepals broadly ovate, 5–7 × 3–5 mm, apex shortly acuminate. Petals white, ovate to broadly elliptic, 6–8 × 4–5 mm, glabrous, margin lobed or coarsely serrate. Stamens 30, 1-seriate, much shorter than petals; filaments broad, complanate; anthers ovoid, small. Pistils ca. 3, ca. 2.5 mm; filaments slender; ovary glabrous, smooth. Aggregate fruit glabrous when young. Fl. Jul–Aug, fr. Aug–Sep.

Rocky slopes, forests; 2800–4200 m. NW Yunnan [N Myanmar].

202. *Rubus arcticus* Linnaeus, Sp. Pl. 1: 494. 1753.

北悬钩子 *bei xuan gou zi*

Herbs dwarf, 10–30 cm tall. Roots creeping, nearly woody. Stems greenish or greenish brown, slender, pilose, unbranched or branched. Leaves compound, 3-foliolate; petiole longer, pilose, petiolule of terminal leaflet to 0.5 cm; lateral leaflets subsessile; stipules free, ovate or oblong, 5–7 × 3–5 mm, herbaceous, pubescent, margin entire, apex acute or obtuse; blade of leaflets rhombic to obovate-rhombic, terminal leaflet 3–5 cm, slightly longer than lateral leaflets, abaxially pilose, adaxially subglabrous, base narrowly cuneate, margin irregularly sharply serrulate or doubly serrate, sometimes shallowly incised, apex acute or obtuse. Inflorescences usually terminal, 1–2 cm in diam., usually 1-flowered, sometimes flowers 1 or 2 in leaf axils, bisexual or incompletely unisexual. Pedicel 2–4 cm, pubescent. Calyx turbinate, abaxially pubescent; tube cupular; sepals 5–10, ovate-lanceolate to narrowly lanceolate, 5–8 × 2–3 mm, apex acuminate. Petals purplish red, broadly obovate, rarely oblong or spatulate, 0.8–1.2 cm × 6–8 mm, base clawed, sometimes apically emarginate. Stamens erect, shorter than petals; filaments linear, inflated basally. Pistils 20, glabrous or pi-

lose abaxially, shorter than stamens. Aggregate fruit dark red, semiglobose, not more than 1 cm in diam., with few drupelets, persistent sepals reflexed; pyrenes nearly smooth or slightly rugulose. Fl. Jun–Jul, fr. Jul–Aug. $2n = 14$.

Slopes, forests, ravines; ca. 1200 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Korea, Mongolia, Russia; N Europe].

203. *Rubus saxatilis* Linnaeus, Sp. Pl. 1: 494. 1753.

石生悬钩子 shi sheng xuan gou zi

Cylactis saxatilis (Linnaeus) A. Löve.

Herbs 20–60 cm tall. Stems greenish brown, terete, slender; sterile stems creeping, with minute needle-like prickles, sparsely pubescent, sometimes with stalked glands. Leaves usually compound and 3-foliolate, rarely simple and divided; petiole 2–3.5 cm, pilose, with minute needle-like prickles; lateral leaflets subsessile, petiolule of terminal leaflet 1–2 cm; stipules free, on flowering branches ovate or elliptic, 5–8 × 3–5 mm, on creeping branches narrower, lanceolate or linear-oblong, pubescent, margin entire; blade of leaflets ovate-rhombic or oblong-rhombic, terminal leaflet 5–7 cm, slightly longer than lateral leaflets, both surfaces pubescent, more densely so along veins abaxially, base subcuneate or obliquely subcuneate, margin often coarsely doubly serrate, rarely incised-serrate, lateral leaflets sometimes 2-lobed, apex acute. Inflorescences corymbs or flowers several in clusters; peduncles unequal in length, shorter ones ca. 5 mm, longer ones to 3 cm; bracts ovate or elliptic, rarely linear-oblong, pubescent, margin entire. Pedicel 6–10 mm, pilose, with minute needle-like prickles, often with stalked glands. Flowers less than 1 cm in diam. Calyx turbinate, sometimes pelviform in fruit, abaxially pubescent; sepals ovate-lanceolate, 5–7 × 1.5–2.5 mm, apex acuminate. Petals white, spatulate or oblong, 6–9 × 3–5 mm, glabrous, base clawed, erect. Stamens many, much shorter than petals; filaments erect, base inflated, apex subulate, incurved. Pistils 5 or 6, nearly equaling stamens. Aggregate fruit red, globose, 1–1.5 cm in diam., glabrous, with larger drupelets; pyrenes oblong, alveolate-pitted. Fl. Jun–Jul, fr. Jul–Aug. $2n = 28$.

Stony soils, thickets, forests; below 3000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi, Xinjiang [Mongolia, Russia; Europe, North America].

204. *Rubus fockeanus* Kurz, J. Asiat. Soc. Bengal. 44(2): 206. 1875.

凉山悬钩子 liang shan xuan gou zi

Rubus allophyllus Hemsley, p.p.; *R. loropetalus* Franchet; *R. nutans* Wallich var. *fockeanus* (Kurz) Kuntze; *R. radicans* Focke.

Herbs perennial, creeping, without prickles and glands, sometimes with intermixed small glandular hairs. Stems prostrate, rooting at nodes, slender, pubescent. Leaves compound, 3-foliolate; petiole 2–5 cm, pubescent, terminal leaflet shortly petiolulate, lateral leaflets subsessile; stipules free, elliptic, 5–7 × 3–5 mm, membranous, margin entire, rarely toothed, apex ± obtuse or shortly pointed; blade of leaflets suborbicular to broadly obovate, 2.5–4 × 3.5–5 cm, abaxially pilose along veins, adaxially pilose, base broadly cuneate to rounded, lateral

leaflets with oblique base, margin unevenly coarsely obtusely serrate, apex obtuse. Inflorescences terminal, to 2 cm in diam., 1- or 2-flowered; bracts elliptic, smaller than stipules, membranous, puberulous, margin entire or toothed. Pedicel 2–5 cm, pubescent, sometimes bristly. Calyx abaxially pubescent, or intermixed sparsely reddish brown bristly; sepals 5 or more, ovate-lanceolate to narrowly lanceolate, 7–10 × (2–)3–4 mm, undivided, rarely shallowly lacinate, apex long acuminate. Petals white, obovate-oblong to linear-oblong, 7–11 × 3–5 mm, base clawed. Stamens many, shorter than petals; filaments enlarged toward base. Pistils 4–20, shorter than stamens; ovary glabrous or slightly puberulous; styles glabrous or basally slightly pubescent. Aggregate fruit red, globose, glabrous, with few semiglobose drupelets; pyrenes rugose. Fl. May–Jun, fr. Jul–Aug.

Grassy slopes, forests; 2000–4000 m. Hubei, Sichuan, S Xizang, Yunnan [Bhutan, N Myanmar, Nepal, Sikkim].

205. *Rubus nyalamensis* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 18: 499. 1980.

聂拉木悬钩子 nie la mu xuan gou zi

Herbs perennial, low. Stems creeping, rooting at nodes, slender, with reddish brown soft bristles and soft hairs. Leaves compound, 3-foliolate; petiole 4–6 cm, petiolule of leaflets 2–5 mm, villous, reddish brown bristly; stipules persistent, free, brown, ovate, membranous, soft hairy, margin entire or apically serrate, apex acute or obtuse; blade of leaflets broadly ovate to suborbicular, 1–3 × 0.8–2.8 cm, both surfaces sparsely villous, abaxially with sparse bristles along veins, base cuneate, lateral leaflets with oblique base, margin doubly serrulate, sometimes lobed, apex obtuse. Inflorescences terminal or axillary, to 2 cm in diam., 2–4-flowered, rarely 1-flowered; bracts ovate, soft hairy, margin entire or apically deeply divided-serrate. Pedicel 1–4 cm, slender, villous, reddish brown bristly. Calyx abaxially villous and reddish brown bristly; sepals triangular-ovate to ovate-lanceolate, margin often lacinate, rarely entire, apex acute to acuminate. Petals white, broadly obovate, slightly longer than sepals, base shortly clawed. Stamens many; filaments erect, much shorter than petals. Pistils ca. 25–70 or more; ovary glabrous or pilose adaxially. Aggregate fruit red, globose, glabrous, with many drupelets; pyrenes smooth. Fl. May–Jun, fr. Jul–Aug.

• Grasslands on slopes, forests, near water courses; 2000–3000 m. S Xizang.

206. *Rubus rubrisetulosus* Cardot, Notul. Syst. (Paris) 3: 289. 1914.

红刺悬钩子 hong ci xuan gou zi

Herbs perennial, dwarf, 10–20 cm tall. Stems brownish or dark purplish red, creeping, rooting at nodes, thinly villous, intermixed bristly or stipitate glandular. Leaves compound, 3-foliolate; petiole 4–7 cm, slender, thinly villous, sparsely bristly and stipitate glandular, petiolule of leaflets 2–5 mm; stipules free, ovate-oblong or obovate, 6–9 mm, basally attenuate, apex pectinately lobed; lobes lanceolate, sometimes with 3–5 shallow teeth, thinly villous, stipitate glandular; blade of leaflets suborbicular, 2–3.5 cm in diam., both surfaces sparsely appress-

ed villous, base broadly cuneate to rounded, lateral leaflets with distinctly oblique base, margin serrulate or doubly serrate, apex obtuse. Inflorescences terminal and axillary, 1.8–2.5 cm in diam., 1-flowered; bracts similar to stipules, 5–8 mm, palmately lobed; lobes lanceolate or linear, villous, stipitate glandular. Pedicel 2–4 cm, slender, villous, with purplish red bristles and stipitate glands. Calyx abaxially densely and finely villous, purplish red bristly, with stalked glands; sepals narrowly ovate-lanceolate or triangular-lanceolate, 1–1.8 cm × 3–5(–6) mm, margin entire, apex long caudate. Petals white, obovate-oblong or oblong, 1–1.5 cm × 4–6 mm, base gradually attenuate into claw, apex obtuse. Stamens many, shorter than petals; filaments slightly inflated. Pistils ca. 10–15, shorter than stamens, glabrous. Aggregate fruit red, globose, to 1 cm in diam., glabrous; pyrenes prominently rugose. Fl. Jun–Jul, fr. Aug–Sep.

• Montane forests, ravines, waste fields; 2000–3500 m. Sichuan, Yunnan.

207. *Rubus humulifolius* C. A. Meyer, Beitr. Pflanzenk. Russ. Reiches 57. 1848.

8. *Rubus* sect. *Chamaemorus* Focke, Abh. Naturwiss. Vereine Bremen 4: 142. 1874.

单性莓组 dan xian mei zu

Herbs perennial, dioecious, creeping, dwarf, unarmed. Leaves simple; stipules persistent, free, at junction of stem and petiole, broader, leaflike, undivided. Inflorescences 1-flowered. Aggregate fruit adnate to torus, falling away from base of torus at maturity, not hollow.

One species in China.

208. *Rubus chamaemorus* Linnaeus, Sp. Pl. 1: 494. 1753.

兴安悬钩子 xing an xuan gou zi

Herbs perennial, dwarf, 5–30 cm tall, dioecious, with long branched creeping rhizomes. Stems annual, somewhat woody, simple, erect, 30 cm tall, with few squamous leaves, pubescent, with intermixed sparse, short glandular hairs. Leaves simple; petiole 3–6(–9) cm, pubescent or with sparse, short glandular hairs when young; stipules free, leaflike, brownish, oblong, 5–10 × 4–7 mm, pubescent, with sparse, intermixed short glandular hairs when young, glabrescent; cauline leaf blade reniform or orbicular, 4–9 cm in diam., abaxially pubescent, ± with intermixed short glandular hairs when young, adaxially subglabrous or slightly pilose, base cordate, margin 5–7-lobed; lobes obtuse, with uneven coarse sharp serrations. Inflorescences terminal, 1-flowered. Pedicel 3.5–6 cm, pubescent, with sparse, intermixed short glandular hairs. Flowers unisexual, 2–3

葎草叶悬钩子 lu cao ye xuan gou zi

Herbs perennial, dwarf, 10–30 cm tall. Rhizomes creeping, blackish brown, slender, much branched. Stems erect or ascending, soft hairy, rarely glabrous, prickly-bristly. Leaves simple; petiole 2–6 cm, pubescent or subglabrous, ± prickly-bristly; stipules often caducous, inconspicuous; blade cordate or reniform-cordate, 4–8 × 3.5–9 cm, abaxially greenish, pubescent, with few bristles, adaxially green, bristly pilose at first, glabrescent, base cordate, margin palmately 3–5-lobed; lobes ovate or suborbicular, apex obtuse or acute, irregularly doubly serrate. Inflorescences terminal, 1-flowered, rarely 2- or 3-flowered. Pedicel 1–2 cm, bristly. Calyx abaxially pubescent; sepals erect or spreading, narrowly lanceolate, 7–9 mm, apex caudate. Petals white, lanceolate, longer than sepals, apex acuminate. Stamens many, much shorter than petals; filaments of outer stamens dilated. Aggregate fruit red at maturity, globose, ca. 1 cm in diam., glabrous; pyrenes foveolate. Fl. Jun–Jul, fr. Aug. $2n = 14$.

Coniferous forests, moist thickets. Heilongjiang, Jilin, Nei Mongol [Korea, Mongolia, Russia].

cm in diam., usually staminate larger than pistillate, to 3 cm in diam. Calyx abaxially pubescent, sometimes with intermixed short glandular hairs; tube 1.5–2 mm; sepals erect, spreading, 4 or 5, oblong, 0.8–1.2 cm × 4–6 mm, apex obtuse or acute. Petals 4 or 5, white, obovate, 1.4–1.8 cm × 7–10 mm, apex retuse. Stamens shorter than petals; filaments long, linear, basally somewhat broadened. Pistils abortive in staminate flowers; in pistillate flowers ca. 20; styles linear, long, but stamens not developed or without anthers in pistillate flowers. Aggregate fruit orange-red or becoming yellowish brown, subglobose, ca. 1 cm in diam., glabrous; pyrenes smooth or slightly rugulose. Fl. May–Jul, fr. Aug–Sep. $2n = 56$.

Forests, mossy bogs, mossy tundra. Heilongjiang, Jilin, Liaoning [Japan, Korea, Russia; C and N Europe, North America].

The edible fruit are harvested commercially and are used in preserves and juices.

The following taxa have been described from or reported for China, but we have seen no specimens and are therefore unable to treat them in this account. Further revision is necessary.

Rubus calophyllus C. B. Clarke (J. Linn. Soc., Bot. 25: 19. 1889), described from India, reported for Xizang (“Tibet”): *F. K. Ward* 6321.

Rubus chui Handel-Mazzetti (Oesterr. Bot. Z. 90: 121. 1941), described from Sichuan: *K. L. Chu* 3019; *K. L. Chu* 3533.

Rubus hiemalis Focke (Annuaire Conserv. Jard. Bot. Genève 20: 105. 1917, not Kuntze, 1879), described from Taiwan: *O. Warburg* 10161.

Rubus nigricaulis Prochanov (Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 5: 54. 1924), described from Yunnan: *A. Henry* s.n.

Rubus parapungens H. Hara (Bull. Univ. Mus. Univ. Tokyo 2: 58. 1971; *R. horridulus* J. D. Hooker, Fl. Brit. India 2: 341. 1878, not P. J. Mueller, 1868; *R. pungens* Cambessèdes var. *horridulus* H. Hara): a specimen (at E, not seen) from SE Xizang has been identified as this taxon (Eona Aitken, pers. comm.).

Rubus pekinensis Focke (Annuaire Conserv. Jard. Bot. Genève 20: 104. 1917), described from Hebei: *O. Warburg* 6549.

Rubus rectangulifolius Kuntze (Meth. Sp.-Besch. *Rubus*, 60, 78. 1879), described from China: *G. Staunton* s.n.

Rubus sinosudrei H. Léveillé (Bull. Acad. Int. Géogr. Bot. 24: 251.

ROSACEAE

1914), described from Guizhou: *J. Esquirol* 3506.
Rubus sweginzowianus Sivers ex Focke (Biblioth. Bot. 17(Heft 72):
 188. 1911), described from Gansu: *M. v. Sivers s.n.*

Rubus viburnifolius Franchet (Bull. Mus. Hist. Nat. (Paris) 1: 63. 1895,
 not Focke, 1910, nor (Greene) Rydberg, 1913), described from
 Yunnan ("Tchen-fong-chan"): *Delavay s.n.*

29. DRYAS Linnaeus, Sp. Pl. 1: 501. 1753.

仙女木属 xian nu mu shu

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Shrublets evergreen, low and prostrate, hermaphroditic, rarely polygamous. Leaves alternate, petiolate; stipules adnate to petiole, persistent; leaf blade simple, abaxially white, margin entire to subpinnatifid, recurved. Flowers solitary, pedicellate. Hypanthium concave, short, glandular hairy. Sepals (6-)8(-10), persistent. Petals (6-)8(-10), white, sometimes yellow, obovate. Stamens numerous, in 2 series, free. Disk lining hypanthium. Carpels numerous, free; style terminal, plumose. Achenes numerous, terminating in a persistent, plumose style. $x = 9$.

Between three and 14 species: mountains of Arctic and N temperate zone; one species in China.

1. *Dryas octopetala* Linnaeus var. ***asiatica*** (Nakai) Nakai, Fl. Sylv. Kor. 7: 47. 1918.

东亚仙女木 dong ya xian nu mu

Dryas octopetala f. *asiatica* Nakai, Bot. Mag. (Tokyo) 30: 233. 1916; *D. ajanensis* Juzepczuk; *D. nervosa* Juzepczuk; *D. octopetala* subsp. *nervosa* (Juzepczuk) Hultén; *D. octopetala* subsp. *tschonokii* (Juzepczuk) Hultén; *D. tschonokii* Juzepczuk.

Shrublets 3–6 cm tall. Roots woody. Stems tufted, prostrate, much branched from base. Stipules mostly adnate to petiole, linear-lanceolate, 4–5 mm, membranous, villous, margin entire, apex acute; petiole 4–20 mm, densely white tomentose and yellow-brown branched villous; leaf blade elliptic, broadly so, or suborbicular, 5–20 × 3–12 mm, subleathery, abaxially white tomentose, yellowish brown branched villous on veins, adaxially pilose or glabrous, veins abaxially elevated, lateral veins in 7–10 pairs, base truncate or subcordate, margin

recurved and obtusely serrate, apex rounded. Flowering stems 2–3 cm, elongating to 7 cm in fruit, densely white tomentose, branched villous, and densely glandular hairy. Flowers 1.5–2.5 cm in diam. Hypanthium 7–9 mm, sparsely white floccose, densely dark purple branched villous, and dark purple and light yellow glandular hairy. Sepals ovate-lanceolate, 5–6 mm, abaxially dark purple branched villous and white pilose, adaxially villous near apex, apex subacute. Petals white or creamy white, obovate, 8–14 mm, glabrous, apex rounded. Stamens numerous; filaments 4–5 mm, glabrous. Style sericeous. Achenes brown, long ovoid, 3–4 mm, villous, terminating in a plumose style 1.5–2.5 cm. Fl. and fr. Jul–Aug.

Alpine meadows; 2200–2800 m. S Jilin (Changbai Shan, Fusong Xian), Xinjiang (Tian Shan) [Japan, Korea, E Russia (Kamchatka, Sakhalin)].

Dryas octopetala var. *octopetala* occurs in mountainous regions of Asia, Europe, and North America.

30. GEUM Linnaeus, Sp. Pl. 1: 500. 1753.

路边青属 lu bian qing shu

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial, rhizomatous, sometimes stoloniferous. Stipules adnate to and sheathing petiole; radical leaves pinnate or pseudopinnate; terminal leaflet largest; lateral leaflets often in alternating larger and smaller pairs; cauline leaves few, often 3-foliolate or bractlike. Flowers solitary or in corymbs, bisexual. Hypanthium turbinate or hemispheric. Sepals 5, valvate, persistent; epicalyx segments 5, small, alternate with sepals. Petals 5, yellow, white, or red, orbicular or obovate. Stamens numerous, crowded. Disk lining hypanthium, smooth or ribbed. Carpels numerous, borne on prominent, usually cylindrical receptacle, free; ovule ascending; style filiform, jointed; stigma slightly recurved or hooked, minute. Achenes sessile or stipitate, small, hooked at apex of beak. Seed erect; testa membranous; cotyledons oblong. $x = 7$.

About 70 species: widespread in temperate zones of both hemispheres; three species in China.

Wu Zhengyi (editor's note) believes that *Geum sensu lato* may include *Acomastylis* and even *Taihangia*.

- 1a. Flowers nodding, 2–2.5 cm in diam.; sepals erect, ± purplish; petals yellow with purple stripes, semicordate, base long clawed 3. *G. rivale*
 1b. Flowers erect, not more than 1.5 cm in diam.; sepals spreading, green; petals yellow, ovate or obovate, base not clawed.
 2a. Receptacle hispidulous, hairs ca. 1 mm; cauline leaves 2–6-foliolate, sometimes repeatedly pinnatifid; terminal leaflet of radical leaves broadly rhombic-ovate or obovate-lanceolate, apex usually acuminate, rarely acute 1. *G. aleppicum*
 2b. Receptacle hirtellous, hairs 2–3 mm; upper cauline leaves usually simple, entire or 3-lobed; terminal leaflet of radical leaves ovate to broadly obovate, apex rounded, rarely acute 2. *G. japonicum*

1. *Geum aleppicum* Jacquin, Icon. Pl. Rar. 1: 10. 1781.

路边青 lu bian qing

Geum aleppicum var. *bipinnatum* (Batalin) Handel-Mazzetti; *G. intermedium* Besser ex Marschall von Bieberstein (1808), not Ehrhart (1791), nor Willdenow (1806), nor Tenore ex Nyman (1878); *G. potaninii* Juzepczuk; *G. strictum* Aiton; *G. strictum* var. *bipinnatum* Batalin; *G. vidalii* Franchet & Savatier.

Roots fascicled, fibrous. Stems erect, 30–100 cm tall, together with petioles spreading rigid hairy, rarely glabrescent. Radical leaves lyrate-pinnate, 5–15 cm including petiole, usually with 2–6 pairs of leaflets, both surfaces sparsely rigid hairy; leaflets unequal, terminal one largest, broadly rhombic-ovate or compressed orbicular, 4–15 × 5–15 cm, base broadly cordate to cuneate, margin usually irregularly coarsely serrate, apex obtuse or acute; cauline leaves: stipules green, leaflike, ovate, large, margin irregularly coarsely serrate; leaf blade pinnate, sometimes repeatedly lobed; terminal leaflet lanceolate or obovate-lanceolate, base cuneate, apex often acuminate or shortly so. Inflorescence terminal, lax. Flowers 1–1.7 cm in diam.; pedicel pubescent or hirtellous. Sepals ovate-triangular, apex acuminate; epicalyx segments lanceolate, minute, ca. 1/2 as long as sepals, abaxially pubescent and villous, apex acuminate, rarely 2-fid. Petals yellow, suborbicular, longer than sepals. Style terminal, twisted at joint ca. 1/4 way from apex; proximal section pilose; distal section deciduous at fruit maturity. Achene aggregate obovoid; fruiting receptacle hispidulous, hairs ca. 1 mm; achenes hirtellous; proximal section of style persistent, glabrous, apex hooked. Fl. and fr. Jul–Oct.

Forests, open places in forests, grassy mountain slopes, river and stream banks, fields; 200–3500 m. Gansu, Guizhou, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [widespread in N temperate zone].

This species is used medicinally and as a source of oil.

2. *Geum japonicum* Thunberg var. **chinense** F. Bolle, Notizbl. Bot. Gart. Berlin-Dahlem 11: 210. 1931.

柔毛路边青 rou mao lu bian qing

Roots fascicled, fibrous. Stems erect, 25–60 cm tall, together with petioles yellow pubescent and rigid hairy. Radical leaves lyrate-pinnate, 5–20 cm including petiole, usually with 1 or 2 pairs of lateral leaflets and several segments, both surfaces sparsely strigose; leaflets unequal, terminal one largest, ovate to broadly obovate, lobed or not, 3–8 × 5–9 cm, base broadly cor-

date or cuneate, margin coarsely obtusely or acutely serrate, apex rounded; cauline leaves: stipules green, herbaceous, margin irregularly coarsely crenate; leaf blade of lower leaves 3-foliolate, of upper ones simple, entire or 3-lobed, segments obtuse or acute at apex. Inflorescence terminal, laxly several flowered. Flowers 1.5–1.8 cm in diam.; pedicel densely rigid hairy and pubescent. Sepals triangular-ovate, apex acuminate; epicalyx segments elliptic-lanceolate, minute, ca. 1/2 as long as sepals, pubescent abaxially, apex acute. Petals yellow, suborbicular, longer than sepals. Style terminal, twisted at joint ca. 1/4 way from apex; proximal section pilose; distal section deciduous at fruit maturity. Achene aggregate ovoid to ellipsoid; fruiting receptacle hirtellous, hairs 2–3 mm; achenes hirtellous; proximal section of style persistent, glabrous, apex hooked. Fl. and fr. May–Oct.

• Thinned forests, thickets, grassy mountain slopes, river banks, field margins; 200–2300 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Xinjiang, Yunnan, Zhejiang.

Geum japonicum var. *japonicum* occurs in Japan and Korea.

This species is used medicinally.

3. *Geum rivale* Linnaeus, Sp. Pl. 1: 501. 1753.

紫萼路边青 zi e lu bian qing

Roots robust, terete. Stems erect, 25–70 cm tall, pilose or hirtellous. Radical leaves lyrate-pinnate, 10–35 cm including petiole, with 2–4 pairs of leaflets, both surfaces scattered strigose; leaflets unequal, terminal one largest, usually rhombic-ovate, lobed, 4–9 × 3–8 cm, base broadly cuneate or subtruncate, margin markedly incised-lobed to 3-parted and coarsely serrate, apex rounded; cauline leaves: stipules green, ovate-elliptic, lobed to parted, herbaceous; leaf blade simple, 3-lobed or 3-parted. Inflorescence usually nodding, laxly 2–4-flowered. Flowers 2–2.5 cm in diam.; pedicel densely yellow pubescent and pilose. Sepals ovate-triangular, apex acuminate; epicalyx segments usually purplish, linear-lanceolate, minute, 1/3–1/2 as long as sepals, apex acuminate. Petals yellow, purple-brown striate, semiorbicular, longer than sepals, base abruptly tapered into a rather long claw. Style terminal, filiform, twisted at joint; proximal section yellow villous; distal section deciduous at fruit maturity. Fruiting receptacle hirtellous, hairs 1.5–2 mm; achenes yellow villous; proximal section of style persistent. Fl. and fr. May–Aug.

Thickets, meadows in valleys, ravine gravels; 1200–2300 m. Xinjiang [widespread in Arctic and N temperate zone].

31. ACOMASTYLIS Greene, Leaf. Bot. Observ. Crit. 1: 174. 1906.

羽叶花属 yu ye hua shu

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial, low, tufted, with stout rootstock. Radical leaves pinnate; leaflets numerous, margin cleft or toothed; cauline leaves few, reduced. Flowers terminal, solitary or very few in cymes. Hypanthium ± turbinate. Sepals 5, valvate; epicalyx segments smaller, alternate with sepals. Petals 5, yellow. Stamens numerous, inserted at mouth of hypanthium. Carpels numerous, densely hirsute or only sparsely so near apex, apically tapered into persistent, glabrous style; ovule basal; style not elongating in fruit. $x = 7$.

About 15 species: E Asia, North America; two species in China.

- 1a. Radical leaves broadly linear in outline, interrupted or compacted pinnate, with 9–13 pairs of leaflets; sepals green, ca. 2 × as long as epicalyx segments; petals glabrous; style glabrous or sparsely pilose at base 1. *A. elata*
 1b. Radical leaves lyrate pinnate, with 5–10 pairs of leaflets; sepals usually purple-brownish yellow, 3–4 × as long as epicalyx segments; petals abaxially sparsely pilose; style hirsute except at apex 2. *A. macrosepala*

1. *Acomastylis elata* (Wallich ex G. Don) F. Bolle, Repert. Spec. Nov. Regni Veg. Beih. 72: 83. 1933.

羽叶花 yu ye hua

Rootstock stout, terete. Flowering stems to 40 cm tall, pubescent. Radical leaves 12–24 cm including petiole; stipules green, ovate-lanceolate, herbaceous, margin entire; petiole 1–4 cm, pubescent or pilose, rarely glabrescent; leaf blade broadly linear in outline, interrupted or compacted pinnate, with 9–13 pairs of leaflets, both surfaces pilose or glabrescent; leaflets semiobovate, 4–25 × 3–22 mm, proximal ones smaller, base broadly cuneate, mostly adnate to axis, margin irregularly crenate and ciliate, apex rounded; cauline leaves reduced and bractlike, oblong-lanceolate, parted. Inflorescence terminal, cymose, 2–6-flowered. Flowers 2.8–3.5 cm in diam.; pedicel pubescent. Sepals green, ovate-triangular, apex acute; epicalyx segments linear-lanceolate, minute, ca. 1/2 as long as sepals, abaxially pubescent. Petals yellow, broadly obovate, ca. 2 × as long as sepals, glabrous, apex emarginate. Ovary glabrous, sparsely pilose only near apex, or densely hirsute, apically tapered into style; style terminal, not twisted, glabrous or sparsely pilose at base; stigma minute. Achenes ovoid; style persistent. Fl. and fr. Jun–Aug.

Alpine meadows; 3500–5400 m. Qinghai, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, Kashmir, Nepal, Sikkim].

- 1a. Plants 20–40 cm tall; radical leaves interrupted pinnate; cymes 2–6-flowered 1a. var. *elata*
 1b. Plants rather low; radical leaves compacted pinnate; cymes 1(–3)-flowered 1b. var. *humilis*

1a. *Acomastylis elata* var. *elata*

羽叶花(原变种) yu ye hua (yuan bian zhong)

Geum elatum Wallich ex G. Don, Gen. Hist. 2: 526. 1832; *Acomastylis elata* var. *leiocarpa* (W. E. Evans) F. Bolle; *G. elatum* var. *leiocarpum* W. E. Evans; *Sieversia elata* (Wallich ex G. Don) Royle.

Plants 20–40 cm tall. Radical leaves interrupted pinnate. Cymes 2–6-flowered. Fl. and fr. Jun–Aug.

Alpine meadows; 3500–5400 m. Shaanxi, Sichuan, Xizang [Bhutan, Kashmir, Nepal, Sikkim].

Acomastylis elata var. *elata* is similar to *Coluria longifolia*, but differs in having a persistent style; the latter species has a filiform style

evenly thickened throughout its length and deciduous in fruit. The indumentum of the achene is variable, even in one individual, and var. *leiocarpa* cannot be distinguished on the basis of having a glabrous or sparsely pilose achene.

1b. *Acomastylis elata* var. *humilis* (Royle) F. Bolle, Repert. Spec. Nov. Regni Veg. Beih. 72: 84. 1933.

矮生羽叶花 ai sheng yu ye hua

Sieversia elata var. *humilis* Royle, Ill. Bot. Himal. Mts. 1: 207. 1835; *Geum elatum* var. *humile* (Royle) J. D. Hooker; *Potentilla adnata* Wallich ex Lehmann.

Plants rather low. Radical leaves compacted pinnate. Cymes 1(–3)-flowered. Fl. and fr. Jun–Aug.

Alpine meadows; 3500–5400 m. Qinghai, Xizang, Yunnan [Bhutan, Nepal, Sikkim].

2. *Acomastylis macrosepala* (Ludlow) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 225. 1985.

大萼羽叶花 da e yu ye hua

Geum macrosepalum Ludlow, Bull. Brit. Mus. (Nat. Hist.), Bot. 5: 271. 1976.

Rootstock stout, terete; lateral roots many. Flowering stems erect or ascending, 30–70 cm tall, pubescent or hirtellous. Radical leaves 10–15 cm including petiole; leaf blade lyrate pinnate, with 5–10 pairs of leaflets, appressed pilose or strigose; terminal leaflet rather large, ovate or reniform, not lobed, 5–6 × 4–7 cm, base deeply cordate, margin irregularly obtusely crenate, apex rounded; lateral leaflets smaller than terminal one; cauline leaves: stipules green, oblong-ovate, herbaceous, margin serrate or subentire; leaf blade simple, obovate or broadly ovate, slightly 5–7-lobed, 10–40 × 5–20 mm. Flower 1(or 2), erect, rarely nodding, 2.5–3.5 cm in diam. Sepals ovate or broadly so, apex acute; epicalyx segments usually purple-brownish yellow, ovate, 1/4–1/3 as long as sepals, abaxially hirsute. Petals yellow, sometimes purple-brown at apex, obovate, nearly equaling sepals, abaxially sparsely pilose, base tapered into a claw, apex emarginate. Style terminal, filiform, not twisted, hirsute but glabrous distally. Achenes long ellipsoid, 5–6 mm when ripe, hirsute; style erect, short, persistent. Fl. and fr. Aug–Sep.

Meadow and thickets on mountain slopes; 3800–4400 m. Xizang [Bhutan, India, Sikkim].

32. TAIHANGIA T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 471. 1980.

太行花属 tai hang hua shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial, with stout rhizome, andromonoecious or androdioecious. Radical leaves simple, sometimes with 1 or 2 minute ovate or elliptic lobules on distal part of petiole. Scape with a few 3-sect bracts. Flower 1(or 2), terminal. Hypanthium obconic or turbinate. Sepals 5, valvate; epicalyx segments 5, smaller than sepals. Petals 5, white. Stamens numerous, inserted on margin of hypanthium. Disk annular, glabrous. Carpels shortly stipitate at base of ovary; those in male flowers few, sterile, glabrous; those in female flowers many, spirally inserted on receptacle, pilose; style terminal, elongated; stigma slightly dilated. Achenes pilose. $x = 7^*$.

- One species.

1. Taihangia rupestris T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 471. 1980.

太行花 tai hang hua

Petiole 2.5–10 cm, glabrous, or sparsely or markedly pilose; leaf blade ovate, elliptic, cordate-ovate, or rarely triangular-ovate, 2.5–10 × 2–8 cm, abaxially glabrescent or very sparsely pilose on veins at base, adaxially glabrous, base truncate, rounded, subcordate, or rarely broadly cuneate, margin coarsely crenate, undulate crenate, or densely serrate, rarely slightly lobed, sometimes markedly ciliate, apex rounded. Scape 4–15 cm tall, glabrous or sometimes sparsely pilose, with 1–5 opposite or alternate, sterile bracts; bracts 3-sect with segments lanceolate, glabrous. Flower(s) 3–4.5 cm in diam. Hypanthium glabrous. Sepals pale green or often purplish, ovate-elliptic or ovate-lanceolate, apex acute to acuminate. Petals obovate-elliptic, apex rounded. Style elongated to 16 mm, pubescent, glabrous near apex. Fruiting receptacle slender, elongated to 10 mm, ca. 1 mm in diam. Achenes 3–4 mm with hairs ca. 0.5 mm. Fl. and fr. May–Aug.

- Cliffs on shady slopes; 1000–1200 m. S Hebei, N Henan.

1a. Petiole glabrous or sparsely pilose, leaf blade ovate or elliptic, abaxially glabrescent or very sparsely pilose on veins at base, adaxially glabrous, base truncate or rounded, rarely broadly cuneate, margin

coarsely crenate or undulate crenate 1a. var. *rupestris*
 1b. Petiole markedly pilose, leaf blade cordate-ovate, rarely triangular-ovate, base usually subcordate, margin usually densely serrate, rarely slightly lobed, markedly ciliate 1b. var. *ciliata*

1a. Taihangia rupestris var. **rupestris**

太行花(原变种) tai hang hua (yuang bian zhong)

Petiole glabrous or sparsely pilose; leaf blade ovate or elliptic, abaxially glabrescent or very sparsely pilose on veins at base, adaxially glabrous, base truncate or rounded, rarely broadly cuneate, margin coarsely crenate or undulate crenate. Fl. and fr. May–Aug.

- Cliffs on shady slopes; 1100–1200 m. N Henan (Taihang Shan).

1b. Taihangia rupestris var. **ciliata** T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 472. 1980.

缘毛太行花 yuan mao tai hang hua

Petiole markedly pilose; leaf blade cordate-ovate, rarely triangular-ovate, base usually subcordate, margin usually densely serrate, rarely slightly lobed, markedly ciliate. Fl. May–Jun.

- Cliffs on shady slopes; 1000–1200 m. S Hebei (Wu'an Xian).

33. COLURIA R. Brown, Chlor. Melvill. 18. 1823.

无尾果属 wu wei guo shu

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial, low, rhizomatous, softly tomentose. Leaves mostly radical; leaf blade interrupted pinnatisect; lobes obovate, margin crenate; cauline leaves sessile among connate stipules and entire or 3-fid. Inflorescence erect, few-flowered, bracteate. Hypanthium obconic, eventually elongated, 10-ribbed. Sepals 5, valvate, persistent; epicalyx segments minute. Petals 5, yellow or white, larger than sepals. Stamens numerous, in 2 or 3 series; filaments free, persistent in fruit. Disk lining hypanthium, glabrous. Carpels numerous, inserted on short receptacle; ovule ascending from base of locule; style subterminal, erect, deciduous. Achenes numerous on columnar receptacle, included in hypanthium, compressed, rugose.

Five species: China, Mongolia, Russia; four species (all endemic) in China.

- 1a. Radical leaf blades lyrate-pinnate.
 2a. Carpels and achenes markedly papillate 1. *C. henryi*
 2b. Carpels and achenes rigidly hairy 2. *C. omeiensis*
 1b. Radical leaf blades pinnate, but not lyrate-pinnate so.
 3a. Radical leaf blades regularly interrupted pinnate, leaflets in 9–20 pairs, proximal ones smaller, distal ones larger; flowers 1.5–2.5 cm in diam.; carpels numerous; carpels and achenes glabrous 3. *C. longifolia*
 3b. Radical leaf blades irregularly interrupted pinnate, leaflets in 4 or 5 pairs, variously sized; flowers ca. 1 cm in diam.; carpels ca. 4; carpels and achenes markedly papillate 4. *C. oligocarpa*

1. Coluria henryi Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 94. 1893.

大头叶无尾果 da tou ye wu wei guo

Coluria henryi var. *grandiflora* Cardot; *C. henryi* var. *pluriflora* Cardot.

Rhizome long, slender, covered with remains of old leaves. Radical leaves: stipules ovate, both surfaces pilose or ciliate,

margin entire or 1- or 2-serrate; petiole 1–2.5 cm, densely yellow-brown villous; leaf blade lyrate-pinnatisect, 5–18 cm; rachis longitudinally ribbed, densely yellow-brown villous; leaflets in 4–10 pairs, laxly arranged at intervals of up to 1 cm; terminal leaflet ovate, broadly so, or oblong-ovate, 3–7 × 1.5–6 cm, yellow-brown villous, base cordate, margin obtusely serrate, apex rounded; lateral leaflets sessile, ovate or oblong-ovate, 2–16 × 0.5–11 mm, densely villous, base oblique, margin

triangular dentate, apex acute; cauline leaves: leaf blade ovate, 1–1.5 cm, margin entire or 3-lobed. Flowering stems radical, ascending, 6–30 cm tall, spreading pilose, 1–4-flowered; bracts ovate or oblong, ca. 1.5 cm, both surfaces pilose, margin serrate. Flowers 2–2.5 cm in diam. Hypanthium obconic, 3–5 mm, densely villous. Sepals triangular-ovate, ca. 5 mm, abaxially pilose, adaxially glabrous or subpilose, apex acute; epicalyx segments minute, lanceolate, 1–2 mm, abaxially pilose, apex acute. Petals yellow or white, obovate, 5–10 mm, glabrous, base shortly clawed, apex emarginate. Filaments 5–6 mm. Carpels numerous; ovary ovoid; style erect. Achenes brown, ovoid or obovoid, 1–1.5 cm, papillate. Fl. Apr–Jun, fr. May–Jul.

- Rocks; 1600–2400 m. Guizhou, Hubei, Sichuan.

2. *Coluria omeiensis* T. C. Ku, Bull. Bot. Res., Harbin 10(3): 19. 1990.

峨眉无尾果 e mei wu wei guo

Plants 10–30 cm tall. Radical leaves 7–15 cm including petiole; leaf blade pinnatisect; rachis hirsute; leaflets sessile, in 4–10 pairs, variously sized, terminal one largest, others becoming smaller toward leaf blade base; terminal leaflet ovate or broadly so, 2–6 × 1.5–4.5 cm, both surfaces sparsely villous, base cordate, margin obtusely incised serrate, apex rounded; lateral leaflets 2–10 × ca. 2 mm, both surfaces hirsute. Flowering stems to 20 cm tall, hirsute, 2–4-flowered; bracts usually 3-lobed, sometimes irregularly lobed, both surfaces hirsute. Flowers 2–3 cm in diam. Sepals triangular-lanceolate or ovate-lanceolate, 6–8 × 3–4 mm, hirsute, apex acuminate; epicalyx segments narrowly oblong, 1–3 × ca. 1 mm, hirsute, apex acuminate. Petals white or yellow, obovate, 1–1.5 × ca. 1 cm. Stamens numerous; filaments 5–6 mm. Carpels numerous; ovary hispidulous or hairy; style erect, base hispidulous or glabrous. Achenes long ovoid or ellipsoid, 1–1.5 cm, rigidly hairy. Fl. and fr. Apr–Jun.

- 1200–2400 m. Guizhou, Shaanxi, Sichuan.

This species is similar to *Coluria henryi*, but differs in having the ovary hispidulous or hairy (vs. papillate).

- 1a. Petals yellow; ovary and style base hispidulous 2a. var. *omeiensis*
 1b. Petals white or yellow; ovary hairy, style base glabrous 2b. var. *nanzhengensis*

2a. *Coluria omeiensis* var. *omeiensis*

峨眉无尾果(原变种) e mei wu wei guo (yuan bian zhong)

Petals yellow. Ovary and style base hispidulous. Fl. May.

- About 2400 m. C Sichuan (Emei Shan).

2b. *Coluria omeiensis* var. *nanzhengensis* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 10(3): 20. 1990.

光柱无尾果 guang zhu wu wei guo

Petals white or yellow. Ovary hairy; style base glabrous. Fl. Apr–May.

- 1200–2300 m. Guizhou, Shaanxi, Sichuan.

3. *Coluria longifolia* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 27: 466. 1882.

无尾果 wu wei guo

Coluria elegans Cardot; *C. elegans* var. *imbricata* Cardot; *C. longifolia* f. *uniflora* T. C. Ku; *C. purdomii* (N. E. Brown) W. E. Evans; *Geum elatum* Wallich ex G. Don var. *humile* Franchet (1890), not (Royle) J. D. Hooker (1878); *Potentilla purdomii* N. E. Brown.

Radical leaves: stipules ovate, both surfaces pilose or margin ciliate, margin entire or 1- or 2-serrate; petiole 1–3 cm, sparsely villous, base decurrent, membranous; leaf blade interrupted pinnate, 5–10 cm, with 9–20 pairs of leaflets; rachis sulcate, villous; leaflets sessile, proximal ones ovate or oblong, 1–3 × 0.5–1 mm, base oblique, margin entire or obtusely crenate, ciliate; distal leaflets broadly ovate to suborbicular, 0.5–1.5 cm × 3–8 mm, base oblique, margin sharply serrate, yellow ciliate, apex rounded or acute; cauline leaves 1–4, broadly linear, 3-lobed or pinnately lobed, 1–1.5 cm. Flowering stems erect, branched distally, 4–20 cm tall, pubescent; inflorescence cymose, (1 or) 2–4-flowered; bracts ovate-lanceolate, 3–4 mm, long ciliate. Flowers 1.5–2.5 cm in diam.; pedicel 1–2.5 cm, densely pubescent. Hypanthium campanulate, ca. 2 mm, together with sepals abaxially densely pubescent and villous. Sepals triangular-ovate, 3–4 mm, apex acute; epicalyx segments oblong, ca. 2 mm, villous and ciliate, apex rounded. Petals yellow, obovate or obcordate, 5–7 mm, glabrous, apex emarginate. Stamens 40–60; filaments persistent, shorter than petals, glabrous, base dilated. Carpels many; ovary cylindrical, glabrous; style filiform, glabrous. Achenes black-brown, long globose, ca. 2 mm, glabrous. Fl. Jun–Jul, fr. Aug–Oct.

- Alpine meadows; 2700–4600 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan.

This species is used medicinally.

4. *Coluria oligocarpa* (J. Krause) F. Bolle, Notizbl. Bot. Gart. Berlin-Dahlem 11: 210. 1931.

汶川无尾果 wen chuan wu wei guo

Geum oligocarpum J. Krause, Repert. Spec. Nov. Regni Veg. Beih. 12: 412. 1922.

Rhizome covered with remains of old leaves. Radical leaves few; stipules ovate, tiny, margin long ciliate, apex rounded; petiole 1–2 cm, spreading villous; leaf blade interrupted pinnate, 5–10 cm; leaflets in 4–6 pairs, laxly arranged, sessile, obovate-flabellate, nearly 3-lobed, 0.6–1.2 × 0.5–1.5 cm, terminal one largest, lateral ones variously sized, both surfaces and margin densely appressed villous; lobes broadly cuneate at base, margin irregularly serrate, apex rounded; cauline leaves ca. 3, sessile, oblong-ovate, 3-lobed, 1–1.5 cm × 4–5 mm. Flowering stems 2 or 3, erect, branched distally, 15–30 cm tall, pubescent; bracts ovate-lanceolate, 3–5 mm, pilose, margin several serrate, apex acute. Flowers ca. 1 cm in diam.; pedicel 1.5–2 cm. Hypanthium obconic, 2–3 mm, abaxially pubescent. Sepals ovate-triangular, ca. 2 mm, pubescent, margin ciliate, apex rounded; epicalyx segments linear-oblong, ca. 1 mm, margin

ROSACEAE

ciliate, apex rounded. Petals white, obovate, 5–7 mm, glabrous, base shortly clawed, apex truncate or emarginate. Filaments shorter than petals, base pilose. Carpels ca. 4; ovary ovoid, apically thickened, papillate; style slightly thickened at base,

villous. Achenes brown, ovoid or obovoid, 2–3 mm, densely papillate. Fl. and fr. Apr.

- Ravines, grassy places. Sichuan.

34. WALDSTEINIA Willdenow, Ges. Naturf. Freunde Berlin Neue Schriften 2: 105. 1799.

林石草属 lin shi cao shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial, creeping. Radical leaves alternate; stipules rather large, membranous; leaf blade 3–5-fid or palmately 3–5-foliolate; segments or leaflets crenate or incised at margin. Inflorescence laxly cymose, 1–5-flowered, bracteate. Hypanthium long obconic or turbinate. Sepals 5, valvate, persistent; epicalyx segments 5, minute or absent. Petals 5, subequaling or longer than sepals. Stamens numerous, in 3 series; filaments persistent. Disk lining mouth of hypanthium. Carpels 2–6, inserted on short, villous receptacle, small; ovule solitary, ascending; style subterminal, filiform, deciduous above articulate base; stigma capitate, entire. Achenes dry or slightly fleshy, hairy, apex scarred. Seed erect; testa membranous. $x = 7$.

About six species: N temperate zone; one species in China.

1. Waldsteinia ternata (Stephan) Fritsch, Oesterr. Bot. Z. 39: 449. 1889.

光叶林石草 guang ye lin shi cao

Dalibarda ternata Stephan, Zap. Obshch. Isp. Prir. Imp. Moskovsk. Univ. 1: 129. 1806; *Comanopsis sibirica* (Tratt) Seringe; *Waldsteinia sibirica* Tratt.

Rhizome prostrate. Radical leaves 7–10 cm including petiole; stipules brown, abaxially subglabrous, margin ciliate; petiole glabrous or apically pilose; leaf blade 3-foliolate; petiolules short, sparsely pilose; leaflet blade abaxially purplish, adaxially green, rhombic-ovate to obovate, 1–4 × 1–3.5 cm, both surfaces sparsely pilose or glabrescent, base cuneate or broadly so, margin crenate, distally 3–5-lobed, apex obtuse to acute; cauline leaf solitary or reduced. Flowering stems 7–20 cm tall, glabrous; cyme 1–3-flowered; bracts ovate-lanceolate, membranous, margin entire. Flowers 1–2.5 cm in diam.; pedicel gla-

brous, rarely slightly pubescent. Sepals triangular-ovate, glabrous or abaxially sparsely pilose, apex acuminate or 2- or 3-serrate; epicalyx segments lanceolate, much shorter than sepals. Petals yellow, elliptic to rhombic-elliptic, nearly 2 × as long as sepals. Achenes black-brown, cylindrical to obliquely obovoid, 2–3 mm, white villous. Fl. and fr. May–Jun.

Damp forests; 700–1000 m. S Jilin (Changbai Shan) [Japan, E Russia (Sakhalin, E Siberia); C and E Europe].

The eastern Asian and European populations are widely disjunct, separated by over 5000 km.

Waldsteinia ternata var. *glabriuscula* T. T. Yu & C. L. Li was described in FRPS (p. 233) based on a difference in the indumentum of the stems and leaves; however stem and leaf hairiness in this species is variable, and it is difficult to distinguish taxa on this basis. The name is anyway invalid because no Latin description or diagnosis was provided (St. Louis Code, Art. 36.1).

35. POTENTILLA Linnaeus, Sp. Pl. 1: 495. 1753.

委陵菜属 wei ling cai shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Dasiphora Rafinesque; *Pentaphylloides* Duhamel.

Herbs perennial, rarely biennial, annual, or shrubs, if perennial then with ± tufted, scaly rootstock. Stems erect, ascending, or prostrate. Leaves pinnate or palmately compound; stipules ± adnate to petiole. Inflorescence often cymose or cymose-paniculate, or 1-flowered. Flowers usually bisexual. Hypanthium concave, mostly hemispheric. Sepals 5, valvate; epicalyx segments 5, alternating with sepals. Petals 5, often yellow, rarely white or purple. Stamens usually ca. 20 in 3 series of 10, 5, and 5, rarely fewer or more (11–30); anthers 2-loculed. Carpels usually numerous, free, inserted on slightly elevated receptacle; ovule ascending or pendulous, anatropous, amphitropous, or suborthotropous; style subterminal, lateral, or basal. Achenes numerous, inserted on dry receptacle with persistent sepals. Seed testa membranous. $x = 7$.

About 500 species: mostly in temperate, arctic, and alpine zones of the N hemisphere, a few in the S hemisphere; 88 species (24 endemic) in China.

- 1a. Herbs perennial, biennial, or annual; style subterminal, not evenly thickened throughout length; ovary glabrous.
 - 2a. Style conic, thickened at base, gradually attenuate distally 5. *P.* sect. *Conostylae*
 - 2b. Style clavate, thickened at apex, thin proximally 6. *P.* sect. *Potentilla*
- 1b. Shrublets or perennial herbs; style basal, lateral, or subterminal, clavate, filiform, slender, or fusiform; ovary hairy or glabrous.
 - 3a. Shrublets or woody-based perennial herbs; style clavate or filiform; ovary densely hairy, rarely glabrous.

- 4a. Style basal or lateral, clavate, thickened at apex, thin proximally; ovary densely hairy or only sparsely so at apex or hilum 1. *P.* sect. *Rhopalostylae*
- 4b. Style basal, lateral, or subterminal, filiform, evenly thickened throughout length; ovary densely villous, very rarely glabrous 2. *P.* sect. *Nematostylae*
- 3b. Herbs perennial; style slender or fusiform; ovary glabrous, very rarely hairy.
 - 5a. Auricles of stipules of radical leaves borne on adaxial side of petiole; flowering stems arising from axils of radical leaves 4. *P.* sect. *Leptostylae*
 - 5b. Auricles of stipules of radical leaves borne on lateral side of petiole; flowering stem developing as distal part of main stem 3. *P.* sect. *Closterostylae*

1. *Potentilla* sect. *Rhopalostylae* (Th. Wolf) Guşuleac in Savulescu, Fl. Reipubl. Popularis Roman. 4: 601. 1956.

棒状花柱组 bang zhuang hua zhu zu

Potentilla subsect. *Rhopalostylae* Th. Wolf, Biblioth. Bot. 16(Heft 71): 44. 1908.

Shrubs or subshrubs. Basal and cauline leaves pinnate, rarely 3-foliolate; leaflets entire or 2-lobed at apex. Ovary densely hairy or only sparsely so at hilum or apex, rarely glabrous; style sub-basal or lateral, clavate, thin proximally, thickened at apex.

About five species: temperate and subarctic regions of N hemisphere; five species in China.

- 1a. Herbs short or woody based; leaflets usually 2-fid, rarely entire, base not articulate at connection with petiole; ovary pilose around hilum or apex when young, glabrescent at maturity or only sparsely pilose at the apex, glabrous at maturity; style lateral.
 - 2a. Leaflets usually opposite, rarely alternate, both surfaces sparsely pilose or subglabrous 4. *P. bifurca*
 - 2b. Leaflets usually alternate, densely softly gray pubescent 5. *P. imbricata*
- 1b. Shrubs with woody stems above ground; leaflets entire, base articulate at connection with petiole; ovary densely villous; style sub-basal.
 - 3a. Petals white 2. *P. glabra*
 - 3b. Petals yellow.
 - 4a. Leaves pinnate with 2 pairs of leaflets, rarely 3-foliolate, leaflets oblong, obovate-oblong, or ovate-lanceolate, 3–20 × 3–10 mm 1. *P. fruticosa*
 - 4b. Leaves pinnate with 2 or 3 pairs of leaflets, basal 2 pairs usually palmately arranged or appearing whorled, rarely leaves 3-foliolate, leaflets lanceolate, linear-lanceolate, or obovate-lanceolate, 5–10 × 2–5 mm 3. *P. parvifolia*

1. *Potentilla fruticosa* Linnaeus, Sp. Pl. 1: 495. 1753.

金露梅 jin lu mei

Shrubs erect or sometimes prostrate, usually many branched. Branches covered with reddish brown or gray, peeling bark, villous when young. Stipules broad, thinly membranous, abaxially villous or glabrescent; petiole sericeous or pilose; leaf blade pinnate with 2 pairs of leaflets, rarely 3-foliolate; leaflets oblong, obovate-oblong, or ovate-lanceolate, 0.3–2 × 0.3–1 cm, abaxially ± densely hairy, sometimes sparsely so or glabrescent, adaxially sparsely or rather densely appressed hairy, base cuneate, decurrent and adnate to rachis in apical pair of leaflets, margin entire, flat or often ± revolute, apex usually acute. Inflorescence terminal, laxly racemose or corymbiform, small, 1- to several flowered. Flowers 1–3 cm in diam. Sepals ovate, apex acute to shortly acuminate; epicalyx segments lanceolate to obovate-lanceolate, nearly equaling sepals, sparsely sericeous-villous, apex acute to acuminate. Petals yellow, broadly obovate, nearly equaling sepals, apex rounded. Style sub-basal, clavate, thin proximally, constricted at base of dilated stigma. Achenes brown, subovate, ca. 1.5 mm, abaxially villous. Fl. and fr. Jun–Sep.

Rocks in forests, forest margins, thickets, alpine meadows, dry and grassy mountain slopes, talus slopes; 400–5000 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Asia, Europe, North America].

- 1a. Shrubs low, tufted; stems slender 1d. var. *pumila*
- 1b. Shrubs erect; stems robust.
 - 2a. Leaflets adaxially densely silvery tomentose or sericeous 1c. var. *albicans*
 - 2b. Leaflets adaxially sparsely pilose, sericeous, subglabrous, or glabrous.
 - 3a. Leaflets abaxially sparsely pilose or subglabrous, adaxially inconspicuously elevated reticulate veined, margin flat 1a. var. *fruticosa*
 - 3b. Leaflets abaxially densely appressed white villous, adaxially prominently elevated reticulate veined, margin strongly revolute 1b. var. *arbuscula*

1a. *Potentilla fruticosa* var. *fruticosa*

金露梅(原变种) jin lu mei (yuan bian zhong)

Dasiphora fruticosa (Linnaeus) Rydberg; *D. riparia* Rafinesque; *Pentaphylloides fruticosa* (Linnaeus) O. Schwarz; *Potentilla fruticosa* var. *rigida* (Wallich ex Lehmann) Th. Wolf; *Potentilla rigida* Wallich ex Lehmann.

Shrubs erect. Stems robust. Leaflets oblong, obovate, or ovate-lanceolate, 7–20 × 4–10 mm, abaxially sparsely pilose or

subglabrous, adaxially sparsely pilose, sericeous, or subglabrous, inconspicuously elevated reticulate veined, margin flat. Inflorescence terminal, laxly racemose or corymbose, 1- to several flowered. Flowers 2.2–3 cm in diam. Fl. and fr. Jun–Sep.

Forest margins, thickets, grassy mountain slopes, talus slopes; 1000–4000 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Asia, Europe, North America].

1b. *Potentilla fruticosa* var. *arbuscula* (D. Don) Maximowicz, *Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg* 9: 158. 1877.

伏毛金露梅 fu mao jin lu mei

Potentilla arbuscula D. Don, *Prodr. Fl. Nepal*. 256. 1925; *P. lespedeza* H. Léveillé; *P. rigida* Wallich ex Lehmann, p.p.

Shrubs erect. Stems robust. Leaflets abaxially densely appressed white villous, adaxially sparsely pilose or glabrous, prominently elevated reticulate veined, margin strongly revolute. Fl. and fr. Jul–Aug.

Rocks in forests, thickets, grassy mountain slopes; 2600–4600 m. Sichuan, Xizang, Yunnan [Bhutan, Nepal, Sikkim].

1c. *Potentilla fruticosa* var. *albicans* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 302. 1915.

白毛金露梅 bai mao jin lu mei

Potentilla arbuscula var. *albicans* (Rehder & E. H. Wilson) Handel-Mazzetti; *P. arbuscula* var. *bulleyana* I. B. Balfour ex H. R. Fletcher; *P. fruticosa* var. *vilmoriniana* Komarov.

Shrubs erect. Stems robust. Leaflets abaxially sparsely spreading pilose, adaxially densely silvery tomentose or sericeous, margin flat. Fl. and fr. Jun–Sep.

• Forest margins, thickets, alpine meadows, dry mountain slopes; 400–4600 m. Sichuan, Xinjiang, Xizang, Yunnan.

1d. *Potentilla fruticosa* var. *pumila* J. D. Hooker, *Fl. Brit. India* 2: 348. 1878.

垫状金露梅 dian zhuang jin lu mei

Potentilla arbuscula var. *pumila* (J. D. Hooker) Handel-Mazzetti.

Shrubs low, tufted. Stems densely fasciculate, slender, 5–10 cm tall. Leaflets elliptic, 3–5 × 3–4 mm, abaxially densely appressed villous, adaxially subglabrous or sparsely pilose, prominently reticulate veined, margin revolute. Flowers solitary, subsessile or shortly pedicellate, 1–1.5 cm in diam. Fl. Jun.

Thickets, alpine meadows, talus slopes; 4200–5000 m. Xizang [Bhutan, Nepal, Sikkim].

2. *Potentilla glabra* Loddiges, *Bot. Cab.* 10: t. 914. 1824.

银露梅 yin lu mei

Shrubs 0.3–2(–3) m tall. Young branchlets sparsely pubescent, older ones covered with grayish brown, peeling bark. Stipules thinly membranous, sparsely pilose or subglabrous; petiole sparsely pilose; leaf blade pinnate with 2(or 3) pairs of leaflets; leaflets oblong, obovate-elliptic, or ovate-elliptic, 0.5–1.2 cm × 4–8 mm, both surfaces sparsely (rarely densely) pi-

lose, sericeous, or glabrescent, base cuneate or rounded, decurrent and adnate to rachis in apical pair of leaflets, margin entire, flat or slightly revolute, apex obtuse or acute. Flowers 1 to several, terminal on separate branches, 1.5–2.5 cm in diam.; pedicel long, thin, sparsely pilose. Sepals ovate, apex acute or shortly mucronate; epicalyx segments lanceolate, obovate-lanceolate, or ovate, shorter than or nearly equaling sepals, abaxially sparsely pilose. Petals white, obovate, apex rounded. Style sub-basal, clavate, thin at base, constricted at base of dilated stigma. Achenes hairy. Fl. and fr. May–Nov.

Forests, forest margins, thickets, meadows, slopes, alpine talus slopes, ravines, open places, rocky places; 1200–4200 m. Anhui, Gansu, Hebei, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Yunnan [Korea, Mongolia, Russia].

- 1a. Leaflets abaxially densely white tomentose or sericeous 2d. var. *mandshurica*
- 1b. Leaflets abaxially sparsely white sericeous or glabrescent.
 - 2a. Leaflets adaxially appressed sericeous; pedicels densely white sericeous-villous 2c. var. *veitchii*
 - 2b. Leaflets adaxially sparsely pilose; pedicels pilose.
 - 3a. Leaflets elliptic, ovate-elliptic, or obovate-elliptic; flowers 1.5–2.5 cm in diam.; sepals ovate, apex acute or acuminate; petals obovate 2a. var. *glabra*
 - 3b. Leaflets lanceolate or oblong-lanceolate; flowers 2.5–3 cm in diam.; sepals lanceolate, apex long acuminate; petals spatulate-obovate-oblong, base tapered into a long claw 2b. var. *longipetala*

2a. *Potentilla glabra* var. *glabra*

银露梅(原变种) yin lu mei (yuan bian zhong)

Potentilla fruticosa Linnaeus var. *dahurica* Seringe; *P. fruticosa* var. *mongolica* Maximowicz; *P. fruticosa* var. *tangutica* Th. Wolf; *P. glabra* var. *rhodocalyx* H. R. Fletcher; *P. glabrata* Willdenow ex Schlechtendal.

Leaflets elliptic, obovate-elliptic, or ovate-elliptic, 0.5–1.2 cm × 4–8 mm, both surfaces sparsely pilose or glabrescent, base cuneate or rounded, margin entire, flat or slightly revolute, apex obtuse or acute. Flowers 1.5–2.5 cm in diam. Sepals ovate, apex acute or shortly mucronate; epicalyx segments lanceolate, obovate-lanceolate, or ovate, shorter than or nearly equaling sepals. Petals white, obovate, apex rounded. Fl. and fr. Jun–Nov.

Forests, thickets, meadows on mountain slopes, among rocks in valleys; 1400–4200 m. Anhui, Gansu, Hebei, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Yunnan [Korea, Mongolia, Russia].

2b. *Potentilla glabra* var. *longipetala* T. T. Yu & C. L. Li, *Acta Phytotax. Sin.* 18: 7. 1980.

长瓣银露梅 chang ban yin lu mei

Leaflets lanceolate or oblong-lanceolate. Flowers 2.5–3

cm in diam. Sepals triangular-lanceolate, apex long acuminate; epicalyx segments lanceolate or linear-lanceolate, nearly equaling sepals, apex acuminate. Petals spatulate-obovate-oblong, base tapered into a long claw, apex obtuse; claw ca. 2 × as long as sepals.

- Alpine talus slopes; ca. 4200 m. NW Yunnan (Weixi Xian).

2c. *Potentilla glabra* var. *veitchii* (E. H. Wilson) Handel-Mazzetti, Acta Horti Gothob. 13: 298. 1939.

伏毛银露梅 fu mao yin lu mei

Potentilla veitchii E. H. Wilson, Gard. Chron., ser. 3, 50: 102. 1911; *Dasiphora fruticosa* (Linnaeus) Rydberg var. *veitchii* (E. H. Wilson) Nakai; *Potentilla davurica* Nestler var. *veitchii* (E. H. Wilson) Jesson; *P. fruticosa* var. *veitchii* (E. H. Wilson) Bean.

Leaflets abaxially sparsely white sericeous or glabrescent, adaxially appressed white sericeous. Pedicels thick, densely white sericeous. Fl. and fr. Jul–Aug.

- Forest margins, alpine meadows, open places, rocky places; 2600–4100 m. Sichuan, Yunnan.

2d. *Potentilla glabra* var. *mandshurica* (Maximowicz) Handel-Mazzetti, Acta Horti Gothob. 13: 297. 1939.

白毛银露梅 bai mao yin lu mei

Potentilla fruticosa var. *mandshurica* Maximowicz, Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 9: 158. 1877; *Dasiphora mandshurica* (Maximowicz) Juzepczuk; *P. davurica* var. *mandshurica* (Maximowicz) Th. Wolf; *P. fruticosa* var. *subalbicans* Handel-Mazzetti.

Leaflets abaxially densely white tomentose or sericeous, adaxially ± appressed pilose. Fl. and fr. May–Sep.

Mixed forests, thickets, dry mountain slopes, rocky slopes, ravines; 1200–3400 m. Gansu, Hebei, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Yunnan [Korea].

3. *Potentilla parvifolia* Fischer ex Lehmann, Nov. Stirp. Pug. 3: 6. 1831.

小叶金露梅 xiao ye jin lu mei

Shrubs low, prostrate, or often erect, 0.3–1.5 m tall, much branched. Branchlets gray or grayish brown, canescent pilose or sericeous when young, with peeling bark when old. Stipules brown or paler, membranous, sparsely pilose, margin entire; leaf blade pinnate with 2 or 3 pairs of leaflets; basal 2 pairs usually palmately arranged or appearing whorled; leaflets small, lanceolate, linear-lanceolate, or obovate-lanceolate, 5–10 × 2–5 mm, abaxially sericeous, white tomentose, or pilose, adaxially sericeous, base cuneate, margin entire, usually strongly revolute, apex usually acuminate, rarely obtuse. Inflorescence terminal, a few-flowered raceme or a solitary flower. Flowers 1.2–2.2 cm in diam.; pedicel grayish white or sericeous-pilose. Sepals ovate, apex acute; epicalyx segments lanceolate, ovate-lanceolate, or obovate-lanceolate, slightly shorter than or equaling sepals, abaxially sericeous or pilose, apex acute or acuminate. Petals yellow, broadly obovate, 1–2 × as long as sepals, apex emarginate or rounded. Style sub-basal,

clavate, thin at base, constricted at base of dilated stigma. Achenes hairy. Fl. and fr. Apr–Sep.

Forests, forest margins, thickets on mountain slopes, rock crevices, steppes; 900–5000 m. Gansu, Heilongjiang, Nei Mongol, Qinghai, Sichuan, Xizang, Yunnan [Mongolia, Russia].

- 1a. Leaflets sericeous on both surfaces, or abaxially glaucous, sometimes sparsely pilose 3a. var. *parvifolia*
- 1b. Leaflets abaxially white tomentose or sericeous, adaxially sericeous-pubescent 3b. var. *hypoleuca*

3a. *Potentilla parvifolia* var. *parvifolia*

小叶金露梅(原变种) xiao ye jin lu mei (yuan bian zhong)

Dasiphora parvifolia (Fischer ex Lehmann) Juzepczuk; *Potentilla fruticosa* Linnaeus var. *grandiflora* C. Marquand; *P. fruticosa* var. *parvifolia* (Fischer ex Lehmann) Th. Wolf; *P. fruticosa* var. *purdonii* Rehder; *P. rehderiana* Handel-Mazzetti.

Leaflets sericeous on both surfaces, or abaxially glaucous, sometimes sparsely pilose. Fl. and fr. Jun–Aug.

Forests, forest margins, rock crevices, steppes; 900–5000 m. Gansu, Heilongjiang, Nei Mongol, Qinghai, Sichuan, Xizang [Mongolia, Russia].

3b. *Potentilla parvifolia* var. *hypoleuca* Handel-Mazzetti, Acta Horti Gothob. 13: 293. 1939.

白毛小叶金露梅 bai mao xiao ye jin lu mei

Leaflets abaxially white tomentose or sericeous, adaxially sericeous-pubescent. Fl. and fr. Apr–Sep.

- Thickets on mountain slopes; 1200–3600 m. Gansu, Qinghai, Sichuan, Yunnan.

4. *Potentilla bifurca* Linnaeus, Sp. Pl. 1: 497. 1753.

二裂委陵菜 er lie wei ling cai

Herbs perennial or low shrubs, 5–20 cm tall, with partly subterranean stems. Aerial stems usually ascending or prostrate, together with petioles and pedicels ± densely or rarely sparsely covered throughout with spreading or often erect-spreading, rarely ± laxly appressed, rigid hairs. Leaves 3–8 cm including petiole; stipules of lower leaves brown, membranous, abaxially hirtellous, rarely glabrescent, those of upper leaves ovate-elliptic, herbaceous, margin usually entire, rarely serrate; leaf blade pinnate with 3–8 pairs of leaflets; leaflets opposite, rarely alternate, sessile, elliptic or obovate, 0.5–1.5 cm × 4–8 mm, appressed pilose, base cuneate or broadly so, decurrent and adnate to rachis in distal 2 or 3 pairs of leaflets, apex entire, 2- or 3-fid. Inflorescence terminal, laxly corymbose or cymose, or a solitary flower. Flowers 0.7–1.5 cm in diam. Sepals ovate, apex acute; epicalyx segments elliptic, shorter than or nearly equaling sepals, sparsely pilose abaxially, apex obtuse or acute. Petals yellow, obovate, slightly longer than sepals, apex rounded. Ovary adaxially pilose; style lateral, thickened and clavate at apex, slightly constricted under dilated stigma. Achenes smooth. Fl. and fr. May–Oct.

Sparse forests, grassy mountain slopes, loess slopes, sandy river

banks, field and road banks, field margins, steppe meadows, semidry desert grasslands, sandy coasts; 400–4000 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [Korea, Mongolia, Russia; SW Asia, C and E Europe].

- 1a. Flowers usually solitary 4b. var. *humilior*
 1b. Flowers many per inflorescence.
 2a. Flowering stems 5–20 cm tall, together with petioles and pedicels densely villous or hirtellous throughout; leaflets elliptic or obovate-elliptic, apex 2-fid, rarely 3-fid; inflorescence corymbose; flowers 0.7–1 cm in diam. 4a. var. *bifurca*
 2b. Flowering stems less than 7 cm tall, lower part together with petioles appressed pilose or glabrescent; leaflets linear or long elliptic, apex rounded, obtuse, or 2-fid; inflorescence cymose; flowers 1.2–1.5 cm in diam. 4c. var. *major*

4a. *Potentilla bifurca* var. *bifurca*

二裂委陵菜(原变种) *er lie wei ling cai (yuan bian zhong)*

Flowering stems 5–20 cm tall, together with petioles and pedicels densely villous or hirtellous throughout. Leaflets elliptic or obovate-elliptic, apex 2-fid, rarely 3-fid. Inflorescence corymbose, many flowered. Flowers 0.7–1 cm in diam. Fl. and fr. May–Sep.

Sparse forests, grassy mountain slopes, loess slopes, field and road banks, semidry desert grasslands, sandy coasts; 800–3600 m. Gansu, Hebei, Heilongjiang, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang [Korea, Mongolia, Russia].

This variety is used medicinally and for forage.

4b. *Potentilla bifurca* var. *humilior* Osten-Sacken & Ruprecht, Sert. Tianschan. 45. 1869.

矮生二裂委陵菜 *ai sheng er lie wei ling cai*

Potentilla bifurca var. *moorcroftii* (Wallich ex Lehmann) Th. Wolf; *P. moorcroftii* Wallich ex Lehmann.

Flowering stems less than 7 cm tall. Leaflets usually in 3–5 (or 6) pairs, apex usually entire, occasionally 2-fid. Flowers usually solitary. Fl. and fr. May–Oct.

2. *Potentilla* sect. *Nematostylae* (Th. Wolf) Guşuleac in Savulescu, Fl. Reipubl. Popularis Roman. 4: 602. 1956.

线状花柱组 *xian zhuang hua zhu zu*

Potentilla subsect. *Nematostylae* Th. Wolf, Biblioth. Bot. 16(Heft 71): 45. 1908.

Subshrubs or perennial, woody-based herbs. Basal leaves pinnate, palmate, or 3-foliolate; leaflets entire, serrate, or divided at margin. Ovary densely villous, very rarely glabrous; style sub-basal, lateral, or subterminal, filiform, evenly thickened throughout its length.

About 50 species: mainly temperate and subarctic regions of N hemisphere; five species (one endemic) in China.

- 1a. Leaflet margin entire; style subterminal.
 2a. Leaf blade pinnately or subpalmately 5–7-foliolate, leaflets not articulate at base 9. *P. biflora*
 2b. Leaf blade 3-foliolate, leaflets articulate at base 10. *P. articulata*
 1b. Leaflet margin or apex serrate or lobed; style sub-basal, lateral, or subterminal.
 3a. Leaflets 3-serrate at apex; style lateral or sub-basal 6. *P. cuneata*

Grassy mountain slopes, sandy river banks, steppe meadows; 1100–4000 m. Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [Mongolia, Russia].

4c. *Potentilla bifurca* var. *major* Ledebour, Fl. Ross. 2: 43. 1843.

长叶二裂委陵菜 *chang ye er lie wei ling cai*

Potentilla bifurca var. *glabrata* Lehmann; *P. bifurca* subsp. *orientalis* (Juzepczuk) Soják; *P. orientalis* Juzepczuk; *P. semiglabra* Juzepczuk.

Flowering stems less than 7 cm tall, lower part together with petioles appressed pilose or glabrescent. Leaflets linear or long elliptic, apex rounded, obtuse, or 2-fid. Inflorescence cymose, many flowered. Flowers 1.2–1.5 cm in diam. Fl. and fr. May–Oct.

Grassy mountain slopes, sandy river banks, field margins; 400–3200 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Shaanxi, Shanxi, Xinjiang [Asia, C and E Europe].

5. *Potentilla imbricata* Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 14: 416. 1841.

覆瓦委陵菜 *fu wa wei ling cai*

Potentilla bifurca Linnaeus var. *canescens* Bongard & C. A. Meyer.

Herbs perennial, 10–22 cm tall, evenly and densely grayish tomentose-villous in all green parts. Roots robust, terete, woody. Stems erect, many branched from base. Leaves numerous, 2–6 cm including petiole; leaf blade pinnate with (3–)5–7 pairs of leaflets; leaflets usually alternate, adjacent, imbricate, elliptic or obovate-elliptic, base cuneate or broadly so, decurrent and adnate to rachis in distal 2 or 3 pairs of leaflets, margin entire, apex acute, often 2-fid, rarely entire. Inflorescence terminal, laxly corymbose. Flowers 6–8 mm in diam. Sepals triangular-ovate, apex acute; epicalyx segments elliptic, ca. 1/2 as long as sepals, apex acute. Petals yellow, obovate-elliptic, nearly equaling or slightly longer than sepals, apex rounded. Carpels sparsely pilose around hilum; style sublateral, clavate, slightly attenuate at base, constricted below dilated stigma. Achenes rugose when ripe. Fl. and fr. Aug–Sep.

Shaded grasslands, flood lands, dry calcareous soils; 500–600 m. Xinjiang [Mongolia, Russia].

3b. Leaflets many serrate or distally 5–7-dentate or 2–5-parted at margin; style subterminal.

4a. Flowering stems ascending, rarely erect; rhizome elongate; leaflets distally 5–7-dentate or 2–5-parted at margin 7. *P. eriocarpa*

4b. Flowering stems usually erect; rhizome short; leaflets many serrate at margin 8. *P. ancistrifolia*

6. *Potentilla cuneata* Wallich ex Lehmann, Nov. Stirp. Pug. 3: 34. 1831.

楔叶委陵菜 xie ye wei ling cai

Potentilla ambigua Cambessèdes; *P. dolichopogon* H. Léveillé.

Subshrubs low, tufted or perennial herbs. Roots slender, woody. Flowering stems erect or ascending, 4–12 cm tall, woody, together with petioles appressed pilose. Radical leaves 2–3 cm including petiole; stipules brown, membranous, abaxially spreading pilose or glabrescent; leaf blade 3-foliolate; leaflets obovate, elliptic, or long elliptic, 0.6–1.5 cm × 4–8 mm, subleathery, both surfaces sparsely spreading pilose or glabrescent, base cuneate, apex truncate or obtuse and 3-dentate; lateral leaflets sessile, terminal one shortly petiolulate; cauline leaves: stipules green, ovate-lanceolate, herbaceous, margin entire, apex acuminate. Inflorescence terminal, 1- or 2-flowered. Flowers 1.8–2.5 cm in diam.; pedicel 2.5–3 cm, villous. Sepals triangular-ovate, apex acuminate; epicalyx segments oblong-elliptic, slightly shorter than sepals, abaxially spreading pilose, apex acute. Petals yellow, broadly obovate, slightly longer than sepals, apex emarginate. Style sub-basal, filiform; stigma slightly dilated. Achenes slightly longer than persistent sepals, villous. Fl. and fr. Jun–Oct.

Forest margins, thickets, alpine meadows, rock crevices; 2700–3600 m. Sichuan, Xizang, Yunnan [Bhutan, Kashmir, Nepal, Sikkim].

7. *Potentilla eriocarpa* Wallich ex Lehmann, Nov. Stirp. Pug. 3: 35. 1831.

毛果委陵菜 mao guo wei ling cai

Subshrubs. Roots robust, terete. Rhizome stout, elongate, woody, densely covered with remains of old stipules. Flowering stems erect or ascending, 4–12 cm tall, together with petioles sparsely white villous, sometimes glabrescent. Radical leaves 3–7 cm including petiole; stipules brown, membranous, abaxially white villous; leaf blade 3-foliolate; leaflets shortly petiolulate or subsessile, abaxially green, adaxially dark green, obovate-elliptic, obovate-cuneate, or rhombic-elliptic, abaxially sparsely white villous on veins and later glabrescent elsewhere, or densely white villous and later glabrescent, adaxially sparsely pilose or densely white villous, often glabrescent, base cuneate or broadly so, margin proximally entire, distally deeply 5–7-dentate with teeth ovate or elliptic-ovate and apex subrounded to acute, or 2–5-parted with segments broadly fasciated or lanceolate and apex acute or acuminate; cauline leaves: stipules herbaceous, ovate-elliptic, margin entire or slightly serrate, apex acuminate; leaf blade absent, bractlike, or occasionally 3-foliolate. Inflorescence terminal, 1–3-flowered. Flowers 2–2.5 cm in diam.; pedicel 2–2.5 cm, pilose. Sepals triangular-ovate, apex acuminate; epicalyx segments oblong-elliptic or elliptic-lanceolate, nearly equaling sepals, abaxially sparsely pilose or subglabrous, apex acute, rarely 2-fid. Petals yellow, broadly obovate, ca. 2 × as long as sepals, apex emar-

ginate. Carpels densely twisted villous; style subterminal, filiform; stigma dilated. Achenes smooth, villous. Fl. and fr. Jul–Oct.

Sparse forests, alpine meadows, talus slopes, rock crevices; 2700–5000 m. Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Sikkim].

1a. Leaflets abaxially sparsely white villous on veins, later glabrescent elsewhere, adaxially sparsely pilose or glabrescent, margin distally deeply 5–7-dentate, teeth ovate or elliptic-ovate, apex subrounded to acute 7a. var. *eriocarpa*

1b. Leaflets on both surfaces usually densely white villous, later glabrescent, margin distally 2–5-parted, segments broadly fasciated or lanceolate, apex acute or acuminate 7b. var. *tsarongensis*

7a. *Potentilla eriocarpa* var. *eriocarpa*

毛果委陵菜(原变种) mao guo wei ling cai (yuan bian zhong)

Potentilla davidii Franchet; *P. eriocarpa* var. *cathayana* C. K. Schneider; *P. eriocarpoidea* var. *glabrescens* J. Krause.

Leaflets abaxially sparsely white villous on veins, later glabrescent elsewhere, adaxially sparsely pilose or glabrescent, margin distally deeply 5–7-dentate, teeth ovate or elliptic-ovate, apex subrounded to acute. Fl. and fr. Jul–Oct.

Sparse forests, alpine meadows, rock crevices; 2700–5000 m. Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Sikkim].

7b. *Potentilla eriocarpa* var. *tsarongensis* W. E. Evans, Notes Roy. Bot. Gard. Edinburgh 13: 178. 1921.

裂叶毛果委陵菜 lie ye mao guo wei ling cai

Potentilla eriocarpa var. *dissecta* C. Marquand & Airy Shaw; *P. eriocarpoidea* J. Krause.

Leaflets on both surfaces usually densely white villous, later glabrescent, margin distally 2–5-parted, segments broadly fasciated or lanceolate, apex acute or acuminate.

• Talus slopes, alpine rock crevices; 2800–4300 m. Sichuan, Xizang, Yunnan.

8. *Potentilla ancistrifolia* Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg, Sér. 6, Sci. Math. 2: 99. 1833.

皱叶委陵菜 zhou ye wei ling cai

Herbs perennial. Roots robust, terete, woody. Flowering stems erect, 10–30 cm tall, sparsely pilose, in upper part sometimes mixed with glandular hairs. Radical leaves 5–15 cm including petiole; stipules brown, membranous, abaxially villous; petiole sparsely pilose; leaf blade pinnate with 2–4 pairs of leaflets, sometimes also 3-foliolate; basal pair usually small; leaflets sessile, sometimes apical pair shortly petiolulate, abaxi-

ally gray or grayish green, adaxially green or dark green, elliptic, oblong-elliptic, or elliptic-ovate, 1–4 × 0.5–1.5 cm, subleathery, abaxially densely villous, appressed villous on veins, or sparsely pilose or glabrescent, adaxially markedly bullate or not, prominently or inconspicuously reticulate veined, appressed pilose, sparsely pilose, or glabrescent, base cuneate or broadly so, margin acutely and usually roughly serrate, teeth usually triangular-ovate, apex obtuse or acute; cauline leaves 2 or 3; stipules green, ovate-lanceolate or lanceolate, herbaceous, margin 1–3-dentate, rarely entire; leaf blade with 1–3 pairs of leaflets. Inflorescence terminal, laxly corymbiform or cymose. Flowers 8–12 mm in diam.; pedicel 5–10 mm, densely villous and glandular hairy. Sepals triangular-ovate, apex caudate; epicalyx segments usually purplish abaxially, linear-lanceolate, nearly equaling sepals, sparsely pilose, apex acute. Petals yellow, obovate-oblong, 0.5–1 × as long as sepals, apex rounded. Ovary densely villous at hilum; style subterminal, filiform; stigma not dilated. Achenes rugose at maturity, inconspicuously so, or smooth, sometimes villous around hilum. Fl. and fr. May–Sep.

Forests, thickets, meadows, ravines, gravels, rock crevices; 200–2700 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Shaanxi, Shanxi, Sichuan [Japan, Korea, Russia].

- 1a. Radical leaves with 2–4 pairs of leaflets, leaflets abaxially densely villous, appressed villous on veins, adaxially usually markedly bullate and prominently reticulate veined, appressed pilose; mature achenes rugose, villous around hilum 8a. var. *ancistrifolia*
- 1b. Radical leaves with 2 or 3 pairs of leaflets, often also 3-foliolate, leaflets on both surfaces sparsely pilose or glabrescent, abaxially inconspicuously reticulate veined, adaxially not bullate; mature achenes smooth or inconspicuously rugose 8b. var. *dickinsii*

8a. *Potentilla ancistrifolia* var. *ancistrifolia*

皱叶委陵菜(原变种) *zhou ye wei ling cai* (yuan bian zhong)

Potentilla aemulans Juzepczuk; *P. rugulosa* Kitagawa; *P. tranzschelii* Juzepczuk.

Flowering stems and petioles sparsely pilose, sometimes mixed with glandular hairs. Radical leaves with 2–4 pairs of leaflets; leaflets abaxially densely villous, appressed villous on veins, adaxially usually markedly bullate and prominently reticulate veined, appressed pilose. Achenes rugose at maturity, villous around hilum. Fl. and fr. May–Sep.

Thickets, meadows on mountain slopes, gravels, rock crevices; 300–2400 m. Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Shaanxi, Shanxi, Sichuan [Korea, Russia].

Potentilla ancistrifolia var. *tomentosa* Liou & Y. Y. Li ex C. L. Li was described in FRPS (p. 256), but the name is invalid because no Latin description or diagnosis was provided (St. Louis Code, Art. 36.1). The entity described belongs to var. *ancistrifolia*.

8b. *Potentilla ancistrifolia* var. *dickinsii* (Franchet & Savatier) Koidzumi, Bot. Mag. (Tokyo) 23: 177. 1909.

薄叶皱叶委陵菜 *bo ye zhou ye wei ling cai*

Potentilla dickinsii Franchet & Savatier, Enum. Pl. Jap. 2: 337. 1878.

Radical leaves with 2 or 3 pairs of leaflets, often also 3-foliolate; leaflets on both surfaces sparsely pilose or glabrescent, abaxially inconspicuously reticulate veined, adaxially not bullate. Achenes smooth or inconspicuously rugose at maturity. Fl. and fr. Jun–Sep.

Forests, meadows, ravines, rock crevices on mountain slopes; 200–2700 m. Anhui, Gansu, Hebei, Henan, Liaoning, Shaanxi, Shanxi [Japan, Korea].

9. *Potentilla biflora* Willdenow ex Schlechtendal, Ges. Naturf. Freunde Berlin Mag. Neuesten Entdeck. Gesammten Naturk. 7: 297. 1816.

双花委陵菜 *shuang hua wei ling cai*

Herbs perennial, tufted, pulvinate. Roots stout, terete. Flowering stems erect, 4–12 cm tall, pilose. Radical leaves 2–6 cm including petiole; stipules brown, membranous, abaxially white pilose, later glabrescent; petiole white villous; leaf blade pinnately to palmately 5-foliolate; leaflets adaxially dark green, linear, 0.8–1.7 cm × 1–3 mm, abaxially densely white villous on midvein, adaxially pilose, base decurrent and adnate to rachis in apical pair of leaflets, margin entire and revolute, but in basal pair of leaflets sometimes 2-parted nearly to base, apex acute to acuminate. Flowers 1 or 2 (or 3), 1.2–1.8 cm in diam.; pedicel 1–2 cm, pilose, proximally with linear bract. Sepals triangular-ovate, apex acute; epicalyx segments lanceolate, slightly shorter or longer than sepals, abaxially pilose, apex acuminate. Petals yellow, oblong-obovate, 0.5–1 × as long as sepals, apex emarginate. Style subterminal, filiform; stigma hardly dilated. Achenes smooth, hairy around hilum. Fl. and fr. Jun–Oct.

Alpine meadows, talus slopes, gravels, rock crevices near snow line; 2300–4800 m. Gansu, Sichuan, Xinjiang, Xizang [N Mongolia, Nepal, Russia (Far East, Siberia); C Asia, North America].

- 1a. Basal pair of leaflets of radical leaves usually 2-parted nearly to base, rarely entire; flowers 1.2–1.5 cm in diam. 9a. var. *biflora*
- 1b. Basal pair of leaflets of radical leaves not 2-parted; flowers 1.5–1.8 cm in diam. 9b. var. *lahulensis*

9a. *Potentilla biflora* var. *biflora*

双花委陵菜(原变种) *shuang hua wei ling cai* (yuan bian zhong)

Potentilla inglisii Royle.

Basal pair of leaflets of radical leaves usually 2-parted nearly to base, rarely entire; flowers 1.2–1.5 cm in diam. Fl. and fr. Jul–Oct.

Alpine meadows, gravels, rock crevices near snow line; 2300–3600 m. Xinjiang [N Mongolia, Nepal, Russia (Far East, Siberia); C Asia, North America].

9b. *Potentilla biflora* var. *lahulensis* Th. Wolf, Biblioth. Bot. 16(Heft 71): 72. 1908.

五叶双花委陵菜 *wu ye shuang hua wei ling cai*

Basal pair of leaflets of radical leaves not 2-parted; flowers 1.5–1.8 cm in diam. Fl. and fr. Jun–Aug.

• Alpine meadows, talus slopes, gravelly slopes; 3700–4800 m. Gansu, Sichuan, Xizang.

10. *Potentilla articulata* Franchet, Pl. Delavay. 3: 210. 1890.

关节委陵菜 *guan jie wei ling cai*

Herbs perennial, tufted, pulvinate. Roots stout, terete, woody. Flowering stems 1.5–3 cm tall. Radical leaves: stipules brown, broad, membranous, abaxially sparsely villous, later glabrescent; leaf blade 3-foliolate; leaflets sessile, linear-lanceolate or narrower, 0.5–1.5 cm × ca. 2 mm, adaxially densely villous when young, later both surfaces pilose or glabrescent, base markedly or inconspicuously articulate, margin entire, slightly revolute, apex acute. Flower solitary, to 1.5 cm in diam.; pedicel 1.5–2 cm, densely villous, with linear bract. Sepals triangular-ovate, apex acuminate; epicalyx segments elliptic-lanceolate, nearly equaling or slightly longer than sepals, abaxially sparsely villous, apex acute. Petals yellow, obovate, ca. 1/2 as long as sepals, apex emarginate. Style subterminal, filiform; stigma hardly dilated. Achenes smooth. Fl. and fr. Jun–Sep.

• Alpine meadows, gravels near snow line, bare rocks; 3200–4800 m. SW Sichuan, Xizang, Yunnan.

1a. Leaflets linear-lanceolate, base markedly articulate 10a. var. *articulata*

1b. Leaflets narrower, base inconspicuously articulate 10b. var. *latipetiolata*

10a. *Potentilla articulata* var. *articulata*

关节委陵菜(原变种) *guan jie wei ling cai (yuan bian zhong)*

Potentilla biflora Willdenow ex Schlechtendal var. *armerioides* (J. D. Hooker) Handel-Mazzetti; *P. fruticosa* Linnaeus var. *armerioides* J. D. Hooker; .

Leaflets linear-lanceolate, base markedly articulate. Fl. and fr. Jun–Sep.

• Gravels near snow line; 4200–4800 m. S Sichuan (Muli Xian), SE Xizang (Zayü Xian), NW Yunnan (Lijiang Xian, Zhongdian Xian).

10b. *Potentilla articulata* var. *latipetiolata* (E. C. Fischer) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 259. 1985.

宽柄关节委陵菜 *kuan bing guan jie wei ling cai*

Potentilla latipetiolata E. C. Fischer, Bull. Misc. Inform. Kew 1940: 294. 1941.

Leaflets narrower, base inconspicuously articulate. Fl. and fr. Jul–Aug.

• Alpine meadows, bare rocks; 3200–4100 m. Xizang, Yunnan.

3. *Potentilla* sect. *Closterostylae* (Th. Wolf) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 259. 1985.

梭状花柱组 *suo zhuang hua zhu zu*

Potentilla subsect. *Closterostylae* Th. Wolf, Biblioth. Bot. 16(Heft 71): 48. 1908.

Herbs perennial. Basal leaves pinnate, sometimes 3-foliolate. Ovary glabrous; style sub-basal, fusiform, thickened at middle, gradually tapered at both ends.

About 20 species: mainly temperate regions of N hemisphere; one species in China.

11. *Potentilla rupestris* Linnaeus, Sp. Pl. 1: 496. 1753.

石生委陵菜 *shi sheng wei ling cai*

Potentilla inquinans Turczaninow; *P. okubo* Kitagawa.

Herbs perennial. Roots thick, terete. Flowering stems erect, 18–45 cm tall, pilose and glandular hairy. Radical leaves 6–15 cm including petiole; stipules brown, membranous, abaxially pilose and glandular hairy; petiole sparsely pilose and glandular hairy; leaf blade usually with 2 or 3 pairs of leaflets, sometimes 3-foliolate; terminal leaflet shortly petiolulate, lateral ones sessile; leaflets elliptic, obovate-elliptic, or ovate-elliptic, usually 1.5–5 × 1–2.5 cm, apical 3 much larger than others, both surfaces pilose and glandular hairy, adaxially glabrescent,

base cuneate or broadly so, margin doubly incised serrate, apex obtuse or acute; cauline leaves resembling radical ones except upper ones sessile with leaf blade 3-foliolate; stipules green, ovate, herbaceous, margin entire, apex acute, rarely 2-fid. Inflorescence terminal, corymbose. Flowers ca. 2 cm in diam. Sepals triangular-ovate, apex acuminate; epicalyx segments narrowly lanceolate, nearly 1/2 as long as sepals, pilose and glandular hairy abaxially, apex subobtuse or acute. Petals white, obovate, nearly 2 × as long as sepals, apex rounded. Carpels glabrous; style sub-basal, fusiform, thickened at middle, gradually tapered at both ends. Achenes rugose at maturity. Fl. and fr. Jun–Aug.

Gravelly slopes; 1000–1100 m. Heilongjiang, Nei Mongol [Russia (Siberia)]; Europe].

4. *Potentilla* sect. *Leptostylae* (Th. Wolf) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 263. 1985.

枝状花柱组 *zhi zhuang hua zhu zu*

Potentilla subsect. *Leptostylae* Th. Wolf, Biblioth. Bot. 16(Heft 71): 52. 1908.

Herbs perennial. Basal leaves pinnate; leaflets serrate at margin. Ovary glabrous, rarely sparsely hairy; style sub-basal, lateral, or subterminal, not swollen at middle but nearly evenly thickened throughout its length, sometimes distally slightly thickened.

About 40 species: mainly Sino-Himalayan region and Malesian archipelago; 21 species (eight endemic) in China.

ROSACEAE

- 1a. Plants with stolons.
- 2a. Radical leaves more than 10 at flowering.
- 3a. Pedicels with scalelike bracts 30. *P. gombalana*
- 3b. Pedicels without scalelike bracts 29. *P. anserina*
- 2b. Radical leaves absent or fewer than 4 at flowering.
- 4a. Leaves adaxially sericeous, terminal leaflet elliptic 32. *P. taronensis*
- 4b. Leaves adaxially subglabrous, terminal leaflet rhombic-elliptic 31. *P. smithiana*
- 1b. Plants without stolons.
- 5a. Cauline leaves more than 4.
- 6a. Auricles of stipules of radical leaves connate from base to middle 12. *P. festiva*
- 6b. Auricles of stipules of radical leaves free.
- 7a. Peduncle and hypanthium without gland-tipped, multicellular hairs 15. *P. polyphylla*
- 7b. Peduncle and hypanthium with gland-tipped, multicellular hairs.
- 8a. Stigma not inflated; leaflets abaxially densely silvery sericeous, distal lateral ones cuneate at base 13. *P. lineata*
- 8b. Stigma inflated; leaflets abaxially sparsely strigose, distal lateral ones rounded at base.
- 9a. Epicalyx segments shorter than sepals, margin subentire; style nearly 2 × as long as ovary 14. *P. fallens*
- 9b. Epicalyx segments longer than sepals, margin with 3–7 teeth; style ca. 1.5 × as long as ovary 16. *P. polyphyloides*
- 5b. Cauline leaves 1–3.
- 10a. Apical pair of leaflets sessile, but not decurrent at base.
- 11a. Smaller leaflets usually present between leaflets 21. *P. turfosa*
- 11b. Smaller leaflets usually not present between leaflets.
- 12a. Rhizome with a few slender, elongate roots 20. *P. aristata*
- 12b. Rhizome without slender, elongate roots.
- 13a. Stamens 5–8(–10) 19. *P. glabriuscula*
- 13b. Stamens ca. 20.
- 14a. Leaflets 2–4 mm 17. *P. microphylla*
- 14b. Leaflets 5–15 mm 18. *P. stenophylla*
- 10b. Apical pair of leaflets decurrent at base.
- 15a. Inflorescence pseudoumbellate.
- 16a. Auricles of stipules of radical leaves 2 27. *P. leuconota*
- 16b. Auricle of stipules of radical leaves 1 28. *P. wenchuensis*
- 15b. Inflorescence cymose.
- 17a. Rhizome erect.
- 18a. Auricles of stipules of radical leaves 2 24. *P. cardotiana*
- 18b. Auricle of stipules of radical leaves 1 25. *P. commutata*
- 17b. Rhizome creeping.
- 19a. Auricles of stipules of radical leaves 2, apex acute 23. *P. contigua*
- 19b. Auricle of stipules of radical leaves 1, apex rounded.
- 20a. Flowering stems and petioles sericeous and appressed villous 22. *P. peduncularis*
- 20b. Flowering stems and petioles densely canescent tomentose, tomentose-villous, or sericeous-villous 26. *P. tugitakensis*

12. *Potentilla festiva* Soják, Candollea 43: 166. 1988.

合耳委陵菜 he er wei ling cai

Herbs perennial. Flowering stems 5–25 cm tall, together with petioles densely spreading villous and pubescent. Radical leaves 4–15 cm including petiole; auricles of stipules of radical leaves connate from base to middle, apex acute; leaf blade interrupted pinnate with 5–15 pairs of leaflets; terminal leaflet oblong to narrowly obovate, 1–3 × 0.5–1.2 cm, abaxially densely white sericeous or tomentose, adaxially appressed pilose, margin sharply serrate; cauline leaves: auricles of stipules herbaceous, abaxially white sericeous, adaxially villous; leaf blade resembling that of radical leaves but pairs of leaflets fewer higher up stem. Inflorescence corymbose-cymose. Flowers 0.7–1.2 cm in diam.; pedicel with unicellular hairs. Sepals

triangular-ovate, apex acute; epicalyx segments elliptic, margin entire or with 3 teeth. Petals yellow, 5–7 × 4–5.5 mm, apex rounded. Style lateral. Achenes not seen. Fl. and fr. Jun–Oct. 2n = 28.

Forests, forest margins, thickets, grassy mountain slopes, open grassy places by roads; 2000–3800 m. Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal, Sikkim].

13. *Potentilla lineata* Treviranus, Index Seminum Hort. Vratislav. 1822, 1822.

西南委陵菜 xi nan wei ling cai

Potentilla fulgens Lehmann; *P. fulgens* var. *acutiserrata* (T. T. Yu & C. L. Li) T. T. Yu & C. L. Li; *P. fulgens* var. *macrophylla* Cardot; *P. martini* H. Léveillé; *P. siemensiana*

Lehmann, nom. illeg. (included *P. lineata*); *P. siemersiana* var. *acutiserrata* T. T. Yu & C. L. Li; *P. splendens* Buchanan-Hamilton ex Treviranus (1823), not Candolle (1805).

Herbs perennial. Flowering stems 5–40 cm tall, together with petioles densely spreading villous and pubescent. Radical leaves 4–30 cm including petiole; auricles of stipules free, apex acute; leaf blade interrupted pinnate with 5–13 pairs of leaflets; terminal leaflet oblong or broadly obovate, 1.5–4 × 0.8–1.5 cm, abaxially densely white sericeous or tomentose, adaxially appressed pilose, margin sharply serrate; cauline leaves: auricles of stipules herbaceous, abaxially white sericeous; leaf blade resembling that of radical leaves but pairs of leaflets fewer higher up stem. Inflorescence corymbose-cymose. Flowers 1–1.5 cm in diam.; pedicel 2–4 cm, with gland-tipped, multicellular hairs and unicellular hairs. Sepals entire at margin; epicalyx segments entire at margin or with 3–6 teeth. Petals yellow, obovate to broadly so, apex rounded. Carpels glabrous; style sub-basal, fusiform. Achenes smooth. Fl. and fr. Jun–Oct. $2n = 14$.

Forests, forest margins, thickets, grassy mountain slopes, open grassy places by roads; 1500–3800 m. Guizhou, Hubei, Sichuan, Xizang, Yunnan [Bhutan, India, Laos, Myanmar, Nepal, Sikkim, N Vietnam].

Various names has been used for this species, including *Potentilla fulgens*, *P. lineata*, *P. siemersiana*, and *P. splendens*. The earliest legitimate name is *P. lineata*.

Potentilla festiva and *P. lineata* are similar in external appearance, and were treated as conspecific for a long time. The auricles of the stipules of the radical leaves of *P. festiva* are connate from the base to the middle, whereas those of *P. lineata* are free. Moreover, *P. lineata* has gland-tipped, multicellular hairs as well as unicellular ones on the pedicels and abaxially on the hypanthium, whereas *P. festiva* has only unicellular hairs.

14. *Potentilla fallens* Cardot, Notul. Syst. (Paris) 3: 232. 1916.

川滇委陵菜 chuan dian wei ling cai

Potentilla rockiana Melchior.

Herbs perennial. Flowering stems 5–35 cm tall, densely yellow pubescent and yellow villous. Radical leaves 4–20 cm including petiole; auricles of stipules free, apex acute; petiole densely pubescent and villous; leaf blade interrupted pinnate, rarely non-interrupted, with 8–15 pairs of leaflets; leaflets elliptic or obovate, 0.8–1.7 × 0.5–1.2 cm, abaxially densely pubescent, sericeous on veins, margin subobtusely or acutely serrate; cauline leaves 2 or 3; auricles of stipules herbaceous; leaf blade resembling radical ones but pairs of leaflets fewer higher up stem. Inflorescence cymose. Flowers 1–1.8 cm in diam.; pedicel densely villous and glandular hairy. Sepals abaxially villous and glandular hairy; epicalyx segments shorter than sepals, margin entire or shallowly 2- or 3-serrate. Petals yellow, broadly obovate, apex rounded or emarginate. Style lateral, nearly 2 × as long as ovary; stigma slightly dilated. Achenes slightly rugose. Fl. and fr. May–Aug. $2n = 28^*$.

• Forests, grassy mountain slopes; 2800–3900 m. Sichuan, Yunnan.

15. *Potentilla polyphylla* Wallich ex Lehmann, Nov. Stirp. Pug. 3: 13. 1831.

多叶委陵菜 duo ye wei ling cai

Herbs perennial. Flowering stems 5–40 cm tall, spreading villous. Radical leaves 4–30 cm including petiole; auricles of stipules free, apex acute to acuminate; petiole spreading, slightly rigid villous; leaf blade interrupted pinnate with 5–12 pairs of leaflets; leaflets obovate to broadly ovate or broadly linear to lanceolate, 1–5 × 0.8–1.6 cm, abaxially strigose or villous, margin roughly serrate; cauline leaves: auricles of stipules herbaceous, margin serrate; leaf blade resembling that of radical leaves but pairs of leaflets fewer higher up stem. Inflorescence cymose, few flowered. Flowers 1–2 cm in diam. Sepals triangular-elliptic, abaxially villous; epicalyx segments oblong to obovate, broader and slightly shorter than sepals, abaxially pilose, apex 2–5-serrate, rarely entire. Petals yellow, obovate to broadly so, apex rounded. Carpels glabrous; style sub-basal, fusiform. Achenes smooth. Fl. and fr. Jul–Sep. $2n = 28$.

Forests, forest margins, meadows on mountain slopes; 2500–4500 m. Sichuan, Yunnan [Bhutan, India, Indonesia (Java), Myanmar, Nepal, Pakistan, Sikkim, Sri Lanka].

- 1a. Radical leaves 4–20(–25) cm including petiole; leaflets obovate to broadly ovate, abaxially strigose; flowers 1–1.5 cm in diam. 15a. var. *polyphylla*
 1b. Radical leaves 16–30 cm including petiole; leaflets broadly linear to lanceolate, abaxially villous; flowers 1.5–2 cm in diam. 15b. var. *interrupta*

15a. *Potentilla polyphylla* var. *polyphylla*

多叶委陵菜(原变种) duo ye wei ling cai (yuan bian zhong)

Potentilla sordida Klotzsch.

Radical leaves 4–20(–25) cm including petiole; leaflets obovate to broadly ovate, abaxially strigose. Flowers 1–1.5 cm in diam. Fl. and fr. Jul–Sep. $2n = 28$.

Forests, forest margins, meadows on mountain slopes; 2500–4200 m. Yunnan [Bhutan, India, Indonesia (Java), Myanmar, Nepal, Pakistan, Sikkim, Sri Lanka].

15b. *Potentilla polyphylla* var. *interrupta* (T. T. Yu & C. L. Li) H. Ikeda & H. Ohba, Bot. J. Linn. Soc. 112: 179. 1992.

间断委陵菜 jian duan wei ling cai

Potentilla interrupta T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 8. 1980.

Radical leaves 16–30 cm including petiole; leaflets broadly linear to lanceolate, abaxially villous. Flowers 1.5–2 cm in diam. Fl. and fr. Jul–Sep. $2n = 28$.

Forests, forest margins, meadows on mountain slopes; 2900–4500 m. Sichuan, Yunnan [Bhutan, Nepal, Sikkim].

16. *Potentilla polyphyloides* H. Ikeda & H. Ohba, Novon 12: 53. 2002.

似多叶委陵菜 si duo ye wei ling cai

Herbs perennial. Flowering stems ascending or prostrate, 17–60 cm tall, appressed or ascending unicellular hairy, occa-

sionally rooting from nodes in lower part. Radical leaves 8–20 cm including petiole; auricles of stipules free; petiole 0.8–3.5 cm, ascending or spreading unicellular hairy; leaf blade interrupted pinnate with 10–15 pairs of leaflets; leaflets abaxially glandular multicellular hairy and ascending unicellular hairy, adaxially appressed or ascending unicellular hairy, margin serrate; terminal leaflet oblong to obovate, 1.2–2.4 × 0.7–1.4 cm, larger than lateral leaflets; cauline leaves: auricles of stipules entire at margin, or those on lower part of stem with a few teeth and those on upper part with 10–20 teeth; leaf blade 3-foliolate or pinnate with 2–8 pairs of leaflets, sometimes interrupted pinnate. Flowers 1.1–1.5 cm in diam.; pedicel 1.2–3.8 cm, glandular multicellular hairy. Sepals elliptic to ovate, 2.5–4 × 1.8–4 mm, margin entire, apex obtuse to acute; epicalyx segments oblong to broadly obovate, 2.5–5.5 × 2–4.5 mm, abaxially glandular multicellular hairy, margin usually serrate, apex acute. Petals obovate to broadly so, 5–6.5 × 3.5–7 mm, apex retuse or rounded. Stamens ca. 20, in 3 whorls, 1.2–2.2 mm; anthers sub-basal, globose, 4-loculed. Ovary ellipsoid, smooth; placenta adaxial-lateral near style base; style sub-basal, 0.8–0.9 mm. Achenes many, borne on dome-shaped receptacle, obliquely ellipsoid, 1.2–1.4 mm, smooth. Fl. and fr. Jul–Sep. $2n = 42^*$.

• Mountain meadows; 3200–3500 m. NW Yunnan (Dali Xian, Yangbi Xian).

Potentilla polyphyloides differs from *P. polyphylla* in having flowering stems occasionally rooting from the nodes in the lower part, and leaflets abaxially, pedicels, and epicalyx segments abaxially with glandular, multicellular hairs. *Potentilla fallens* differs from *P. polyphyloides* in having epicalyx segments shorter than the sepals, subentire at the margin or shallowly 2- or 3-serrate, and a style nearly 2 × as long as the ovary.

17. *Potentilla microphylla* D. Don, Prodr. Fl. Nepal. 231. 1825.

小叶委陵菜 xiao ye wei ling cai

Herbs perennial, low, usually tufted and pulvinate. Flowering stems erect, 2–3 cm tall, appressed white pilose. Radical leaves 0.5–6 cm including petiole, crowded or not; auricles of stipules free; petiole short, appressed pilose; leaf blade pinnate with 2–9 pairs of leaflets; leaflets elliptic or obovate, 2–4 × 1.5–2.5 mm, abaxially sericeous-pilose, later glabrescent, adaxially glabrescent, or both surfaces glabrous, margin pinnately lobed or parted, apex obtuse or acute; lobes or segments lanceolate; cauline leaf 1, small, margin entire or parted. Flower 1(or 2), 1–1.5 cm in diam.; pedicel 2–12 mm, appressed pilose. Sepals triangular-ovate, apex obtuse or acute; epicalyx segments lanceolate or elliptic-lanceolate, margin entire or 2-lobed. Petals yellow, elliptic to obovate, apex rounded. Style lateral; stigma slightly dilated. Achenes rugose. Fl. and fr. Jun–Aug.

Alpine meadows and rocky places; 3400–5200 m. Sichuan, Xizang, Yunnan [Bhutan, NW India, Nepal, Sikkim].

- 1a. Leaves 0.5–1 cm, crowded, with 2 or 3(–5) pairs of leaflets 17c. var. *tapetodes*
 1b. Leaves 1–6 cm, not crowded, with 7–9 pairs of leaflets.
 2a. Leaflets parted almost to midvein, apex acute 17a. var. *microphylla*

- 2b. Leaflets lobed ca. 1/2 way to midvein, apex obtuse 17b. var. *luteopilosa*

17a. *Potentilla microphylla* var. *microphylla*

小叶委陵菜(原变种) xiao ye wei ling cai (yuan bian zhong)

Potentilla microphylla var. *depressa* Wallich ex Lehmann; *P. microphylla* var. *glabriuscula* Wallich ex Lehmann; *P. tapetodes* Soják var. *decidua* Soják.

Leaves 1–6 cm, not crowded, with 7–9 pairs of leaflets; leaflets parted almost to midvein, apex acute. Fl. and fr. Jun–Aug. $2n = 28$.

Alpine or rocky meadows; 3400–4900 m. Xizang [Bhutan, NW India, Nepal, Sikkim].

17b. *Potentilla microphylla* var. *luteopilosa* (T. T. Yu & C. L. Li) H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 48. 1999.

黄毛小叶委陵菜 huang mao xiao ye wei ling cai

Potentilla luteopilosa T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 9. 1980.

Leaves 1–6 cm, not crowded, with 7–9 pairs of leaflets; leaflets lobed ca. 1/2 way to midvein, apex obtuse. Fl. and fr. Jun–Aug.

• Alpine rocks; 3800–4200 m. Sichuan, Xizang, Yunnan.

17c. *Potentilla microphylla* var. *tapetodes* (Soják) H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 49. 1999.

丛生小叶委陵菜 cong sheng xiao ye wei ling cai

Potentilla tapetodes Soják, Čas. Nár. Mus., Odd. Přír. 152: 160. 1983.

Leaves 0.5–1 cm, crowded, with 2 or 3(–5) pairs of leaflets. Fl. and fr. Jun–Sep.

Rocks on mountain slopes; 3500–5200 m. Xizang [Bhutan, Sikkim].

Potentilla microphylla var. *caespitosa* T. T. Yu & C. L. Li was described in FRPS (p. 274), but the name is invalid because no Latin description or diagnosis was provided (St. Louis Code, Art. 36.1). The entity described belongs to var. *tapetodes*.

The rootstock branches of var. *tapetodes* are surrounded by many old leaves to form towerlike structures that cluster together to form a large cushion.

18. *Potentilla stenophylla* (Franchet) Diels, Notes Roy. Bot. Gard. Edinburgh 5: 271. 1912.

狭叶委陵菜 xia ye wei ling cai

Herbs perennial. Flowering stems 3–25 cm tall, together with petioles appressed sericeous-pilose. Radical leaves 2.5–23 cm including petiole; auricles of stipules free, apex acute to acuminate; leaf blade pinnate with 5–25 pairs of leaflets; leaflets oblong, 0.3–1.5 cm × 2–8 mm, becoming gradually smaller toward base of leaf, abaxially densely appressed villous on veins, becoming glabrescent or sericeous-villous, adaxially sparsely villous or glabrescent, or both surfaces glabrous except for tufts of hairs on apices of teeth, margin 3–15-serrate; cauline leaves: auricles of stipules lanceolate to ovate, herbaceous, mar-

gin entire, apex acuminate; leaf blade leafletlike, margin entire. Inflorescence cymose. Flowers 1.5–2.5 cm in diam.; pedicel 1–4 cm, appressed villous. Sepals elliptic to ovate; epicalyx segments lanceolate to elliptic, apex obtuse or acute. Petals yellow, oblong to obovate, 3–7 × 2.5–5.5 cm, apex rounded. Style lateral; stigma slightly dilated. Achenes smooth or rugose. Fl. and fr. Jul–Sep.

Forest margins, alpine meadows; 3200–5800 m. Sichuan, Xizang, Yunnan [Myanmar, Sikkim].

- 1a. Leaflets with 3–5 apical teeth 18a. var. *stenophylla*
 1b. Leaflets with 5–15 teeth.
 2a. Leaflets 0.6–1 cm, with 5–7 teeth
 18d. var. *emergens*
 2b. Leaflets 0.8–1.5 cm, with 6–15 teeth.
 3a. Leaflets hairy on both surfaces
 18c. var. *taliensis*
 3b. Leaflets glabrous except for
 tufts of hairs on apices of teeth
 18b. var. *cristata*

18a. *Potentilla stenophylla* var. *stenophylla*

狭叶委陵菜(原变种) xia ye wei ling cai (yuan bian zhong)

Potentilla peduncularis D. Don var. *stenophylla* Franchet, Pl. Delavay. 3: 214. 1890; *P. millefolia* H. Léveillé (1914), not Rydberg (1896); *P. stenophylla* var. *millefolia* Soják.

Leaflets with 3–5 teeth at apex. Fl. and fr. Jun–Sep.

• Forest margins, alpine meadows; 3200–5300 m. Sichuan, Xizang, Yunnan.

18b. *Potentilla stenophylla* var. *cristata* (H. R. Fletcher) H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 52. 1999.

贡山狭叶委陵菜 gong shan xia ye wei ling cai

Potentilla cristata H. R. Fletcher, Notes Roy. Bot. Gard. Edinburgh 20: 218. 1950.

Leaflets 0.8–1.5 cm, with 11–13 teeth, glabrous except for tufts of hairs on apices of teeth. Fl. Jul–Aug.

Alpine meadows; 3500–3700 m. NW Yunnan (Gaoligong Shan) [Myanmar].

18c. *Potentilla stenophylla* var. *taliensis* (W. W. Smith) H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 52. 1999.

大理委陵菜 da li wei ling cai

Potentilla taliensis W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 7: 199. 1914.

Leaflets 0.8–1.5 cm, with 6–15 teeth, hairy on both surfaces. Fl. and fr. Jul–Oct.

• Forest margins, alpine meadows; 3800–4000 m. NW Yunnan (Dali Xian).

18d. *Potentilla stenophylla* var. *emergens* Cardot, Notul. Syst. (Paris) 3: 241. 1916.

康定委陵菜 kang ding wei ling cai

Potentilla stenophylla var. *compacta* J. Krause; *P. steno-*

phylla var. *exaltata* Cardot; *P. tatsienluensis* Th. Wolf.

Leaflets 0.6–1 cm, with 5–7 teeth. Fl. and fr. Jun–Oct.

Forest margins, alpine meadows; 3200–5800 m. Sichuan, Xizang [Sikkim].

19. *Potentilla glabriuscula* (T. T. Yu & C. L. Li) Soják, Candollea 43: 453. 1988.

光叶委陵菜 guang ye wei ling cai

Herbs perennial, low. Roots robust, terete; lateral roots filiform. Flowering stems erect, 1–2.5 cm tall, pilose. Radical leaves 1.5–5 cm including petiole; stipules brown, membranous, abaxially subglabrous, auricles connate from base to apex, apex rounded; petiole subglabrous; leaf blade pinnate with 3–7 pairs of leaflets; leaflets shortly petiolulate or subsessile, oblong to narrowly obovate, 3–5 × 2–4 mm, subglabrous, margin 3–7-serrate, apex acute; cauline leaves 1 (or 2), or reduced and bractlike. Flower solitary, 6–12 mm in diam. Sepals elliptic to ovate, apex rounded; epicalyx segments oblong-lanceolate, nearly equaling sepals, abaxially sparsely pubescent or subglabrous, apex obtuse or acute. Petals yellow, oblong to elliptic, 6–8 × 4–5 mm, apex rounded. Stamens 5–10. Style lateral. Achenes not seen. Fl. and fr. Jun–Oct.

Forest margins, alpine meadows; 2500–5500 m. E and S Xizang, NW Yunnan [Bhutan, N Myanmar, E Nepal, Sikkim].

Two varieties occur in China. Two of us (Ohba and Ikeda) believe that var. *majuscula* Soják, described from Sikkim, is synonymous with var. *glabriuscula*, but we have not seen the type.

- 1a. Stamens ca. 5 19a. var. *glabriuscula*
 1b. Stamens 8–10 19b. var. *oligandra*

19a. *Potentilla glabriuscula* var. *glabriuscula*

光叶委陵菜(原变种) guang ye wei ling cai (yuan bian zhong)

Sibbaldia glabriuscula T. T. Yu & C. L. Li, Acta Phytotax. Sin. 19: 516. 1981; ?*Potentilla glabriuscula* var. *majuscula* Soják; *P. glabriuscula* var. *narimensis* Soják.

Stamens ca. 5. Fl. and fr. Jun–Oct.

Forest margins, alpine meadows; 2500–5500 m. E and S Xizang, NW Yunnan [Bhutan, N Myanmar, E Nepal, ?Sikkim].

19b. *Potentilla glabriuscula* var. *oligandra* (Soják) Soják, Bot. Jahrb. Syst. 116: 41. 1994.

多蕊光叶委陵菜 duo rui guang ye wei ling cai

Potentilla oligandra Soják, Čas. Nár. Mus., Odd. Přír. 152: 160. 1983.

Stamens 8–10. Fl. and fr. Jun–Oct.

• Alpine meadows; ca. 4000 m. SE Xizang.

20. *Potentilla aristata* Soják, Candollea 43: 159. 1988.

多对小叶委陵菜 duo dui xiao ye wei ling cai

Potentilla microphylla D. Don var. *achilleifolia* J. D. Hooker; *P. microphylla* var. *multijuga* T. T. Yu & C. L. Li.

Herbs perennial, low, often mat forming. Roots several, slender, terete. Flowering stems 2–3 cm tall, appressed white

pilose. Radical leaves 1.5–4 cm including petiole; auricles of stipules free, apex acute to acuminate; petiole short, appressed pilose; leaf blade pinnate with 13–16 pairs of leaflets; terminal leaflet oblong to narrowly obovate, ca. 2 × 3 mm, pinnately lobed to parted with 8–12 segments; segments narrowly lanceolate, abaxially sericeous-pilose, later glabrescent, or both surfaces glabrous; cauline leaf 1, small; leaf blade simple or pinnate with 4 or 5(–9) pairs of leaflets. Flower 1(or 2), 1–1.5 mm in diam.; pedicel 5–10 mm, appressed pilose. Sepals triangular-ovate; epicalyx segments lanceolate to oblong, margin entire or deeply 2-lobed. Petals yellow, elliptic to obovate, apex rounded. Style lateral; stigma slightly dilated. Achenes not seen. Fl. and fr. Jun–Aug.

Forest margins, open places in thickets, alpine meadows, rocks on mountain slopes; 3600–4800 m. Xizang, Yunnan [Bhutan, Nepal, Sikkim].

21. *Potentilla turfosa* Handel-Mazzetti, Symb. Sin. 7: 518. 1933.

簇生委陵菜 *cu sheng wei ling cai*

Herbs perennial. Flowering stems 10–30 cm tall, together with petioles appressed pilose or glabrescent. Radical leaves 4–15 cm including petiole; auricles of stipules free, apex acute to acuminate; leaf blade usually interrupted pinnate with 3–11 pairs of leaflets; terminal leaflet ovate or elliptic, 0.3–2 × 0.3–1.5 cm, abaxially densely appressed villous when young, glabrescent or appressed pilose when old, margin acutely incised 5–7-serrate on each side; cauline leaves 1 or 2; auricles of stipules herbaceous, apex acuminate or 2–4-serrate; leaf blade with 1–3 pairs of leaflets. Inflorescence 1–4-flowered. Flowers 0.8–1.5 cm in diam.; pedicel 3–4 cm, appressed pilose. Sepals triangular-ovate; epicalyx segments oblong to obovate, margin entire or 2- or 3-serrate. Petals yellow, elliptic to obovate, apex rounded. Stamens 11–20. Style lateral to sub-basal. Achenes not seen. Fl. and fr. Aug–Sep.

• Alpine meadows; 1300–4200 m. Xizang, Yunnan.

1a. Stamens ca. 20 21a. var. *turfosa*
1b. Stamens 11–14 21b. var. *gracilescens*

21a. *Potentilla turfosa* var. *turfosa*

簇生委陵菜(原变种) *cu sheng wei ling cai (yuan bian zhong)*

Stamens ca. 20. Fl. and fr. Jul–Sep.

• Alpine meadows; 1300–4000 m. Xizang, Yunnan.

21b. *Potentilla turfosa* var. *gracilescens* (Soják) H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 61. 1999.

纤细委陵菜 *xian xi wei ling cai*

Potentilla glabriuscula (T. T. Yu & C. L. Li) Soják var. *gracilescens* Soják, Bot. Jahrb. Syst. 116: 41. 1994, based on *P. gracillima* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 9. 1980, not Kamelin (1977); *P. turfosa* var. *caudiculata* Soják.

Stamens 11–14. Fl. and fr. Aug–Sep.

• Alpine meadows; 3800–4200 m. Xizang.

22. *Potentilla peduncularis* D. Don, Prodr. Fl. Nepal. 230. 1825.

总梗委陵菜 *zong geng wei ling cai*

Herbs perennial, rhizomatous. Rhizomes prostrate, robust, terete. Flowering stems 10–35 cm tall, together with petioles appressed villous or sericeous. Radical leaves 2.5–25 cm including petiole; auricles of stipules membranous, connate from base to rounded apex; leaf blade non-interrupted pinnate with 10–21 pairs of leaflets; terminal leaflet narrowly or broadly ovate, narrowly obovate, ovate-lanceolate, oblong-lanceolate, or oblong, 0.5–3 × 0.3–1.5 cm, both surfaces densely silvery sericeous or adaxially only sparsely so, base decurrent on apical 2 or 3 pairs of leaflets, margin sharply or bluntly serrate or apex dentate; cauline leaves small; auricles of stipules herbaceous, margin incised parted or incised serrate; leaf blade with 1 or 2 pairs of leaflets. Inflorescence corymbose-cymose. Flowers 1–3.5 cm in diam.; pedicel 1–3.5 cm. Sepals triangular-ovate; epicalyx segments oblong to elliptic-lanceolate, margin entire or 2–4-parted. Petals yellow, broadly elliptic to obovate, apex rounded or retuse. Style lateral. Achenes not seen. Fl. and fr. May–Oct.

Forests, alpine meadows, gravelly slopes; 3000–4800 m. Sichuan, Xizang, Yunnan [Bhutan, NW India, Nepal, Sikkim].

- 1a. Leaflet margin more than 10-serrate.
2a. Leaflets narrowly ovate, abaxially densely hairy, adaxially sparsely hairy 22a. var. *peduncularis*
2b. Leaflets broadly ovate, both surfaces densely hairy 22b. var. *shweliensis*
1b. Leaflet margin 4–9-serrate or apex dentate.
3a. Leaflets narrowly ovate, 1.5–3 cm, margin bluntly 5–9-serrate or apex dentate 22c. var. *vittata*
3b. Leaflets narrowly obovate, 0.5–2 cm, margin 4(or 5)-serrate or apex dentate 22d. var. *curta*

22a. *Potentilla peduncularis* var. *peduncularis*

总梗委陵菜(原变种) *zong geng wei ling cai (yuan bian zhong)*

Potentilla peduncularis var. *elongata* T. T. Yu & C. L. Li; *P. remota* Soják.

Leaflets narrowly ovate, abaxially densely hairy, adaxially sparsely hairy, margin more than 10-serrate. Fl. and fr. Jun–Oct. $2n = 42$.

Forests, alpine meadows, gravelly slopes; 3000–4800 m. Sichuan, Xizang, Yunnan [Bhutan, NW India, Nepal, Sikkim].

Potentilla peduncularis var. *abbreviata* T. T. Yu & C. L. Li was described in FRPS (p. 266), but the name is invalid because no Latin description or diagnosis was provided (St. Louis Code, Art. 36.1). The entity described belongs to var. *peduncularis*.

22b. *Potentilla peduncularis* var. *shweliensis* (H. R. Fletcher) H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 66. 1999.

多齿总梗委陵菜 *duo chi zong geng wei ling cai*

Potentilla shweliensis H. R. Fletcher, Notes Roy. Bot. Gard. Edinburgh 20: 215. 1950.

Leaflets broadly ovate, both surfaces densely hairy, margin more than 10-serrate. Fl. and fr. Jun–Oct.

- Forests, alpine meadows, gravelly slopes; ca. 3300 m. Yunnan.

22c. *Potentilla peduncularis* var. *vittata* (Soják) H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 67. 1999.

狭叶总梗委陵菜 xia ye zong geng wei ling cai

Potentilla vittata Soják, Candollea 43: 164. 1988; *P. vittata* var. *abbreviata* Soják; *P. vittata* var. *assidens* Soják; *P. vittata* var. *pluriflora* Soják; *P. oxyodonta* Soják.

Leaflets narrowly ovate, 1.5–3 cm, margin bluntly 5–9-serrate or apex dentate. Fl. and fr. Jun–Oct.

- Alpine meadows, gravelly slopes; 3000–4200 m. Xizang, Yunnan.

22d. *Potentilla peduncularis* var. *curta* (Soják) H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 68. 1999.

少齿总梗委陵菜 shao chi zong geng wei ling cai

Potentilla curta Soják, Bot. Jarhb. Syst. 116: 215. 1994.

Leaflets narrowly obovate, 0.5–2 cm, margin 4(or 5)-serrate or apex dentate. Fl. and fr. Jun–Oct.

- Alpine meadows, gravelly slopes; 3400–4800 m. Xizang [Sikkim].

23. *Potentilla contigua* Soják, Candollea 43: 160. 1988.

高山委陵菜 gao shan wei ling cai

Potentilla peduncularis var. *clarkei* J. D. Hooker; *P. peduncularis* var. *glabriuscula* T. T. Yu & C. L. Li.

Herbs perennial, rhizomatous. Rhizomes prostrate, robust, terete. Flowering stems 10–30 cm tall, together with petioles appressed villous or sericeous. Radical leaves 10–20 cm including petiole; auricles of stipules free, apex acute to acuminate; leaf blade non-interrupted pinnate with 13–16 pairs of leaflets; terminal leaflet oblong or narrowly obovate, 1–2 cm × 5–7 mm, abaxially densely or sparsely strigose, base decurrent in apical 2 or 3 pairs of leaflets, margin sharply serrate; cauline leaves: auricles of stipules herbaceous, apex incised parted or incised serrate; leaf blade with 3–5 pairs of leaflets. Inflorescence corymbose-cymose. Flowers 1.5–2.5 cm in diam.; pedicel 1.5–4 cm. Epicalyx segments oblong to elliptic-lanceolate, margin entire or 2–4-parted. Petals yellow, broadly elliptic to obovate, apex rounded or retuse. Style lateral. Achenes not seen. Fl. and fr. May–Oct. $2n = 28$.

- Forest, thickets, alpine meadows, gravelly slopes; 3500–4600 m. Sichuan, Xizang [Bhutan, Nepal, Sikkim].

Potentilla contigua is similar to *P. peduncularis* in habit, but has radical leaf stipules with free auricles, whereas the stipules of *P. peduncularis* have auricles connate from the base to the apex.

24. *Potentilla cardotiana* Handel-Mazzetti, Acta Horti Gothob. 13: 322. 1939.

聚伞委陵菜 ju san wei ling cai

Potentilla leuconota D. Don var. *corymbosa* Cardot.

Herbs perennial. Rhizomes short. Flowering stems 10–35 cm tall, together with petioles appressed villous or sericeous. Radical leaves 7–16 cm including petiole; auricles of stipules free, apex acute to acuminate; leaf blade interrupted pinnate with 10–22 pairs of leaflets; terminal leaflet lanceolate to oblong, 1–2 cm × 4–8 mm, abaxially densely silvery or yellowish sericeous, base decurrent in apical 2 or 3 pairs of leaflets, margin sharply serrate; cauline leaves: auricles of stipules herbaceous, apex incised parted or incised serrate; leaf blade with 1–6 pairs of leaflets. Inflorescence corymbose-cymose. Flowers 0.8–1.5 cm in diam.; pedicel 1.5–2 cm. Epicalyx segments oblong to obovate, margin entire or 2–4-parted. Petals yellow, elliptic to obovate, apex rounded or subretuse. Style lateral; stigma slightly dilated. Achenes not seen. Fl. and fr. May–Oct.

- Forests, thickets, alpine meadows, gravelly slopes; 3100–4000 m. Yunnan [Myanmar, Nepal].

Potentilla cardotiana is similar to *P. peduncularis* in habit, but has radical leaf stipules with free auricles acute to acuminate at the apex, whereas the stipules of *P. peduncularis* have auricles connate from the base to the rounded apex. Many specimens of *P. cardotiana* collected in China were misidentified as *P. peduncularis*.

25. *Potentilla commutata* Lehmann var. ***polyandra*** Soják, Bot. Jahrb. Syst. 116: 38. 1994.

多蕊委陵菜 duo rui wei ling cai

Potentilla decemjuga Soják; *P. mieheorum* Soják.

Herbs perennial. Flowering stems ascending, 3–10 cm tall, together with petioles appressed villous or sericeous. Radical leaves 2–8 cm including petiole; auricles of stipules connate from base to rounded apex; leaf blade non-interrupted pinnate with 5–15 pairs of leaflets; terminal leaflet oblong to narrowly obovate, 3.5–8 × 2–4 mm, abaxially densely silvery sericeous, base decurrent in apical 2 or 3 pairs of leaflets, margin sharply serrate; cauline leaves small; auricles of stipules herbaceous, apex incised parted or incised serrate; leaf blade simple or with 1 pair of leaflets. Inflorescence 1- to several flowered. Flowers 0.5–1.2 cm in diam.; pedicel 0.3–2.5 cm. Epicalyx segments oblong to lanceolate, margin entire or 2–4-parted. Petals yellow, broadly oblong to elliptic, apex rounded or retuse. Stamens ca. 20. Style subterminal; stigma slightly dilated. Achenes not seen. Fl. and fr. Jul–Aug. $2n = 14$.

- Alpine meadows, gravelly slopes; 3800–4500 m. Sichuan [Bhutan, NW India, Nepal, Sikkim].

Potentilla commutata var. *commutata* is distributed in NW India, Nepal, and Sikkim.

26. *Potentilla tugitakensis* Masamune, J. Soc. Trop. Agric. 4: 77. 1932.

台湾委陵菜 tai wan wei ling cai

Potentilla leuconota D. Don var. *tugitakensis* (Masamune) H. L. Li.

Herbs perennial. Flowering stems 25–30 cm tall, densely canescent tomentose and villous. Radical leaves 10–18 cm in-

cluding petiole; auricles of stipules connate from base to rounded apex; petiole densely white villous and white tomentose; leaf blade non-interrupted (rarely interrupted) pinnate with usually 19–27 pairs of leaflets; terminal leaflet oblong, 1–2 cm × 4–8 mm, abaxially densely white sericeous-villous on veins, base decurrent in apical 2 or 3 pairs of leaflets, margin regularly sharply many serrate; cauline leaves 1 or 2; auricles of stipules herbaceous, abaxially densely villous, margin entire or 1- or 2-serrate; leaf blade with 3–7 pairs of leaflets. Inflorescence corymbose-cymose. Flowers 2–2.5 cm in diam.; pedicel 3–5 cm, proximally with a serrate bract; bract abaxially densely grayish white tomentose and villous. Epicalyx segments ovate-lanceolate, apex acuminate. Petals yellow. Style lateral. Achenes smooth. Fr. Jul–Aug.

- Alpine meadows; ca. 3400 m. Taiwan.

27. *Potentilla leuconota* D. Don, Prodr. Fl. Nepal. 230. 1825.

银叶委陵菜 yin ye wei ling cai

Herbs perennial. Flowering stems 10–45 cm tall, together with petioles appressed or slightly spreading villous. Radical leaves 2.5–25 cm including petiole; auricles of stipules connate from base to middle, apex acute; leaf blade interrupted (rarely non-interrupted) pinnate with 6–18 pairs of leaflets; terminal leaflet ovate to elliptic, or oblong, 0.5–3 × 0.3–1.5 cm, abaxially densely appressed silvery or yellowish sericeous, or sparsely strigose, base decurrent in apical 2 or 3 pairs of leaflets, margin 4- to many serrate, teeth acute or acuminate; cauline leaves 1 or 2, resembling radical ones; auricles of stipules herbaceous, margin lacerate or parted. Inflorescence compactly pseudumbellate, with leaflike involucre. Flowers 5–8 mm in diam.; pedicel 1.5–2 cm, densely appressed white villous. Epicalyx segments lanceolate or oblong-lanceolate, abaxially densely white villous. Petals yellow, obovate, apex rounded. Style lateral. Achenes not seen. Fl. and fr. May–Nov.

Forests, meadows on mountain slopes, stream banks, cliffs; 2200–4600 m. Hubei, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal, Sikkim].

- 1a. Leaflets abaxially sparsely strigose 27c. var. *brachyphyllaria*
 1b. Leaflets abaxially densely sericeous.
 2a. Leaflets abaxially densely appressed silvery sericeous 27a. var. *leuconota*
 2b. Leaflets abaxially densely appressed yellowish sericeous 27b. var. *omeiensis*

27a. *Potentilla leuconota* var. *leuconota*

银叶委陵菜(原变种) yin ye wei ling cai (yuan bian zhong)

Potentilla leuconota var. *morrisonicola* Hayata; *P. morrisonicola* (Hayata) Hayata.

Leaflets abaxially densely appressed silvery sericeous. Fl. and fr. Jun–Oct.

Forests, meadows on mountain slopes; 2200–4600 m. Hubei, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal, Sikkim].

- This variety is used medicinally.

27b. *Potentilla leuconota* var. *omeiensis* H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 78. 1999.

峨眉银叶委陵菜 e mei yin ye wei ling cai

Leaflets abaxially densely appressed yellowish sericeous. Fl. and fr. May–Aug.

- Forests, meadows on mountain slopes; 3000–3200 m. C Sichuan (Emei Shan).

27c. *Potentilla leuconota* var. *brachyphyllaria* Cardot, Notul. Syst. (Paris) 3: 241. 1916.

脱毛银叶委陵菜 tuo mao yin ye wei ling cai

Leaflets abaxially sparsely strigose. Fl. and fr. Jun–Nov.

Alpine meadows, stream banks, cliffs; 3600–4200 m. Sichuan, Xizang, Yunnan [NE India (Assam)].

28. *Potentilla wenchuensis* H. Ikeda & H. Ohba in H. Ohba, Himal. Pl. 3: 81. 1999.

汶川委陵菜 wen chuan wei ling cai

Herbs perennial. Flowering stems erect or ascending, 10–15 cm tall, together with petioles appressed villous or sericeous. Radical leaves 10–18 cm including petiole; auricles of stipules connate from base to rounded apex; leaf blade non-interrupted pinnate with 8–10 pairs of leaflets; terminal leaflet lanceolate to narrowly oblong, 5–7 × ca. 2 mm, abaxially densely yellowish sericeous, base decurrent in apical 2 or 3 pairs of leaflets, margin sharply serrate; cauline leaves small; auricles of stipules green, herbaceous, apex incised parted or incised serrate; leaf blade with 1 or 2 pairs of leaflets. Inflorescence compactly pseudumbellate. Flowers 0.8–1.2 cm in diam.; pedicel 1–1.5 cm. Epicalyx segments oblong to obovate, margin entire. Sepals triangular-obovate, apex obtuse or acute. Petals yellow, elliptic to obovate, apex rounded. Style lateral; stigma slightly dilated. Achenes not seen. Fl. and fr. May–Oct.

- Meadows, gravelly slopes; 2000–4000 m. Guizhou, Sichuan.

29. *Potentilla anserina* Linnaeus, Sp. Pl. 1: 495. 1753.

蕨麻 jue ma

Potentilla anserina var. *nuda* Gaudin; *P. anserina* var. *sericea* Hayne; *P. anserina* var. *viridis* W. D. J. Koch.

Herbs perennial, stoloniferous. Roots sometimes with fusiform or ellipsoid tubers. Stems prostrate, creeping, together with petioles appressed or subspreading pilose or glabrescent, rooting at nodes and producing plantlets. Radical leaves 2–20 cm including petiole; auricles of stipules connate from base to rounded apex; leaf blade interrupted pinnate with 5–11 pairs of leaflets; terminal leaflet elliptic, obovate-elliptic, or oblong-elliptic, 1–2.5 × 0.5–1 cm, abaxially densely appressed silvery sericeous, rarely glabrescent, base decurrent in apical pair of leaflets, margin sharply many serrate; cauline leaves: auricles of stipules sheathing at base. Flower solitary, 1.5–2.5 cm in diam.; pedicel 2.5–8 cm, pilose. Epicalyx segments elliptic or elliptic-lanceolate, margin usually 2- or 3-fid, rarely entire. Petals yellow, obovate, apex rounded. Style lateral. Achenes not seen. Fl. and fr. Jun–Aug. *2n* = 28, 42.

- Meadows, grasslands on mountain slopes, river and ditch banks,

wet places, roadsides; 500–4100 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Asia, Australia (Tasmania), Europe, North America, Pacific Islands (New Zealand), South America (Chile)].

30. *Potentilla gombalana* Handel-Mazzetti, Acta Horti Gothob. 13: 324. 1939.

川边委陵菜 chuan bian wei ling cai

Herbs perennial, stoloniferous. Stems prostrate, together with petioles appressed pilose. Radical leaves 13–25 cm including petiole; auricles of stipules of radical leaves connate from base to rounded apex; leaf blade interrupted pinnate with 9–12 pairs of leaflets; terminal leaflet oblong-elliptic or ovate-lanceolate, 1.5–4 × 0.5–1.5 cm, abaxially densely sericeous, base decurrent in apical pair of leaflets, margin incised serrate, teeth hairy at apex; cauline leaves resembling radical ones but reduced; auricles of stipules (on prostrate stems) broad, membranous, base sheathing, apex slightly parted or entire; leaf blade 3–5-foliolate. Flowers 1 or 2, ca. 3 cm in diam.; pedicel 5–6 cm, appressed pilose. Sepals broadly triangular-ovate; epicalyx segments narrowly lanceolate, appressed pilose, apex acuminate. Petals yellow, broadly obovate, apex rounded or emarginate. Style lateral; stigma slightly dilated. Achenes not seen. Fl. Jul.

• Forest margins; ca. 3700 m. Sichuan (Kangding Xian, Yulin-gong).

31. *Potentilla smithiana* Handel-Mazzetti, Acta Horti Gothob. 13: 325. 1939.

齿萼委陵菜 chi e wei ling cai

Herbs perennial, stoloniferous. Stems prostrate, spreading villous or glabrescent, often with adventitious roots at nodes. Radical leaves not present at anthesis; leaves mostly cauline, 4–15 cm including petiole; stipules brown, membranous, abaxially

pilose or glabrescent, margin entire, apex acute or acuminate; petiole spreading villous; leaf blade interrupted pinnate with 3–5 pairs of leaflets; terminal leaflet narrowly obovate or oblong-elliptic, 1–4 × 0.5–2 cm, abaxially densely appressed sericeous, lateral veins prominent, parallel, straight, base decurrent in apical pair of leaflets, margin sharply serrate. Flower solitary, 1.5–2 cm in diam.; pedicel 2–7 cm, appressed pilose. Sepals triangular-ovate, apex acute; epicalyx segments elliptic or oblanceolate, abaxially pilose, 3- or 4-veined, margin 3–7-serrate, apex acute. Petals yellow, obovate, apex rounded. Style lateral; stigma dilated. Achenes not seen. Fl. and fr. May–Aug.

• Grassy mountain slopes; 1000–2900 m. Sichuan.

32. *Potentilla taronensis* C. Y. Wu ex T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 9. 1980.

大果委陵菜 da guo wei ling cai

Herbs perennial. Stems spreading, densely spreading yellow villous. Radical leaves 5–10 cm including petiole; auricles of stipules free (also those on lower cauline leaves), apex acute; petiole spreading yellow villous; leaf blade interrupted pinnate usually with 4 or 5 pairs of leaflets (on upper cauline leaves with 1–3 pairs); leaflets elliptic or obovate-oblong, 1–3 × 0.5–1.6 cm, abaxially pilose on veins, margin sharply incised serrate, apex subrounded or obtuse; upper cauline leaves: auricles of stipules green, herbaceous, margin acutely incised many serrate. Flower solitary; pedicel 1.5–4 cm, pilose, with 1–3 bracts. Sepals triangular-ovate, apex acuminate; epicalyx segments obovate, slightly shorter than sepals, margin 2- or 3-parted. Style lateral; stigma not dilated. Achenes ellipsoid, ca. 2 mm in diam., markedly papillate. Fr. Nov.

• Alpine gravelly slopes; 3000–3200 m. NW Yunnan (Gaoligong Shan).

5. *Potentilla* sect. *Conostylae* (Th. Wolf) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 279. 1985.

锥状花柱组 zhui zhuang hua zhu zu

Potentilla subsect. *Conostylae* Th. Wolf, Biblioth. Bot. 16(Heft 71): 48. 1908.

Herbs annual or perennial. Basal leaves pinnate, palmate, or 3-foliolate; leaflets serrate or divided at margin. Ovary glabrous; style subterminal, conic, visibly thickened at base, gradually tapered distally.

About 350 species: mainly temperate and subarctic regions of N hemisphere; 47 species (13 endemic) in China.

1a. Radical leaves pinnate (sometimes 3-foliolate in *P. hypargyrea*).

2a. Leaves abaxially green or greenish, sericeous, pilose, or glabrescent.

3a. Leaflet margin parted to midvein.

4a. Radical leaves 3-foliolate, or terminal leaflets pseudopinnately parted, abaxially white sericeous 63. *P. hypargyrea*

4b. Radical leaves pinnate, abaxially green, pilose or sparsely sericeous.

5a. Leaflets 2-pinnately dissected, ultimate segments ca. 1 mm wide, both surfaces pilose, apex acuminate; stipules proximally adnate to petiole for ca. 3/4 their length; inflorescences 1–3-flowered 62. *P. coriandrifolia*

5b. Leaflets 1-pinnatifid, ultimate segments ca. 2 mm wide, both surfaces pilose and granular sessile glandular, apex obtuse; stipules proximally adnate to petiole for ca. 1/2 their length; inflorescences cymose, many flowered 64. *P. granulosa*

3b. Leaflet margin serrate or lobed, but not deeply so to midvein.

6a. Radical leaves with 2 or 3(or 4) pairs of leaflets.

7a. Leaflet margin coarsely acutely or obtusely incised serrate; flowers ca. 2 cm in diam.; epicalyx segments equaling sepals 67. *P. lancinata*

7b. Leaflet margin crenulate; flowers 1.5–1.8 cm in diam.; epicalyx segments shorter than sepals 68. *P. crenulata*

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- 6b. Radical leaves with 4–23 pairs of leaflets.
- 8a. Inflorescence lax, many flowered; flowers usually 1–1.5 cm in diam.; epicalyx segments linear-lanceolate, usually shorter than sepals, not enlarged in fruit 65. *P. tanacetifolia*
- 8b. Inflorescence compact, few flowered; flowers 1.5–1.8 cm in diam.; epicalyx segments oblong-lanceolate, nearly equaling or slightly longer than sepals, enlarged in fruit 66. *P. longifolia*
- 2b. Leaves abaxially densely white or yellowish tomentose or sericeous.
- 9a. Radical leaves with 2–4 pairs of leaflets, leaflet margin serrate.
- 10a. Flowering stems and petioles pilose or villous 47. *P. griffithii*
- 10b. Flowering stems and petioles ± interwoven white tomentose and pilose, rarely glabrescent.
- 11a. Leaflets abaxially appressed sericeous on veins; sepals abaxially densely villous or sericeous 46. *P. potaninii*
- 11b. Leaflets abaxially white tomentose on veins; sepals abaxially densely white tomentose.
- 12a. Leaflets in 2–4 pairs, oblong or oblong-lanceolate, margin incised serrate 45. *P. discolor*
- 12b. Leaflets in 2 pairs, oblong to obovate-oblong, margin pectinately lobed 48. *P. hololeuca*
- 9b. Radical leaves with (2 or)3–11 pairs of leaflets, leaflet margin parted or lobed.
- 13a. Flowering stems and petioles ± interwoven white tomentose or downy, rarely glabrescent.
- 14a. Leaflets of radical leaves pinnately or palmately parted nearly to base, thereby appearing verticillate 40. *P. verticillaris*
- 14b. Leaflets of radical leaves not as above, not appearing verticillate.
- 15a. Leaflet margin pectinate, lobes fasciated oblong or oblong-lanceolate 44. *P. strigosa*
- 15b. Leaflet margin not pectinate, lobes often broader.
- 16a. Leaflets in 3–5(–8) pairs, subleathery, abaxially densely white tomentose, margin oblong or triangular lobed 39. *P. sischanensis*
- 16b. Leaflets in 4–8 pairs, thinly papery, abaxially canescent tomentose, margin oblong dentate or triangular lobed 41. *P. limprichtii*
- 13b. Flowering stems and petioles sericeous, villous, floccose, or pubescent, but not tomentose.
- 17a. Leaflets abaxially wholly tomentose or sericeous, sometimes glabrescent.
- 18a. Leaflets abaxially densely appressed sericeous, sometimes glabrescent, margin flat or slightly revolute; stipules of cauline leaves entire; flowering stems and petioles sparsely sericeous or glabrescent 36. *P. multiceps*
- 18b. Leaflets abaxially tomentose or sericeous, margin strongly revolute; stipules of cauline leaves entire or 2-fid; flowering stems and petioles densely spreading white sericeous 38. *P. sericea*
- 17b. Leaflets abaxially tomentose, white sericeous on veins.
- 19a. Leaflets abaxially tomentose and sparsely white villous, adaxially greenish, appressed white villous or sericeous, lobes adjacent.
- 20a. Radical leaves with 3–5 pairs of leaflets; stipules of cauline leaves entire, rarely 2-fid; stems and petioles appressed white villous 35. *P. pamiroalaica*
- 20b. Radical leaves with 6–9 pairs of leaflets; stipules of cauline leaves 2- or 3-fid; stems and petioles spreading white sericeous-villous 37. *P. plumosa*
- 19b. Leaflets abaxially sericeous only on veins, adaxially green, appressed pilose, rarely glabrescent, lobes distant.
- 21a. Flowers usually 1.2–1.5 cm in diam.; sepals erect, enlarged after flowering.
- 22a. Leaflets usually parted almost to midvein, lobes narrow, ± fasciated lanceolate; plants appressed pubescent or recumbent sericeous, rarely glabrescent, hairs to 2 mm 33. *P. multifida*
- 22b. Leaflets usually lobed, but not nearly midvein, lobes triangular-oblong or triangular-lanceolate to fasciated oblong; plants sparsely spreading white villous, hairs 3–4 mm 43. *P. conferta*
- 21b. Flowers usually 0.8–1.2 cm in diam.; sepals adnate to fruit, not enlarged after flowering.
- 23a. Stipules of cauline leaves usually dentately lobed; flowering stems white sericeous 42. *P. chinensis*
- 23b. Stipules of cauline leaves usually entire; flowering stems white villous 34. *P. multicaulis*
- 1b. Radical leaves palmately 3–5-foliolate.
- 24a. Leaves abaxially white tomentose or sericeous.
- 25a. Radical leaves palmately 5-foliolate, rarely 3-foliolate with leaflets pinnately parted, cauline leaves 3 to many; inflorescence corymbose, many flowered.
- 26a. Leaflets of radical leaves 5–8-lobed; flowers 0.8–1 cm in diam. 58. *P. virgata*
- 26b. Leaflets of radical leaves serrate or 1–4-lobed; flowers 1–2 cm in diam.
- 27a. Leaflets abaxially gray pilose or tomentose, margin flat, incised serrate 61. *P. inclinata*
- 27b. Leaflets abaxially densely white tomentose, margin slightly or markedly revolute, irregularly 2–5-dentate distally or 2–4-lobed on each side.
- 28a. Leaflet margin slightly revolute, 2–4-lobed on each side, lobes narrowly fasciated 59. *P. angustiloba*
- 28b. Leaflet margin markedly revolute, entire in proximal 1/2, irregularly 2–5-dentate in distal 1/2 60. *P. argentea*
- 25b. Radical leaves 3(or 5)-foliolate, cauline leaves very few, 1- or 2-foliolate; inflorescence 2- or 3-flowered.
- 29a. Radical leaves 5-foliolate 52. *P. saundersiana*

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- 29b. Radical leaves 3-foliolate.
- 30a. Flowering stems and petioles usually white tomentose; leaflets abaxially tomentose on lateral veins.
- 31a. Leaflets lanceolate or ovate-lanceolate, margin pinnately parted 51. *P. zhangbeiensis*
- 31b. Leaflets oblong-lanceolate, elliptic-ovate, or obovate, margin coarsely or sharply serrate.
- 32a. Leaflets oblong-lanceolate, margin coarsely triangular 5–7-serrate; sepals abaxially appressed pilose 49. *P. nivea*
- 32b. Leaflets elliptic-ovate or obovate, margin sharply ovate 3–7-serrate; sepals abaxially white tomentose 50. *P. betonicifolia*
- 30b. Flowering stems and petioles villous or also white tomentose; leaflets abaxially sericeous or pilose.
- 33a. Stipules of cauline leaves broad, fasciated 2–4-lobed; flowers 2–3 cm in diam.; epicalyx segments abaxially silvery tomentose 54. *P. delavayi*
- 33b. Stipules of cauline leaves small, entire, rarely 2-serrate; flowers 1–2 cm in diam.; epicalyx segments abaxially usually green and pilose.
- 34a. Pedicels and sepals abaxially glandular hairy; leaflets abaxially canescent tomentose, glabrescent when old, adaxially pilose and glandular hairy 56. *P. evestita*
- 34b. Pedicels and sepals abaxially not glandular hairy; leaflets abaxially densely persistently tomentose, adaxially appressed sericeous or pilose, rarely glabrescent.
- 35a. Plants gray tomentose; terminal leaflet of radical leaves shortly petiolulate 55. *P. nervosa*
- 35b. Plants white tomentose; leaflets of radical leaves sessile.
- 36a. Leaflets abaxially densely silvery tomentose and appressed silvery sericeous, adaxially appressed silvery sericeous; flowers ca. 2 cm in diam.; petals purplish at base; stamens and styles purple 57. *P. argyrophylla*
- 36b. Leaflets abaxially densely gray or white tomentose, pilose on veins, adaxially green or gray-green, appressed sericeous or pilose; petals yellow; stamens and styles yellow-white.
- 37a. Leaflets adaxially appressed pilose, margin crenate; pedicels erect; flowers 1–1.4 cm in diam. 52. *P. saundersiana*
- 37b. Leaflets adaxially appressed sericeous, margin lobed, lobes fasciated; pedicels nodding; flowers 1.5–2 cm in diam. 53. *P. pendula*
- 24b. Leaves abaxially green, pilose.
- 38a. Radical leaves pinnate 70. *P. supina*
- 38b. Radical leaves 3-foliolate, pedate, or palmate, rarely some leaves pinnate.
- 39a. Radical leaves palmately or pedately 5-foliolate, rarely some leaves 3-foliolate or pinnate.
- 40a. Stems prostrate, stoloniferous; roots slender; flowers 0.5–1 cm in diam. 69. *P. kleiniana*
- 40b. Stems erect or decumbent; roots robust, usually woody; flowers 1.5–2.5 cm in diam.
- 41a. Plants glandular hairy.
- 42a. Plants red stipitate glandular hairy; radical leaves palmately or pedately 5-foliolate 78. *P. desertorum*
- 42b. Plants sessile glandular hairy; radical leaves palmately 5-foliolate, some leaves 3-foliolate, rarely pinnate 79. *P. subdigitata*
- 41b. Plants not glandular hairy.
- 43a. Flowering stems and petioles pubescent, glabrescent; plants with leaf rosettes at anthesis 76. *P. chrysantha*
- 43b. Flowering stems and petioles white villous, hairs basally enlarged; plants without leaf rosettes at anthesis 77. *P. recta*
- 39b. Radical leaves 3-foliolate.
- 44a. Flowering stems prostrate, elongate.
- 45a. Flowers many, in terminal cymes 72. *P. cryptotaeniae*
- 45b. Flower solitary, lateral or terminal.
- 46a. Leaflets sessile, margin deeply serrate, stipules leathery, margin entire 70. *P. supina*
- 46b. Leaflets markedly petiolulate, margin narrowly serrate, stipules membranous, margin entire or serrate 71. *P. centigrana*
- 44b. Flowering stems erect or ascending.
- 47a. Flowers 2.5–4 cm in diam. 74. *P. macrosepala*
- 47b. Flowers not more than 2 cm in diam.
- 48a. Leaflets abaxially and sepals abaxially densely sessile glandular 79. *P. subdigitata*
- 48b. Leaflets abaxially and sepals abaxially not or only inconspicuously glandular.
- 49a. Plants spiny-setose, 10–20 cm tall 73. *P. asperrima*
- 49b. Plants not spiny-setose, more than 20 cm tall.
- 50a. Plants 50–100 cm tall; leaflets usually oblong or oblong-lanceolate, apex prolonged acuminate; stipules of cauline leaves lanceolate or oblong-lanceolate, mostly adnate to petiole 72. *P. cryptotaeniae*

- 50b. Plants 20–50 cm tall; leaflets usually elliptic, obovate, rhombic, or flabellate, apex obtuse or acute; stipules of cauline leaves broadly ovate or ovate-elliptic, free part longer than adnate part.
- 51a. Stems spreading; stipules of cauline leaves submembranous, margin entire or serrate; peduncle leafy; flowers 0.6–0.8 cm in diam. 71. *P. centigrana*
- 51b. Stems erect or ascending; stipules of cauline leaves herbaceous, margin entire; peduncle with minute, leaflike bracts; flowers 1–1.2 cm in diam. 75. *P. xizangensis*

33. *Potentilla multifida* Linnaeus, Sp. Pl. 1: 496. 1753.

多裂委陵菜 duo lie wei ling cai

Herbs perennial. Roots terete, slightly woody. Flowering stems ascending, sometimes spreading near ground, rarely erect, 3–40 cm tall, appressed or spreading pubescent or sericeous. Radical leaves 2.5–17 cm including petiole; stipules brown, membranous, abaxially pilose or glabrescent; petiole appressed or spreading pubescent; leaf blade pinnate with (2 or)3–5(or 6) pairs of leaflets; leaflets opposite, rarely alternate, at intervals of 0.5–2 cm, oblong-elliptic or broadly ovate, 1–5 × 0.8–2 cm, distal leaflets larger than proximal ones, abaxially white tomentose, appressed sericeous-villous on veins, adaxially appressed pubescent, densely appressed villous, or rarely glabrescent, midvein and lateral veins convex, margin revolute, pinnately parted almost to midvein, apex acute or ligulate; segments fasciated, fasciated lanceolate, or ligulate fasciated; cauline leaves 2 or 3; stipules green, ovate or ovate-lanceolate, herbaceous, apex acute or acuminate, 2-fid or entire; leaf blade resembling that of radical leaves but leaflets fewer higher up stem. Inflorescence corymbose-cymose, elongated and lax after flowering. Flowers 1.2–1.5 cm in diam.; pedicel 1.5–2.5 cm, pubescent. Sepals triangular-ovate, apex acute or acuminate; epicalyx segments lanceolate or elliptic-lanceolate, slightly shorter than sepals, appressed villous, apex obtuse or acute. Petals yellow, obovate, equaling sepals, apex emarginate. Style subterminal, conic, base thickened, papillate; stigma slightly enlarged. Achenes smooth or rugose. Fl. and fr. May–Aug.

Forest margins, meadows, grassy mountain slopes, alpine valleys, ravines, sandy river banks; 700–5000 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Asia, Europe, North America].

- 1a. Stems spreading near ground, 3–8 cm tall 33c. var. *nubigena*
- 1b. Stems ascending, rarely erect, 12–40 cm tall.
- 2a. Cauline leaves pinnate with up to 5 pairs of leaflets 33a. var. *multifida*
- 2b. Cauline leaves pinnate or appearing palmate with 5 pairs of leaflets densely inserted at petiole apex 33b. var. *ornithopoda*

33a. *Potentilla multifida* var. *multifida*

多裂委陵菜(原变种) duo lie wei ling cai (yuan bian zhong)

Potentilla hypoleuca Turczaninow; *P. multifida* var. *angustifolia* Lehmann; *P. multifida* var. *hypoleuca* (Turczaninow) Th. Wolf; *P. plurijuga* Handel-Mazzetti.

Flowering stems ascending, rarely erect, 12–40 cm tall. Cauline leaves pinnate with up to 5 pairs of leaflets. Fl. and fr.

May–Aug.

Forest margins, meadows on mountain slopes, ravines; 1200–4300 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan [Asia, Europe, North America].

This variety is used medicinally.

33b. *Potentilla multifida* var. *ornithopoda* (Tausch) Th. Wolf, Biblioth. Bot. 16(Heft 71): 156. 1908.

掌叶多裂委陵菜 zhang ye duo lie wei ling cai

Potentilla ornithopoda Tausch, Hort. Canal. t. 10. 1823; *P. multifida* var. *subpalmata* Krylov.

Flowering stems ascending, 12–40 cm tall. Cauline leaves pinnate or appearing palmate with 5 pairs of leaflets densely inserted at petiole apex.

Forest margins, meadows, grassy mountain slopes, ravines, sandy river banks; 700–4800 m. Gansu, Hebei, Heilongjiang, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xizang [Mongolia, Russia].

33c. *Potentilla multifida* var. *nubigena* Th. Wolf, Biblioth. Bot. 16(Heft 71): 155. 1908.

矮生多裂委陵菜 ai sheng duo lie wei ling cai

Potentilla multifida var. *minor* Ledebour.

Flowering stems spreading near ground, 3–8 cm tall. Radical leaves 2.5–4 cm including petiole; leaf blade with (2 or)3 pairs of leaflets; segments ligulate fasciated, abaxially densely tomentose and sericeous-villous, adaxially densely appressed villous. Inflorescence few flowered. Fl. and fr. May–Jul.

Mountain meadows, alpine valleys; 1300–5000 m. Gansu, Hebei, Nei Mongol, Qinghai, Shaanxi, Xinjiang, Xizang [C and SW Asia].

34. *Potentilla multicaulis* Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg, Sér. 6, Sci. Math. 2: 99. 1833.

多茎委陵菜 duo jing wei ling cai

Potentilla sericea Linnaeus var. *multicaulis* (Bunge) Lehmann.

Herbs perennial. Roots robust, terete. Flowering stems many, tufted, ascending or spreading, usually dark reddish, 7–35 cm tall, white villous or pubescent. Radical leaves 3–10 cm including petiole; stipules brown, membranous, abaxially white villous; petiole dark red, white villous; leaf blade pinnate with 4–6(–8) pairs of leaflets; leaflets opposite, rarely alternate, at intervals of 3–8 mm, sessile, elliptic to obovate, 5–20 × 3–8 mm, distal leaflets much larger than proximal ones, abaxially white tomentose, sparsely white villous on veins, adaxially sparsely appressed pilose, rarely glabrescent, main veins slightly concave, margin flat or slightly revolute, pinnately parted,

apex ligulate; segments fasciated; cauline leaves resembling radical ones but leaflets fewer; stipules green, herbaceous, margin entire, apex acuminate. Inflorescence cymose, many flowered, compact initially, lax after anthesis. Flowers 0.8–1(–1.3) cm in diam. Sepals triangular-ovate, apex acute; epicalyx segments linear-lanceolate, ca. 1/2 as long as sepals, apex rounded. Petals yellow, obovate or suborbicular, slightly longer than to $2 \times$ as long as sepals, apex emarginate. Style subterminal, cylindrical, base thickened. Achenes ovoid, rugose. Fl. and fr. Apr–Sep.

Thinned forests, meadows, shady places in ravines, sunny gravelly slopes, field margins; 200–3800 m. Gansu, Hebei, Henan, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang [Mongolia].

35. *Potentilla pamiroalaica* Juzepczuk in Komarov, Fl. URSS 10: 609. 1941.

高原委陵菜 gao yuan wei ling cai

Herbs perennial. Roots robust, terete. Rhizome usually multicapital, densely covered with brown relics of stipules. Flowering stems usually ascending, rarely erect, 5–22 cm tall, appressed white villous, hairs subspreading in lower part. Radical leaves 3–10 cm including petiole; stipules brown, membranous, abaxially white sericeous, rarely glabrescent; petiole appressed white pilose; leaf blade pinnate, very rarely palmate, with 3–5 pairs of leaflets; leaflets opposite or alternate, at intervals of 3–5 mm, sessile, adaxially green or grayish, ovate or obovate-oblong, 5–13 \times 3–7 mm, distal leaflets larger than proximal ones, abaxially densely white tomentose, densely white sericeous-villous on veins, adaxially densely appressed white villous, margin flat, pinnately parted, apex obtuse; segments oblong-linear; cauline leaves 1 or 2; stipules green, ovate or ovate-lanceolate, herbaceous, margin entire. Inflorescence lax, few flowered. Flowers 1.2–1.5 cm in diam.; pedicel 1.5–3 cm, densely appressed villous. Sepals triangular-lanceolate or ovate-lanceolate, apex acute or acuminate; epicalyx segments lanceolate or elliptic-lanceolate, shorter than or rarely nearly equaling sepals, apex obtuse. Petals yellow, obovate, longer than sepals, apex emarginate. Style subterminal, base slightly thickened. Achenes smooth. Fl. and fr. Jun–Aug.

Mountain slopes, shady places in river valleys; 3300–4700 m. Xinjiang, Xizang [C Asia].

36. *Potentilla multiceps* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 9. 1980.

多头委陵菜 duo tou wei ling cai

Herbs perennial. Roots robust, terete. Rhizome multicapital. Flowering stems densely tufted, erect, ascending, or spreading, 3–7 cm tall, white pilose, sometimes glabrescent. Radical leaves 1.5–3 cm including petiole; stipules brown, membranous, pilose or glabrescent; petiole white pilose; leaf blade pinnate with (3 or) 4 or 5 pairs of leaflets; leaflets opposite or alternate, elliptic or obovate-elliptic, abaxially densely white sericeous or glabrescent, adaxially appressed white pilose or glabrescent, margin flat, pinnately parted almost to midvein, apex obtuse; segments 1–3 on each side of midvein, fasciated ligulate; cauline leaves reduced; stipules green, herbaceous, margin entire; leaf blade palmate or subpinnate; leaflets resem-

bling those of radical leaves. Inflorescence cymose, 1- to several flowered. Flowers 0.7–1.2 cm in diam. Sepals elliptic-lanceolate or triangular-ovate, apex acute or acuminate; epicalyx segments narrowly fasciated, usually ca. 1/2 as long as sepals, abaxially pubescent and sparsely pilose. Petals yellow, obovate, ca. 1/2 as long as sepals, apex emarginate. Stamens ca. 20. Carpels numerous; style subterminal, ca. 1.5 \times as long as ovary, base thickened, papillate; stigma dilated, capitate. Achenes not seen. Fl. Jul.

• Mountain slopes, sandy river banks; 4000–5200 m. Qinghai, Xizang.

37. *Potentilla plumosa* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 10. 1980.

羽毛委陵菜 yu mao wei ling cai

Herbs perennial. Roots robust, terete, woody. Flowering stems spreading or ascending, 4–30 cm tall, spreading white sericeous-villous. Radical leaves 2–7 cm including petiole; stipules brown, membranous, abaxially white villous, rarely glabrescent; petiole white tomentose and white villous; leaf blade pinnate with 6–9 pairs of leaflets; leaflets opposite or alternate, at intervals of 2–4 mm, sessile, elliptic, 3–15 \times 2–8 mm, abaxially white tomentose, sometimes glabrescent, densely appressed white villous on veins, adaxially appressed white pubescent, margin slightly revolute, parted to midvein, apex obtuse; segments 3–5 on each side of midvein, fasciated; cauline leaves resembling radical ones but only with 3–5 pairs of leaflets; stipules green, ovate or ovate-lanceolate, herbaceous, abaxially densely appressed villous, margin 2–4-dentate-lobed or serrate, apex acuminate. Inflorescence densely or laxly corymbose-cymose, 3–10-flowered. Flowers 1–1.5 cm in diam. Sepals ovate or triangular-ovate, apex acute or acuminate; epicalyx segments ovate-lanceolate, slightly shorter than sepals, abaxially densely pubescent or villous, apex obtuse or acute. Petals yellow, obovate, ca. 2 \times as long as sepals, apex emarginate. Stamens ca. 20. Carpels numerous; ovary subreniform; style subterminal, base inconspicuously thickened; stigma slightly dilated, capitate. Achenes ovoid-ellipsoid, smooth, abaxially swollen. Fl. and fr. Jun–Aug.

• Open places in forests, meadows, terraces in valleys, grassy alpine slopes; 2500–4000 m. Gansu, Qinghai, Sichuan, Xizang.

38. *Potentilla sericea* Linnaeus, Sp. Pl. 1: 495. 1753.

绢毛委陵菜 juan mao wei ling cai

Herbs perennial. Roots robust, slightly woody. Flowering stems erect or ascending, 5–20 cm tall, together with petioles spreading white sericeous-villous. Radical leaves 3–8 cm including petiole; stipules brown, membranous, abaxially sericeous or villous; leaf blade pinnate with 2–6 pairs of leaflets; leaflets opposite, rarely alternate, at intervals of 3–5 mm or adjacent, sessile, adaxially green, oblong, usually 5–15 \times 3–8 mm, distal leaflets larger than proximal ones, abaxially white tomentose and white sericeous, adaxially appressed sericeous, margin revolute or not, pectinately parted, apex obtuse or acute; segments linear; cauline leaves 1 or 2; stipules green, ovate, herbaceous, abaxially villous, margin acutely serrate, rarely entire, apex acuminate. Inflorescence laxly cymose. Flowers 0.8–2.2

cm in diam.; pedicel 1–2 cm, densely pubescent and villous. Sepals triangular-ovate, apex acute; epicalyx segments lanceolate, slightly shorter than or rarely nearly equaling sepals, apex obtuse or acute. Petals yellow, obovate, slightly longer than sepals, apex emarginate. Style subterminal, base thickened. Achenes brown, cylindrical-ovoid, rugose. Fl. and fr. May–Sep.

Forest margins, grasslands, meadows and rock crevices on mountain slopes, inundated river banks; 600–5200 m. Gansu, Heilongjiang, Jilin, Nei Mongol, Qinghai, Xinjiang, Xizang [NW Himalayas to Kashmir, Mongolia, Russia].

1a. Radical leaves with 3–6 pairs of leaflets, leaflets at intervals of 3–5 mm, abaxially white tomentose and white sericeous, margin revolute 38a. var. *sericea*

1b. Radical leaves with 2 pairs of leaflets, leaflets adjacent, abaxially densely white tomentose, densely sericeous on veins, margin not revolute 38b. var. *polyschista*

38a. *Potentilla sericea* var. *sericea*

绢毛委陵菜(原变种) juan mao wei ling cai (yuan bian zhong)

Potentilla dasyphylla Bunge; *P. sericea* var. *dasyphylla* (Bunge) Ledebour.

Radical leaves with 3–6 pairs of leaflets; leaflets at intervals of 3–5 mm, abaxially white tomentose and white sericeous, margin revolute. Fl. and fr. May–Sep.

Forest margins, grasslands, meadows on mountain slopes, inundated river banks; 600–4100 m. Gansu, Heilongjiang, Jilin, Nei Mongol, Qinghai, Xinjiang, Xizang [Mongolia, Russia].

38b. *Potentilla sericea* var. *polyschista* (Boissier) Lehmann, Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 23, Suppl. [Revis. Potentill.]: 34. 1856.

变叶绢毛委陵菜 bian ye juan mao wei ling cai

Potentilla polyschista Boissier, Diagn. Pl. Orient., ser. 1, 10: 6. 1849.

Radical leaves with 2 pairs of leaflets; leaflets adjacent, abaxially densely white tomentose, densely sericeous on veins, margin not revolute.

Alpine meadows, rock crevices on mountain slopes; 4400–5200 m. Xizang [NW Himalayas to Kashmir].

39. *Potentilla sischanensis* Bunge ex Lehmann, Nov. Stirp. Pug. 9: 3. 1851.

西山委陵菜 xi shan wei ling cai

Herbs perennial. Roots robust, terete, woody. Flowering stems tufted or not, erect, ascending, or spreading, 10–30 cm tall, together with petioles white tomentose and sparsely villous, glabrescent when old. Radical leaves 3–25(–30) cm including petiole; stipules brown, membranous, abaxially white villous; leaf blade pinnate with 3–5(–8) pairs of leaflets; leaflets opposite, rarely proximal ones alternate, at intervals of 0.5–1.8 cm, adaxially green, ovate, oblong-elliptic, or lanceolate, 0.5–3 × 0.4–1.5 cm, subleathery, abaxially densely white tomentose, appressed white villous and tomentose on veins, adaxially sparse-

ly villous, margin flat or slightly revolute, pinnately parted or serrate-lobed, apex obtuse or acute; segments oblong-elliptic, lanceolate, or ovate-lanceolate, or lobes triangular or triangular-ovate; cauline leaves absent or undeveloped, bractlike, and palmately or pinnately 3–5-sect; stipules green, ovate-lanceolate, subleathery, abaxially densely white tomentose. Inflorescence laxly cymose. Flowers 0.8–1 cm in diam.; pedicel 1–1.5 cm, sparsely pilose, with small, opposite bracteoles. Sepals ovate-lanceolate or triangular-ovate, apex acuminate; epicalyx segments linear-lanceolate, shorter than or nearly equaling sepals, white tomentose and abaxially sparsely pilose. Petals yellow, obovate, 0.5–1 × as long as sepals, apex rounded or emarginate. Style subterminal, base slightly thickened; stigma slightly dilated. Achenes ovoid, rugose at maturity. Fl. and fr. Apr–Aug.

Thickets, grasslands, grassy or dry mountain slopes, ravines, loess hills, waste places; 200–3600 m. Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan [Mongolia].

1a. Flowering stems tufted, erect or ascending; leaflet margin pinnately parted, segments oblong-elliptic, lanceolate, or ovate-lanceolate 39a. var. *sischanensis*

1b. Flowering stems ascending or spreading, rarely tufted and erect; leaflet margin serrate-lobed, lobes triangular or triangular-ovate 39b. var. *peterae*

39a. *Potentilla sischanensis* var. *sischanensis*

西山委陵菜(原变种) xi shan wei ling cai (yuan bian zhong)

Potentilla songarica Bunge var. *chinensis* Bunge.

Flowering stems tufted, erect or ascending. Leaflet margin pinnately parted; segments oblong-elliptic, lanceolate, or ovate-lanceolate. Fl. and fr. Apr–Aug.

Thickets, grasslands, dry mountain slopes, loess hills; 200–3600 m. Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi [Mongolia].

39b. *Potentilla sischanensis* var. *peterae* (Handel-Mazzetti) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 287. 1985.

齿裂西山委陵菜 chi lie xi shan wei ling cai

Potentilla peterae Handel-Mazzetti, Acta Horti Gothob. 13: 317. 1939.

Flowering stems ascending or spreading, rarely tufted and erect. Leaflet margin serrate-lobed; lobes triangular or triangular-ovate. Fl. and fr. May–Aug.

• Grassy mountain slopes, ravines, waste places; 1700–2500 m. Gansu, Nei Mongol, Ningxia, Shaanxi, Shanxi, Sichuan.

40. *Potentilla verticillaris* Stephan ex Willdenow, Sp. Pl. 2: 1096. 1799.

轮叶委陵菜 lun ye wei ling cai

Potentilla verticillaris var. *acutipetala* Lehmann; *P. verticillaris* var. *condensata* Th. Wolf.

Herbs perennial. Roots cylindrical. Flowering stems tufted,

erect, 5–16 cm tall, white tomentose and villous. Radical leaves 3–5; stipules brown, membranous, abaxially densely white villous; leaflets adaxially green, proximal ones slightly shorter than distal ones, usually 0.5–3 cm × 1–3 mm, abaxially white tomentose, sparsely white villous on veins, adaxially pilose or glabrescent, base cuneate, margin revolute, pinnately or palmately parted almost to midvein, apex obtuse or acute; segments linear or narrowly fasciated; cauline leaves 1 or 2; stipules ovate-lanceolate, abaxially densely white tomentose, margin entire; leaf blade palmately 3–5-sect; segments fasciated. Inflorescence laxly cymose, few flowered. Flowers 0.8–1.5 cm in diam.; pedicel 1–1.5 cm, white tomentose. Sepals oblong, apex acuminate; epicalyx segments linear-lanceolate, shorter than or nearly equaling sepals, abaxially white tomentose and villous, apex acute or acuminate. Petals yellow, broadly obovate, slightly longer than to ca. 2 × as long as sepals, apex emarginate. Style subterminal, base thickened; stigma dilated. Achenes smooth. Fl. and fr. May–Aug.

Thickets, grasslands, dry mountain slopes, sandy river banks; 600–1900 m. Hebei, Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Mongolia, Russia (Siberia)].

41. *Potentilla limprichtii* J. Krause, *Repert. Spec. Nov. Regni Veg. Beih.* 12: 408. 1922.

下江委陵菜 *xia jiang wei ling cai*

Herbs perennial. Roots stout, terete, slightly fleshy. Flowering stems subspreading to ascending, slender, 15–30 cm tall, together with petioles pilose and sparsely tomentose, usually glabrescent in lower part. Radical leaves 6–20 cm including petiole; stipules tinged brown, membranous, abaxially pilose, rarely glabrescent; leaf blade pinnate with 4–8 pairs of leaflets; leaflets opposite, rarely alternate, at intervals of 1–2.5 cm, shortly petiolulate or sessile, ovate, elliptic-ovate, or oblong-obovate, 1–2.5 × 0.5–1.5 cm, thinly papery, abaxially grayish white tomentose and pilose, adaxially appressed pilose or glabrescent, base cuneate or broadly so, margin distally 4–7-dentate-lobed or -serrate, on basal leaflets only 2- or 3-dentate-lobed; cauline leaves: stipules green, ovate, papery, margin entire; leaf blade 3-foliolate; leaflets resembling those of radical leaves. Inflorescence laxly several flowered. Flowers 1–1.5 cm in diam.; pedicel slender, 3–4 cm, pilose or tomentose. Sepals triangular-ovate, apex acute or acuminate; epicalyx segments fasciated lanceolate or elliptic-lanceolate, shorter than or rarely nearly equaling sepals, abaxially pilose and white tomentose. Petals yellow, obovate, 0.5–1 × as long as sepals, apex emarginate. Style subterminal, base slightly thickened; stigma capitate. Achenes smooth. Fl. and fr. Oct.

Rock crevices in ravines. Guangdong, Hubei, Jiangxi, Sichuan [Vietnam].

42. *Potentilla chinensis* Seringe in Candolle, *Prodr.* 2: 581. 1825.

委陵菜 *wei ling cai*

Herbs perennial. Roots robust, terete, slightly woody. Flowering stems erect or ascending, 20–70 cm tall, sparsely pubescent and sericeous-villous. Radical leaves 4–25 cm including petiole; stipules brown, submembranous, abaxially white sericeous-villous; petiole pubescent and sericeous-vil-

lous; leaf blade pinnate with 5–15 pairs of leaflets; leaflets opposite or alternate, at intervals of 5–8 mm, sessile, oblong, obovate, or oblong-lanceolate, 1–5 × 0.5–1.5 cm, gradually becoming smaller toward leaf blade base, abaxially white tomentose, white sericeous-villous on veins, adaxially pubescent or glabrescent, midvein concave, margin revolute, pinnatifid or parted to midvein or nearly so, apex obtuse or acute; segments triangular-ovate, triangular-lanceolate, oblong-lanceolate, or linear; cauline leaves resembling radical ones but leaflets fewer; stipules green, herbaceous, margin sharply serrate. Inflorescence corymbose-cymose. Flowers 0.8–1(–1.3) cm in diam.; pedicel 0.5–1.5 cm, densely pubescent, with lanceolate bracts at base. Sepals triangular-ovate, apex acute; epicalyx segments fasciated or lanceolate, ca. 1/2 as long as sepals, abaxially pubescent and slightly sericeous-pilose, apex narrowly acute. Petals yellow, broadly obovate, slightly longer than sepals, apex emarginate. Style subterminal, base slightly thickened, slightly papillate; stigma dilated. Achenes dark brown, ovoid, markedly rugose. Fl. and fr. Apr–Oct.

Sparse forests, forest margins, thickets, meadows, grasslands, mountain slopes, ravines; 400–3200 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan [Japan, Korea, Mongolia, Russia (Far East)].

- 1a. Leaflets pinnatifid, segments triangular-ovate, triangular-lanceolate, or oblong-lanceolate 42a. var. *chinensis*
 1b. Leaflets parted to midvein or nearly so, segments linear 42b. var. *lineariloba*

42a. *Potentilla chinensis* var. *chinensis*

委陵菜(原变种) *wei ling cai* (*yuan bian zhong*)

Potentilla chinensis subsp. *trigonodonta* Handel-Mazzetti; *P. chinensis* var. *xerogenes* Handel-Mazzetti; *P. exaltata* Bunge.

Leaflets pinnatifid; segments triangular-ovate, triangular-lanceolate, or oblong-lanceolate.

Sparse forests, forest margins, thickets, meadows on mountain slopes, ravines; 400–3200 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan [Japan, Korea, Mongolia, Russia (Far East)].

This variety is used medicinally.

42b. *Potentilla chinensis* var. *lineariloba* Franchet & Savatier, *Enum. Fl. Jap.* 2: 339. 1878.

细裂委陵菜 *xi lie wei ling cai*

Leaflets parted to midvein or nearly so; segments linear.

Meadows, grasslands, sunny mountain slopes; 800–1400 m. Hebei, Heilongjiang, Henan, Jiangsu, Liaoning, Shandong [Japan, Korea].

43. *Potentilla conferta* Bunge in Ledebour, *Fl. Altaic.* 2: 240. 1830.

大萼委陵菜 *da e wei ling cai*

Herbs perennial. Roots terete, woody. Flowering stems erect, ascending, or low and spreading, 4–45 cm tall, together with petioles pubescent and spreading white sericeous-villous, hairs to 4 mm. Radical leaves 2–20 cm including petiole; stipules brown, submembranous, abaxially white sericeous-villous; leaf blade pinnate with 3–6 pairs of leaflets; leaflets opposite or alternate, at intervals of 3–5 mm, lanceolate or oblong-elliptic, 1–5 × 0.5–2 cm, abaxially canescent tomentose, spreading white sericeous or villous on veins, adaxially appressed pubescent, pilose, or glabrescent, margin revolute, sometimes inconspicuously so, pinnatifid or pinnately parted, apex obtuse or ligulate; segments usually triangular-oblong, triangular-lanceolate, or fasciated oblong, often dilated at base; cauline leaves resembling radical ones but with fewer leaflets; stipules green, herbaceous, margin dentate-lobed or not, apex acuminate. Inflorescence cymose, 3- to many flowered. Flowers 1–1.5 cm in diam.; pedicel 1–2.5 cm, densely pubescent. Sepals triangular-ovate or elliptic, apex acute or acuminate; epicalyx segments lanceolate or oblong-lanceolate, slightly shorter than sepals, markedly dilated in fruit, apex obtuse or acute. Petals yellow, obovate, slightly longer than sepals, apex rounded or emarginate. Style conic, base thickened; stigma slightly dilated. Achenes ovoid or hemispheric, ca. 1 mm in diam., rugose, rarely inconspicuously so. Fl. and fr. Jun–Sep.

Thickets, meadows on mountain slopes, ravines, field margins; below 3500 m. Gansu, Hebei, Heilongjiang, Nei Mongol, Shanxi, Sichuan, Xizang, Yunnan [Mongolia, Russia].

- 1a. Stems erect or ascending, 20–45 cm tall; radical leaves 6–20 cm including petiole, leaf blade with 3–6 pairs of leaflets, leaflets pinnatifid but not parted to midvein; cymes few to many flowered; flowers 1.2–1.5 cm in diam. 43a. var. *conferta*
- 1b. Stems low and spreading, 4–6 cm tall; radical leaves 2–3 cm including petiole, leaf blade with 3 pairs of leaflets, leaflets pinnately parted; cymes 3–5-flowered; flowers ca. 1 cm in diam. 43b. var. *trijuga*

43a. *Potentilla conferta* var. *conferta*

大萼委陵菜(原变种) da e wei ling cai (yuan bian zhong)

Potentilla approximata Bunge; *P. pennsylvanica* Linnaeus var. *conferta* (Bunge) Ledebour; *P. sibirica* Th. Wolf. var. *longipila* Th. Wolf.

Stems erect or ascending, 20–45 cm tall. Radical leaves 6–20 cm including petiole; leaf blade with 3–6 pairs of leaflets; leaflets pinnatifid but not parted to midvein. Cymes few to many flowered. Flowers 1.2–1.5 cm in diam. Fl. and fr. Jun–Sep.

Thickets, meadows on mountain slopes, ravines, field margins; below 3500 m. Gansu, Hebei, Heilongjiang, Nei Mongol, Shanxi, Sichuan, Xizang, Yunnan [Mongolia, Russia].

43b. *Potentilla conferta* var. *trijuga* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 10. 1980.

矮生大萼委陵菜 ai sheng da e wei ling cai

Stems low and spreading, 4–6 cm tall. Radical leaves 2–3 cm including petiole; leaf blade with 3 pairs of leaflets; leaflets pinnately parted. Cymes 3–5-flowered. Flowers ca. 1 cm in diam. Fl. and fr. Sep.

- Meadows on mountain slopes; ca. 3500 m. Xizang.

44. *Potentilla strigosa* Pallas ex Pursh, Fl. Amer. Sept. 1: 356. 1814.

茸毛委陵菜 rong mao wei ling cai

Potentilla pennsylvanica Linnaeus var. *strigosa* (Pallas ex Pursh) Lehmann; *P. sibirica* Th. Wolf.

Herbs perennial. Roots robust, terete, woody. Flowering stems erect, tinged yellow or gray, 10–50 cm tall, together with petioles spreading pilose and strigose. Radical leaves 5–10 cm including petiole; stipules yellow-brown, membranous, abaxially strigose and pubescent; leaf blade pinnate with 3 or 4 pairs of leaflets; leaflets opposite or alternate, at intervals of 1–1.5 cm, adaxially yellowish or grayish green, oblong, obovate-oblong, or obovate-lanceolate, 2–5 × 0.5–1.5 cm, adaxially densely strigose and pubescent, densely villous along midvein and lateral veins, base cuneate or broadly so, margin pectinate, apex obtuse; lobes fasciated oblong or oblong-lanceolate; cauline leaves resembling radical ones but petiole shorter and leaflets fewer higher up stem; stipules yellowish green, herbaceous, margin dentate-parted. Inflorescence corymbose-cymose, compact, many flowered. Flowers ca. 1 cm in diam.; pedicel 0.8–1.5 cm, strigose and pubescent. Sepals triangular-ovate, apex acute; epicalyx segments elliptic-lanceolate, nearly equaling sepals, markedly dilated in fruit, abaxially densely strigose and pubescent, apex acute. Petals yellow, obovate, slightly longer than sepals, apex rounded or emarginate. Style subterminal, base thickened. Achenes ellipsoid-reniform, markedly rugose. Fl. and fr. Jun–Aug.

Grassy mountain slopes, dunes; 600–700 m. Heilongjiang, Nei Mongol, Xinjiang [Mongolia, Russia].

45. *Potentilla discolor* Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg, Sér. 6, Sci. Math. 2: 99. 1833.

翻白草 fan bai cao

Potentilla discolor var. *formosana* (Hance) Franchet; *P. formosana* Hance.

Herbs perennial. Roots robust, lower parts often enlarged and fusiform. Flowering stems erect, ascending, or subspreading, 10–45 cm tall, together with petioles densely white lanate, sometimes also villous. Radical leaves 4–20 cm including petiole; stipules brown, membranous, white villous; leaf blade with 2–4 pairs of leaflets; leaflets opposite or alternate, at intervals of 0.8–1.5 cm, adaxially dark green, oblong or oblong-lanceolate, 1–5 cm × 5–8 mm, abaxially densely white or grayish white lanate, inconspicuously veined, adaxially sparsely white lanate or glabrescent, base cuneate, broadly cuneate, or obliquely rounded, margin obtusely serrate, rarely acutely so, apex obtuse, rarely acute; cauline leaves 1 or 2; stipules green, ovate or broadly so, herbaceous, abaxially densely white lanate, margin incised dentate, rarely entire; leaf blade palmately 3–5-foliolate. Inflorescence cymose, laxly several to many flowered.

Flowers 1–2 cm in diam.; pedicel 1–2.5 cm, lanate. Sepals triangular-ovate; epicalyx segments lanceolate, shorter than sepals, abaxially white lanate. Petals yellow, obovate, longer than sepals, apex rounded or emarginate. Style subterminal, base thickened, papillate; stigma slightly dilated. Achenes subreniform, ca. 1 mm wide, smooth. Fl. and fr. May–Sep.

Sparse forests, meadows, valleys, ravines. Anhui, Fujian, Gansu, Guangdong, Hebei, Heilongjiang, Henan, Jiangxi, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Japan, Korea].

This species is used medicinally.

46. *Potentilla potaninii* Th. Wolf, Biblioth. Bot. 16(Heft 71): 166. 1908.

华西委陵菜 hua xi wei ling cai

Herbs perennial. Roots usually branched. Flowering stems tufted, erect or ascending, 10–30 cm tall, together with petioles white tomentose and pilose. Radical leaves 2–10 cm including petiole; stipules brown, membranous, abaxially pilose; leaf blade pinnate with 2 or 3 pairs of leaflets; leaflets opposite, at intervals of 3–5 mm, sessile or subsessile, adaxially green, obovate or obovate-elliptic, 0.5–2.5 × 0.3–1.5 cm, abaxially white lanate, appressed villous on veins, adaxially appressed pilose, base cuneate, margin obtusely or acutely serrate, or pectinately parted, apex obtuse; teeth oblong or segments fasciated ligulate; cauline leaves: stipules green, lanceolate or ovate-lanceolate, herbaceous, abaxially white tomentose and pilose, margin entire, apex acuminate; leaf blade pinnate with 2 pairs of leaflets, or 3-foliolate. Inflorescence cymose, laxly many flowered. Flowers 1–1.5 cm in diam.; pedicel 1.5–2.5 cm, white tomentose. Sepals ovate-lanceolate or oblong-ovate, apex acuminate; epicalyx segments lanceolate or elliptic-lanceolate, nearly equaling or rarely slightly shorter than sepals, abaxially pilose. Petals yellow, obovate, 0.5–1 × as long as sepals, apex emarginate. Style subterminal, base slightly thickened; stigma dilated. Achenes smooth. Fl. and fr. Jun–Sep.

Forests, forest margins, meadows on mountain slopes; 1700–4700 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan [Bhutan].

- 1a. Leaflet margin obtusely or acutely serrate, teeth oblong 46a. var. *potaninii*
 1b. Leaflet margin pectinately parted, segments fasciated ligulate 46b. var. *compsophylla*

46a. *Potentilla potaninii* var. *potaninii*

华西委陵菜(原变种) hua xi wei ling cai (yuan bian zhong)

Potentilla saundersiana Royle var. *potaninii* (Th. Wolf) Handel-Mazzetti.

Leaflet margin obtusely or acutely serrate, teeth oblong. Fl. and fr. Jun–Aug.

Forests, forest margins, meadows on mountain slopes; 1700–3000 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan [Bhutan].

46b. *Potentilla potaninii* var. *compsophylla* (Handel-Mazzetti) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 294. 1985.

裂叶华西委陵菜 lie ye hua xi wei ling cai

Potentilla compsophylla Handel-Mazzetti, Acta Horti Gothob. 13: 306. 1939.

Leaflet margin pectinately parted, segments fasciated ligulate. Fl. and fr. Jun–Sep.

- Meadows on mountain slopes; 3300–4700 m. Sichuan, Xizang.

47. *Potentilla griffithii* J. D. Hooker, Fl. Brit. India 2: 351. 1878.

柔毛委陵菜 rou mao wei ling cai

Herbs perennial. Roots robust, terete, sometimes much branched. Flowering stems erect or ascending, 10–60 cm tall, together with petioles spreading villous and pubescent or tomentose. Radical leaves 3–10 cm including petiole; stipules brown, membranous, abaxially villous or glabrescent; leaf blade pinnate with 2 or 3(or 4) pairs of leaflets; leaflets usually opposite, rarely proximal ones alternate, at intervals of 0.8–1.2 cm, sessile or subsessile, adaxially green, elliptic or obovate-elliptic, 0.5–3 × 0.5–1.5 cm, abaxially white tomentose and villous, densely villous on veins, sometimes white tomentum deciduous, adaxially appressed pilose, base cuneate or broadly so, margin obtusely or acutely incised serrate, apex obtuse, rarely acute; cauline leaves: stipules herbaceous, sometimes abaxially densely white tomentose and villous, margin 2- or 3-fid, dentate-lobed, or entire; leaf blade pinnate with 2 pairs of leaflets, or 3-foliolate; leaflets resembling those of radical leaves. Inflorescence corymbose-cymose, laxly few flowered. Flowers 1.5–2.5 cm in diam. Sepals triangular-ovate, apex acute to acuminate; epicalyx segments lanceolate, oblong-lanceolate, or oblong-elliptic, shorter than or nearly equaling sepals, green and pilose or sometimes white tomentose abaxially. Petals yellow, rarely white, obovate, 1–2 × as long as sepals, apex emarginate. Style subterminal, conic, base thickened; stigma minute, not dilated. Achenes smooth. Fl. and fr. May–Oct.

Forests, forest margins, meadows on mountain slopes; 2000–4000 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, Nepal, Sikkim].

- 1a. Flowering stems and petioles spreading villous and pubescent; leaflets abaxially white tomentose and white villous, densely villous on veins, stipules of cauline leaves green, herbaceous, margin dentate-lobed or entire 47a. var. *griffithii*
 1b. Flowering stems and petioles spreading white villous, usually also interwoven white tomentose; leaflets abaxially densely white tomentose, appressed white villous on veins, stipules of cauline leaves abaxially densely white tomentose and villous, margin 2- or 3-fid or entire 47b. var. *velutina*

47a. *Potentilla griffithii* var. *griffithii*

柔毛委陵菜(原变种) rou mao wei ling cai (yuan bian zhong)

Potentilla leschenaultiana Seringe var. *pumila* Franchet; *P. leschenaultiana* var. *reticulata* Franchet; *P. sikkimensis* Th. Wolf (1908), not Prain (1904).

Flowering stems and petioles spreading villous and pubescent. Leaflets abaxially white tomentose and white villous, densely villous on veins; stipules of cauline leaves green, herbaceous, margin dentate-lobed or entire.

Forests, forest margins, meadows on mountain slopes; 2000–3600 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, Nepal, Sikkim].

47b. *Potentilla griffithii* var. *velutina* Cardot, Notul. Syst. (Paris) 3: 235. 1916.

长柔毛委陵菜 chang rou mao wei ling cai

Potentilla beauvaisii Cardot; *P. leschenaultiana* var. *concolor* Cardot.

Flowering stems and petioles spreading white villous, usually also interwoven white tomentose. Leaflets abaxially densely white tomentose, appressed white villous on veins; stipules of cauline leaves abaxially densely white tomentose and villous, margin entire or 2- or 3-fid.

• Forest margins, mountain meadows; 3000–4000 m. Sichuan, Xizang, Yunnan.

This variety is used medicinally.

48. *Potentilla hololeuca* Boissier ex Lehmann, Del. Sem. Hort. Hamburg. 1849: 8. 1849.

全白委陵菜 quan bai wei ling cai

Herbs perennial. Roots robust, terete. Flowering stems erect or ascending, 5–25 cm tall, together with petioles canescent tomentose and villous. Radical leaves 2–6 cm including petiole; stipules brown, membranous, sparsely villous; leaf blade pinnate with 2 pairs of leaflets; leaflets opposite, usually adjacent, subsessile, adaxially green, oblong to obovate-oblong, 1–2.5 × 0.8–1.5 cm, abaxially densely canescent tomentose or villous, white tomentose and villous on veins, adaxially white pilose, base cuneate or broadly so, margin pectinatifid, apex obtuse; segments oblong, apex obtuse or acute; cauline leaves undeveloped; stipules margin entire, rarely 2-fid. Inflorescence terminal, cymose, 3–7-flowered. Flowers 1.5–2 cm in diam. Sepals triangular-ovate, apex acuminate; epicalyx segments narrowly oblong, shorter than sepals, abaxially tomentose and sericeous, apex subobtuse. Petals obcordate, usually 1–2 × as long as sepals, apex emarginate. Style terminal, base slightly thickened; stigma dilated. Achenes not seen. Fl. Aug.

Alpine meadows, ravines near snow line; 3000–3600 m. Xinjiang [Russia; SW Asia (Iran)].

49. *Potentilla nivea* Linnaeus, Sp. Pl. 1: 499. 1753.

雪白委陵菜 xue bai wei ling cai

Herbs perennial. Roots terete. Flowering stems erect or ascending, 5–25 cm tall, together with petioles white tomentose. Radical leaves 15–80 cm including petiole; stipules brown, membranous, abaxially sparsely pilose or glabrescent; leaf blade 3-foliolate; leaflets sessile or sometimes terminal one shortly petiolulate, ovate, obovate, or elliptic, 1–2 × 0.8–1.3 cm, abaxially white tomentose, inconspicuously veined, adaxially appressed pilose, base rounded or broadly cuneate, margin obtusely 3–6(or 7)-crenate or (6 or)7–14-serrate on each side,

apex obtuse or acute; cauline leaves 1 or 2; stipules green, ovate, herbaceous, abaxially densely white tomentose, margin usually entire, rarely serrate; leaflets smaller than those of radical leaves. Inflorescence terminal, cymose, few flowered, rarely a solitary flower. Flowers 1–1.8 cm in diam.; pedicel 1–2 cm, white tomentose. Sepals triangular-ovate, apex acuminate or acute; epicalyx segments linear-lanceolate, shorter than sepals, abaxially spreading sericeous-pilose, apex obtuse. Petals yellow, obovate, apex emarginate. Style subterminal, base thickened and papillate, or inconspicuously thickened; stigma dilated. Achenes smooth. Fl. and fr. May–Sep.

Alpine thickets, meadows on mountain slopes, grassy slopes, marsh margins, rocks; 1600–3400 m. Hebei, Jilin, Nei Mongol, Shanxi, Xinjiang [Japan, Korea, Mongolia, Russia; Europe].

- 1a. Leaflet margin obtusely 3–6(or 7)-crenate on each side; style base thickened, papillate 49a. var. *nivea*
 1b. Leaflet margin (6 or)7–14-serrate on each side; style base inconspicuously thickened 49b. var. *elongata*

49a. *Potentilla nivea* var. *nivea*

雪白委陵菜(原变种) xue bai wei ling cai (yuan bian zhong)

Potentilla nivea var. *camtschatica* Chamisso & Schlechtendal; *P. nivea* var. *polyphylla* Yong Zhang & Z. T. Yin.

Leaflet margin obtusely 3–6(or 7)-crenate on each side, Style base thickened, papillate. Fl. and fr. Jun–Aug.

Alpine thickets, meadows on mountain slopes, marsh margins; 2100–3200 m. Hebei, Jilin, Nei Mongol, Shanxi, Xinjiang [Japan, Korea, Russia; Europe].

49b. *Potentilla nivea* var. *elongata* Th. Wolf, Biblioth. Bot. 16(Heft 71): 237. 1908.

多齿雪白委陵菜 duo chi xue bai wei ling cai

Potentilla crebridens Juzepczuk; *P. nivea* var. *macrantha* Ledebour.

Leaflet margin (6 or)7–14-serrate on each side; style base inconspicuously thickened. Fl. and fr. May–Sep.

Grassy slopes, rocks; 1600–3400 m. Hebei, Shanxi [Mongolia, Russia (Baikal region)].

50. *Potentilla betonicifolia* Poirlet in Lamarck, Encycl. 5: 601. 1804.

白萼委陵菜 bai e wei ling cai

Potentilla leucophylla Pallas; *P. nivea* Linnaeus var. *angustifolia* Ledebour.

Herbs perennial. Roots robust, terete, usually woody. Flowering stems erect or ascending, 8–16 cm tall, together with petioles white tomentose when young, later glabrescent. Radical leaves 5–12 cm including petiole; stipules brown, membranous, abaxially white sericeous-villous; leaf blade 3-foliolate; leaflets sessile, adaxially green, oblong-lanceolate or ovate-lanceolate, 1–5 × 0.5–1.5 cm, leathery, abaxially densely white tomentose, sparsely sericeous pilose along midvein, adaxially

ially white tomentose initially, later glabrescent, base cuneate or subrounded, margin obtusely or acutely coarsely many dentate, apex acute; cauline leaves undeveloped, bractlike; stipules minute, oblong-ovate, leathery, abaxially white tomentose, margin entire. Inflorescences cymose-paniculate, laxly many flowered. Flowers ca. 1 cm in diam.; pedicel 1–1.5 cm, white tomentose. Sepals triangular-ovate, apex acute; epicalyx segments lanceolate or elliptic, shorter than or nearly equaling sepals, abaxially white tomentose and pilose, apex acute. Petals yellow, obovate, apex rounded. Style subterminal, base thickened; stigma slightly dilated. Achenes rugose. Fl. and fr. May–Jun.

Meadows on mountain slopes, rock crevices; 700–1600 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Mongolia, Russia].

51. *Potentilla zhangbeiensis* Yong Zhang & Z. T. Yin, *Acta Phytotax. Sin.* 32: 482. 1994.

张北委陵菜 zhang bei wei ling cai

Herbs perennial. Roots black-brown, robust, terete. Flowering stems erect or ascending, 6–20 cm tall, densely white tomentose and sparsely villous when young, later glabrescent. Radical leaves 1.5–8 cm including petiole; stipules brown, membranous, abaxially villous; leaf blade palmately 3-foliolate, sometimes pinnately 5-foliolate; leaflets sessile, adaxially green, lanceolate or ovate-lanceolate, 0.5–3.5 × 0.2–1.5 cm (basal pair extremely small), abaxially densely white tomentose, adaxially sparsely pubescent or subglabrous, base cuneate, margin pinnately parted, apex acute; lobes triangular or linear-lanceolate; cauline leaves bractlike, small; stipules ovate, small, subleathery, abaxially densely white tomentose, margin entire. Inflorescence terminal, cymose. Flowers ca. 1 cm in diam.; pedicel 1–2.5 cm, densely tomentose and sparsely villous. Sepals ovate-lanceolate, ca. 4.5 × 3 mm, abaxially white tomentose and sparsely villous; epicalyx segments lanceolate, ca. 3 × 1 mm, abaxially white tomentose and sparsely villous. Petals yellow, obovate, ca. 5 mm, apex emarginate or obtuse. Receptacle densely villous. Style subterminal, base thickened; stigma slightly dilated. Achenes black-brown, ovoid, rugose. Fl. and fr. May–Aug.

- Grassy slopes; ca. 1600 m. NW Hebei (Zhangbei Xian).

One of us (Ohba) believes this species may be synonymous with *Potentilla betonicifolia*.

52. *Potentilla saundersiana* Royle, *Ill. Bot. Himal. Mts.* 1: 207. 1835.

钉柱委陵菜 ding zhu wei ling cai

Herbs perennial. Roots robust, terete, rarely slender. Flowering stems erect or ascending, rarely low and tufted, 10–20 cm tall, together with petioles white tomentose and pilose. Radical leaves 2–5 cm including petiole; stipules brown, membranous, abaxially white villous or glabrescent; leaf blade subpinnately or palmately 3–7(or 8)-foliolate; leaflets sessile, adaxially green or grayish green, oblong-obovate, rarely broadly obovate, 0.5–2 cm × 4–10 mm, abaxially densely white tomentose, appressed pilose on veins, adaxially sparsely appressed pilose or densely appressed sericeous, base cuneate, margin slightly obtusely or acutely many incised serrate, rarely lobed to parted, apex obtuse, rarely acute; cauline leaves 1 or 2; stipules green, ovate or

ovate-lanceolate, herbaceous, abaxially white tomentose and pilose, margin usually entire, apex acute or acuminate; leaf blade 3–5-foliolate; leaflets resembling those of radical leaves. Inflorescence terminal, laxly cymose, 1(or 2)- or many flowered. Flowers 1–1.4 cm in diam.; pedicel 1–3 cm, white tomentose. Sepals triangular-ovate or triangular-lanceolate; epicalyx segments lanceolate or elliptic, shorter than or nearly equaling sepals, abaxially white tomentose and pilose, apex acute or 1–3(–5)-fid. Petals yellow, obovate, slightly longer than or ca. 2 × as long as sepals, apex emarginate. Style subterminal, base inconspicuously thickened; stigma slightly dilated. Achenes smooth. Fl. and fr. Jun–Aug.

Alpine thickets and meadows, gravel fields; 2600–5200 m. Gansu, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Bhutan, India, Nepal, Sikkim].

- 1a. Inflorescence 1(or 2)-flowered 52d. var. *caespitosa*
- 1b. Inflorescence a many-flowered cyme.
 - 2a. Radical leaves subpinnately (3–)5–7(or 8)-foliolate 52c. var. *subpinnata*
 - 2b. Radical leaves palmately 3–5-foliolate.
 - 3a. Leaflets adaxially green, sparsely appressed pilose; epicalyx segments shorter than or nearly equaling sepals, apex acute 52a. var. *saundersiana*
 - 3b. Leaflets adaxially grayish green, densely appressed sericeous; epicalyx segments nearly equaling sepals, apex 2- or 3(–5)-fid 52b. var. *jacquemontii*

52a. *Potentilla saundersiana* var. *saundersiana*

钉柱委陵菜(原变种) ding zhu wei ling cai (yuan bian zhong)

Potentilla griffithii J. D. Hooker var. *pumila* (Franchet) Handel-Mazzetti; *P. leschenaultiana* Seringe var. *pumila* Franchet; *P. multifida* Linnaeus var. *saundersiana* (Royle) J. D. Hooker; *P. potaninii* Th. Wolf var. *subdigitata* Th. Wolf; *P. tibetica* Cardot.

Radical leaves palmately 3–5-foliolate; leaflets adaxially green, sparsely appressed pilose. Inflorescence many flowered. Epicalyx segments shorter than or nearly equaling sepals, apex acute.

Alpine thickets and meadows; 2600–5200 m. Gansu, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan [Bhutan, India, Nepal, Sikkim].

52b. *Potentilla saundersiana* var. *jacquemontii* Franchet, *Pl. Delavay.* 3: 215. 1890.

裂萼钉柱委陵菜 lie e ding zhu wei ling cai

Potentilla forrestii W. W. Smith.

Radical leaves palmately 3–5-foliolate; leaflets adaxially grayish green, densely appressed sericeous. Inflorescence many flowered. Epicalyx segments nearly equaling sepals, apex 2- or 3(–5)-fid.

- Alpine thickets and meadows; 3400–4100 m. Xizang, Yunnan.

52c. *Potentilla saundersiana* var. *subpinnata* Handel-Mazzetti, Symb. Sin. 7: 513. 1933.

羽叶钉柱委陵菜 yu ye ding zhu wei ling cai

Potentilla forrestii var. *subpinnata* (Handel-Mazzetti) Handel-Mazzetti.

Radical leaves subpinnately (3–)5–7(or 8)-foliolate. Inflorescence a many-flowered cyme. Epicalyx segments acute or 1- or 2-fid at apex.

• Alpine meadows, gravel fields; 3100–3600 m. Sichuan, Yunnan.

52d. *Potentilla saundersiana* var. *caespitosa* (Lehmann) Th. Wolf, Biblioth. Bot. 16(Heft 71): 243. 1908.

丛生钉柱委陵菜 cong sheng ding zhu wei ling cai

Potentilla caespitosa Lehmann, Del. Sem. Hort. Hamburg. 1849: 10. 1849; *P. sinonivea* Hultén.

Plants low and tufted. Roots slender. Radical leaves usually 3-foliolate; leaflets broadly obovate, margin lobed to parted. Inflorescence 1(or 2)-flowered.

• Alpine thickets and meadows; 2700–5200 m. Gansu, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Yunnan, Xinjiang, Xizang.

53. *Potentilla pendula* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 10. 1980.

垂花委陵菜 chui hua wei ling cai

Herbs perennial. Roots slender. Flowering stems erect or ascending, purplish, 5–10 cm tall, together with petioles canescent tomentose, rarely pilose. Radical leaves 3–6 cm including petiole; stipules brown, membranous, abaxially white villous or glabrescent; leaf blade 3-foliolate; leaflets sessile or terminal one shortly petiolulate, adaxially green, elliptic to ovate, 1.5–2 × 0.5–1 cm, abaxially densely canescent tomentose, appressed sericeous on veins, adaxially appressed sericeous, base broadly cuneate, margin lobed, apex obtuse; lobes fasciated, apex obtuse or acute; cauline leaves 1 or 2, shortly petiolate, small; stipules ovate-lanceolate, margin entire or 1- or 2-serrate. Inflorescence terminal, cymose, many flowered. Flowers usually nodding, 1–1.4 cm in diam.; pedicel 1.5–2 cm, tomentose. Sepals triangular-lanceolate, apex acute; epicalyx segments fasciated, slightly shorter than sepals, abaxially densely canescent tomentose and pilose, apex subobtusate. Petals yellow, obovate, nearly 2 × as long as sepals, apex emarginate. Stamens ca. 18. Carpels numerous; style subterminal, nearly 3 × as long as ovary; stigma slightly dilated, capitate. Achenes not seen. Fl. Jul.

• Rocks; ca. 2600 m. Chongqing (Wuxi Xian).

54. *Potentilla delavayi* Franchet, Pl. Delavay. 3: 215. 1890.

滇西委陵菜 dian xi wei ling cai

Herbs perennial. Roots robust, terete. Flowering stems erect or ascending, 15–35 cm tall, densely yellowish villous. Radical leaves 4–18 cm including petiole; stipules purple-brown, membranous, abaxially villous; petiole spreading villous; leaf blade 3-foliolate; leaflets sessile or subsessile, obo-

vate, 1–4 × 0.5–2 cm, abaxially densely white tomentose, markedly sparsely villous on veins, adaxially densely spreading villous, base cuneate or broadly so, margin obtusely or acutely serrate, apex obtuse; cauline leaves 3 or 4; stipules green, herbaceous, abaxially densely white tomentose and sparsely villous, margin lobed or parted; leaflets resembling those of radical leaves. Inflorescence terminal, cymose, few flowered. Flowers 2–2.5 cm in diam.; pedicel 1–2.5 cm, tomentose and villous. Sepals triangular-ovate, abaxially green and spreading villous, apex acute or acuminate; epicalyx segments elliptic, nearly equaling sepals, abaxially usually white tomentose and pilose, base sometimes with very short stipe, apex obtuse or acute. Petals yellow, apex markedly emarginate. Style terminal, base prominently thickened; stigma slightly dilated. Achenes smooth. Fl. and fr. Jul–Sep.

• Meadows on mountain slopes; 3000–3500 m. Yunnan.

55. *Potentilla nervosa* Juzepczuk in Komarov, Fl. URSS 10: 610. 1941.

显脉委陵菜 xian mai wei ling cai

Herbs perennial. Roots robust, terete. Flowering stems erect or slightly curved at base, 16–30 cm tall, together with petioles grayish white tomentose and pilose. Radical leaves 3–10 cm including petiole; stipules brown, membranous, abaxially appressed villous; leaf blade 3-foliolate; leaflets sessile or terminal one shortly petiolulate, oblong-elliptic or obovate-elliptic, 1–3.5 × 0.7–1.5 cm, abaxially canescent tomentose, appressed white villous on veins, adaxially appressed pilose, sometimes sparsely canescent tomentose, base cuneate or broadly so, margin acutely or obtusely 6–10-serrate, apex acute or obtuse; cauline leaves 1–3; stipules ovate-lanceolate, herbaceous, abaxially densely white tomentose and villous, margin entire, apex rarely 2- or 3-fid; leaflets resembling those of radical leaves. Inflorescence terminal, laxly cymose-corymbose, many flowered. Flowers 1.5–1.8 cm in diam.; pedicel 1.5–2.5 cm, densely tomentose. Sepals triangular-ovate, apex acuminate; epicalyx segments fasciated or lanceolate, nearly equaling sepals, abaxially appressed pilose, apex subobtusate or acuminate. Petals yellow, obovate, 0.5–1 × as long as sepals, apex emarginate. Style subterminal, base inconspicuously thickened; stigma dilated. Achenes not seen. Fl. and fr. Jun–Jul.

Forest margins, grassy slopes; 1900–2500 m. Xinjiang [Russia].

56. *Potentilla evestita* Th. Wolf, Biblioth. Bot. 16(Heft 71): 248. 1908.

脱绒委陵菜 tuo rong wei ling cai

Herbs perennial. Roots terete. Flowering stems erect or ascending, 15–30 cm tall, sparsely pilose or glabrescent. Radical leaves 5–15 cm including petiole; stipules brown, membranous, abaxially pilose; petiole sparsely pilose, sometimes sparsely glandular hairy; leaf blade 3-foliolate; leaflets adaxially green, broadly obovate or rhombic-elliptic, 1.5–4.5 × 1–3 cm, abaxially initially canescent tomentose, later glabrescent, villous and glandular along midvein, adaxially pilose and glandular, base broadly cuneate or subrounded, margin obtusely 3–6-incised serrate or lobed, apex obtuse; cauline leaves: stipules brown, ovate, herbaceous, abaxially pilose and glandular, mar-

gin entire or apex 2-fid; leaflets resembling those of radical leaves. Inflorescence laxly corymbose-cymose. Flowers ca. 1.5 cm in diam.; pedicel 1.5–2.5 cm, pilose and glandular hairy. Sepals ovate-oblong or triangular-lanceolate, apex obtuse or acute; epicalyx segments linear-lanceolate, abaxially pilose and glandular, apex obtuse. Petals yellow, obovate, apex emarginate. Style subterminal, base thickened; stigma slightly dilated. Achenes sparsely rugose. Fl. and fr. Jun–Sep.

Stream sides, alpine rock crevices; 2000–2600 m. Xinjiang [Mongolia, Russia (Siberia); C Asia].

57. *Potentilla argyrophylla* Wallich ex Lehmann, Nov. Stirp. Pug. 3: 36. 1831.

银光委陵菜 yin guang wei ling cai

Herbs perennial. Roots terete. Flowering stems erect or basally slightly curved, 15–20 cm tall, together with petioles densely silvery tomentose and villous. Radical leaves 5–10 cm including petiole; stipules brown, membranous, abaxially appressed white sericeous, later glabrescent; leaf blade 3-foliolate; leaflets sessile or terminal one very shortly petiolulate, obovate, elliptic, or broadly ovate, 1.5–2 × 1–1.5 cm, abaxially densely silvery tomentose, appressed silvery sericeous on veins, adaxially appressed silvery sericeous, base cuneate or broadly so, margin sharply incised serrate, apex obtuse; cauline leaves 2 or 3, shortly petiolate, small; stipules green, ovate or ovate-lanceolate, herbaceous, abaxially tomentose and villous, margin entire, apex acuminate. Inflorescence terminal, 2- or 3-flowered. Flowers ca. 2 cm in diam.; pedicel 2–2.5 cm, tomentose and villous. Sepals triangular-lanceolate, apex acuminate; epicalyx segments elliptic-ovate or elliptic-lanceolate, nearly equaling sepals, abaxially appressed white sericeous. Petals yellow, sometimes purple at base, obcordate, ca. 2 × as long as sepals, apex markedly emarginate. Stamens yellow or purple. Style subterminal, yellow or purple, ca. 2.5 × as long as ovary; stigma slightly dilated, capitate. Achenes not seen. Fl. May.

Forests, thickets, sandy river banks, ditch sides; 3700–4000 m. Xizang [Afghanistan, Kashmir, Nepal, Pakistan, Sikkim].

- 1a. Petals, stamens, and styles yellow 57a. var. *argyrophylla*
 1b. Petals basally, stamens, and styles purple 57b. var. *atrosanguinea*

57a. *Potentilla argyrophylla* var. *argyrophylla*

银光委陵菜(原变种) yin guang wei ling cai (yuan bian zhong)

Petals, stamens, and styles yellow.

Forests, thickets, sandy river banks; 3700–4000 m. Xizang [Afghanistan, Kashmir, Nepal, Pakistan, Sikkim].

57b. *Potentilla argyrophylla* var. *atrosanguinea* (Loddiges) J. D. Hooker, Fl. Brit. India 2: 357. 1878.

紫花银光委陵菜 zi hua yin guang wei ling cai

Potentilla atrosanguinea Loddiges, Bot. Cab. 8: t. 786. 1824.

Petals basally, stamens, and styles purple.

Ditch sides; ca. 4000 m. Xizang [Nepal, Pakistan].

58. *Potentilla virgata* Lehmann, Monogr. Potentill. 75. 1820.

密枝委陵菜 mi zhi wei ling cai

Herbs perennial. Roots terete. Flowering stems erect or ascending, or low and spreading, much branched from base, 15–60 cm tall, together with petioles densely appressed villous or sericeous-pilose. Radical leaves 5–20 cm including petiole; stipules dark brown, membranous, subglabrous; leaf blade palmately 3–5-foliolate; leaflets adaxially green, oblong-lanceolate or obovate-lanceolate, 1.5–10 × 1–2 cm, abaxially densely white tomentose, appressed villous on veins, adaxially densely appressed villous, sometimes glabrescent, base cuneate, margin revolute, 2–8-parted to 2–8-fid on each side, apex acute or acuminate; segments triangular-lanceolate or oblong-lanceolate, 1–3 mm wide, apex acute or acuminate; cauline leaves: stipules green, ovate-lanceolate, herbaceous, abaxially white tomentose, margin entire, rarely dentate. Inflorescence corymbose-cymose, laxly few or many flowered. Flowers 0.8–1 cm in diam.; pedicel slender, 0.8–1.5 cm, tomentose. Sepals triangular-ovate or ovate-lanceolate, apex acuminate; epicalyx segments lanceolate or linear, shorter than sepals, apex obtuse or acute. Petals yellow, obovate, slightly longer than or nearly 2 × as long as sepals, apex emarginate or rounded. Style subterminal, base thickened; stigma slightly dilated. Achenes rugose. Fl. and fr. Jun–Sep.

Sunny mountain slopes, valleys, grasslands, flood lands, Gobi desert sands; 1000–3700 m. Gansu, Qinghai, Xinjiang [Mongolia].

- 1a. Stems erect or ascending; radical leaves 5-foliolate, segments 5–8 on each side; inflorescences many flowered 58a. var. *virgata*
 1b. Stems low and spreading, almost on ground, or ascending; radical leaves 3–5-foliolate, segments 2–4(or 5) on each side; inflorescences few flowered 58b. var. *pinnatifida*

58a. *Potentilla virgata* var. *virgata*

密枝委陵菜(原变种) mi zhi wei ling cai (yuan bian zhong)

Potentilla dealbata Bunge.

Stems erect or ascending. Radical leaves 5-foliolate; segments 5–8 on each side. Inflorescences many flowered. Fl. and fr. Jun–Sep.

Grasslands, Gobi desert sands; 1500–1700 m. Xinjiang [Mongolia].

58b. *Potentilla virgata* var. *pinnatifida* (Lehmann) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 304. 1985.

羽裂密枝委陵菜 yu lie mi zhi wei ling cai

Potentilla nivea Linnaeus var. *pinnatifida* Lehmann, Nov. Stirp. Pug. 9: 67. 1851; *P. altaica* Bunge.

Stems low and spreading, almost on ground, or ascending. Radical leaves 3–5-foliolate; segments 2–4(or 5) on each side. Inflorescences few flowered. Fl. Jun, fr. Sep.

• Sunny mountain slopes, valleys, grasslands, flood lands; 1000–3700 m. Gansu, Qinghai, Xinjiang.

59. *Potentilla angustiloba* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 11. 1980.

窄裂委陵菜 zhai lie wei ling cai

Herbs perennial. Roots terete, upper parts thick, lower parts prolonged, slender. Flowering stems spreading or ascending, 8–30 cm tall, together with petioles sparsely villous or hirtellous. Radical leaves 3–12 cm including petiole; stipules dark brown, membranous, pilose or glabrescent; leaf blade palmately 5-foliolate; leaflets obovate-elliptic or oblong-elliptic, abaxially densely white tomentose, appressed white villous on veins, adaxially appressed pilose or glabrescent, margin 2–4-parted to midvein, apex acute or acuminate; segments fasciated, 0.5–1.5 cm × 0.8–1 mm, apex acute or acuminate; cauline leaves 1–3, resembling radical ones but petioles becoming shorter higher up stem; stipules green, ovate-lanceolate, herbaceous, abaxially densely appressed villous, margin entire or 1- or 2-dentate; leaflet margin 3–5-fid. Inflorescence terminal, corymbose-cymose, 3–12-flowered. Flowers 0.8–1 cm in diam.; pedicel 0.5–1 cm, appressed villous. Sepals triangular-ovate or ovate-oblong, apex acuminate; epicalyx segments fasciated lanceolate, slightly shorter than sepals, abaxially appressed villous, apex acuminate. Petals yellow, obovate, nearly equaling or longer than sepals, apex emarginate. Stamens ca. 20. Carpels numerous; style subterminal, base thickened; stigma slightly dilated. Achenes not seen. Fl. and fr. Jun–Sep.

• Grasslands, valleys, sandy river banks; 2500–3200 m. Gansu, Qinghai, Xinjiang.

60. *Potentilla argentea* Linnaeus, Sp. Pl. 1: 479. 1753.

银背委陵菜 yin bei wei ling cai

Herbs perennial. Roots robust, terete. Flowering stems erect or ascending, 15–40 cm tall, together with petioles white tomentose and sparsely villous. Radical leaves 2–10 cm including petiole; stipules brown, membranous, abaxially white pilose and pubescent; leaf blade palmately 5-foliolate; leaflets adaxially green, oblong-obovate, 1–3 × 0.5–1 cm, abaxially densely white tomentose, adaxially appressed pilose, base cuneate, margin revolute, proximally entire, distally irregularly 2–5-serrate on each side; cauline leaves many, resembling radical ones but petioles becoming shorter higher up stem, uppermost leaves sessile; stipules green, ovate-lanceolate, herbaceous, abaxially densely white tomentose, apex acuminate, entire or 2- or 3-dentate. Inflorescence corymbose-cymose or paniculate-cymose, laxly many flowered. Flowers ca. 1 cm in diam.; pedicel 1.5–2.5 cm, tomentose. Sepals triangular-ovate, apex acute to acuminate; epicalyx segments oblong-lanceolate, shorter than sepals, abaxially canescent tomentose and villous, apex acute. Petals yellow, obovate, slightly longer than sepals, apex emarginate. Style subterminal, base thickened and papillate; stigma dilated. Achenes smooth or slightly rugose. Fl. and fr. May–Aug.

Sunny mountain slopes, gravel fields; ca. 1100 m. Xinjiang [Mongolia, Russia (Siberia); C Asia, Europe].

61. *Potentilla inclinata* Villars, Hist. Pl. Dauphiné 3: 567. 1788.

薄毛委陵菜 bo mao wei ling cai

Potentilla canescens Besser.

Herbs perennial. Roots robust, terete. Flowering stems erect or ascending, 12–40 cm tall, together with petioles villous, pubescent, and sparsely tomentose. Radical leaves usually withered after anthesis; stipules brown, membranous, abaxially villous; leaf blade palmately 5(–7)-foliolate; leaflets adaxially green, obovate-oblong or obovate-lanceolate, abaxially canescent tomentose, glabrescent, adaxially appressed pilose, base cuneate, margin coarsely regularly serrate, apex obtuse; cauline leaves resembling radical ones but smaller and petiole shorter or absent; stipules green, ovate-lanceolate, herbaceous, abaxially tomentose and villous, margin entire or 1- or 2-serrate. Inflorescence corymbose-cymose or paniculate-cymose, laxly many flowered. Flowers ca. 1 cm in diam.; pedicel 1–1.5 cm, sparsely tomentose and villous. Sepals triangular-lanceolate to oblong-ovate, apex acute to acuminate; epicalyx segments linear-lanceolate, shorter than or rarely nearly equaling sepals, abaxially villous and pubescent, apex acute. Petals yellow, ovate, slightly longer than sepals, apex emarginate or subrounded. Style subterminal, base thickened; stigma slightly thickened. Achenes rugose. Fl. and fr. Jun–Sep.

Wet places on mountain slopes, flood lands; 1000–1300 m. Xinjiang [C Asia, C and S Europe].

62. *Potentilla coriandrifolia* D. Don, Prodr. Fl. Nepal. 232. 1825.

萎叶委陵菜 sui ye wei ling cai

Herbs perennial. Roots robust, terete. Rhizome enlarged. Flowering stems erect or ascending or low and tufted, 4–13 cm tall, together with petioles pilose or glabrescent. Radical leaves 7–16 cm including petiole; stipules brown, membranous, subglabrous; leaf blade pinnate with 2–8 pairs of leaflets; leaflets opposite, at intervals of 5–8 mm, subsessile, abaxially densely appressed villous, or glabrescent and hairy only along midvein, adaxially sparsely appressed pilose or later glabrescent, margin pectinate to midvein; segments fasciated to fasciated lanceolate, apex acuminate; cauline leaves 1 or 2; stipules green, herbaceous, abaxially appressed villous, margin dissected into linear segments; leaf blade 2-pinnately dissected into linear segments. Inflorescence terminal, 1–3(–5)-flowered. Flowers 0.8–1.5 cm in diam.; pedicel 1.5–3 cm, appressed pubescent. Sepals triangular-ovate, apex acute or acuminate; epicalyx segments lanceolate, nearly equaling sepals, abaxially appressed pilose, apex acute or acuminate. Petals white and purple-red at base or yellow throughout, obovate, nearly 1/2 as long as sepals, apex emarginate. Style subterminal, base slightly thickened; stigma dilated. Achenes smooth. Fl. and fr. Jul–Sep.

Meadows on mountain slopes, rock crevices; 3300–4200 m. Sichuan, Xizang, Yunnan [Bhutan, Myanmar, Nepal, Sikkim].

- 1a. Stems erect or ascending; leaflets in 5–8 pairs; inflorescence 2- or 3(–5)-flowered; petals white, purple-red at base 62a. var. *coriandrifolia*
- 1b. Stems low and tufted; leaflets usually in 2–4 pairs; inflorescence 1(–3)-flowered; petals yellow throughout, not purple-red at base 62b. var. *dumosa*

62a. *Potentilla coriandrifolia* var. *coriandrifolia*

菱叶委陵菜(原变种) sui ye wei ling cai (yuan bian zhong)

Stems erect or ascending. Leaflets in 5–8 pairs. Inflorescence 2- or 3(-5)-flowered. Petals white, purple-red at base.

Meadows on mountain slopes; 4100–4200 m. Xizang [Bhutan, Nepal, Sikkim].

62b. *Potentilla coriandrifolia* var. *dumosa* Franchet, Pl. Delavay, 3: 214. 1890.

丛生菱叶委陵菜 cong sheng sui ye wei ling cai

Potentilla dumosa (Franchet) Handel-Mazzetti; *P. dumosa* subsp. *salwinensis* Soják; *P. dumosa* var. *stromatodes* (Melchior) H. R. Fletcher; *P. pulvinata* (T. T. Yu & C. L. Li) Soják; *P. salwinensis* (Soják) Soják; *P. salwinensis* var. *latiuscula* Soják; *P. salwinensis* var. *parviflora* Soják; *P. stromatodes* Melchior; *Sibbaldia pulvinata* T. T. Yu & C. L. Li.

Stems low and tufted. Leaflets usually in 2–4 pairs. Inflorescence 1(-3)-flowered. Petals yellow throughout, not purple-red at base.

Alpine meadows, rock crevices; 3300–4500 m. Sichuan, Xizang, Yunnan [Myanmar].

63. *Potentilla hypargyrea* Handel-Mazzetti, Symb. Sin. 7: 514. 1933.

白背委陵菜 bai bei wei ling cai

Herbs perennial. Roots robust, terete. Rhizomes often enlarged. Flowering stems tufted, ascending, 5–16 cm tall, recumbent white villous. Radical leaves 6–10 cm including petiole; stipules brown, membranous, abaxially white pilose, apex acuminate; petiole villous; leaf blade 3-foliolate or subpinnate; terminal leaflet shortly petiolulate, lateral ones sessile or subsessile, all leaflets orbicular to ovate, 1–3 cm, abaxially sparsely white villous, adaxially densely white sericeous, margin irregularly parted or lobed, or pinnately parted, usually 2-parted on lateral leaflets; segments acute at apex; cauline leaves 1 or 2; stipules herbaceous, abaxially white sericeous, margin parted into acuminate segments; leaflet margin parted into linear-lanceolate, acuminate segments. Inflorescence cymose, (1 or)2- or 3-flowered. Flowers 0.6–1.3 cm in diam.; pedicel 1.5–3 cm, villous. Sepals triangular-ovate, apex acute; epicalyx segments elliptic-lanceolate, shorter than or nearly equaling sepals, abaxially densely appressed villous, apex acute. Petals yellow, obovate, nearly 1/2 as long as sepals, apex emarginate. Style subterminal, base slightly thickened; stigma not dilated. Achenes smooth. Fl. and fr. Aug–Sep.

• Thickets on grassy slopes, meadows on mountain slopes, rocky slopes; 3300–4800 m. Xizang, Yunnan.

- 1a. Radical leaves 3-foliolate, central leaflet irregularly parted or lobed 63a. var. *hypargyrea*
 1b. Radical leaves subpinnate, terminal leaflet pinnately parted 63b. var. *subpinnata*

63a. *Potentilla hypargyrea* var. *hypargyrea*

白背委陵菜(原变种) bai bei wei ling cai (yuan bian zhong)

Radical leaves 3-foliolate; central leaflet irregularly parted

or lobed.

• Meadows on mountain slopes; 3300–4000 m. Yunnan.

63b. *Potentilla hypargyrea* var. *subpinnata* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 11. 1980.

假羽白背委陵菜 jia yu bai bei wei ling cai

Radical leaves subpinnate; terminal leaflet pinnately parted.

• Thickets on grassy slopes, meadows on mountain slopes, rocky slopes; 3900–4800 m. Xizang, Yunnan.

64. *Potentilla granulosa* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 11. 1980.

腺粒委陵菜 xian li wei ling cai

Herbs perennial. Roots robust, terete. Flowering stems erect or ascending, 10–20 cm tall, together with petioles pilose, pubescent, and glandular hairy. Radical leaves 4–10 cm including petiole; stipules dark brown, membranous, abaxially pilose, pubescent, and glandular; leaf blade pinnate with 4–8 pairs of leaflets; leaflets opposite or alternate, at intervals of 3–8 mm, elliptic, oblong, or oblong-lanceolate, usually 1–2 × 0.5–1 cm, abaxially pubescent and glandular, adaxially pilose and granular glandular, base ± decurrent and adnate to rachis in apical 2 or 3 pairs of leaflets, margin pinnately parted nearly to midvein; segments fasciated, apex obtuse; cauline leaves resembling radical ones but leaflets reduced to 2 pairs in upper leaves; stipules green, herbaceous, abaxially pilose and glandular, margin entire or 1- or 2-fid, apex acuminate. Inflorescence laxly corymbose-cymose. Flowers ca. 1.5 cm in diam.; pedicel 1–3.5 cm, pubescent and glandular. Sepals triangular-ovate, apex acute; epicalyx segments elliptic-lanceolate, shorter than or nearly equaling sepals, pilose and granular glandular, apex obtuse or acute. Petals yellow, broadly obovate, 0.5–1 × as long as sepals, apex emarginate. Stamens ca. 20. Carpels numerous; style thickened at base; stigma dilated. Achenes not seen. Fl. and fr. Jul–Aug.

• Alpine meadows; 3400–4200 m. Sichuan, Xizang.

This species is used medicinally.

65. *Potentilla tanacetifolia* Willdenow ex Schlechtendal, Ges. Naturf. Freunde Berlin Mag. Neuesten Entdeck. Gesammten Naturk. 7: 286. 1816.

菊叶委陵菜 ju ye wei ling cai

Potentilla acervata Soják; *P. filipendula* Willdenow ex Schlechtendal; *P. nudicaulis* Willdenow ex Schlechtendal; *P. strigosa* Pallas var. *conferta* Kitagawa; *P. tanacetifolia* f. *decumbens* Krylov; *P. tanacetifolia* var. *decumbens* (Krylov) Th. Wolf; *P. tanacetifolia* f. *erecta* Krylov; *P. tanacetifolia* var. *erecta* (Krylov) Th. Wolf.

Herbs perennial. Roots robust, terete. Flowering stems erect or ascending, 15–65 cm tall, together with petioles villous, pubescent, or floccose and sparsely glandular with hairs sometimes deciduous. Radical leaves 5–20 cm including petiole; stipules brown, membranous, abaxially pilose; leaf blade pinnate with 5–8 pairs of leaflets; leaflets alternate or opposite, at

intervals of 3–10 mm, terminal one shortly petiolulate or sessile, all leaflets oblong, oblong-lanceolate, or narrowly oblong-obovate, 1–5 × 0.5–1.5 cm, abaxially pubescent, appressed pilose on veins, or sparsely glandular hairy, adaxially appressed pilose, villous, or glabrescent, base cuneate, decurrent and adnate to rachis in apical 1–3 pairs of leaflets, margin incised serrate, apex obtuse; cauline leaves resembling radical ones but with fewer leaflets; stipules green, leathery, abaxially pubescent or villous, margin deeply lacerate. Inflorescence corymbose-cymose, many flowered. Flowers 1–1.5 cm in diam.; pedicel 0.5–2 cm, pubescent. Sepals triangular-ovate, apex acute or acuminate; epicalyx segments lanceolate or elliptic-lanceolate, shorter than or nearly equaling sepals, abaxially pubescent and glandular hairy, apex obtuse or acute. Petals yellow, obovate, nearly 2 × as long as sepals, apex emarginate. Style subterminal, conic; stigma slightly dilated. Achenes ovoid, ca. 2.5 mm, rugose. Fl. and fr. May–Oct.

Forest margins, grasslands, meadows on mountain slopes, loess plateau lands, low-lying and sandy lands, gravels; 400–2600 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi [Mongolia, Russia (Siberia)].

This species is used medicinally.

66. *Potentilla longifolia* Willdenow ex Schlechtendal, Ges. Naturf. Freunde Berlin Mag. Neuesten Entdeck. Gesammten Naturk. 7: 287. 1816.

腺毛委陵菜 xian mao wei ling cai

Potentilla viscosa Donn ex Lehmann; *P. viscosa* var. *macrophylla* Komarov.

Herbs perennial. Roots robust, terete. Flowering stems erect or slightly ascending, 30–90 cm tall, together with petioles villous, pubescent, and glandular. Radical leaves 10–30 cm including petiole; stipules brown, membranous, abaxially pubescent and villous; leaf blade pinnate with 4 or 5 pairs of leaflets; leaflets opposite, rarely alternate, sessile, oblong-lanceolate or oblanceolate, 1.5–8 × 0.5–2.5 cm, abaxially pubescent and glandular, pilose on veins, adaxially pilose or glabrescent, base decurrent and adnate to rachis in apical 1–3 pairs of leaflets, margin incised serrate, apex obtuse or acute; cauline leaves resembling radical ones; stipules green, herbaceous, abaxially pubescent or villous, margin entire or parted. Inflorescence terminal, corymbose, congested, few flowered. Flowers 1.5–1.8 cm in diam.; pedicel short. Sepals triangular-lanceolate, apex usually acuminate; epicalyx segments oblong-lanceolate, shorter than or nearly equaling sepals, abaxially densely pubescent and glandular, apex obtuse or acuminate. Petals erect and enlarged in fruit, broadly obovate, nearly equaling sepals, apex emarginate. Style subterminal, conic, base thickened, markedly papillate; stigma not dilated. Achenes subreniform or ovoid, ca. 1 mm, smooth. Fl. and fr. Jul–Sep.

Sparse forests, forest margins, alpine thickets, meadows on mountain slopes; 300–3200 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai, Shandong, Shanxi, Sichuan, Xizang [Korea, Mongolia, Russia].

This species is used medicinally.

67. *Potentilla lancinata* Cardot, Notul. Syst. (Paris) 3: 236. 1916.

条裂委陵菜 tiao lie wei ling cai

Potentilla lancinata var. *minor* H. R. Fletcher; *P. rhytidocarpa* Cardot.

Herbs perennial. Roots terete. Flowering stems erect or ascending, 15–55 cm tall, together with petioles pubescent and pilose. Radical leaves 6–15 cm including petiole; stipules brown, membranous, abaxially pilose; leaf blade pinnate, rarely interrupted pinnate, with 2–4 pairs of leaflets; leaflets usually opposite, at intervals of 1–2 cm, sessile or subsessile, elliptic or oblong-elliptic, 1–4 × 0.5–2 cm, abaxially pubescent, villous on veins, adaxially appressed pilose, base cuneate or broadly so, margin coarsely acutely or obtusely incised serrate, apex obtuse or acute; cauline leaves: stipules green, large, herbaceous, abaxially densely pubescent or villous, margin 2- or 3-incised parted, rarely entire; leaf blade 3-foliolate or pinnate with 2 pairs of leaflets; leaflets resembling those of radical leaves. Inflorescence laxly cymose. Flowers ca. 2 cm in diam.; pedicel 1–2 cm, pubescent, proximally with ovate bract. Sepals triangular-ovate, apex acute; epicalyx segments elliptic, nearly equaling sepals, abaxially pubescent and pilose. Petals yellow, obovate or orbiculate, ca. 2 × as long as sepals, apex emarginate. Style terminal, base thickened; stigma minute, not dilated. Achenes yellow-brown, ovoid, rugose. Fl. and fr. Jun–Sep.

• Forest margins, meadows on mountain slopes, stream sides, rocks; 3200–4100 m. Sichuan, Yunnan.

68. *Potentilla crenulata* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 12. 1980.

圆齿委陵菜 yuan chi wei ling cai

Herbs perennial. Roots terete. Flowering stems ascending, ca. 15 cm tall, together with petioles spreading villous and pubescent. Radical leaves 3–5 cm including petiole; stipules brown, membranous, abaxially villous; leaf blade pinnate with 2 pairs of leaflets; leaflets opposite, at intervals of 5–8 mm, sessile, obovate or oblong, apical 3 large, abaxially densely spreading white villous, adaxially appressed pilose, base cuneate, margin obtusely serrulate, apex obtuse; cauline leaves: stipules green, herbaceous, abaxially densely pubescent and villous, margin entire or 2- or 3-serrate; leaf blade 3-foliolate; leaflets resembling apical 3 of radical leaves. Inflorescence laxly cymose. Flowers 1–1.6 cm in diam.; pedicel 0.5–1.5 cm, densely pubescent. Sepals triangular-ovate, apex acute to acuminate; epicalyx segments elliptic, shorter than sepals, abaxially villous and pubescent, apex obtuse or acute. Petals yellow, obovate, nearly 2 × as long as sepals, apex emarginate. Stamens ca. 20. Style subterminal, base thickened; stigma not dilated. Achenes not seen.

• Meadows, sandy mountain slopes; ca. 2800 m. Yunnan.

69. *Potentilla kleiniana* Wight & Arnott, Prodr. Fl. Ind. Orient. 300. 1834.

蛇含委陵菜 she han wei ling cai

Potentilla anemonifolia Lehmann; *P. bodinieri* H. Léveillé.

Herbs annual, biennial, or perennial. Flowering stems prostrate or ascending, 10–50 cm tall, together with petioles

pilose or spreading villous, usually rooting at nodes and developing new plants. Radical leaves 3–20 cm including petiole; stipules tinged brown, membranous, abaxially pilose or glabrescent; leaf blade subpedately 5-foliolate; leaflets subsessile or shortly petiolulate, both surfaces green, obovate or oblong-obovate, 0.5–4 × 0.4–2 cm, both surfaces pilose, abaxially densely appressed villous on veins, adaxially sometimes glabrescent, base cuneate, margin acutely or obtusely many serrate, apex obtuse; lower cauline leaves 5-foliolate, upper ones 3-foliolate; stipules green, ovate or ovate-lanceolate, herbaceous, abaxially sparsely villous, margin entire, rarely acutely or acuminate 1- or 2-serrate; petiole gradually shorter higher up stem; leaflets resembling those of radical leaves. Inflorescence terminal, cymose, congested, pseudumbellate. Flowers 0.8–1 cm in diam.; pedicel 1–1.5 cm, densely spreading villous, bracteate. Sepals triangular-ovate, apex acute or acuminate; epicalyx segments lanceolate or elliptic-lanceolate, shorter than sepals at anthesis, nearly equaling or slightly longer than sepals in fruit, abaxially pilose, apex acute or acuminate. Petals yellow, obovate, longer than sepals, apex emarginate. Style subterminal, conic, base thickened; stigma dilated. Achenes subglobose, flattened on 1 side, ca. 0.5 mm in diam., rugose. Fl. and fr. Apr–Sep.

Meadows, grasslands on mountain slopes, field margins; 400–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Sichuan, Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Korea, Malaysia, Nepal, Sikkim].

This species is used medicinally.

70. *Potentilla supina* Linnaeus, Sp. Pl. 1: 497. 1753.

朝天委陵菜 *chao tian wei ling cai*

Herbs annual or biennial. Roots slender, with sparse lateral rootlets. Flowering stems spreading, ascending, or erect, dichotomously branched, 20–50 cm tall, together with petioles pilose or glabrescent. Radical leaves 4–15 cm including petiole; stipules brown, membranous, abaxially pilose or glabrescent; leaf blade 3-foliolate or pinnate with 2–5 pairs of leaflets; leaflets alternate or opposite, sessile, or terminal leaflet shortly petiolulate or subsessile, both surfaces green, oblong or obovate-oblong, 1–2.5 × 0.5–1.5 cm, both surfaces pilose or glabrescent, base cuneate or broadly so, often decurrent and adnate to rachis in apical 1 or 2 pairs of leaflets, margin obtusely serrate, incised serrate, or 2- or 3-parted, apex obtuse or acute; cauline leaves resembling radical ones but pairs of leaflets fewer higher up stem; stipules green, herbaceous, margin entire, serrate, or parted. Inflorescence terminal, corymbose-cymose, with axillary flowers on lower part of flowering stem. Flowers 6–8 mm in diam.; pedicel 0.8–1.5 cm, densely pubescent. Sepals triangular-ovate, apex acute; epicalyx segments oblong-elliptic or elliptic-lanceolate, nearly equaling or slightly longer than sepals, apex acute. Petals yellow, obovate, slightly shorter than sepals, apex emarginate. Style subterminal, base thickened, papillate; stigma dilated. Achenes cylindrical, rugose, apex acute. Fl. and fr. Mar–Oct.

Meadows, wet places on mountain slopes, sandy river banks, field margins, saline deserts; 100–2000 m. Anhui, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang [widespread in N hemisphere and subtropical regions].

sphere and subtropical regions].

- 1a. Flowering stems horizontally spreading, ascending, or erect; radical leaf blade pinnate with 2–5 pairs leaflets, leaflets sessile with base decurrent and adnate to rachis in apical 1 or 2 pairs, margin obtusely serrate or incised serrate 70a. var. *supina*
- 1b. Flowering stems low and spreading or slightly ascending, rarely erect; radical leaf blade 3-foliolate, central leaflet shortly petiolulate or subsessile, margin often 2- or 3-parted 70b. var. *ternata*

70a. *Potentilla supina* var. *supina*

朝天委陵菜(原变种) *chao tian wei ling cai* (yuan bian zhong)

Potentilla fauriei H. Léveillé; *P. paradoxa* Nuttall ex Torrey & A. Gray; *P. supina* var. *egibbosa* Th. Wolf; *P. supina* subsp. *paradoxa* (Nuttall ex Torrey & A. Gray) Soják; *P. supina* var. *paradoxa* (Nuttall ex Torrey & A. Gray) Th. Wolf.

Flowering stems horizontally spreading, ascending, or erect. Radical leaf blade pinnate with 2–5 pairs leaflets; leaflets sessile with base decurrent and adnate to rachis in apical 1 or 2 pairs, margin obtusely serrate or incised serrate.

Meadows, wet places on mountain slopes, sandy river banks, field margins; 100–2000 m. Anhui, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang [widespread in N hemisphere and subtropical regions].

70b. *Potentilla supina* var. *ternata* Petermann, Anal. Pfl.-Schlüss. 125. 1846.

三叶朝天委陵菜 *san ye chao tian wei ling cai*

Potentilla amurensis Maximowicz; *P. supina* var. *campestris* Cardot.

Flowering stems low and spreading or slightly ascending, rarely erect. Radical leaf blade 3-foliolate; central leaflet shortly petiolulate or subsessile, margin often 2- or 3-parted.

Sandy river banks, field margins, saline deserts; 100–1900 m. Anhui, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shanxi, Sichuan, Xinjiang, Yunnan, Zhejiang [Russia (Far East)].

71. *Potentilla centigrana* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 18: 163. 1874.

蛇莓委陵菜 *she mei wei ling cai*

Herbs annual or biennial. Rootlets numerous, fibrous. Flowering stems prostrate, ascending, or suberect, 20–50 cm tall, together with petioles glabrous or pilose, sometimes with adventitious roots at nodes in lower part. Radical leaves usually withered at anthesis; stipules brown, membranous, glabrous or pilose; leaf blade 3-foliolate; cauline leaves: stipules pale green, ovate, margin usually serrate, rarely entire; petiole long; leaf blade 3-foliolate; leaflets shortly petiolulate or subsessile, both surfaces green, elliptic or obovate, 0.5–1.5 × 0.4–1.5 cm, both surfaces glabrous or pilose, base cuneate to rounded, margin

obtusely or acutely incised serrate, apex rounded. Flowers solitary, opposite leaves in lower part of flowering stem, axillary in upper part, 4–8 mm in diam.; pedicel slender, 0.5–2 cm, glabrous or subglabrous. Sepals broadly ovate or ovate-lanceolate, apex acute or acuminate; epicalyx segments lanceolate, shorter than or nearly equaling sepals, apex acuminate. Petals tinged yellow, obovate, shorter than sepals, apex emarginate or rounded. Style subterminal, base thickened; stigma not dilated. Achenes obovoid, ca. 1 mm in diam., smooth. Fl. and fr. Apr–Aug.

Damp forests, forest margins, fields; 400–2300 m. Guizhou, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Sichuan, Yunnan [Japan, Korea, Russia].

72. *Potentilla cryptotaeniae* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 18: 162. 1874.

狼牙委陵菜 lang ya wei ling cai

Potentilla aegopodiifolia H. Léveillé; *P. cryptotaeniae* var. *obovata* Th. Wolf; *P. cryptotaeniae* var. *obtusata* Th. Wolf.

Herbs annual or biennial. Roots fibrous. Flowering stems erect or ascending, 50–100 cm tall, hirsute, villous, or glabrescent. Radical leaves withered at anthesis; stipules brown, membranous, abaxially densely villous; leaf blade 3-foliolate; cauline leaves: stipules green, lanceolate, usually adnate to petiole with adnate part 1–3 × as long as free part, herbaceous, margin entire, apex acuminate; petiole spreading villous and pubescent, sometimes glabrescent; leaf blade 3-foliolate; leaflets green on both surfaces, oblong to ovate-lanceolate, 2–6 × 1–2.5 cm, usually widest at middle, both surfaces pilose, sometimes glabrescent, abaxially hairs denser and spreading on veins, base cuneate, margin acutely many serrate, apex acuminate or caudate-acuminate. Inflorescence terminal, corymbose-cymose, many flowered. Flowers ca. 1 cm in diam.; pedicel slender, 1–2 cm, villous or pubescent. Sepals oblong-ovate, apex acute or acuminate; epicalyx segments lanceolate, nearly equaling sepals at anthesis, longer than sepals in fruit, abaxially pilose, apex acuminate. Petals yellow, obovate, nearly equaling or longer than sepals, apex rounded or emarginate. Style subterminal, base slightly thickened; stigma slightly dilated. Achenes ovoid, smooth. Fl. and fr. Jul–Sep.

Forest margins, grasslands, meadows, valleys, ravines; 1000–2500 m. Gansu, Heilongjiang, Jilin, Liaoning, Shaanxi, Sichuan [Japan, Korea, Russia (Far East)].

Potentilla cryptotaeniae var. *radicans* T. T. Yu & C. L. Li was described in FRPS (p. 319), but the name is invalid because no Latin description or diagnosis was provided (St. Louis Code, Art. 36.1).

73. *Potentilla asperrima* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 16: 609. 1843.

刚毛委陵菜 gang mao wei ling cai

Herbs perennial. Roots terete. Flowering stems erect or ascending, 8–13 cm tall, together with petioles setose, sparsely pubescent, and stipitate or sessile glandular. Radical leaves 4–9 cm including petiole; stipules brown, membranous, abaxially setose, pubescent, and sparsely glandular; leaf blade 3-foliolate;

leaflets subsessile or shortly petiolulate, obovate, 1–2.5 × 0.7–1.5 cm, abaxially setose, pubescent, and sessile glandular, adaxially setose, base cuneate, margin acutely incised serrate, occasionally doubly serrate, apex obtuse; cauline leaves 1 or 2, resembling radical ones; stipules herbaceous, abaxially setose, pubescent, and glandular. Inflorescence terminal, corymbose-cymose, few flowered. Flowers ca. 1 cm in diam.; pedicel 1–1.5 cm, villous and glandular hairy. Sepals triangular-ovate, apex acuminate; epicalyx segments lanceolate, abaxially setose, margin serrate, apex acuminate. Petals yellow, obcordate, nearly equaling or longer than sepals, apex emarginate. Style subterminal, base thickened; stigma dilated. Achenes subreniform, rugose. Fl. and fr. Jun–Sep.

Forest margins, meadows, gravels. Heilongjiang [E Russia].

74. *Potentilla macrosepala* Cardot, Notul. Syst. (Paris) 3: 239. 1916.

大花委陵菜 da hua wei ling cai

Potentilla concolor (Franchet) Rolfe (1908), not Zimmermann (1887); *P. griffithii* J. D. Hooker var. *concolor* Franchet.

Herbs perennial. Roots terete, with fibrous rootlets. Flowering stems erect or ascending, 15–55 cm tall, pubescent and sparsely villous. Radical leaves 6–25 cm including petiole; stipules brown, membranous, abaxially pilose or glabrescent; petiole pubescent and pilose; leaf blade 3-foliolate; leaflets sessile or shortly petiolulate, elliptic, ovate, or obovate, abaxially pubescent, pilose on veins, adaxially appressed pilose, base rounded or broadly cuneate, margin coarsely obtusely many serrate, apex obtuse, rarely acute; cauline leaves petiolate, becoming sessile higher up stem; stipules green, herbaceous, abaxially pilose, margin 2–4-serrate; leaflets resembling those of radical leaves. Inflorescence corymbose-cymose, laxly few flowered. Flowers 2.5–4 cm in diam.; pedicel 2–3 cm, pubescent. Sepals triangular-ovate or oblong-ovate, apex acute, rarely acuminate; epicalyx segments elliptic or oblong-elliptic, nearly equaling or longer than sepals, margin entire or sometimes parted, apex obtuse or acute. Petals yellow, obcordate, apex emarginate. Style terminal, base markedly thickened; stigma dilated. Achenes rugose. Fl. and fr. Jul–Dec.

• Meadows on mountain slopes; 3200–4100 m. Xizang, Yunnan.

75. *Potentilla xizangensis* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 12. 1980.

西藏委陵菜 xi zang wei ling cai

Herbs perennial. Roots thin terete, with fibrous rootlets. Flowering stems erect, ascending, or spreading, 6–35 cm tall, sparsely pubescent or glabrescent. Radical leaves 4–8 cm including petiole; stipules brown, membranous, abaxially sparsely pubescent; leaf blade 3-foliolate; petiole pilose and glandular hairy, or glabrescent; leaflets sessile or shortly petiolulate, green on both surfaces, obovate, broadly elliptic, or flabellate, both surfaces sparsely pubescent or glabrescent, base broadly cuneate, margin crenate, apex obtuse; cauline leaves 3 or 4, resembling radical ones; stipules green, ovate, herbaceous, abaxially pubescent and glandular hairy, margin entire, apex obtuse or acute. Inflorescence terminal, compact, congested, 3–5-flowered, laxly cymose after anthesis. Flowers 1–1.2 cm in

diam.; pedicel 1–2 cm, pubescent. Sepals ovate, apex acute; epicalyx segments elliptic, shorter than or nearly equaling sepals, apex obtuse. Petals obovate, apex emarginate. Stamens ca. 20, sometimes 12 or 13. Style subterminal, conic, base markedly thickened and papillate; stigma slightly dilated. Achenes not seen. Fl. Jun–Jul.

• Thickets, bamboo stands, valleys, meadows on mountain slopes; 3600–4800 m. Xizang (Kata He, Nyalam Xian).

76. *Potentilla chrysantha* Treviranus, Index Seminum Hort. Vratislav. 1818: 5. 1818.

黄花委陵菜 huang hua wei ling cai

Potentilla asiatica (Th. Wolf) Juzepczuk; *P. chrysantha* var. *asiatica* Th. Wolf.

Herbs perennial. Roots robust, terete. Flowering stems erect or ascending, 15–55 cm tall, together with petioles spreading or appressed pilose or glabrescent. Radical leaves 5–20 cm including petiole; stipules brown, membranous, villous or glabrescent; leaf blade pinnate with 2 pairs of leaflets; leaflets sessile or subsessile, green on both surfaces, obovate-oblong, usually $1.5\text{--}7 \times 1\text{--}3$ cm, both surfaces appressed or subspreading pilose, or abaxially sometimes villous on veins, base cuneate, margin acutely serrate, apex obtuse or acute; cauline leaves: stipules herbaceous, abaxially villous, margin entire, apex acuminate; lower leaf blades 3-foliolate, upper ones 5-foliolate; leaflets resembling those of radical leaves. Inflorescence corymbose-cymose, laxly many flowered. Flowers 1.2–1.5 cm in diam.; pedicel 1–2 cm, densely pubescent. Sepals long triangular-ovate, apex acute or acuminate; epicalyx segments lanceolate or elliptic-lanceolate, slightly shorter than sepals, abaxially pubescent and pilose, apex acute or acuminate. Petals obovate, $0.5\text{--}1 \times$ as long as sepals, apex emarginate. Style slightly thickened at base; stigma dilated. Achenes smooth or obscurely rugose. Fl. and fr. May–Aug.

Forest margins, meadows, river valleys, ditch banks; 1000–2200 m. Xinjiang [Mongolia, Russia; E Europe].

77. *Potentilla recta* Linnaeus, Sp. Pl. 1: 497. 1753.

直立委陵菜 zhi li wei ling cai

Herbs perennial. Roots terete. Flowering stems erect, 30–40 cm tall, together with petioles white villous, rarely glabrescent. Radical leaves usually withered at anthesis; stipules tinged brown, membranous, margin white villous; leaf blade palmately 5-foliolate; cauline leaves: stipules green, herbaceous, abaxially appressed villous, margin entire, apex acuminate; petiole gradually shorter higher up stem, almost absent on uppermost leaves; leaf blade 5–7-foliolate; leaflets obovate-lanceolate, $2\text{--}5 \times 0.5\text{--}1.5$ cm, abaxially white villous, more densely so on veins, adaxially appressed white villous or glabrescent, base cuneate, margin acutely or obtusely incised serrate, apex obtuse. Inflorescence terminal, compact, corymbose-cymose. Flowers ca. 1.5 cm in diam.; pedicel 0.5–1 cm, white villous and white pubescent. Sepals ovate-oblong, apex acuminate; epicalyx segments lanceolate, nearly equaling sepals, abaxially white villous, apex acuminate. Petals yellow, obovate-elliptic, nearly equaling sepals, apex emarginate or subrounded. Style slightly thickened at base; stigma not dilated. Achenes rugose. Fl. and fr. Jul–Aug.

River valleys, dry mountain slopes; 1000–1200 m. Xinjiang [C and SW Asia, Europe].

78. *Potentilla desertorum* Bunge in Ledebour, Fl. Altaic. 2: 267. 1830.

荒漠委陵菜 huang mo wei ling cai

Herbs perennial. Roots robust, terete. Flowering stems erect or ascending, 20–50 cm tall, together with petioles pubescent, villous, and stipitate or sessile red glandular. Radical leaves 8–20 cm including petiole; stipules dark brown to purple, membranous, abaxially densely pubescent, villous, and stipitate or sessile red glandular; leaf blade palmately or subpedately 5-foliolate; leaflets sessile or shortly petiolulate, obovate-cuneate or obovate, abaxially pubescent, villous, and stipitate or sessile red glandular, adaxially pilose or glabrescent, margin coarsely obtusely many serrate; cauline leaves: stipules herbaceous, abaxially densely pubescent and glandular, margin entire or 2-parted, apex acuminate; leaf blade 5-foliolate, uppermost ones 3-foliolate; leaflets resembling those of radical leaves, shortly petiolulate. Inflorescence terminal, corymbose-cymose. Flowers 1.5–2 cm in diam.; pedicel 1–2 cm, pubescent, villous, and stipitate or sessile glandular. Sepals ovate-lanceolate or ovate-oblong, apex acute or acuminate; epicalyx segments erect after flowering, lanceolate, nearly equaling sepals, abaxially pubescent, villous, and stipitate or sessile glandular, apex acuminate, usually 2-fid. Petals yellow, obovate, apex emarginate. Style subterminal, base markedly thickened; stigma dilated. Achenes smooth or inconspicuously rugose. Fl. and fr. Jun–Aug.

Ravines, river banks; ca. 1700 m. Xinjiang [India, Mongolia, Russia].

79. *Potentilla subdigitata* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 12. 1980.

混叶委陵菜 hun ye wei ling cai

Herbs perennial. Roots robust, terete, usually woody. Flowering stems erect or ascending, together with petioles pubescent, sparsely villous, and sessile glandular. Radical leaves 4–12 cm including petiole; stipules brown, membranous, abaxially densely sessile glandular, pubescent, and pilose; leaf blade 3-foliolate or pedately (rarely subpinnately) 5-foliolate; central 3 leaflets shortly petiolulate, the lateral two (if present) sessile, all leaflets obovate-cuneate or obovate, both surfaces densely spreading pubescent and sessile glandular, abaxially more densely so on veins, base cuneate, margin markedly revolute, obtusely serrate proximally, apex truncate or obtuse; cauline leaves: stipules ovate-elliptic, herbaceous, margin entire, apex obtuse or 2- or 3-serrate; petiole gradually shorter higher up stem; leaf blade 3- or 5-foliolate; leaflets resembling those of radical leaves. Inflorescence corymbose-cymose, laxly few flowered. Flowers 1.2–1.5 cm in diam.; pedicel slender, 2–2.5 cm, densely pubescent and sessile glandular. Sepals triangular-lanceolate, apex acuminate; epicalyx segments lanceolate or elliptic-lanceolate, slightly shorter than sepals, apex acute. Petals yellow, obovate, ca. $1/2$ as long as sepals, apex rounded. Style markedly thickened at base; stigma dilated. Achenes slightly rugose. Fl. and fr. Jul–Aug.

• Sunny slopes at *Pinus* forest margins, dry gravelly slopes; 2000–2500 m. Xinjiang.

6. *Potentilla* sect. *Potentilla*

钉状花柱组 ding zhuang hua zhu zu

Herbs perennial. Basal leaves palmate or 3-foliolate, rarely pinnate. Ovary glabrous; style subterminal, clavate, tapered toward base, thickened at apex.

About 20 species: mainly temperate and subarctic regions of N hemisphere; nine species (two endemic) in China.

- 1a. Flowering stems erect or ascending.
- 2a. Leaves pinnate with 2 or 3(or 4) pairs of leaflets 82. *P. fragarioides*
- 2b. Leaves 3-foliolate.
- 3a. Plants stellate hairy throughout 81. *P. acaulis*
- 3b. Plants pilose or glabrescent throughout, not stellate hairy.
- 4a. Leaflets abaxially pilose or glabrescent; flowers 1–2 cm in diam.; epicalyx segments oblong, apex rounded; anthers basifixed, subglobose or ovoid, minute 80. *P. gelida*
- 4b. Leaflets abaxially spreading strigose or densely hairy; flowers 0.8–1 cm in diam.; epicalyx segments lanceolate, apex acuminate; anthers dorsifixed, ellipsoid, larger 83. *P. freyniana*
- 1b. Flowering stems prostrate or horizontally creeping.
- 5a. Leaves palmately 5-foliolate.
- 6a. Flowers 1.5–2.2 cm in diam.; epicalyx segments usually broad, enlarged and leaflike after anthesis, apex obtuse or acute; leaflets obovate-oblong, margin regularly obtusely or rarely acutely serrate 85. *P. reptans*
- 6b. Flowers 1–1.5 cm in diam.; epicalyx segments narrow, not enlarged after anthesis, apex acuminate, rarely acute; leaflets oblong-lanceolate, margin irregularly acutely or acuminately serrate 87. *P. flagellaris*
- 5b. Leaves 3-foliolate.
- 7a. Lateral leaflets 2-lobed or 2-parted 85. *P. reptans*
- 7b. Leaflets neither lobed nor parted.
- 8a. Plants not stoloniferous, but flowering stems sometimes prostrate 88. *P. pseudosimulatrix*
- 8b. Plants stoloniferous; stolons curved and zigzagged or not, with adventitious roots at nodes or only at base.
- 9a. Inflorescence terminal, 6–8-flowered; leaflets rhombic-ovate, rhombic-obovate, or broadly elliptic, margin sharply serrate (teeth fasciated ovate) or doubly serrate; stolons curved and zigzagged; flowers 1.5–2 cm in diam. 84. *P. rosulifera*
- 9b. Inflorescence axillary, a solitary flower; leaflets obovate or elliptic, margin regularly acutely or obtusely serrate; stolons neither curved nor zigzagged; flowers 0.7–1 cm in diam. 86. *P. simulatrix*

80. *Potentilla gelida* C. A. Meyer, Verz. Pfl. Casp. Meer. 167. 1831.

耐寒委陵菜 nai han wei ling cai

Herbs perennial. Roots terete, slender; rootlets usually fibrous. Flowering stems erect, ascending, or spreading, 6–30 cm tall, together with petioles pilose and sessile glandular, or sericeous, rarely glabrescent. Radical leaves 25–70 cm including petiole; stipules brown, membranous, abaxially villous or glabrescent; leaf blade 3-foliolate; leaflets shortly petiolulate or subsessile, obovate, elliptic, or ovate-elliptic, 0.8–2 × 0.6–1.5 cm, abaxially pilose and sessile glandular, or sericeous, adaxially pilose, sericeous, or glabrescent, base cuneate or broadly so, margin acutely or obtusely 3–5-serrate on each side but entire near base, apex obtuse; cauline leaves 1 or 2; stipules green, ovate, herbaceous, abaxially pilose and glandular, margin entire, apex obtuse or acuminate; petiole very short; leaflets resembling those of radical leaves. Inflorescence laxly cymose, 3–5-flowered. Flowers 1–2 cm in diam.; pedicel 1–2.5 cm, pilose. Sepals triangular-ovate, sometimes sericeous, apex acute; epicalyx segments oblong-elliptic, slightly shorter than sepals, apex obtuse. Petals yellow, obovate, 0.5–1 × as long as sepals, apex emarginate. Style subterminal, thin at base, thickened distally; stigma dilated. Mature achenes rugose. Fl. and fr. Jun–Aug.

Marshes, valley grasslands, alpine meadows, rock crevices; 2200–4800 m. Xinjiang [N Asia to Himalayas; Europe].

- 1a. Flowering stems erect or ascending, together with petioles and abaxial surface of leaflets pilose and sessile glandular, rarely glabrescent; leaflets adaxially pilose or glabrescent 80a. var. *gelida*
- 1b. Flowering stems spreading, together with petioles, both surfaces of leaflets, and sepals sericeous 80b. var. *sericea*

80a. *Potentilla gelida* var. *gelida*

耐寒委陵菜(原变种) nai han wei ling cai (yuan bian zhong)

Potentilla fragiformis Willdenow ex Schlechtendal var. *gelida* (C. A. Meyer) Trautvetter.

Flowering stems erect or ascending, together with petioles and abaxial surface of leaflets pilose and sessile glandular, rarely glabrescent. Leaflets adaxially pilose or glabrescent. Fl. and fr. Jun–Aug.

Marshes, valley grasslands, rock crevices; 2200–4800 m. Xinjiang [N Asia to Himalayas; Europe].

One of us (Ohba) believes that *Potentilla morrisonensis* Hayata (Icon. Pl. Formosan. 3: 96. 1913), described from Taiwan, may be synonymous with this variety.

80b. *Potentilla gelida* var. *sericea* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 18: 13. 1980.

绢毛耐寒委陵菜 juan mao nai han wei ling cai

Flowering stems spreading, together with petioles, both surfaces of leaflets, and sepals sericeous. Fl. Jun.

- Alpine meadows; ca. 3200 m. Xinjiang.

81. *Potentilla acaulis* Linnaeus, Sp. Pl. 1: 500. 1753.

星毛委陵菜 xing mao wei ling cai

Potentilla subacaulis Linnaeus.

Herbs perennial, grayish green. Roots terete, much branched. Flowering stems tufted, 2–15 cm tall, together with petioles densely stellate hairy and spreading hirtellous. Radical leaves 15–70 cm including petiole; stipules tinged brown, membranous, stellate hairy and spreading hirtellous; leaf blade 3-foliolate; leaflets usually shortly petiolulate or sessile, grayish green on both surfaces, obovate-elliptic or rhombic-obovate, 0.8–3 × 0.4–1.5 cm, both surfaces densely stellate hairy and spreading hirtellous, abaxially more densely so on veins, base cuneate, margin obtusely 4–6-serrate on each side, apex obtuse; cauline leaves 1–3; stipules grayish green, linear or linear-lanceolate, herbaceous, abaxially stellate hairy; petiole very short; leaflets resembling those of radical leaves. Inflorescence terminal, cymose, 1–5-flowered. Flowers ca. 1.5 cm in diam.; pedicel 1–2 cm, densely stellate hairy and pilose. Sepals triangular-ovate, apex acute; epicalyx segments elliptic, abaxially densely stellate hairy and pilose, apex obtuse, rarely 2-fid. Petals yellow, obovate, about 2 × as long as sepals, apex emarginate or obtuse. Style subterminal, base papillate; stigma slightly dilated. Achenes subreniform, ca. 1 mm in diam., inconspicuously rugose. Fl. and fr. Apr–Aug.

Meadows on mountain slopes, loess slopes, gravelly slopes; 600–3000 m. Gansu, Hebei, Heilongjiang, Nei Mongol, Qinghai, Shaanxi, Shanxi, Xinjiang [Mongolia, Russia].

82. *Potentilla fragarioides* Linnaeus, Sp. Pl. 1: 496. 1753.

莓叶委陵菜 mei ye wei ling cai

Potentilla fragarioides var. *major* Maximowicz; *P. fragarioides* var. *sprengeliana* (Lehmann) Maximowicz; *P. sprengeliana* Lehmann.

Herbs perennial. Roots numerous. Flowering stems tufted, ascending or spreading, 8–25 cm, together with petioles spreading villous. Radical leaves 5–22 cm including petiole; stipules brown, membranous, abaxially sparsely spreading villous; leaf blade pinnate with 2 or 3 (or 4) pairs of leaflets; leaflets at intervals of 0.8–1.5 cm, shortly petiolulate or sessile, green on both surfaces, obovate, elliptic, or oblong-elliptic, 0.5–7 × 0.4–3 cm, both surfaces appressed pilose, abaxially more densely so on veins, sometimes densely ciliate on teeth, base cuneate or broadly so, margin obtusely or acutely many serrate but entire near base, apex obtuse or acute; cauline leaves: stipules green, ovate, herbaceous, abaxially spreading pilose, margin entire, apex acute; petiole very short or almost absent; leaf blade usually 3-foliolate; leaflets resembling those of radical leaves, or oblong, margin entire proximally, and apex serrate. Inflo-

rescence terminal, laxly corymbose-cymose, many flowered. Flowers 1–1.7 cm in diam.; pedicel slender, 1.5–2 cm, pilose. Sepals triangular-ovate, apex acute to acuminate; epicalyx segments oblong-lanceolate, slightly shorter than sepals, apex acute. Petals yellow, obovate, apex rounded or emarginate. Style subterminal, thin at base, thickened distally. Mature achenes subreniform, ca. 1 mm in diam., rugose. Fl. Apr–Jun, fr. Jun–Aug.

Thinned forests, thickets, meadows, ditches, field banks; 300–2400 m. Anhui, Fujian, Gansu, Guangxi, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [Japan, Korea, Mongolia, Russia (Siberia)].

83. *Potentilla freyniana* Bormüller, Mitth. Thüring. Bot. Vereins 20: 12. 1904.

三叶委陵菜 san ye wei ling cai

Herbs perennial, with slender or inconspicuous stolons. Roots much branched, tufted. Flowering stems slender, erect or ascending, 8–25 cm tall, together with petioles spreading pilose or densely spreading villous. Radical leaves 4–30 × 1–4 cm including petiole; stipules brown, membranous, abaxially sparsely villous; leaf blade 3-foliolate; leaflets green on both surfaces, oblong, elliptic, ovate, broadly ovate, or rhombic-ovate, both surfaces appressed to spreading pilose, abaxially more densely so on veins, base cuneate or broadly so, margin acutely many serrate or obtusely crenate, apex obtuse or acute; cauline leaves 1 or 2; stipules green, herbaceous, sparsely villous, apex acutely incised serrate, entire, or very rarely 2-fid; leaflets resembling those of radical leaves but very shortly petiolulate and margin less serrate. Inflorescence terminal, laxly corymbose-cymose, many flowered. Flowers 0.8–1 cm in diam.; pedicel slender, 1–1.5 cm, pilose. Sepals triangular-ovate, apex acuminate; epicalyx segments lanceolate, nearly equaling sepals, abaxially appressed pilose, apex acuminate. Petals pale yellow, oblong-obovate, apex emarginate or rounded. Style subterminal, thin at base, thickened distally. Mature achenes ovoid, 0.5–1 mm in diam., markedly rugose. Fl. and fr. Mar–Jun.

Grassy and damp places in forests, meadows on mountain slopes, stream sides; 300–2100 m. Anhui, Fujian, Gansu, Guizhou, Hebei, Heilongjiang, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea, Russia].

- 1a. Flowering stems and petioles spreading pilose; leaflets oblong, elliptic, or ovate, both surfaces sparsely appressed pilose, abaxially more densely so on veins, margin acutely serrate, stipules of cauline leaves acutely incised serrate at apex 83a. var. *freyniana*
- 1b. Flowering stems and petioles densely spreading villous; leaflets rhombic-ovate or broadly ovate, both surfaces spreading or subspreading pilose, more densely so on veins, margin obtusely crenate, stipules of cauline leaves or those on stolons ovate, margin entire, very rarely 2-fid at apex 83b. var. *sinica*

83a. *Potentilla freyniana* var. *freyniana*

三叶委陵菜(原变种) san ye wei ling cai (yuan bian zhong)

Potentilla fragarioides Linnaeus var. *ternata* Maximowicz; *P. freyniana* var. *nitens* Pampanini; *P. longepetiolata* H. Léveillé; *P. morii* Hayata; *P. sutchuenica* Cardot.

Flowering stems and petioles spreading pilose. Leaflets oblong, elliptic, or ovate, both surfaces sparsely appressed pilose, abaxially more densely so on veins, margin acutely serrate; stipules of cauline leaves acutely incised serrate at apex. Fl. and fr. Mar–Jun.

Grassy and damp places in thinned forests, meadows on mountain slopes, stream sides; 300–2100 m. Fujian, Gansu, Guizhou, Hebei, Heilongjiang, Hubei, Hunan, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea, Russia].

This variety is used medicinally.

83b. *Potentilla freyniana* var. *sinica* Migo, Bull. Shanghai Sci. Inst. 14: 310. 1944.

中华三叶委陵菜 zhong hua san ye wei ling cai

Flowering stems and petioles densely spreading villous. Leaflets rhombic-ovate or broadly ovate, both surfaces spreading or subspreading pilose, more densely so on veins, margin obtusely crenate; stipules of cauline leaves or those on stolons ovate, margin entire, very rarely 2-fid at apex. Fl. and fr. Apr–May.

• Grassy and damp place in forests; 600–800 m. Anhui, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang.

84. *Potentilla rosulifera* H. Léveillé, Repert. Spec. Nov. Regni Veg. 7: 198. 1909.

曲枝委陵菜 qu zhi wei ling cai

Potentilla freyniana Bornmüller var. *grandiflora* Th. Wolf; *P. querpertensis* Cardot; *P. yokusaiana* Makino.

Herbs perennial, stoloniferous. Roots fibrous. Stolons curved and zigzagged, with adventitious roots at nodes. Radical leaves 4–7 cm including petiole; stipules brown, membranous, abaxially sparsely villous; petiole sparsely spreading villous; leaf blade 3-foliolate, rarely also with 1 or 2 minute segments on petiole; leaflets shortly petiolulate or sessile, adaxially green, rhombic-ovate, rhombic-obovate, or broadly elliptic, 1–3.5 × 1–2 cm, adaxially sparsely spreading villous, margin many serrate with teeth ovate and dissected into linear lobes, sometimes acutely doubly serrate, apex acute, rarely obtuse; stolon leaves resembling radical ones; stipules pale brown, lanceolate, thinly membranous, margin entire; cauline leaves: stipules ovate, herbaceous, abaxially sparsely villous, margin entire, very rarely serrate at apex; leaf blade 1- or 2-foliolate; leaflets reduced, obovate-elliptic, apex 3- or 4-serrate. Inflorescence terminal, laxly corymbose, 6–8-flowered. Flower 1.5–2 cm in diam. Sepals ovate-lanceolate, apex acuminate; epicalyx segments lanceolate, nearly equaling sepals, apex acuminate. Petals yellow, obovate-oblong, ca. 1/2 as long as sepals, apex emarginate. Style subterminal, thin at base; stigma dilated, capitate. Achenes not seen. Fl. May.

Mountain forest margins, thickets on mountain slopes. Liaoning [Japan, Korea].

This species is used medicinally.

85. *Potentilla reptans* Linnaeus, Sp. Pl. 1: 499. 1753.

匍匐委陵菜 pu fu wei ling cai

Herbs perennial, stoloniferous. Roots much branched, usually with fusiform tubers. Stolons 20–100 cm, sparsely pilose or glabrescent, with adventitious roots at nodes. Radical leaves 7–12 cm including petiole; stipules brown, membranous, abaxially glabrescent; petiole sparsely pilose, appressed sericeous, or glabrescent; leaf blade pedately 5-foliolate, or 3-foliolate; leaflets shortly petiolulate or sessile, obovate to obovate-oblong, abaxially pilose or appressed sericeous, rarely glabrescent, adaxially subglabrous, base cuneate, margin acutely or obtusely serrate or lobed to parted, sometimes entire, apex obtuse; stolon leaves resembling radical ones; stipules green, ovate-oblong or ovate-lanceolate, herbaceous, margin entire, rarely 1- or 2-serrate, apex acute or acuminate. Flowers solitary, axillary or opposite leaves, 1.5–2.2 cm in diam.; pedicel 6–9 mm, pilose. Sepals ovate-lanceolate, apex acute; epicalyx segments oblong-elliptic or elliptic-lanceolate, nearly equaling sepals, markedly enlarged in fruit, abaxially pilose, apex obtuse or acute. Petals yellow, broadly obovate, slightly longer than sepals, apex markedly emarginate. Style subterminal, thin at base; stigma dilated. Achenes yellow-brown, ovoid, markedly rugose. Fl. and fr. Apr–Sep.

Forest margins, thickets by streams, meadows on mountain slopes, ditch banks, damp field margins; 300–3500 m. Gansu, Hebei, Henan, Jiangsu, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Yunnan, Zhejiang [Russia (Siberia); N Africa, C and SW Asia, Europe].

- 1a. Petiole pilose or glabrescent, leaf blade pedately 5-foliolate, leaflets abaxially pilose, margin acutely or obtusely serrate 85a. var. *reptans*
- 1b. Petiole appressed sericeous, leaf blade 3-foliolate, leaflets abaxially appressed sericeous, rarely glabrescent or pilose, margin of lateral leaflets lobed to parted, sometimes entire 85b. var. *sericophylla*

85a. *Potentilla reptans* var. *reptans*

匍匐委陵菜(原变种) pu fu wei ling cai (yuan bian zhong)

Potentilla procumbens Sibthorp (1794), not (Linnaeus) Clairville (1811); *Tormentilla reptans* Linnaeus.

Petiole pilose or glabrescent; leaf blade pedately 5-foliolate; leaflets abaxially pilose, margin acutely or obtusely serrate. Fl. and fr. Jun–Aug.

Damp field margins; 500–600 m. Xinjiang [Russia (Siberia); N Africa, C and SW Asia, Europe].

85b. *Potentilla reptans* var. *sericophylla* Franchet, Pl. David. 1: 113. 1883.

绢毛匍匐委陵菜 juan mao pu fu wei ling cai

Fragaria filipendula Hemsley; *Potentilla hemsleyana* Th. Wolf; *P. reptans* var. *incisa* Franchet.

Petiole appressed sericeous; leaf blade 3-foliolate; leaflets abaxially appressed sericeous, rarely glabrescent or pilose, margin of lateral leaflets lobed to parted, sometimes entire. Fl. and fr. Apr–Sep.

• Forest margins, thickets by streams, meadows on mountain slopes, ditch banks, damp field margins; 300–3500 m. Gansu, Hebei, Henan, Jiangsu, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang.

86. *Potentilla simulatrix* Th. Wolf, *Biblioth. Bot.* 16(Heft 71): 663. 1908.

等齿委陵菜 *deng chi wei ling cai*

Herbs perennial, stoloniferous. Roots slender, much branched. Stolons slender, 15–30 cm, together with petioles pubescent and villous, usually with adventitious roots at base. Radical leaves 3–10 cm including long, slender petiole; stipules submembranous, densely pilose; leaf blade 3-foliolate; leaflets subsessile, green on both surfaces, cuneate-obovate, oblong-obovate, or subrhomboid, central one ca. 2 cm, lateral ones shorter with strongly oblique base, abaxially somewhat densely appressed pilose especially on veins, adaxially sparsely pilose or glabrescent, margin coarsely crenate-dentate, sometimes somewhat deeply incised, apex hardly prominent; teeth broadly ovate or oblong, apex rounded or shortly apiculate; stolon leaves similar to radical ones but petiole shorter and leaf blade gradually smaller higher up stem; stipules ovate or oblong and entire on lower leaves, often larger and dentate or 2–5-fid on upper leaves. Flower solitary, axillary, 0.7–1 cm in diam.; pedicel slender, 1.5–3 cm, pubescent and pilose. Sepals ovate-lanceolate, apex acute; epicalyx segments oblong-elliptic, nearly equaling or rarely slightly longer than sepals, abaxially pilose, apex obtuse or acute. Petals yellow, obovate, longer than sepals, apex emarginate or rounded. Style subterminal, thin at base; stigma dilated. Achenes inconspicuously rugose. Fl. and fr. Apr–Oct.

• Stream sides in damp forests; 300–2200 m. Gansu, Hebei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan.

87. *Potentilla flagellaris* Willdenow ex Schlechtendal, *Ges. Naturf. Freunde Berlin Mag. Neuesten Entdeck. Gesammten Naturk.* 7: 291. 1816.

匍枝委陵菜 *pu zhi wei ling cai*

Potentilla reptans Linnaeus var. *angustiloba* Seringe.

Herbs perennial, stoloniferous. Roots tufted, slender. Stolons 8–60 cm, together with petioles appressed pubescent or pilose. Radical leaves 4–10 cm including petiole; stipules brown, membranous, abaxially sparsely hirsute; leaf blade palmately 5-foliolate; leaflets sessile, green on both surfaces, lanceolate, ovate-lanceolate, or oblong-elliptic, 1.5–3 × 0.7–1.5 cm, both surfaces sparsely appressed pubescent, later glabrescent or abaxially appressed pilose on veins, base broadly cuneate, margin irregularly acutely incised 3–6-serrate, sometimes 2-fid on outer 2 leaflets, apex acute or acuminate; stolon leaves resembling radical ones; stipules green, ovate-lanceolate, herbaceous, margin usually parted. Flowers solitary, opposite leaves, 1–1.5 cm in diam.; pedicel 1.5–4 cm, pubescent. Sepals ovate-oblong, apex acute; epicalyx segments slightly shorter than sepals, abaxially pubescent and pilose. Petals yellow, slightly longer than sepals, apex emarginate or rounded. Style subterminal, thin at base; stigma slightly dilated. Mature achenes cylindrical-ovoid, bullate. Fl. and fr. May–Sep.

Thinned forests, damp meadows, lake shores, river banks; 300–2100 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Shandong, Shanxi [Korea, Mongolia, Russia].

This species is used for food and forage.

88. *Potentilla pseudosimulatrix* W. B. Liao et al., *Bull. Bot. Res.*, Harbin 10(4): 21. 1990.

粗齿委陵菜 *cu chi wei ling cai*

Herbs perennial. Roots much branched, slender; rootlets usually fibrous. Flowering stems prostrate or ascending, 20–60 cm, pilose. Radical leaves: stipules lanceolate, margin entire; petiole 8–15 cm, villous; leaflets 3, abaxially grayish green, adaxially green, rhombic-ovate or rhombic-elliptic, 3–5 × 2–3.5 cm, both surfaces sparsely pubescent, rarely sericeous, base strongly obliquely cuneate, margin coarsely dentate with 7–11 pairs of teeth, apex acute; cauline leaves 1 or 2; stipules ovate, herbaceous, margin entire or 2- or 3-lobed; petiole 2–4 cm, densely villous; leaflets similar to radical ones but smaller, 1.5–3.6 × 1–1.5 cm. Inflorescence cymose, 2–4-flowered. Flowers 1–1.4 cm in diam.; pedicel slender, 0.6–6 cm, pubescent. Sepals broadly ovate, ca. 6 × 3 mm, abaxially villous, apex acute; epicalyx segments lanceolate, slightly longer than sepals, abaxially villous, apex acute. Petals yellow, suborbicular, ca. 3 mm, apex emarginate. Ovary lanate at base; style subterminal, thin at base, thickened distally. Fl. Apr–Jun.

• Forest margins; 1200–1400 m. S Shaanxi (Ningshan Xian).

36. COMARUM Linnaeus, *Sp. Pl.* 1: 502. 1753.

沼委陵菜属 *zhao wei ling cai shu*

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Farinopsis Chrtek & Soják.

Herbs perennial or subshrubs. Flowering stems erect or ascending. Leaves alternate; leaf blade imparipinnate. Flowers bisexual, in cymes. Hypanthium almost flat or slightly saucer-shaped, enlarging in fruit. Sepals 5, persistent; epicalyx segments 5, persistent. Petals 5, red, dark purple, or white. Stamens 15–25; filaments filiform, persistent; anthers compressed globose, dehiscing by marginal slits, base cordate. Fruiting receptacle enlarged, ellipsoid or hemispheric, spongy. Carpels numerous; style lateral, filiform. Achenes glabrous or hairy. $x = 7$.

About five species: temperate regions of N hemisphere; two species in China.

This genus is often included in *Potentilla*.

- 1a. Herbs perennial; leaflets 5–7; petals dark purple, ovate-lanceolate, shorter than sepals, apex acuminate; achenes glabrous 1. *C. palustre*
 1b. Subshrubs; leaflets 7–11; petals white or red, obovate, subequaling sepals, apex rounded; achenes villous 2. *C. salesovianum*

1. Comarum palustre Linnaeus, Sp. Pl. 1: 502. 1753.

沼委陵菜 zhao wei ling cai

Fragaria palustris (Linnaeus) Crantz; *Potentilla comarum* Nestler, nom. illeg. (included *Comarum palustre*); *P. palustris* (Linnaeus) Scopoli.

Herbs perennial, 20–30 cm tall. Rhizome branched, dark brown, long, woody. Flowering stems ascending, branched near base, pale red-brown, hollow, glabrous in lower part, hairy in upper part. Radical leaves 6–16 cm including petiole; stipules mostly adnate to petiole, membranous; petiole 2.5–12 cm; leaf blade imparipinnate, 5–7-foliolate; upper cauline leaves: stipules ovate, foliaceous, apex often serrate; leaf blade 3-foliolate; leaflets sessile or subsessile, adaxially dark green, elliptic or oblong, 4–7 × 1.2–3 cm, abaxially villous, adaxially glabrous or slightly appressed pilose, base cuneate, margin proximally entire, distally sharply serrate, apex obtuse or acute. Inflorescence terminal or axillary, cymose, 1- to several flowered; peduncle and pedicels pilose and glandular hairy. Flowers 1–1.5 cm in diam.; pedicel 1–1.5 cm; bracts conic, 3–5 mm. Hypanthium saucer-shaped, abaxially pilose. Sepals spreading, dark purple, triangular-ovate, 0.7–1.8 cm, both surfaces pilose, apex acuminate; epicalyx segments lanceolate to linear, 4–9 mm, abaxially pilose, apex acute or acuminate. Petals dark purple, ovate-lanceolate, 3–8 mm, shorter than sepals, apex acuminate. Stamens 15–25, shorter than the petals; filaments and anthers dark purple. Ovary dark purple, ovoid, glabrous; style filiform. Achenes numerous, yellow-brown, compressed ovoid, ca. 1 mm, glabrous. Fl. May–Aug, fr. Jul–Oct.

Marshes, fens, bogs. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia; Europe, North America].

2. Comarum salesovianum (Stephan) Ascherson & Graebner, Syn. Mitteleur. Fl. 6: 663. 1904.

西北沼委陵菜 xi bei zhao wei ling cai

Potentilla salesoviana Stephan, Mém. Soc. Imp. Naturalistes Moscou 2: 6. 1808; *Comarum salesovii* (Stephan ex Willdenow) Bunge; *Farinopsis salesoviana* (Stephan) Chrték & Soják; *P. salesovii* Stephan ex Willdenow.

Herbs perennial, woody based, 30–100 cm tall. Flowering stems erect, branched, red-brown, villous, farinaceous when young. Leaves 4.5–9.5 cm including petiole; stipules mostly adnate to petiole, scarious, abaxially farinaceous and villous, apex long caudate; petiole 1–1.5 cm; leaf blade imparipinnate, 7–11-foliolate, or 3-foliolate or simple on uppermost leaves; rachis brownish red, villous; leaflets alternate or subopposite, very shortly petiolulate or sessile, adaxially green, oblong-lanceolate or ovate-lanceolate, rarely obovate-lanceolate, 1.5–3.5 × 0.4–1.2 cm, papery, abaxially appressed pilose, often whitish farinaceous, adaxially glabrous, midvein abaxially slightly elevated, lateral veins in 4 or 5 pairs, obscure, base cuneate, margin sharply serrate, apex acute. Inflorescence terminal or axillary, cymose, laxly several flowered; peduncle and pedicels densely villous and farinaceous. Flowers 2.5–3 cm in diam.; pedicel 1.5–3 cm; bracts and bracteoles red-brown, linear-lanceolate, 6–20 mm, apex acuminate. Hypanthium obconic, fleshy, pubescent and white farinaceous. Sepals purplish, triangular-ovate, ca. 1.5 cm, abaxially pubescent and white farinaceous, adaxially appressed pubescent, apex acuminate; epicalyx segments purple, linear-lanceolate, 7–10 mm, abaxially pilose, apex acuminate. Petals white or red, obovate, 1–1.5 cm, nearly equaling sepals, glabrous, base shortly clawed, apex rounded. Stamens ca. 20; filaments 5–6 mm. Ovary cylindrical-ovoid, villous. Fruiting receptacle densely villous. Achenes numerous, oblong-ovoid, ca. 2 mm, enclosed by persistent sepals and epicalyx segments. Fl. Jun–Aug, fr. Aug–Oct.

Mountain slopes, ravines, river banks; 3600–4000 m. Gansu, Nei Mongol, Ningxia, Qinghai, Xinjiang, Xizang [Afghanistan, NW India, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan].

37. SIBBALDIA Linnaeus, Sp. Pl. 1: 284. 1753.

山莓草属 shan mei cao shu

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Sibbaldianthe Juzepczuk.

Herbs perennial, often woody based. Flowering stems prostrate to erect. Leaves pinnate or palmately 3–5-foliolate; leaflets serrate at apex or margin, rarely entire. Inflorescence a cyme or solitary flower. Flowers usually bisexual, rarely unisexual. Hypanthium saucer-shaped or cupular. Sepals (4 or)5, alternate, persistent; epicalyx segments (4 or)5. Petals (4 or)5, yellow, purple-red, or white. Disk usually markedly broad, rarely not so. Stamens (4 or)5(–10); anthers 2-loculed. Carpels 4–20, free; ovules usually ascending; style sub-basal, lateral, or subterminal. Achenes few, inserted on elevated, dry receptacle. $x = 7$.

About 20 species: arctic and alpine regions of N hemisphere; 13 species (four endemic) in China.

- 1a. Radical leaves pinnately 3–11-foliolate.
 2a. Leaflets abaxially sericeous, strigose, or subglabrous.
 3a. Flowers 5-merous; petals yellow or white, longer than sepals; leaflets abaxially strigose, adaxially subglabrous, terminal one (2 or)3-serrate at apex 10. *S. adpressa*
 3b. Flowers 4- or 5-merous; petals white, equaling or only slightly longer than sepals; leaflets appressed sericeous on both surfaces, margin entire 11. *S. sericea*

- 2b. Leaflets abaxially densely white tomentose.
 - 4a. Flowering stems and petioles densely white tomentose; leaflets abaxially inconspicuously veined and densely white tomentose 12. *S. micropetala*
 - 4b. Flowering stems and petioles yellow pilose and white tomentose; leaflets abaxially prominently veined 13. *S. phanerophlebia*
- 1b. Radical leaves palmately 3–5-foliolate.
 - 5a. Radical leaves 5-foliolate.
 - 6a. Leaflets densely white sericeous on both surfaces 9. *S. omeiensis*
 - 6b. Leaflets appressed pilose on both surfaces.
 - 7a. Leaflets obovate-oblong or oblong, central and lateral ones subequal, apex 2–6-serrate; petals 5, purple-red, longer than sepals 7. *S. purpurea*
 - 7b. Leaflets obovate, 2 lateral ones much smaller than 3 central ones, apex (2 or)3-serrate; petals 4(or 5), yellow-white, nearly equaling sepals 8. *S. pentaphylla*
 - 5b. Radical leaves 3-foliolate.
 - 8a. Leaflet margin entire except for (2 or)3–5-dentate apex.
 - 9a. Petals 5, shorter than sepals 1. *S. procumbens*
 - 9b. Petals 4 or 5, nearly equaling or slightly longer than sepals.
 - 10a. Leaflets broadly obovate, base rounded to broadly cuneate; flowers numerous, in cymes; petals 5, equaling sepals 2. *S. cuneata*
 - 10b. Leaflets obovate-oblong, base cuneate; flowers 1(–3); petals 4, nearly equaling or slightly longer than sepals 3. *S. tetrandra*
 - 8b. Leaflet margin serrate or lobed.
 - 11a. Flower solitary, terminal; petals white, longer than sepals 4. *S. perpusilloides*
 - 11b. Flowers 2–6, in cymes; petals red or purple-red, shorter than or nearly equaling sepals.
 - 12a. Leaflets broadly obovate to suborbicular, 0.3–1.5 cm, both surfaces appressed pilose; petals red, nearly equaling sepals 5. *S. tenuis*
 - 12b. Leaflets broadly elliptic, 1.3–2.5 cm, abaxially densely yellow hirsute; petals purple-red, slightly shorter than or equaling sepals 6. *S. sikkimensis*

1. *Sibbaldia procumbens* Linnaeus, Sp. Pl. 1: 307. 1753.

山莓草 shan mei cao

Herbs perennial, woody based. Flowering stems prostrate or ascending, 4–30 cm tall, appressed pilose, or strigose throughout. Radical leaves 3–12 cm including petiole; stipules brown, membranous; petiole pilose; leaf blade 3-foliolate; leaflets shortly petiolulate or sessile, oblong or obovate, 1–3 × 0.6–1.5 cm, abaxially appressed pilose, adaxially sparsely pilose or sometimes glabrous, base cuneate, margin 3–5-dentate, apex truncate; teeth triangular, rarely ovate and acute; cauline leaves 1 or 2, resembling radical ones but petiole shorter; stipules lanceolate or ovate, sparsely pilose, margin entire. Inflorescence terminal, compact, corymbose, 8–12-flowered. Flowers 4–6 mm in diam. Sepals ovate to triangular-ovate, apex acute; epicalyx segments much shorter than to nearly equaling sepals. Petals yellow, obovate-oblong, slightly or much shorter than sepals, apex rounded. Stamens ca. 5. Style lateral. Achenes glabrous. Fl. and fr. Jul–Aug.

Forests, meadows on mountain slopes, dry mountain slopes, grasslands by lakes, rock crevices; 2400–4000 m. Gansu, Jilin, Qinghai, Shaanxi, Sichuan, Xinjiang, Xizang, Yunnan [widely distributed in N temperate zone, extending N nearly to arctic circle].

- 1a. Flowering stems 4–20 cm tall, appressed pilose; cauline leaf 1; epicalyx segments much shorter than sepals; petals slightly shorter than sepals 1a. var. *procumbens*
- 1b. Flowering stems to 30 cm tall, strigose throughout; cauline leaves 1 or 2;

epicalyx segments slightly shorter than sepals; petals much shorter than sepals 1b. var. *aphanopetala*

1a. *Sibbaldia procumbens* var. *procumbens*

山莓草(原变种) shan mei cao (yuan bian zhong)

Potentilla procumbens (Linnaeus) Clairville (1811), not Sibthorp (1794); *P. sibbaldia* Griesselich; *P. sibbaldii* A. Haller; *Sibbaldia macrophylla* Turczaninow ex Juzepczuk; *S. procumbens* var. *macrophylla* (Turczaninow ex Juzepczuk) Gubanov.

Flowering stems 4–20 cm tall, appressed pilose. Cauline leaf 1. Epicalyx segments much shorter than sepals. Petals slightly shorter than sepals. Fl. and fr. Jul–Aug.

Dry mountain slopes, grasslands by lakes; 2400–2600 m. Jilin, Xinjiang [widely distributed in N temperate zone, extending N nearly to arctic circle].

1b. *Sibbaldia procumbens* var. *aphanopetala* (Handel-Mazzetti) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 337. 1985.

隐瓣山莓草 yin ban shan mei cao

Sibbaldia aphanopetala Handel-Mazzetti, Acta Horti Gothob. 13: 327. 1939.

Flowering stems to 30 cm tall, strigose throughout. Cauline leaves 1 or 2. Epicalyx segments slightly shorter than sepals. Petals much shorter than sepals. Fl. and fr. Jul–Aug.

• Forests, meadows on mountain slopes, rock crevices; 2500–4000 m. Gansu, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

This variety is used medicinally.

2. *Sibbaldia cuneata* Hornemann ex Kuntze, *Linnaea* 20: 59. 1874.

楔叶山莓草 xie ye shan mei cao

Sibbaldia taiwanensis H. L. Li.

Herbs perennial, woody based. Flowering stems erect or ascending, 5–14 cm tall, appressed or subappressed pilose. Radical leaves 1.5–10 cm including petiole; stipules brown, membranous, abaxially sparsely strigose; petiole appressed pilose; leaf blade 3-foliolate; leaflets usually shortly petiolulate or subsessile, green on both surfaces, broadly obovate or elliptic, 0.8–2.5 × 0.6–1.8 cm, both surfaces sparsely pilose, base cuneate, margin 3–5-dentate, apex truncate; teeth ovate, apex acute or obtuse; cauline leaves 1 or 2, resembling radical ones but leaflets smaller; stipules green, lanceolate, herbaceous, apex acuminate. Inflorescence terminal, compact, corymbose. Flowers 5–7 mm in diam. Sepals ovate or oblong, apex acute; epicalyx segments lanceolate, equaling sepals, abaxially pilose, apex acuminate. Petals yellow, obovate, nearly equaling or slightly longer than sepals, apex rounded. Stamens ca. 5. Style lateral. Achenes glabrous. Fl. and fr. May–Oct.

Alpine meadows, rock crevices; 3400–4500 m. Qinghai, Sichuan, Taiwan, Xizang, Yunnan [Afghanistan, Bhutan, Nepal, Pakistan, Russia, Sikkim].

3. *Sibbaldia tetrandra* Bunge, *Verz. Altai Pfl.* 17. 1836.

四蕊山莓草 si rui shan mei cao

Dryadanthe bungeana Ledebour; *D. tetrandra* (Bunge) Juzepczuk; *Potentilla tetrandra* (Bunge) J. D. Hooker.

Herbs perennial, low, tufted. Rhizome robust, terete. Flowering stems 2–5 cm tall. Radical leaves 0.5–15 cm including petiole; stipules brown, dilated, membranous, abaxially pilose; petiole white pilose; leaf blade 3-foliolate; leaflets green on both surfaces, obovate-oblong, 5–8 × 3–4 mm, both surfaces white pilose, base cuneate, apex truncate and 3-dentate. Flowers 1(–3), usually unisexual, 4–8 mm in diam. Sepals 4, triangular-ovate, apex rounded or acute; epicalyx segments lanceolate or ovate, minute, nearly equaling sepals, apex acute to acuminate. Petals 4, pale yellow, obovate-oblong, nearly equaling or slightly longer than sepals. Stamens 4, inserted away from broad, 4-fid disk. Style lateral. Achenes glabrous. Fl. and fr. May–Aug.

Forests, meadows on mountain slopes, rock crevices; 3000–5400 m. Qinghai, Xinjiang, Xizang [Mongolia, Nepal, Pakistan, Russia (W Siberia), Sikkim; C Asia].

4. *Sibbaldia perpusilloides* (W. W. Smith) Handel-Mazzetti, *Symb. Sin.* 7: 520. 1933.

短蕊山莓草 duan rui shan mei cao

Potentilla perpusilloides W. W. Smith, *Rec. Bot. Surv. India* 4: 188. 1911; *P. brachystemon* Handel-Mazzetti.

Herbs perennial, small. Roots slender, slightly woody; rootlets slender. Flowering stems 1–1.5 cm tall. Radical leaves

0.7–1.5 cm including petiole; stipules brown, membranous, pilose or subglabrous; petiole pilose or subglabrous; leaf blade 3-foliolate; leaflets shortly petiolulate or subsessile, broadly obovate, 2–3.5 × 1.5–2.5 mm, both surfaces subglabrous, base cuneate, margin 2–5-serrate; teeth ovate, apex acute, rarely obtuse. Flower solitary, terminal, ca. 6 mm in diam., base pilose. Sepals broadly ovate, apex acute; epicalyx segments elliptic-lanceolate, slightly shorter than sepals, abaxially sparsely pilose or subglabrous, margin ciliate, apex acute. Petals 5, white, obovate, nearly 2 × as long as sepals, apex rounded. Stamens up to 10; filaments short. Style lateral. Achenes glabrous. Fl. and fr. Jul–Aug.

Alpine meadows, rock crevices; 3800–4300 m. Xizang, Yunnan [Bhutan, N Myanmar, Nepal, Sikkim].

5. *Sibbaldia tenuis* Handel-Mazzetti, *Acta Horti Gothob.* 13: 330. 1939.

纤细山莓草 xian xi shan mei cao

Herbs perennial. Roots slender, much branched. Rhizome sometimes procumbent and creeping underground. Flowering stems 1.5–6 cm tall, densely pubescent. Radical leaves 1–8.5 cm including petiole; stipules brown, membranous, appressed pilose or subglabrous; petiole appressed pilose; leaf blade 3-foliolate; leaflets sessile, green on both surfaces, elliptic or obovate, 3–15 × 2.5–13 mm, both surfaces appressed pilose, base subrounded or broadly cuneate, margin incised serrate, apex obtuse, rarely subtruncate. Inflorescence corymbose, numerous flowered. Flowers ca. 5 mm in diam. Sepals ovate-triangular, apex acuminate; epicalyx segments lanceolate, slightly shorter than sepals, abaxially appressed pilose, apex acute to acuminate. Petals pink, narrowly oblong, apex obtuse. Stamens 5(or 6), inserted away from broad, 5- or 6-fid disk. Style subterminal. Achenes not seen. Fl. Jun.

• Open places in *Picea* forests, ravines; 2500–3600 m. Gansu, Qinghai, Sichuan.

6. *Sibbaldia sikkimensis* (Prain) Chatterjee, *Notes Roy. Bot. Gard. Edinburgh* 19: 327. 1938.

黄毛山莓草 huang mao shan mei cao

Potentilla sikkimensis Prain, *J. Asiat. Soc. Bengal* 73: 201. 1904, not Th. Wolf (1908); *Sibbaldia melinotricha* Handel-Mazzetti.

Herbs perennial. Roots robust, terete. Flowering stems erect or ascending, 6–30 cm tall, yellow hirsute, glabrescent when old. Radical leaves 4–28 cm including petiole; stipules brown, membranous, abaxially sparsely yellow villous; petiole spreading yellow hirsute; leaf blade 3-foliolate; leaflets shortly petiolulate or subsessile, abaxially dark green, broadly elliptic or obovate, 1.5–4 × 1–3 cm, both surfaces sparsely yellow pilose, base subrounded or broadly cuneate, margin coarsely sharply incised serrate, apex obtuse; cauline leaves 1 or 2, resembling radical ones but petiole shorter and leaflets smaller; stipules green or green-brown, ovate, herbaceous, abaxially sparsely yellow pilose. Inflorescence terminal, pseudo-umbellate. Flowers 5–6 mm in diam.; pedicel 1–1.5 cm, sparsely spreading pilose. Sepals triangular-ovate, apex acute; epicalyx

segments oblong-lanceolate, slightly shorter than sepals, abaxially yellow pilose, apex acute. Petals 5(or 6), dark purple-red or violet, obovate, slightly shorter than sepals, apex rounded. Stamens 5(or 6); filaments short. Style subterminal. Achenes ovoid, purple-brown, glabrous. Fl. and fr. Jun–Aug.

Alpine meadows; 3500–4100 m. Yunnan [N Myanmar, Nepal, Sikkim].

7. *Sibbaldia purpurea* Royle, Ill. Bot. Himal. Mts. 1: 208. 1835.

紫花山莓草 *zi hua shan mei cao*

Herbs perennial, woody based. Rhizome much branched. Flowering stems ascending, 4–10 cm tall, appressed pilose. Radical leaves 1.5–4 cm including petiole; stipules dark brown, membranous, abaxially sparsely sericeous-villous or subglabrous; petiole appressed pilose; leaf blade palmately 5-foliolate; leaflets sessile or subsessile, obovate or obovate-oblong, 5–10 × 3–6 mm, subequal, both surfaces appressed white villous or sericeous-villous, base cuneate or broadly so, margin usually 2- or 3-serrate, apex obtuse. Inflorescence axillary, corymbose and many flowered or a solitary flower. Flowers 4–6 mm in diam., unisexual or bisexual, shorter or longer than subtending leaf. Sepals triangular-ovate, apex acute; epicalyx segments lanceolate, slightly shorter than sepals, abaxially sparsely white pilose, apex acute. Petals 5, purple-red, obovate-oblong, apex emarginate. Disk well developed, purple-red. Stamens 5, alternating with petals. Style lateral. Achenes ovoid, purple-brown, glabrous. Fl. and fr. Jun–Aug.

Forest margins, alpine meadows, rock crevices; 3600–4700 m. Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, NW India, ?Kashmir, Nepal, Sikkim].

- 1a. Flowers solitary, unisexual, usually shorter than subtending leaf *7a. var. purpurea*
 1b. Flowers many in corymbs, rarely solitary, bisexual, longer than subtending leaf *7b. var. macropetala*

7a. *Sibbaldia purpurea* var. *purpurea*

紫花山莓草(原变种) *zi hua shan mei cao (yuan bian zhong)*

Potentilla purpurea (Royle) J. D. Hooker.

Flowers solitary, unisexual, usually shorter than subtending leaf.

Rock crevices on mountain slopes; 4400–4700 m. Xizang [Bhutan, NW India, Nepal, Sikkim].

7b. *Sibbaldia purpurea* var. *macropetala* (Muravjeva) T. T. Yu & C. L. Li in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 340. 1985.

大瓣紫花山莓草 *da ban zi hua shan mei cao*

Sibbaldia macropetala Muravjeva, Trudy Bot. Inst. Akad. Nauk SSSR, Ser. 1, Fl. Sist. Vyssh. Rast. 2: 235. 1936.

Flowers many in corymbs, rarely solitary, bisexual, longer than subtending leaf.

Forest margins, alpine meadows, rock crevices near snow line; 3600–4700 m. Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, Sikkim].

8. *Sibbaldia pentaphylla* J. Krause, Repert. Spec. Nov. Regni Veg. Beih. 12: 410. 1922.

五叶山莓草 *wu ye shan mei cao*

Sibbaldia purpurea Royle var. *pentaphylla* (J. Krause) Dikshit.

Herbs perennial, woody based. Rhizome robust. Flowering stems low, tufted, 2–5 cm tall. Radical leaves 1–1.5 cm including petiole; stipules abaxially brown, membranous, sparsely pilose or subglabrous; petiole sericeous; leaf blade palmately 5-foliolate; leaflets green on both surfaces, obovate or obovate-oblong, 3–8 × 2–5 mm, 2 lateral leaflets much smaller than 3 central ones, both surfaces densely white villous or sericeous-villous, base cuneate, apex truncate or obtuse and 2- or 3-serrate. Inflorescence axillary, 1–3-flowered. Flowers ca. 4 mm in diam., unisexual. Sepals 4 or 5, triangular-ovate, apex acute; epicalyx segments lanceolate, slightly shorter than sepals, abaxially pilose, apex acute. Petals yellowish white, obovate-oblong, apex obtuse. Stamens 4 or 5, inserted away from broad, 4- or 5-fid disk. Style lateral. Achenes glabrous. Fl. and fr. Jun–Aug.

• Alpine meadows, rock crevices; 3700–4500 m. Qinghai, Sichuan, Xizang, Yunnan.

9. *Sibbaldia omeiensis* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 19: 516. 1981.

峨眉山莓草 *e mei shan mei cao*

Herbs perennial. Rhizome robust, terete, much branched, with many lateral roots. Flowering stems erect, 12–15 cm tall, densely appressed white sericeous. Radical leaves 3–7 cm including petiole; stipules brown, membranous, abaxially white sericeous or subglabrous; petiole appressed sericeous; leaf blade palmately 5-foliolate; 2 lateral leaflets sessile, lanceolate, margin entire or 1–3-serrate; 3 central leaflets oblong-lanceolate, larger than lateral 2, both surfaces densely white sericeous-villous and shining, base cuneate, distal margin irregularly 1–4-serrate on each side, apex obtuse or acute; cauline leaf 1, reduced and bractlike; stipules ovate-lanceolate, herbaceous, abaxially densely white sericeous. Flowers 2 or 3, ca. 1.5 cm in diam. Sepals triangular-ovate, apex acuminate; epicalyx segments lanceolate, nearly equaling sepals, abaxially densely white sericeous, apex acuminate. Petals white, obcordate. Stamens ca. 5. Style subterminal; stigma not dilated. Achenes not seen. Fl. Jul.

• Rock crevices; ca. 3000 m. C Sichuan (Emei Shan).

10. *Sibbaldia adpressa* Bunge in Ledebour, Fl. Altaic. 1: 428. 1829.

伏毛山莓草 *fu mao shan mei cao*

Potentilla adpressa (Bunge) Cardot; *P. bifurca* Linnaeus var. *unijuga* Th. Wolf; *P. lindenbergii* Lehmann; *Sibbaldia minutissima* Kitamura; *Sibbaldianthe adpressa* (Bunge) Juzepczuk.

Herbs perennial. Roots much branched, long, slender, woody. Flowering stems low, tufted, 1.5–12 cm tall, sericeous-strigose. Radical leaves 1.5–7 cm including petiole; stipules dark brown, membranous, abaxially subglabrous; petiole sericeous.

ous-strigose; leaf blade pinnate with 2 pairs of leaflets, sometimes 3-foliolate; terminal leaflet oblanceolate or obovate-oblong, base cuneate, rarely broadly so, apex truncate and (2 or)3-serrate, rarely entire; lateral leaflets lanceolate or oblong-lanceolate, 0.5–2 cm × 1.5–6 mm, abaxially sericeous-strigose, adaxially sparsely appressed pilose or subglabrous, base cuneate, decurrent and adnate to the rachis in apical pair of leaflets, margin entire, apex acute; cauline leaves 1 or 2, resembling radical ones; stipules green, lanceolate, herbaceous. Inflorescence cymose and several flowered or a solitary, terminal flower. Flowers 5-merous, 6–10 mm in diam. Sepals triangular-ovate, apex acute; epicalyx segments long elliptic, slightly shorter or longer than sepals, abaxially sparsely sericeous-strigose, apex rounded or acute. Petals yellow or white, obovate-oblong. Stamens ca. 10, slightly shorter than or equaling sepals. Style subbasal. Achenes markedly rugose. Fl. and fr. May–Aug.

Meadows on mountain slopes, sandy river banks, gravels, field margins; 600–4200 m. Gansu, Hebei, Heilongjiang, Nei Mongol, Qinghai, Xinjiang, Xizang [Mongolia, Nepal, Russia].

11. *Sibbaldia sericea* (Grubov) Soják, Folia Geobot. Phytotax. 4: 79. 1969.

绢毛山莓草 juan mao shan mei cao

Sibbaldianthe sericea Grubov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 17: 16. 1955; *Potentilla adpressa* (Bunge) Cardot var. *sericea* Cardot.

Herbs perennial. Roots robust, terete, woody. Flowering stems tufted, 1–4 cm tall, appressed sericeous. Radical leaves 1–4 cm including petiole; stipules brown, membranous, sericeous; petiole appressed sericeous; leaf blade pinnately 5-foliolate or 3-foliolate; leaflets opposite, obovate-lanceolate or narrowly lanceolate, 0.5–1.5 cm × 2–3 mm, both surfaces appressed sericeous, base long cuneate, margin entire, apex acuminate; cauline leaves 3, resembling radical ones but smaller; stipules green, sericeous. Flowers 1 or 2, 4- or 5-merous, 3–5 mm in diam. Sepals ovate-triangular, abaxially sericeous; epicalyx segments lanceolate, abaxially sericeous, apex acute. Petals white, obovate, equaling or slightly longer than sepals. Style lateral. Achenes not seen.

Mountain slopes, desert grasslands; 600–1200 m. Nei Mongol [Mongolia].

12. *Sibbaldia micropetala* (D. Don) Handel-Mazzetti in G. Karsten & Schenck, Vegetationsbilder 22(8): 6. 1932.

白叶山莓草 bai ye shan mei cao

Potentilla micropetala D. Don, Prodr. Fl. Nepal. 231. 1825; *P. albifolia* Wallich ex J. D. Hooker.

Herbs perennial. Roots robust, terete. Flowering stems ascending, 10–30 cm tall, together with petioles densely white tomentose or sometimes sparsely tomentose. Radical leaves 3–5 cm including petiole; stipules brown, membranous, abaxially sparsely white tomentose or subglabrous; leaf blade pinnate with 4–6 pairs of leaflets; leaflets usually opposite, sessile, long elliptic or obovate-oblong, 0.5–1 cm × 3–8 mm, abaxially white tomentose, adaxially gray-white or green tomentose and pubescent, or sparsely pubescent only, base cuneate, broadly so, or subrounded, margin sharply incised serrate, apex rounded; cauline leaves resembling radical ones but leaflets fewer higher up stem, eventually 3-foliolate; stipules leaflike, adaxially green or dark green, herbaceous, abaxially white tomentose, margin incised serrate. Flower solitary, 4–8 mm in diam. Sepals long ovate, apex acuminate; epicalyx segments elliptic-lanceolate, slightly shorter than sepals, abaxially densely white tomentose, apex obtuse or acute. Petals yellow or pale orange, oblong-lanceolate, shorter than or equaling sepals, apex obtuse. Stamens 5, alternating with sepals; filaments short. Style lateral. Achenes brown, ovoid, partly glabrous and partly shallowly grooved. Fl. and fr. Jun–Aug.

Meadows on mountain slopes, sandy river banks; 2700–4300 m. Sichuan, Xizang, Yunnan [Bhutan, NW India, Nepal, Sikkim].

13. *Sibbaldia phanerophlebia* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 19: 517. 1981.

显脉山莓草 xian mai shan mei cao

Herbs perennial. Roots much branched, long, thin. Flowering stems spreading, 4–10 cm, together with petioles yellowish pilose and white tomentose. Radical leaves 2–5 cm including petiole; stipules brown, membranous, abaxially pilose or glabrescent; leaf blade pinnate with 2–4 pairs of leaflets; leaflets opposite, rarely alternate, shortly petiolulate or subsessile, elliptic or obovate, 4–10 × 3–8 mm, abaxially densely white tomentose, adaxially pilose, rarely white tomentose, midvein and lateral veins obvious, sparsely yellow pilose, base broadly cuneate or subrounded, sharply incised serrate, apex obtuse; cauline leaves resembling radical ones but upper ones 3-foliolate; stipules green, ovate, herbaceous, abaxially white tomentose, margin sharply serrate. Flower solitary, 5–6 mm in diam. Sepals triangular, apex acute; epicalyx segments lanceolate, nearly equaling sepals, abaxially yellowish pilose and white tomentose, apex acuminate. Petals tinged yellow, long elliptic, nearly equaling sepals, apex rounded. Stamens ca. 5. Style lateral. Achenes not seen. Fl. Jun.

• Meadows on mountain slopes, rock crevices; 3500–3800 m. Xizang, Yunnan.

38. CHAMAERHODOS Bunge in Ledebour, Fl. Altaic. 1: 429. 1829.

地蔷薇属 di qiang wei shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs or subshrubs, glandular pilose or pubescent. Flowering stems erect, slender. Leaves alternate; stipules membranous at base, adnate to petiole; leaf blade 1–3 times 3-parted into narrow segments. Inflorescence cymose, corymbose, or paniculate, rarely a solitary flower. Flowers small. Hypanthium obconic, tubular, or campanulate. Sepals 5, erect, valvate, persistent. Petals 5, white or purple. Disk lining mouth of hypanthium, setose with long, rigid hairs, margin thickened. Stamens 5, opposite petals. Carpels 4–10

or more; ovule ascending from base of locule; style basal, articulate at base, deciduous; stigma capitellate. Achenes few or many, ovoid, glabrous, enclosed by hypanthium. Seed erect.

About eight species: Asia, North America; five species in China.

- 1a. Herbs biennial or annual, usually 1-stemmed, 20–50 cm tall, slightly woody at base; petals equaling or slightly longer than sepals; carpels 10–15 1. *C. erecta*
- 1b. Herbs perennial or shrubs, many stemmed, tufted, 5–30 cm tall, woody at base; petals shorter or longer than sepals; carpels 4–8.
 - 2a. Radical leaves 2 or 3 times 3-parted.
 - 3a. Flowering stems 10–30 cm tall, sparsely glandular pubescent and villous; ultimate segments of radical leaves linear, apex rounded or acute; cauline leaves present; hypanthium broadly campanulate; petals obovate, longer than sepals, apex emarginate; carpels 4–6 2. *C. canescens*
 - 3b. Flowering stems 6–10 cm tall, glandular pubescent and villous; ultimate segments of radical leaves oblong-spatulate, apex obtuse; cauline leaves present or absent; hypanthium campanulate or obconic; petals lanceolate-spatulate or cuneate, shorter or slightly longer than sepals, apex rounded; carpels usually 6–8 3. *C. sabulosa*
 - 2b. Radical leaves once 3-parted or 3-fid.
 - 4a. Subshrubs, 5–6 cm tall, villous and glandular pubescent; radical leaves 3-parted with linear segments; flowers solitary or 3–5 in cymes 4. *C. altaica*
 - 4b. Herbs perennial, 5–18 cm tall, pilose or glabrous; radical leaves 3-fid with narrowly linear segments; flowers many, in dichasial panicles 5. *C. trifida*

1. *Chamaerhodos erecta* (Linnaeus) Bunge in Ledebour, Fl. Altaic. 1: 430. 1829.

地蔷薇 di qiang wei

Sibbaldia erecta Linnaeus, Sp. Pl. 1: 284. 1753; *Chamaerhodos micrantha* J. Krause; *C. songarica* Juzepczuk.

Herbs biennial or annual, villous and glandular hairy. Roots woody. Flowering stem solitary, rarely few and tufted, erect or arcuate-ascending, 20–50 cm tall, slightly woody at base, often branched in upper 1/2. Radical leaves in a dense rosette, usually withering in fruit; stipules leaflike, 3- or more sect; petiole 1–2.5 cm; leaf blade 1–2.5 cm, 2 times 3-parted, base cuneate; lateral lobes 2-sect, median one often 3-sect into 3–5-fid segments; ultimate segments or lobes linear, 1–2 mm, margin entire, apex obtuse; cauline leaves resembling radical ones but sessile and 3-parted. Inflorescence terminal, cymose, repeatedly dichasially branching into a many-flowered panicle 1.5–3 cm in diam.; bracts and bracteoles 2- or 3-fid with linear lobes. Flowers 2–3 mm in diam.; pedicel long, slender, 3–6 mm. Hypanthium turbinate or campanulate, ca. 1 mm. Sepals ovate-lanceolate, 1–2 mm, apex acuminate. Petals pale pink or white, obovate, 2–3 mm, glabrous, base tapering into a cuneate claw, apex rounded. Stamens shorter than petals. Carpels 10–15, free; ovary ovoid or cylindrical; style lateral-basal. Achenes dark brown, ovoid or cylindrical, 1–1.5 mm, glabrous, smooth, apex mucronate. Fl. and fr. Jun–Aug.

Mountain slopes, hills, dry sandy river banks; ca. 2500 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Xinjiang [Korea, Mongolia, Russia].

This species is used medicinally.

2. *Chamaerhodos canescens* J. Krause, Repert. Spec. Nov. Regni Veg. Beih. 12: 411. 1922.

灰毛地蔷薇 hui mao di qiang wei

Chamaerhodos corymbosa Muravjeva var. *brevifolia* Muravjeva.

Herbs perennial. Roots woody. Flowering stems many, tufted, erect or ascending, 10–30 cm tall, densely glandular pubescent and sparsely pilose at base, branched in upper 1/2. Radical leaves densely arranged; petiole 1.5–3 cm, long setose; leaf blade 1–1.5 cm, 2 times 3-parted, glandular hairy and gray setose, base cuneate; segments entire or 2- or 3-sect into 2- or 3-fid segments; ultimate lobes linear, 4–6 mm, margin entire, apex obtuse or acute; cauline leaves resembling radical ones but petiole ca. 5 mm and lateral segments usually entire, sometimes incised, central segment 3-fid into 2- or 3-lobed lobes. Inflorescence compact, compound, cymose, many flowered; peduncle and pedicels glandular hairy; bracts and bracteoles lanceolate, 5–10 mm, 2- or 3-parted into linear segments, glandular hairy. Flowers 2–3 mm in diam.; pedicel 2–4 mm. Hypanthium broadly campanulate, 2–3 mm, abaxially setose. Sepals lanceolate, ca. 2 mm, markedly 10-ribbed and setose, apex acuminate. Petals pale pink or white, obovate, 3–4 mm, glabrous, base tapering into a cuneate claw, apex emarginate. Filaments 1.5–2 mm, glabrous. Receptacle villous. Carpels 4–6, free; ovary glabrous; style filiform. Achenes black-brown, cylindrical-ovoid, ca. 2 mm, glabrous, apex mucronate. Fl. Jun–Aug, fr. Aug–Oct.

Rocks on mountain slopes. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Mongolia, Russia].

3. *Chamaerhodos sabulosa* Bunge in Ledebour, Fl. Altaic. 1: 432. 1829.

砂生地蔷薇 sha sheng di qiang wei

Herbs perennial. Flowering stems many, tufted, spreading or ascending, 6–10(–18) cm tall, slightly hard, together with leaves and petioles glandular hairy and pilose. Radical leaves in a dense rosette, not withering in fruit; stipules entire at margin; petiole 1.5–2.5 cm; leaf blade 1–3 cm, 3 times 3-parted; segments entire or 2- or 3-sect into entire or 2- or 3-fid segments; ultimate lobes spatulate, 1–2 mm, apex rounded; cauline leaves few or absent, resembling radical ones but 3-parted with segments entire or 2- or 3-fid. Inflorescence terminal, compressed

at anthesis, later becoming lax, paniculate-corymbiform, many flowered; bracts and bracteoles linear, 1–2 mm, margin entire. Flowers 3–5 mm in diam. Hypanthium campanulate or pyriform, 2–4.5 mm, pilose. Sepals erect, triangular-ovate, equaling or slightly longer than hypanthium, apex acute. Petals white or pink, lanceolate-spatulate or cuneate, 2–3 mm, shorter than or equaling sepals, apex rounded. Filaments glabrous, shorter than petals. Carpels (5 or)6–8(–10), free. Achenes brown, shining, ovoid, ca. 1 mm. Fl. Jun–Jul, fr. Aug–Sep.

Sands and gravels on river banks. Nei Mongol, Xinjiang, Xizang [Mongolia, Russia].

4. *Chamaerhodos altaica* (Laxmann) Bunge in Ledebour, Fl. Altaic. 1: 429. 1829.

阿尔泰地蔷薇 a er tai di qiang wei

Sibbaldia altaica Laxmann, Novi Comment. Acad. Sci. Imp. Petrop. 18: 527. 1774.

Subshrubs. Flowering stems many, spreading, forming dense, compact tufts 5–6 cm tall, covered with peeling, dark brown bark and with relics of dead leaves in upper part, villous and glandular pubescent throughout. Radical leaves many; petiole 0.5–1.2 cm; leaf blade 1.5–2.5 cm, once 3-parted; lateral segments entire or 2- or 3-sect; ultimate segments linear. Inflorescence cymose and 3–5-flowered or flower solitary; bracts and bracteoles linear, 1–2 mm. Flowers 4–5 mm in diam.; pedicel 3–5 mm. Hypanthium green or red-purple, tubular, 3–4 mm. Sepals ovate-lanceolate, shorter than or nearly equaling hypan-

thium, abaxially villous and glandular pubescent. Petals purple or violet, obovate to broadly ovate, 4–5 mm, glabrous. Stamens shorter than petals. Carpels 6–10, free. Achenes brown, cylindrical, ca. 2 mm, glabrous. Fl. Jun–Aug, fr. Sep–Nov.

Mountain slopes. Nei Mongol [Mongolia, Russia].

5. *Chamaerhodos trifida* Ledebour, Fl. Ross. 2: 34. 1843.

三裂地蔷薇 san lie di qiang wei

Chamaerhodos klementzii Muravjeva, p.p.

Herbs perennial. Flowering stems many, tufted, erect or ascending, unbranched, 5–18 cm tall, woody at base, pilose or glabrous. Radical leaves 1.5–4 cm, villous and glandular hairy; stipules linear, 4–5 mm, margin entire; petiole 1.5–2 cm; leaf blade once 3-parted; segments linear, entire or 2- or 3-sect; lower cauline leaves shortly petiolate, upper ones sessile; leaf blade 3–5-fid. Inflorescence paniculate, dichasially branched, many flowered; peduncle and pedicels slightly glandular hairy; bracts and bracteoles linear, 2–4 mm, pilose. Flowers 5–6 mm in diam.; pedicel 3–5 mm. Hypanthium tubular, 3–4 mm, abaxially pubescent at base, 10-veined. Sepals triangular-ovate, ca. 2 mm, pilose and glandular hairy, apex acuminate. Petals pink, obovate, 4–6 mm, glabrous, base tapering into a cuneate claw, apex rounded. Filaments shorter than petals, glabrous. Carpels 6–10, free. Achenes cylindrical, ca. 2 mm, glabrous. Fl. Jun, fr. Aug.

Meadows on mountain slopes. Heilongjiang [Mongolia, Russia].

39. FRAGARIA Linnaeus, Sp. Pl. 1: 494. 1753.

草莓属 cao mei shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial, mostly stoloniferous, polygamo-dioecious, usually spreading or appressed hairy. Stolons often rooting at nodes and forming plantlets. Leaves alternate, petiolate; stipules adnate to base of petiole, often membranous, sheathing; leaf blade 3-foliolate or pinnately 5-foliolate. Inflorescence erect, cymose or corymbiform, few flowered, rarely a solitary flower. Hypanthium obconic or turbinate. Sepals 5, valvate, persistent; epicalyx segments 5, alternating with and smaller than sepals, margin entire. Petals 5, white, rarely yellow, broadly obovate or suborbicular. Stamens numerous; anther 2-loculed. Carpels numerous, free, borne on convex receptacle; ovule ascending from middle of locule; style adaxial, short, persistent. Aggregate fruit formed from enlarged receptacle, berry-like, long conic to globose, fleshy. Achenes numerous, seated in pits on surface of aggregate fruit, minute, brittle. Seed testa membranous; cotyledons convex. $x = 7$.

About 20 species: temperate and subtropical regions of N hemisphere, extending to South America; nine species (three endemic, one introduced) in China.

- 1a. Stems and petioles appressed hairy.
 - 2a. Sepals appressed to aggregate fruit 9. *F. nubicola*
 - 2b. Sepals reflexed from aggregate fruit.
 - 3a. Leaflets 5; aggregate fruit ovoid 3. *F. pentaphylla*
 - 3b. Leaflets 3, or if 5 then aggregate fruit globose or ellipsoid.
 - 4a. Aggregate fruit long conic, ovoid, or rarely fusiform; epicalyx segments oblong, apex 2- or 3-lobed; leaflets 3 7. *F. daltoniana*
 - 4b. Aggregate fruit globose or ellipsoid; epicalyx segments linear-lanceolate or linear, apex entire or lobed; leaflets 3 or 5 8. *F. gracilis*
- 1b. Stems and petioles spreading hairy.
 - 5a. Pedicels appressed hairy 1. *F. vesca*
 - 5b. Pedicels densely spreading hairy.
 - 6a. Sepals spreading or reflexed from aggregate fruit.
 - 7a. Leaflets 3, thin, both surfaces hairy, abaxially more densely so on veins; sepals spreading in fruit 2. *F. orientalis*

- 7b. Leaflets 5, thick, abaxially sparsely pilose, adaxially glabrous; sepals reflexed in fruit 3. *F. pentaphylla*
 6b. Sepals appressed to aggregate fruit.
 8a. Leaflets (3 or)5, thin; plants silvery hairy throughout 6. *F. moupinensis*
 8b. Leaflets 3, thick; plants brown-yellow hairy throughout.
 9a. Aggregate fruit 1–1.5 cm in diam.; plants wild 4. *F. nilgerrensis*
 9b. Aggregate fruit to 3 cm in diam.; plants cultivated 5. *F. ×ananas*

1. *Fragaria vesca* Linnaeus, Sp. Pl. 1: 494. 1753.

野草莓 ye cao mei

Fragaria chinensis Losinskaja; *F. concolor* Kitagawa.

Herbs perennial, 5–30 cm tall. Stems together with petioles spreading pilose, rarely glabrescent. Petiole 3–20 cm; leaf blade 3-foliolate, rarely pinnately 5-foliolate; leaflets sessile or central one shortly petiolulate, abaxially greenish, adaxially green, obovate, elliptic or broadly ovate, 1–5 × 0.6–4 cm, abaxially pubescent or sometimes glabrescent, adaxially sparsely pubescent, base cuneate or broadly so, margin obtusely or acutely incised serrate, apex obtuse. Inflorescence corymbiform, 2–4(or 5)-flowered, with a greenish, subulate or petiolate, leafletlike bract. Pedicel 1–3 cm, appressed pilose. Sepals ovate-lanceolate, apex caudate; epicalyx segments linear-lanceolate or subulate, shorter than sepals. Petals white, obovate, base tapering into a short claw. Stamens ca. 20, unequal. Carpels numerous. Aggregate fruit ripening red, ovoid. Achenes ovoid, not prominently rugose. Fl. Apr–Jun, fr. Jun–Sep. $2n = 14$.

Forests, mountain slopes, meadows. Gansu, Guizhou, Jilin, Shaanxi, Sichuan, Xinjiang, Yunnan [widely distributed in N temperate zone].

2. *Fragaria orientalis* Losinskaja, Izv. Glavn. Bot. Sada SSSR 25: 70. 1926.

东方草莓 dong fang cao mei

Fragaria corymbosa Losinskaja; *F. uniflora* Losinskaja.

Herbs perennial, 5–30 cm tall. Stems together with petioles spreading pilose, more densely so in upper parts, sometimes glabrescent. Leaf blade 3-foliolate; leaflets subsessile, abaxially greenish, adaxially green, obovate or rhombic-ovate, 1–5 × 0.8–3.5 cm, abaxially pilose, more densely so on veins, adaxially sparsely pilose, base cuneate on central leaflet, oblique on lateral ones, margin incised serrate, apex rounded or acute. Inflorescence corymbiform, (1 or)2–5(or 6)-flowered, with a pale green or petiolate, leafletlike bract at base. Flowers bisexual, rarely unisexual, 1–1.5 cm in diam.; pedicel 0.5–1.5 cm, spreading pilose. Sepals ovate-lanceolate, apex caudate; epicalyx segments linear-lanceolate, occasionally 2-fid. Petals white, suborbicular, base tapering into a short claw. Stamens 18–22, subequal. Carpels numerous. Aggregate fruit ripening purple, hemispheric; persistent sepals spreading or slightly reflexed. Achenes ovoid, ca. 0.5 mm wide, prominently rugose or only so at base. Fl. May–Jul, fr. Jul–Sep. $2n = 28$.

Forests, meadows on mountain slopes; 600–4000 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi [Korea, Mongolia, E Russia].

3. *Fragaria pentaphylla* Losinskaja, Izv. Glavn. Bot. Sada SSSR 25: 69. 1926.

五叶草莓 wu ye cao mei

Herbs perennial, (6–)10–15 cm tall. Stems taller than leaves, together with petioles densely spreading pilose or sometimes appressed-ascending pilose. Petiole 2–8 cm; leaf blade pinnately 5-foliolate; terminal leaflet shortly petiolulate, distal lateral ones sessile, obovate or elliptic, 1–4 × 0.6–3 cm, base cuneate on terminal leaflet, oblique on lateral ones, margin acutely or obtusely incised serrate, apex rounded; proximal lateral leaflets shortly petiolulate or subsessile, much smaller than distal ones, 6–10 × 4–8 mm. Inflorescence corymbiform, (1 or)2 or 3(or 4)-flowered, with pale brown or petiolate, leafletlike bract at base. Flowers bisexual; pedicel 1.5–2 cm. Sepals 5, ovate-lanceolate, abaxially pubescent; epicalyx segments lanceolate, occasionally 2-fid, nearly equaling but narrower than sepals. Petals white, suborbicular, base tapering into a short claw. Stamens ca. 20, unequal. Carpels numerous. Aggregate fruit ripening red, ovoid; persistent sepals prominently reflexed. Achenes ovoid, ca. 0.5 mm wide, rugose only at base. Fl. Apr–May, fr. May–Jun. $2n = 14^*$.

• Forests, forest clearings, scrub, mountain meadows, open gravels; 1000–2700 m. Chongqing, Gansu, Shaanxi, Sichuan.

White-fruited plants from SE Xizang (Mt. Gyala Peri) were described as *Fragaria pentaphylla* f. *alba* Staudt & Dickoré (Bot. Jahrb. Syst. 123: 348. 2001). *Fragaria tibetica* Staudt & Dickoré (loc. cit.: 349) was described from S Xizang, extending to NW Yunnan and possibly W Sichuan. It differs from *F. pentaphylla* in having unisexual flowers (plants dioecious) and a tetraploid chromosome number ($2n = 28$). White-fruited plants from the Lancang Jiang-Nu Jiang divide in SE Xizang and NW Yunnan were described as f. *alba* Staudt & Dickoré (loc. cit.: 351).

4. *Fragaria nilgerrensis* Schlechtendal ex J. Gay, Ann. Sci. Nat. Bot., sér. 4, 8: 206. 1857.

黄毛草莓 huang mao cao mei

Herbs perennial, robust, 5–25 cm tall. Stems densely tufted, nearly equaling leaves, together with petioles densely yellow-brown sericeous. Petiole 4–18 cm; leaf blade 3-foliolate; leaflets shortly petiolulate, abaxially pale green, adaxially dark green, obovate or elliptic, 1–4.5 × 0.8–3 cm, thick, abaxially yellow-brown sericeous or waxy white papillate, adaxially sparsely pubescent, base cuneate on central leaflet, oblique on lateral ones, margin obtusely or acutely incised serrate, apex rounded. Inflorescence cymose, (1 or)2–5(or 6)-flowered, proximally with a petiolate, 1- or 3-foliolate bract. Flowers bisexual, 1–2 cm in diam. Sepals ovate-lanceolate, as broad as or broader than epicalyx segments; epicalyx segments lanceolate, margin entire or 2-fid. Petals white, rarely reddish purple at base, orbicular, rarely obovate or broadly so, base tapering into a short claw. Stamens ca. 20, unequal. Aggregate fruit ripening white, tinged yellow or red, globose; persistent sepals erect, appressed to aggregate fruit. Achenes ovoid, glabrous. Fl. Apr–Jul, fr. Jun–Aug. $2n = 14$.

Valley forests, forest margins, thickets, meadows on mountain slopes, valleys; 700–3000 m. Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Taiwan, Yunnan [E India, Nepal, Sikkim, N Vietnam].

- 1a. Leaves abaxially yellow-brown sericeous, not papillate, hairs dense and long on veins 4a. var. *nilgerrensis*
 1b. Leaves abaxially waxy white papillate 4b. var. *mairei*

4a. *Fragaria nilgerrensis* var. *nilgerrensis*

黄毛草莓(原变种) huang mao cao mei (yuan bian zhong)

Fragaria hayatae Makino; *F. nilgerrensis* subsp. *hayatae* (Makino) Staudt; *F. vesca* Linnaeus var. *minor* Hayata.

Leaves abaxially yellow-brown sericeous, not papillate, hairs dense and long on veins.

Valley forests, meadows on mountain slopes; 700–3000 m. Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Taiwan, Yunnan [E India, Nepal, Sikkim, N Vietnam].

Two of us (Ikeda and Ohba) believe that the plants from Taiwan should be separated as *Fragaria hayatae* (Makino, Bot Mag. (Tokyo) 26: 285. 1912; *F. nilgerrensis* subsp. *hayatae*; *F. vesca* var. *minor*), which differs from *F. nilgerrensis* in having 1(–3)-flowered inflorescences and petals obovate to broadly so, white with a reddish purple base; *F. nilgerrensis*, on the other hand, has (1 or)2–5(or 6)-flowered inflorescences and petals orbicular, white throughout.

4b. *Fragaria nilgerrensis* var. *mairei* (H. Léveillé) Handel-Mazzetti, Symb. Sin. 7: 507. 1933.

粉叶黄毛草莓 fen ye huang mao cao mei

Fragaria mairei H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 300. 1912.

Leaves abaxially waxy white papillate.

- Forest margins, thickets, meadows on mountain slopes, valleys; 800–2700 m. Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Yunnan.

5. *Fragaria ×ananassa* (Weston) Duchesne in Lamarck, Encycl. 2: 538. 1788.

草莓 cao mei

Fragaria chiloensis (Linnaeus) Miller var. *ananassa* Weston, Bot. Univ. 2: 329. 1771; *F. ×grandiflora* Ehrhart (1792), not (Linnaeus) Crantz (1766); *F. vesca* Linnaeus var. *sativa* Linnaeus.

Herbs perennial, 10–40 cm tall. Stems shorter than or equaling leaves, densely spreading yellow villous. Petiole 2–10 cm; leaf blade 3-foliolate; leaflets shortly petiolulate, abaxially pale green, adaxially dark green, obovate or rhombic, rarely suborbicular, 3–7 × 2–6 cm, thick, abaxially sparsely hairy, more densely so on veins, adaxially subglabrous, base broadly cuneate on central leaflet, oblique on lateral ones, margin acutely incised serrate, apex rounded. Inflorescence cymose, 5–15-flowered, proximally with a shortly petiolate, leafletlike bract. Flowers bisexual, 1.5–2 cm in diam. Sepals ovate, slightly longer than epicalyx segments; epicalyx segments elliptic-lanceolate, enlarged in fruit, margin entire, rarely 2-parted. Petals white, suborbicular or obovate-elliptic, base not prominently

clawed. Stamens ca. 20, unequal. Carpels numerous. Aggregate fruit ripening red, large, to 3 cm in diam.; persistent sepals erect, appressed to aggregate fruit. Achenes acutely ovoid, glabrous. Fl. Apr–May, fr. Jun–Jul.

Cultivated throughout China [of cultivated origin].

Fragaria ×ananassa is a hybrid originally produced in cultivation between *F. chiloensis* (Linnaeus) Miller, native to W North and South America, and *F. virginiana* Miller, native to E North America.

6. *Fragaria moupinensis* (Franchet) Cardot, Bull. Mus. Natl. Hist. Nat. 22: 397. 1916.

西南草莓 xi nan cao mei

Potentilla moupinensis Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 7: 222. 1886.

Herbs perennial, 5–15 cm tall. Stems spreading white sericeous. Leaf blade (3 or)5-foliolate; leaflets shortly petiolulate or sessile, obovate or elliptic, 0.7–4 × 0.6–2.5 cm, abaxially white sericeous, adaxially pilose, base cuneate on terminal leaflet, oblique on lateral ones, margin incised serrate, apex rounded. Inflorescence corymbiform, 1–4-flowered, with a green, leaflet-like bract at base. Flowers bisexual, 1–2 cm in diam.; pedicel 2–8 cm, spreading (rarely appressed) white hairy. Sepals ovate-lanceolate; epicalyx segments lanceolate or linear-lanceolate. Petals white, obovate or suborbicular, base tapering into a short claw. Stamens 20–34, unequal. Aggregate fruit ellipsoid or ovoid; persistent sepals erect, appressed to aggregate fruit. Achenes ovoid, inconspicuously rugose. Fl. May–Jul(–Aug), fr. Jun–Jul. $2n = 28^*$.

- Forests, meadows, mountain slopes; 1400–4000 m. Gansu, Shaanxi, Sichuan, Xizang, Yunnan.

7. *Fragaria daltoniana* J. Gay, Ann. Sci. Nat. Bot., sér. 4, 8: 204. 1857.

裂萼草莓 lie e cao mei

Fragaria sikkimensis Kurz.

Herbs perennial, 4–6 cm tall. Stems slender, subglabrous or sparsely appressed pilose. Petiole appressed pilose; leaf blade 3-foliolate; leaflets shortly petiolulate, abaxially greenish, adaxially dark green, oblong or ovate, 1–2.5 × 0.6–1.5 cm, abaxially appressed pilose along midvein and lateral veins, adaxially subglabrous, base cuneate or oblique, margin incised serrate, apex rounded or acute. Flower solitary, axillary; pedicel 2–5 cm, appressed pilose. Sepals ovate, abaxially sparsely appressed pilose, apex shortly caudate; epicalyx segments oblong, nearly equaling sepals, apex 2- or 3-lobed. Petals white, suborbicular. Stamens and carpels numerous, inserted on convex, pulpy receptacle. Aggregate fruit ripening red, long conic, ovoid, or rarely fusiform, 0.7–2.5 × 0.5–1 cm; persistent sepals spreading. Achenes glabrous. $2n = 14$.

Thickets, meadows on mountain summits; 3300–5000 m. Xizang [Bhutan, NW India, N Myanmar, Nepal, Sikkim].

8. *Fragaria gracilis* Losinskaja, Izv. Glavn. Bot. Sada SSSR 25: 63. 1926.

纤细草莓 xian xi cao mei

Herbs perennial, 5–20 cm tall. Stems slender, appressed pilose. Leaf blade 3-foliolate or pinnately 5-foliolate; leaflets sessile or terminal one shortly petiolulate, elliptic, long elliptic, or obovate-elliptic, 1.5–5 × 0.8–3 cm, abaxially appressed pubescent with hairs dense and long on veins, adaxially pilose, base cuneate or oblique, margin incised serrate, apex rounded or acute. Inflorescence corymbiform, 1–3(or 4)-flowered. Flowers 1–2 cm in diam.; pedicel appressed pubescent. Sepals ovate-lanceolate, apex caudate; epicalyx segments linear-lanceolate or linear, equaling sepals, margin entire or lobed. Petals suborbicular, base tapering into a short claw. Stamens ca. 20, unequal. Aggregate fruit globose or ellipsoid; persistent sepals markedly reflexed. Achenes ovoid, glabrous, inconspicuously rugose at base. Fl. Apr–Jul, fr. Jun–Aug.

• Valley forests, meadows on mountain slopes; 1600–3900 m. Gansu, Henan, Hubei, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

9. *Fragaria nubicola* (J. D. Hooker) Lindley ex Lacaita, J. Linn. Soc., Bot. 43: 476. 1916.

西藏草莓 xi zang cao mei

Fragaria vesca Linnaeus var. *nubicola* J. D. Hooker, Fl. Brit. India 2: 344. 1878.

Herbs perennial, 4–25 cm tall. Stems appressed white sericeous. Petiole appressed (rarely spreading) white sericeous; leaf blade 3-foliolate; leaflets shortly petiolulate or sessile, elliptic or obovate, 1–6 × 0.5–3 cm, abaxially appressed white sericeous, sparsely so between veins, adaxially appressed pilose, base broadly cuneate or rounded, margin sharply incised serrate, apex obtuse. Inflorescence 1- to several flowered. Pedicel appressed white sericeous. Sepals ovate-lanceolate or ovate-oblong, apex acuminate; epicalyx segments lanceolate, abaxially sparsely villous, margin entire, rarely dentate, apex acuminate. Petals obovate-elliptic. Stamens ca. 20. Carpels numerous. Aggregate fruit ovoid; persistent sepals appressed to aggregate fruit. Achenes ovoid, glabrous or rugose. Fl. and fr. May–Aug. $2n = 14$.

Valley forests, forest margins, meadows on mountain slopes; 2500–3900 m. Xizang [Afghanistan, Bhutan, Kashmir, Myanmar, Nepal, Pakistan, Sikkim].

40. DUCHESNEA Smith, Trans. Linn. Soc. London 10: 372. 1811.

蛇莓属 she mei shu

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial. Rhizome short. Stolons procumbent, long, filiform, bearing adventitious roots and forming plantlets at nodes. Radical leaves several, stolon leaves alternate, long petiolate; stipules paired, adnate to base of petiole, persistent; leaf blade 3-foliolate; leaflets dentate at margin. Inflorescence axillary, ebracteate, a solitary flower. Sepals 5, persistent; epicalyx segments 5, larger than and alternating with sepals, margin incised. Petals 5, yellow, obovate. Stamens numerous; anthers subglobose. Carpels numerous, free, inserted on convex receptacle; style adaxial or subterminal, deciduous; stigma entire. Aggregate fruit formed from enlarged receptacle, hemispheric or turbinate, fleshy. Achenes seated on surface of aggregate fruit, compressed ovoid, minute. Seed reniform, smooth. $x = 7$.

Two species: Afghanistan, Bhutan, China, India, Indonesia, Japan, Korea, Malaysia, Nepal, Sikkim; naturalized in Africa, Europe, and North America; two species in China.

- 1a. Leaflets 2–3.5 cm, rarely smaller or larger; flowers 1.5–2.5 cm in diam., rarely smaller; aggregate fruit ripening red, shining, 1–2 cm in diam.; achenes shining when fresh, glabrous or inconspicuously papillate 1. *D. indica*
 1b. Leaflets 1.5–2.5 cm; flowers 0.5–1.5 cm in diam.; aggregate fruit ripening pale pink, not shining, 0.8–1.2 cm in diam.; achenes not shining when fresh, rugose 2. *D. chrysantha*

1. *Duchesnea indica* (Andrews) Focke in Engler & Prantl, Nat. Pflanzenfam. 3(3): 33. 1888.

蛇莓 she mei

Herbs perennial. Rhizome robust, short. Stolons 30–100 cm, together with petioles and pedicels spreading hairy or densely villous. Stipules narrowly ovate to broadly lanceolate, 5–8 mm; petiole 1–5 cm; leaflets petiolulate, obovate to rhombic-oblong, 1–5 × 1–3 cm, both surfaces hairy, or adaxially glabrous or densely villous, margin obtusely serrate, apex rounded. Flowers 1–2.5 cm in diam.; pedicel 0.2–6 cm, pilose or densely villous. Sepals ovate, apex acute; epicalyx segments obovate, longer than sepals, apex usually 3–5-serrate. Petals rounded at apex. Stamens 20–30. Carpels numerous, free. Aggregate fruit ripening red, shining, 1–2 cm in diam., spongy. Achenes shining when fresh, ovoid, ca. 1.5 mm, glabrous or inconspicuously papillate. Fl. Jun–Aug, fr. Aug–Oct.

Mountain slopes, meadows, river banks, wet places, ravines, field margins; below 3100 m. Provinces S of Liaoning [Afghanistan, Bhutan,

India, Indonesia, Japan, Korea, Nepal, Sikkim; naturalized in Africa, Europe, and North America].

- 1a. Leaflets 2–3.5(–5) × 1–3 cm, both surfaces together with petiole pilose or adaxially glabrous; flowers 1.5–2.5 cm in diam., pedicel 3–6 cm, pilose 1a. var. *indica*
 1b. Leaflets to 1 cm, abaxially together with petiole densely villous; flowers to 1 cm in diam., pedicel 0.5–1.5 cm, densely villous 1b. var. *microphylla*

1a. *Duchesnea indica* var. *indica*

蛇莓(原变种) she mei (yuan bian zhong)

Fragaria indica Andrews, Bot. Repos. 7: t. 479. 1807; *Duchesnea indica* var. *major* Makino; *Potentilla indica* (Andrews) Th. Wolf.

Leaflets 2–3.5(–5) × 1–3 cm, both surfaces together with

petiole pilose or adaxially glabrous. Flowers 1.5–2.5 cm in diam.; pedicel 3–6 cm, pilose. $2n = 84$.

Mountain slopes, meadows, river banks, wet places; below 1800 m. Provinces S of Liaoning [Afghanistan, Bhutan, India, Indonesia, Japan, Korea, Nepal, Sikkim; naturalized in Africa, Europe, and North America].

This variety is used medicinally.

1b. *Duchesnea indica* var. *microphylla* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 500. 1980.

小叶蛇莓 xiao ye she mei

Leaflets to 1 cm, abaxially together with petiole densely villous. Flowers to 1 cm in diam.; pedicel 0.5–1.5 cm, densely villous.

• Ravines, field margins; 2500–3100 m. Xizang.

2. *Duchesnea chrysantha* (Zollinger & Moritzi) Miquel, Fl. Ned. Ind. 1: 372. 1855.

皱果蛇莓 zhou guo she mei

Fragaria chrysantha Zollinger & Moritzi, Syst. Verz. 7. 1846; *Duchesnea formosana* Odashima; *D. wallichiana*

(Seringe) Nakai ex H. Hara; *F. indica* Andrews var. *wallichii* Franchet & Savatier; *Potentilla indica* (Andrews) Th. Wolf var. *wallichii* (Franchet & Savatier) Th. Wolf; *P. wallichiana* Seringe.

Herbs perennial. Stolons 30–50 cm, together with stipules and petioles pilose. Stipules lanceolate, 2–3 mm; petiole 1.5–3 cm; leaflets petiolulate, rhombic, obovate, or ovate, 1.5–2.5 × 1–2 cm, abaxially sparsely villous, adaxially subglabrous, base cuneate, margin obtusely or acutely serrate, but entire near base, apex rounded, sometimes mucronate; lateral leaflets sometimes 2- or 3-fid. Flowers 0.5–1.5 cm in diam.; pedicel 2–3 cm. Sepals ovate or ovate-lanceolate, 3–5 mm, abaxially villous, margin ciliate, apex acuminate; epicalyx segments triangular-obovate, 3–7 mm, abaxially sparsely villous, apex 3–5-serate. Petals 2.5–5 mm, glabrous, apex emarginate or rounded. Aggregate fruit ripening pale pink, not shining, 0.8–1.2 cm in diam. Achenes red, not shining when fresh, ovoid, 4–6 mm, rugose. Fl. May–Jul, fr. Jun–Sep. $2n = 14$.

Meadows. Fujian, Guangdong, Guangxi, Shaanxi, Sichuan, Taiwan, Yunnan [India, Indonesia, Japan, Korea, Malaysia].

This species is used medicinally.

41. *ROSA* Linnaeus, Sp. Pl. 1: 491. 1753.

蔷薇属 qiang wei shu

Gu Cui zhi (谷粹芝 Ku Tsue-chih); Kenneth R. Robertson

Shrubs, erect, diffuse, or climbing, mostly prickly, bristly, or rarely unarmed, pubescent, glandular pubescent, or glabrous. Leaves alternate, odd pinnate, rarely simple; stipules adnate or inserted at petiole, rarely absent. Flowers solitary or in a corymb, rarely in a compound corymb or a panicle; bracts solitary, several, or absent. Hypanthium globose, urceolate, or cupular, constricted at neck. Sepals 5, rarely 4, quincuncial: 2 outer, 2 inner, and 1 middle, margin entire or variously pinnately lobed. Petals 5, rarely 4, imbricate, white, yellow, pink, or red; disk inserted at mouth of hypanthium. Stamens numerous, in several whorls, inserted at disk. Carpels free, numerous, rarely few, inserted at margin or base of hypanthium, not or rarely stalked; ovule pendulous; styles terminal or lateral, exserted or not, free or connate at upper part. Fruit a hip, formed from fleshy hypanthium. Achenes numerous, rarely few, on adaxial surface of fleshy hypanthium, woody. Seed pendulous. $x = 7$.

About 200 species: widely distributed from subtropical to cold-temperate regions; 95 species (65 endemic) in China.

The following three species require further study. We are unable to treat them in this account because we have seen no specimens. *Rosa atroglandulosa* C. K. Schneider (Bot. Gaz. (Crawfordsville) 64: 75. 1917), described from Sichuan; *R. beauvaisii* Cardot (Notul. Syst. (Paris) 3: 261. 1916), described from N Vietnam, also reported for SW Guangxi (Longzhou Xian) (Kai Larsen, pers. comm.); and *R. tunquinensis* Crépín (Bull. Soc. Roy. Bot. Belgique 25(2): 192. 1886), described from N Vietnam and China, also reported for Laos (Kai Larsen, pers. comm.).

Several species and hybrids are cultivated in China. The following occur in addition to those mentioned below: *Rosa* × *alba* Linnaeus (of uncertain parentage), *R. centifolia* Linnaeus, *R. damascena* Miller, *R. fortuneana* Lindley (probably *R. banksiae* × *R. laevigata*), and *R. gallica* Linnaeus.

Key based mainly on fertile characters

- 1a. Leaves simple, exstipulate; flower solitary; petals yellow (1. *R.* subgen. *Hulthemia*) 1. *R. berberifolia*
- 1b. Leaves compound, stipulate; flowers solitary to many; petals various shades of white, yellow, pink, or red (2. *R.* subgen. *Rosa*).
 - 2a. Hypanthium depressed-globose; achenes inserted at projecting torus at base of hypanthium; styles free, not exserted (8. *R.* sect. *Microphyllae*).
 - 3a. Leaflets pubescent on both surfaces; sepals entire; petals red; flowers 8–9 cm in diam. 95. *R. praelucens*
 - 3b. Leaflets glabrous; sepals pinnately lobed; petals reddish, pink, or white; flowers 2.5–6 cm in diam.
 - 4a. Petals reddish or pink; flowers solitary, or 2 or 3 and fasciculate, 4–6 cm in diam. 93. *R. roxburghii*
 - 4b. Petals white; flowers 7–17 in corymb, 2.5–3 cm in diam. 94. *R. kweichowensis*
 - 2b. Hypanthium globose to urceolate, rarely depressed-globose; achenes inserted at walls and flat base of hypanthium; styles free or connate into a column, exserted or not.
 - 5a. Stipules free or nearly free from petioles, caducous.

ROSACEAE

- 6a. Branchlets tomentose; leaflets (5–)7–9, stipules pectinate; flower solitary, or 2 or 3 and fasciculate, with large pectinate bracts; styles slightly exserted (7. *R.* sect. *Bracteatae*) 92. *R. bracteata*
- 6b. Branchlets glabrous; leaflets 3–5, stipules dentate or subulate; flowers solitary or numerous, with smaller bracts; styles not exserted.
- 7a. Pedicel and hypanthium densely glandular bristly; flowers large, solitary; petals white; stipules dentate (6. *R.* sect. *Laevigatae*) 91. *R. laevigata*
- 7b. Pedicel and hypanthium not glandular bristly; flowers small, numerous in corymb; petals yellow or white; stipules subulate (5. *R.* sect. *Banksianae*).
- 8a. Flowers in simple umbels or corymbs; sepals entire 89. *R. banksiae*
- 8b. Flowers in compound corymbs; sepals pinnately lobed 90. *R. cymosa*
- 5b. Stipules adnate to petioles, persistent.
- 9a. Styles exserted, free or connate into a column, slightly shorter than or nearly equaling stamens.
- 10a. Styles free, slightly shorter than stamens; leaflets often 3–5 (3. *R.* sect. *Chinenses*).
- 11a. Shrub; leaflets 3–5; stipules glandular pubescent at margin; flowers 4 or 5, rarely solitary, slightly fragrant or not; sepals often pinnately lobed; hip ovoid or pyriform 56. *R. chinensis*
- 11b. Liana; stipules not glandular or only glandular at margin of free part; flowers 1–3, fragrant; sepals entire or slightly incised; hip depressed globose, pyriform, or obovoid.
- 12a. Branchlets sparsely hooked prickly; leaflets 5–9; petals pinkish, yellow, or white; flowers 1–3, 5–10 cm in diam., very fragrant; hip depressed globose 57. *R. odorata*
- 12b. Branchlets prickly, setose; leaflets 3(–5); petals purple-red; flower solitary, 3–3.5 cm in diam.; hip pyriform or obovoid 58. *R. lucidissima*
- 10b. Styles connate into a column, nearly equaling stamens; leaflets 5–9 (4. *R.* sect. *Synstylae*).
- 13a. Stipules pectinate or irregularly serrate at margin.
- 14a. Leaflets 3 or 5(or 7).
- 15a. Leaflets usually 3, ovate-lanceolate; petals pink 73. *R. anemoniflora*
- 15b. Leaflets usually 5, rarely 3 or 7; petals white.
- 16a. Leaflets 4–8 × 1.5–3 cm; flowers 2.5–3.5 cm in diam. 67. *R. sambucina*
- 16b. Leaflets 1.5–3.6 × 0.8–1.5 cm; flowers ca. 2.5 cm in diam. 68. *R. taiwanensis*
- 14b. Leaflets (5 or)7 or 9.
- 17a. Stipules pectinate at margin.
- 18a. Styles and leaflets densely pubescent 63. *R. kunmingensis*
- 18b. Styles glabrous; leaflets pubescent on both surfaces or only abaxially sparsely pubescent or subglabrous.
- 19a. Flower solitary; leaflets not exceeding 1 cm, both surfaces pubescent 62. *R. uniflora*
- 19b. Flowers numerous in panicle; leaflets (1.3–)1.5–5 cm, only abaxially sparsely pubescent or subglabrous.
- 20a. Leaflets doubly serrate at margin; sepals pinnately lobed, lobules linear, abaxially glandular pubescent 61. *R. daishanensis*
- 20b. Leaflets usually simply serrate at margin; sepals 2-lobed usually at middle part, abaxially glabrous.
- 21a. Leaflets 7 or 9, rhomboid-elliptic, base cuneate, margin deeply serrate; sepals entire at margin 59. *R. langyashanica*
- 21b. Leaflets 5–9, obovate, oblong, or ovate, base rounded or broadly cuneate, margin shallowly serrate; sepals usually 2-lobed, sometimes entire at margin 60. *R. multiflora*
- 17b. Stipules irregularly serrate, rarely pectinate at margin.
- 22a. Leaflets abaxially densely villous; styles pubescent.
- 23a. Petals white; flowers 1.5–3 cm in diam., in corymb; pedicel and hypanthium densely pubescent and glandular pubescent; leaflets adaxially pubescent along veins 64. *R. kwangtungensis*
- 23b. Petals pink; flowers 2.5–3 cm in diam., in umbel-like corymb; pedicel and hypanthium glabrous or sparsely glandular pubescent; leaflets adaxially glabrous 65. *R. lichiangensis*
- 22b. Leaflets abaxially glabrous or subglabrous; styles pubescent or not.
- 24a. Styles glabrous 72. *R. maximowicziana*
- 24b. Styles pubescent.
- 25a. Flowers double, numerous in panicle 71. *R. miyiensis*
- 25b. Flowers with 5 petals, usually numerous in corymbs.
- 26a. Shrub prostrate, sprawling, or procumbent; pedicel and hypanthium glabrous 70. *R. luciae*
- 26b. Shrub erect; pedicel and hypanthium glandular and sparsely pubescent 69. *R. pricei*
- 13b. Stipules entire at margin, often glandular pubescent.
- 27a. Leaflets pubescent on both surfaces or only abaxially.

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- 28a. Leaflets thicker in texture, adaxially rugose, abaxially densely gray-white pubescent, with prominent veins 75. *R. glomerata*
- 28b. Leaflets thinner in texture, adaxially not rugose, abaxially sparsely pubescent or along veins more densely pubescent.
- 29a. Leaflets usually 5; sepals usually entire 76. *R. rubus*
- 29b. Leaflets 7–9, often fewer just below inflorescence; sepals often with lateral lobes.
- 30a. Inflorescences umbel-like 77. *R. helenae*
- 30b. Inflorescences compound corymbs 74. *R. brunonii*
- 27b. Leaflets glabrous or sparsely pubescent abaxially along veins.
- 31a. Leaflets leathery, lucid, abaxially glabrous or sparsely pubescent; petals abaxially sericeous.
- 32a. Leaflets 5–9, 3–7 × 1–3.5 cm; sepals 0.8–1.2 cm, both surfaces glandular pubescent; flowers in corymb 78. *R. longicuspis*
- 32b. Leaflets 3–5, 7–12 × 3–6 cm; sepals 1.5–2 cm, both surfaces densely whitish tomentose, not glandular; flowers in compound corymb 79. *R. lasiosepala*
- 31b. Leaflets not leathery, not lucid; petals abaxially glabrous.
- 33a. Leaflets 3–5.
- 34a. Leaflets 3.5–9 cm, abaxially not glandular, margin simply serrate 86. *R. henryi*
- 34b. Leaflets smaller, less than 2.5 cm, abaxially glandular, margin doubly serrate.
- 35a. Leaflets 8–15 mm, apex rounded-obtuse or truncate; flowers solitary, or 2 or 3 and fasciculate 87. *R. duplicata*
- 35b. Leaflets larger, 12–25 mm, apex acute or shortly acuminate; flowers 5–10, in corymb 88. *R. weisiensis*
- 33b. Leaflets (5–)7(–9).
- 36a. Leaflets abaxially glandular, larger.
- 37a. Leaflets obovate, 7–10 × 5–8 mm, margin doubly serrate, teeth apically glandular 80. *R. deqenensis*
- 37b. Leaflets ovate, elliptic, or ovate-oblong, larger, margin simply serrate, teeth not apically glandular.
- 38a. Leaflets oblong-ovate or lanceolate, 4–7 cm; pedicel 2–3 cm 81. *R. filipes*
- 38b. Leaflets elliptic or ovate, 3–6 cm; pedicel 1.5–1.8 cm 82. *R. ludingensis*
- 36b. Leaflets abaxially not glandular, smaller.
- 39a. Leaflets 5(or 7); styles glabrous 83. *R. derongensis*
- 39b. Leaflets usually 7; styles pubescent.
- 40a. Pedicel longer, 2–2.5 cm, and hypanthium, sepals abaxially glandular 84. *R. shangchengensis*
- 40b. Pedicel shorter, not exceeding 1 cm, and hypanthium, sepals usually glabrous, occasionally glandular 85. *R. soulieana*
- 9b. Styles free, not exerted or only slightly so, shorter than stamens.
- 41a. Flowers solitary, rarely several, ebracteate (1. *R. sect. Pimpinellifoliae*).
- 42a. Sepals and petals 5.
- 43a. Flowering branches densely bristly and prickly, rarely without bristles.
- 44a. Leaflets doubly serrate at margin, glandular abaxially 5. *R. kokanica*
- 44b. Leaflets simply serrate at margin, or both simply serrate and doubly serrate on same plant, not glandular punctate abaxially.
- 45a. Leaflets 7–11(–15), elliptic, obovate-elliptic, or oblong-elliptic 4. *R. koreana*
- 45b. Leaflets 7–9, rarely 5 or 11, oblong, oblong-ovate, suborbicular, ovate, or elliptic.
- 46a. Leaflets oblong, oblong-ovate, or suborbicular, 1–2.2 cm; flowers 2–6 cm in diam.; hip black or dark brown, subglobose 2. *R. spinosissima*
- 46b. Leaflets ovate or elliptic, 5–18 mm; flowers 1.5–2 cm in diam.; hip deep red, ellipsoid or ovoid-oblong 3. *R. farreri*
- 43b. Flowering branches only prickly, rarely bristly.
- 47a. Petals white, pinkish, or red.
- 48a. Leaflets 3–7, elliptic or oblong, margin simply serrate; stipules lanceolate, filiform dissected, glandular dentate; petals white; flowers 1.8–2.5 cm in diam.; sepals ovate; pedicel ca. 1.5 cm, glandular or not 66. *R. transmorrisonensis*
- 48b. Leaflets 9–13, ovate or elliptic, margin doubly serrate; stipules broadly oblanceolate, glandular pubescent; petals pink or white; flowers 2.5–4 cm in diam.; sepals ovate-lanceolate or triangular-lanceolate; pedicel 1.5–3 cm, glandular pubescent or glabrous.
- 49a. Leaflets (7–)9–11; petals pink or red; pedicel glandular pubescent or glabrous 11. *R. graciliflora*
- 49b. Leaflets 11–13; petals white; pedicel glabrous, but sparsely glandular pubescent 12. *R. tsinglingensis*
- 47b. Petals yellow.
- 50a. Leaflets doubly serrate, abaxially glandular.

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- 51a. Leaflets 9–15, rarely 7, elliptic, elliptic-ovate, or long elliptic, abaxially glabrous; petals yellowish or yellow-white; flowers 2.5–4 cm in diam.; sepals apically acuminate 9. *R. primula*
- 51b. Leaflets 5–9, rarely 11, broadly ovate or obovate, abaxially pubescent; petals yellow; flowers double, 4–6.5 cm in diam.; sepals leaflike 10. *R. foetida*
- 50b. Leaflets simply serrate, abaxially not glandular.
- 52a. Leaflets 5–9, suborbicular, obovate, or elliptic, glabrous, margin serrate at upper part, entire near base 6. *R. platyacantha*
- 52b. Leaflets 5–13, ovate, elliptic, obovate, or suborbicular, pubescent or glabrous, margin serrate from base to apex.
- 53a. Leaflets ovate, elliptic, or obovate, glabrous, margin acutely serrate or entire; flowers 4–5.5 cm in diam.; branches sometimes bristly at base 7. *R. hugonis*
- 53b. Leaflets broadly ovate or suborbicular, rarely elliptic, abaxially sparsely pubescent, margin obtusely serrate or crenate; flowers 3–4(–5) cm in diam.; branches not bristly at base 8. *R. xanthina*
- 42b. Sepals and petals 4.
- 54a. Leaflets abaxially glandular or at least margin doubly glandular serrate.
- 55a. Leaflets oblong or obovate, abaxially glandular, adaxially glabrous or pilose; hip subglobose, abaxially glandular 18. *R. sikangensis*
- 55b. Leaflets obovate, adaxially densely pubescent, abaxially glabrous, glandular only along veins; hip obovoid, abaxially not glandular 19. *R. zhongdianensis*
- 54b. Leaflets abaxially not glandular, margin simply serrate.
- 56a. Fruiting pedicel turgid.
- 57a. Leaflets 7–9(–13), oblong or oblong-obovate, abaxially glabrous, shortly bristly, margin only near apex serrate; petals yellowish; hip orange-yellow, obconic 13. *R. taronensis*
- 57b. Leaflets 9–17, oblong or elliptic-oblong, abaxially glabrous or puberulous along midvein, margin serrate from base to apex; petals white; hip red or yellow, obovoid or pyriform 14. *R. omeiensis*
- 56b. Fruiting pedicel not turgid.
- 58a. Leaflets glabrous on both surfaces, 7–11, oblong or broadly obovate; hip pyriform or obovoid 15. *R. morrisonensis*
- 58b. Leaflets abaxially densely pubescent, 5–13, ovate, obovate, or oblong-obovate; hip globose, obovoid, or obovoid-globose.
- 59a. Leaflets 7–11(–13), ovate, obovate, or obovate-oblong, adaxially glabrous, abaxially sericeous; hip globose or obovoid, 8–15 mm in diam. 16. *R. sericea*
- 59b. Leaflets 5–9(–11), oblong-obovate, both surfaces sericeous; hip obovoid-globose, ca. 1 cm in diam. 17. *R. mairei*
- 41b. Flowers numerous in corymb or solitary, bracteate (2. *R.* sect. *Cinnamomeae*).
- 60a. Apical part of hypanthium with sepals, disk, and styles deciduous at fruit ripening.
- 61a. Prickles hooked; flowers numerous in corymb or panicle; hip globose 20. *R. beggeriana*
- 61b. Prickles straight; flowers 1–4; hip subglobose, pyriform, or ellipsoid.
- 62a. Branchlets often prickly and setose; leaflets abaxially pubescent; petals white 21. *R. albertii*
- 62b. Branchlets usually only prickly, rarely setose; leaflets abaxially glabrous or pubescent along veins; petals purple-red or pink.
- 63a. Leaflets 7–15, oblong or elliptic, abaxially along veins pubescent, margin usually simply serrate; hip ovoid or ellipsoid 22. *R. prattii*
- 63b. Leaflets 7–9, elliptic, obovate, or suborbicular, abaxially glabrous, margin usually simple serrate or doubly serrate at upper part; hip subglobose 23. *R. willmottiae*
- 60b. Apical part of hypanthium and sepals, disk, and styles not deciduous at fruit ripening.
- 64a. Leaflets ca. 1.5 cm or less, apex usually obtuse; flowers solitary or a few in corymb.
- 65a. Bracteoles 2 or 3 or more, suborbicular, ovate, or broadly ovate, apex rounded-obtuse or acute.
- 66a. Leaflets doubly serrate at margin; bracteoles suborbicular or ovate.
- 67a. Sepals pinnately lobed; leaflets usually 5, rarely 7, abaxially densely glandular pubescent 45. *R. pinnatisepala*
- 67b. Sepals undivided; leaflets 5–7, rarely 9, abaxially sparsely puberulous or glandular pubescent 46. *R. forrestiana*
- 66b. Leaflets simply serrate at margin; bracteoles ovate or broadly ovate.
- 68a. Flowers in corymb or panicle, 3–5 cm in diam.; leaflets 7–9 47. *R. multibracteata*
- 68b. Flower solitary, 2–2.5 cm in diam.; leaflets usually 5, rarely 3 or 7 48. *R. calyptopoda*
- 65b. Bracteoles usually 1, rarely 2, ovate, apex shortly acuminate.
- 69a. Pedicel shorter, 8–15 mm; leaflets abaxially puberulous or sparsely pubescent.

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- 70a. Leaflets usually 7–9, suborbicular, obovate, or elliptic, abaxially puberulous, margin acutely serrate; petals pink; pedicel glandular pubescent 51. *R. giraldii*
- 70b. Leaflets 3–5(–7), abaxially sparsely pubescent, margin obtusely serrate; petals white or pink; pedicel glandular pubescent or not.
- 71a. Leaflets rhomboid-ovate or oblong, abaxially sparsely pubescent, margin obtusely serrate or crenate; petals white, before anthesis pink; pedicel not glandular pubescent 49. *R. pseudobanksiae*
- 71b. Leaflets ovate or ovate-elliptic, abaxially sparsely pubescent and densely glandular; petals pink; pedicel glandular pubescent 50. *R. baiyushanensis*
- 69b. Pedicel longer, 15–30 mm; leaflets glabrous or abaxially along veins pubescent.
- 72a. Leaflets abaxially glandular punctate, 5–7, oblong, margin doubly serrate; petals white; flower solitary, 3.5–4 cm in diam.; hip ovoid, glabrous 55. *R. tibetica*
- 72b. Leaflets abaxially not glandular punctate, 5–11, elliptic to obovate or suborbicular, margin simply serrate; petals pink, purple-red, or white; flowers 1 to several, 2–5 cm in diam.; hip subglobose or ovoid.
- 73a. Leaflets 7–15, broadly elliptic or ovate-elliptic, glabrous; petals pink or purple-red; flowers 1–3, 2–3.5 cm in diam. 52. *R. sertata*
- 73b. Leaflets 5–9, suborbicular, obovate, or broadly elliptic; petals pinkish or white; flowers 1–4, 3–5 cm in diam.
- 74a. Petals pinkish; flowers 3.5–5 cm in diam.; hip subglobose or ovoid, glabrous, rarely glandular punctate; leaflets abaxially often pubescent 53. *R. webbiana*
- 74b. Petals white; flowers 3–4 cm in diam.; hip oblong or ovoid, densely glandular pubescent; leaflets glabrous 54. *R. fedtschenkoana*
- 64b. Leaflets 1.5–7 cm, apex usually acute; flowers numerous, rarely a few in corymb, rarely solitary.
- 75a. Flowers numerous in corymb.
- 76a. Sepals pinnately lobed; leaflets 5–9, abaxially often glandular, glabrous or pubescent along veins, margin often glandular and doubly serrate 24. *R. setipoda*
- 76b. Sepals undivided; leaflets 3–11, abaxially puberulous, subglabrous or glabrous, margin simply serrate, or simple and doubly serrate.
- 77a. Branchlets prickly and setose; leaflets 7–9, abaxially puberulous, margin simply serrate; petals red; flowers in corymb 42. *R. persetosa*
- 77b. Branchlets usually only prickly, sometimes nearly not prickly; leaflets 3–11, abaxially pubescent, subglabrous, or glabrous, margin simple and/or doubly serrate; petals pink or red; flowers in umbel or corymb.
- 78a. Leaflets 3–5(–7), abaxially pubescent or glabrous, margin doubly serrate, or both simple and doubly serrate 25. *R. corymbulosa*
- 78b. Leaflets 7–11, abaxially glabrous, subglabrous, or densely pubescent, margin entire below middle or serrate.
- 79a. Leaflets abaxially glabrous or subglabrous; petals red.
- 80a. Leaflets 3–10 cm, margin serrate from base to apex; pedicel 1.5–4 cm, densely glandular pubescent, rarely glabrous; flowers 3.5–6 cm in diam. 26. *R. caudata*
- 80b. Leaflets 1–2.5 cm, margin entire below middle; pedicel 1.5–3 cm, glabrous or sparsely glandular pubescent; flowers 2–3.5 cm in diam. 52. *R. sertata*
- 79b. Leaflets abaxially densely pubescent, at least along veins pubescent; petals pink.
- 81a. Styles exerted, slightly shorter than stamens; receptacle glandular pubescent, or sometimes puberulous 27. *R. davidii*
- 81b. Styles slightly exerted, much shorter than stamens; receptacle glabrous, rarely glandular pubescent 28. *R. banksiopsis*
- 75b. Flowers solitary or few in corymb.
- 82a. Stipules abaxially not prickly.
- 83a. Branchlets and prickles tomentose; leaflets thick in texture, adaxially rugose 29. *R. rugosa*
- 83b. Branchlets and prickles glabrous; leaflets thinner in texture, not rugose.
- 84a. Leaflets abaxially glandular punctate; prickles straight, slender; hypanthium depressed globose or ovoid-globose.
- 85a. Leaflets 7 or 9, abaxially glaucous, oblong or broadly lanceolate, margin simple or doubly serrate; hypanthium depressed globose 30. *R. davurica*
- 85b. Leaflets 5–9, abaxially not glaucous, ovate or elliptic, margin doubly serrate; hypanthium ovoid-globose 31. *R. hezhangensis*

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- 84b. Leaflets abaxially not glaucous, not glandular; prickles straight, weak, sometimes absent; hypanthium ellipsoid or oblong.
- 86a. Leaflets abaxially glabrous, margin partly doubly serrate; pedicel 1.5–2 cm 34. *R. oxyacantha*
- 86b. Leaflets abaxially puberulous or hirsute, margin simply serrate or sharply doubly serrate; pedicel 2–4 cm.
- 87a. Leaflets abaxially puberulous, margin simply serrate; pedicel 2–3.5 cm 32. *R. acicularis*
- 87b. Leaflets abaxially brown hirsute, margin sharply doubly serrate; pedicel 3–4 cm 33. *R. fargesiana*
- 82b. Stipules abaxially prickly.
- 88a. Prickles hooked; leaflets 7–9, abaxially glabrous or puberulous; petals white or pink; flowers (1 or)3–6; pedicel glandular 35. *R. laxa*
- 88b. Prickles straight or absent; leaflets 7–11, abaxially glabrous, subglabrous, or pubescent; petals pink or red; flowers 1 to several; pedicel glandular pubescent or not.
- 89a. Leaflets abaxially glabrous or subglabrous.
- 90a. Leaflets 7, ovate or ovate-lanceolate, 2.5–6.5 cm; petals dark red; flowers often solitary; pedicel 15–25(–30) mm, usually glabrous 36. *R. saturata*
- 90b. Leaflets 7–9(–11), elliptic or ovate, 1–3 cm; petals pink; flowers 1–3; pedicel 5–30 mm, densely glandular pubescent or glabrous.
- 91a. Pedicel 5–10 mm, densely glandular pubescent; leaflets 1–3 cm, apex acute or obtuse; flowers 2–5 cm in diam. 37. *R. bella*
- 91b. Pedicel 1.5–3 cm, glabrous, rarely glandular pubescent; leaflets 0.6–2.5 cm, apex rounded, obtuse, or acute; flowers 2–3.5 cm in diam. 52. *R. sertata*
- 89b. Leaflets abaxially pubescent, at least along veins.
- 92a. Leaflets 5, rarely 7 or 3, adaxially glabrous, abaxially pubescent or glandular, margin doubly serrate; petals pink; flowers solitary or several, 2.5–3 cm in diam.; pedicel 1.5–3 cm 38. *R. chengkouensis*
- 92b. Leaflets 7–13, adaxially glabrous, abaxially sparsely pubescent, not glandular, margin simple or doubly serrate; petals white, pink, or red; flowers 2 or more; pedicel to 1–4 cm.
- 93a. Flowers 2, fasciculate; pedicel shorter than 1 cm; stipules larger, hooked 39. *R. sinobiflora*
- 93b. Flowers often more than 2; pedicel 1–4 cm; stipules shorter, not hooked.
- 94a. Sepals pinnately lobed, often glandular pubescent.
- 95a. Branches prickly and setose; leaflets 7–11, 2–5 cm, margin doubly serrate, rarely partly simply serrate; petals pink; flowers 3–5 cm in diam. 40. *R. sweginzowii*
- 95b. Branches only prickly; leaflets 7–13, 1–5 cm, margin usually simply serrate; petals dark red; flowers 4–6 cm in diam. 41. *R. moyesii*
- 94b. Sepals entire or pinnately lobed, not glandular pubescent.
- 96a. Petals white or pinkish; branchlets prickly and bristly; leaflets 9–15, elliptic or oblong, 1–4.5 cm, abaxially along veins pubescent, margin simply serrate; flowers 2–3 cm in diam. 44. *R. murielae*
- 96b. Petals rosy or red; branchlets densely setose or sparsely prickly or not prickly; leaflets 7–11, elliptic, ovate-elliptic, or oblong, abaxially glabrous, sparsely pubescent, or densely puberulous, margin simply serrate, rarely doubly serrate; flowers 2.5–5 cm in diam.
- 97a. Branchlets usually densely setose; leaflets 7–9(–11), elliptic or ovate-elliptic, 1.2–3 cm, abaxially glabrous or sparsely pubescent, margin simply serrate, rarely doubly serrate; flowers 2.5–3 cm in diam.; pedicel and receptacle glabrous 42. *R. persetosia*
- 97b. Branchlets usually sparsely prickly or not prickly; leaflets 9–11, oblong or elliptic-ovate, 2.5–6 cm, abaxially densely puberulous, margin simply serrate; flowers 3.5–5 cm in diam.; pedicel and receptacle densely glandular pubescent, rarely glabrous 43. *R. macrophylla*

Key based mainly on vegetative characters

- 1a. Leaves simple, exstipulate; flower solitary; petals yellow 1. *R. berberifolia*
- 1b. Leaves compound, stipulate; flowers solitary to numerous; petals variously colored.
- 2a. Stipules free, deciduous.
- 3a. Leaflets 5–9, elliptic or obovate; stipules pectinate; petals white; flowers solitary, or 2 or 3 and fasciculate, 4.5–7 cm in diam.; bracts large, lacinate, abaxially tomentose 92. *R. bracteata*
- 3b. Leaflets 3–5(–7), elliptic, ovate, elliptic-ovate, obovate, or oblong-lanceolate; stipules pectinate or not; petals variously colored; flowers solitary or several in umbel or corymb; bracts small or absent.

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- 4a. Leaflets 3(or 4), elliptic-ovate or obovate, glabrous; petals white; flower solitary, 5–10 cm in diam.; pedicel and hypanthium densely glandular bristly 91. *R. laevigata*
- 4b. Leaflets 3–5(–7), elliptic, ovate, or oblong-lanceolate; petals yellow or white; flowers 1–3, 1.5–2.5 cm diam.; pedicel and hypanthium often glabrous.
- 5a. Flowers in umbel or corymb; sepals entire 89. *R. banksiae*
- 5b. Flowers in compound corymb; sepals pinnately lobed 90. *R. cymosa*
- 2b. Stipules adnate to petiole, persistent.
- 6a. Stipules pectinate or irregularly serrate at margin; styles connate, exserted.
- 7a. Stipules pectinate.
- 8a. Styles hairy; flowers 5–7-flowered, in corymb; leaflets abaxially densely tomentose-pubescent 63. *R. kunningensis*
- 8b. Style glabrous; flowers solitary to numerous, in panicle or corymb; leaflets abaxially pubescent or tomentose-pubescent.
- 9a. Flower solitary; leaflets 5–7, obovate or broadly elliptic 62. *R. uniflorella*
- 9b. Flowers numerous in panicle; leaflets 5–9, rhomboid-elliptic, obovate, oblong, or ovate.
- 10a. Leaflets 5–7, margin doubly serrate; sepals pinnately lobed, lobules linear, abaxially glandular pubescent 61. *R. daishanensis*
- 10b. Leaflets 5–9, margin simple-serrate, occasionally doubly serrate; sepals entire or 2-lobed, abaxially not glandular pubescent.
- 11a. Leaflets 7–9, rhomboid-elliptic, base cuneate, margin deeply serrate; sepals entire at margin 59. *R. langyashanica*
- 11b. Leaflets 5–9, obovate, oblong, or ovate, base rounded or broadly cuneate, margin shallowly serrate; sepals 2-lobed or entire 60. *R. multiflora*
- 7b. Stipules irregularly serrate at margin.
- 12a. Leaflets 3–5, ovate-lanceolate, oblong-lanceolate, oblong, or oblong-obovate; flowers solitary or 4 to several in corymb.
- 13a. Leaflets ovate-lanceolate or oblong-lanceolate; flowers solitary or in corymb 73. *R. anemoniflora*
- 13b. Leaflets oblong to oblong-obovate; flowers 4 to several in terminal corymb 67. *R. sambucina*
- 12b. Leaflets (5–)7–9, elliptic, oblong, ovate or obovate, not lanceolate; flowers several in corymb.
- 14a. Leaflets abaxially densely villous; styles pubescent.
- 15a. Leaflets 5–9, adaxially along midvein pubescent; petals white or red; flowers 1.5–3 cm in diam.; pedicel and hypanthium densely pubescent and glandular pubescent 64. *R. kwangtungensis*
- 15b. Leaflets 3–5(–7), abaxially glabrous; petals pink; flowers 2.5–3 cm in diam.; pedicel and hypanthium glabrous, rarely sparsely glandular pubescent 65. *R. lichiangensis*
- 14b. Leaflets abaxially glabrous or subglabrous; styles glabrous or pubescent.
- 16a. Leaflets 7–9, rarely 5, apex acute or acuminate, abaxially along veins pubescent; styles glabrous; hip ovoid 72. *R. maximowicziana*
- 16b. Leaflets 5–7, rarely 9, apex rounded-obtuse or acute, abaxially glabrous or sparsely pubescent; styles pubescent; hip globose or subglobose.
- 17a. Leaflets elliptic, ovate, or obovate; hypanthium and sepals abaxially subglabrous 70. *R. luciae*
- 17b. Leaflets ovate or oblong; hypanthium abaxially glandular setulose; sepals glandular setulose on both surfaces 69. *R. pricei*
- 6b. Stipules entire; styles free, rarely connate.
- 18a. Leaflets 3–5(–7).
- 19a. Leaflets doubly serrate at margin.
- 20a. Leaflets glabrous or abaxially pubescent along veins.
- 21a. Leaflets ovate-oblong or elliptic, 2.5–6 cm, apex acute or rounded-obtuse; petals red; flowers numerous in corymb, 2–2.5 cm in diam.; styles free, obviously exserted 25. *R. corymbulosa*
- 21b. Leaflets obovate or elliptic, smaller, 0.8–1.5 cm, apex rounded-obtuse or truncate; petals yellowish or white; flowers 1–3 and fasciculate, ca. 1 cm in diam.; styles connate, slightly exserted 87. *R. duplicata*
- 20b. Leaflets abaxially sparsely pubescent and glandular pubescent.
- 22a. Leaflets 3–5; styles connate or free, exserted or slightly so.
- 23a. Styles connate, exserted; petals white; flowers ca. 1.5 cm in diam., in corymb 88. *R. weisiensis*
- 23b. Styles free, slightly exserted; petals pink; flowers ca. 2.5 cm in diam., solitary, rarely 2 or 3 and fasciculate 50. *R. baiyushanensis*
- 22b. Leaflets 5(–7); styles free, slightly exserted.
- 24a. Leaflets elliptic, oblong, or ovate, 15–35 mm; flowers solitary or several; sepals oblong-lanceolate, margin entire, pubescent outside 38. *R. chengkouensis*

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- 24b. Leaflets obovate or oblong, 5–11 mm; flowers 2 or 3 and fasciculate, rarely solitary; sepals triangular-lanceolate, pinnately lobed, glabrous outside 45. *R. pinnatisepala*
- 19b. Leaflets simply serrate, rarely partly doubly serrate at margin.
- 25a. Old branches prickly, bristly, or setose.
- 26a. Leaflets 5–7(–9), thick, adaxially rugose, abaxially tomentose; branchlets and prickles tomentose; petals purple-red or white; flowers 1–3; hip dark red, depressed-globose 29. *R. rugosa*
- 26b. Leaflets 3–7, thin, adaxially not rugose, glabrous, abaxially pubescent or only along midvein pubescent; branchlets glabrous or subglabrous; petals pink or purple-red; flowers 1–3 or 8–12; hip black-purple, pyriform or obovoid.
- 27a. Petals pink; leaflets 3–7; hip red, pyriform or long ellipsoid, with a distinct neck 32. *R. acicularis*
- 27b. Petals purple-red; leaflets 3(–5); hip purple, obovoid or pyriform, without neck 58. *R. lucidissima*
- 25b. Old branches only prickly, not bristly and setose.
- 28a. Leaflets abaxially ± pubescent.
- 29a. Leaflets less than 1.5 cm, 3–5, margin obtusely serrate; flowers 3–5 in corymb; petals white but pink before anthesis; styles free 49. *R. pseudobanksiae*
- 29b. Leaflets more than 2 cm, 3–7, margin acutely serrate; flowers numerous in compound corymb; petals white; styles connate.
- 30a. Leaflets with both surfaces pubescent, 5–7, oblong or long-lanceolate; branchlets densely pubescent; hip purple-brown, ovoid 74. *R. brunonii*
- 30b. Leaflets adaxially glabrous, 3–7, oblong to ovate or lanceolate; branchlets glabrous or slightly pubescent; hip orange-red or red, subglobose.
- 31a. Leaflets adaxially rugose, abaxially densely grayish pubescent and with prominent veins, 5–7, oblong or oblong-obovate; hip orange-red 75. *R. glomerata*
- 31b. Leaflets abaxially smooth, abaxially with only midvein prominent, 3–7, oblong-ovate, lanceolate, or ovate-elliptic to obovate; hip red.
- 32a. Leaflets abaxially glandular, subglabrous, 5–7, oblong-ovate or lanceolate, apex acuminate.... 81. *R. filipes*
- 32b. Leaflets abaxially not glandular, densely pubescent, (3–)5, ovate-elliptic or obovate, apex caudate-acuminate or acute 76. *R. rubus*
- 28b. Leaflets abaxially glabrous.
- 33a. Erect shrub.
- 34a. Leaflets (5–)7(–9), elliptic or obovate, 1–3 cm, apex rounded-obtuse or acute; styles connate; hip ovoid-globose, orange-red 85. *R. soulieana*
- 34b. Leaflets 3–5(–7), obovate or broadly ovate to ovate-oblong, 0.9–6 cm, apex acuminate or rounded-obtuse; styles free or connate; hip ovoid to pyriform or globose to obovoid-globose, red or red-brown.
- 35a. Leaflets broadly ovate to ovate-oblong, 2.5–6 cm, apex acuminate; styles free; hip red, ovoid to pyriform 56. *R. chinensis*
- 35b. Leaflets obovate, 9–15 × 6–10 mm, apex rounded-obtuse; styles connate; hip red-brown, globose or obovoid-globose 83. *R. derongensis*
- 33b. Climbing liana.
- 36a. Flowers 1–3; styles free.
- 37a. Leaflets 5–9, elliptic or ovate, apex acute or acuminate; petals yellow, pink, or white; sepals entire; hip depressed-ovoid 57. *R. odorata*
- 37b. Leaflets 3(–5), oblong-ovate or long elliptic, apex caudate-acuminate or acute; petals purple-red; sepals entire or slightly incised; hip pyriform or obovoid 58. *R. lucidissima*
- 36b. Flowers numerous in corymb or compound corymb; styles connate.
- 38a. Leaflets 5–9, rarely 3, leathery, shorter, 3–7 cm; petals abaxially pubescent; flowers in corymb 78. *R. longicuspis*
- 38b. Leaflets 3–5, papery or leathery, longer, 3.5–12 cm; petals abaxially glabrous or pubescent; flowers in corymb or compound corymb.
- 39a. Leaflets papery; petals abaxially glabrous; flowers 5–15, in corymb 86. *R. henryi*
- 39b. Leaflets leathery; petals abaxially pubescent; flowers numerous, in compound corymb 79. *R. lasiosepala*
- 18b. Leaflets more than (5–)7.
- 40a. Leaflets more than 2 cm.
- 41a. Leaflets doubly serrate at margin.
- 42a. Branches prickly and setose.
- 43a. Leaflets 7–9, oblong or broadly lanceolate, abaxially puberulous and glandular punctate, apex acute or rounded-obtuse; petals deep pink; hip subglobose or ovoid; sepals persistent 30. *R. davurica*

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- 43b. Leaflets 5–7, ovate, elliptic, or obovate, abaxially pubescent, not glandular punctate, apex rounded-obtuse, rarely acute; petals white; hip pyriform or ellipsoid; sepals deciduous 21. *R. albertii*
- 42b. Branches only prickly, not bristly and setose.
- 44a. Leaflets abaxially pubescent or subglabrous.
- 45a. Prickles straight, stout; leaflets 7–9, oblong or elliptic, abaxially subglabrous, apex rounded-obtuse or acute 34. *R. oxyacantha*
- 45b. Prickles broad, plain; leaflets 7–11, elliptic or ovate-oblong, abaxially pubescent, apex acute, rarely rounded-obtuse 40. *R. sweginzowii*
- 44b. Leaflets abaxially pubescent or subglabrous and glandular.
- 46a. Leaflets 5–9; flowers in lax corymb; styles free, slightly exserted 24. *R. setipoda*
- 46b. Leaflets usually 7; flowers in corymb-panicle; styles connate, exserted 82. *R. ludingensis*
- 41b. Leaflets simply serrate at margin.
- 47a. Leaflets abaxially glabrous or subglabrous.
- 48a. Branches with hooked prickles.
- 49a. Leaflets 5–9, broadly elliptic or elliptic-obovate; flowers several or numerous, rarely solitary; petals white, rarely pinkish; hip red or dark purple, subglobose, with sepals deciduous when ripe 20. *R. beggeriana*
- 49b. Leaflets 7–9, elliptic, oblong, or ovate, rarely obovate; flowers (1 or)3–6; petals white or pink; hip red, oblong or ovoid, with persistent sepals 35. *R. laxa*
- 48b. Branches with straight prickles.
- 50a. Old branches prickly, sometimes densely setose.
- 51a. Branchlets densely bristly; pedicel 1.2–3 cm 42. *R. persetosia*
- 51b. Branchlets often only prickly; pedicel shorter, 5–10 mm 37. *R. bella*
- 50b. Old branches only prickly, usually not setose.
- 52a. Prickles broad, plain, scattered.
- 53a. Petals red; flowers in corymb; sepals caudate, leaflike; pedicel and hypanthium often glandular, rarely smooth 26. *R. caudata*
- 53b. Petals white; flowers compound corymb; sepals pinnately lobed; hypanthium prickly abaxially 94. *R. kweichowensis*
- 52b. Prickles slender, straight, rarely few or absent.
- 54a. Leaflets 9–15, elliptic or oblong, apex acute or shortly acuminate; petals white; pedicel 2–4 cm 44. *R. murielae*
- 54b. Leaflets 7–9(–15), ovate, long elliptic, or ovate-lanceolate, apex acute, acuminate, or rounded-obtuse; petals pink or deep red; pedicel 1.5–3 cm.
- 55a. Leaflets 7–15, ovate or long elliptic, apex acute or rounded-obtuse; petals pink; flowers solitary to several, 2–3.5 cm in diam.; sepals, pedicel, and hypanthium often smooth 52. *R. sertata*
- 55b. Leaflets 7(–9), ovate or ovate-lanceolate, apex acuminate or acute; petals deep red; flowers solitary, rarely 2 or 3, 3.5–5 cm in diam.; pedicel and hypanthium usually glabrous, or sparsely glandular pubescent 36. *R. saturata*
- 47b. Leaflets abaxially pubescent or along midvein and lateral veins pubescent.
- 56a. Flowers numerous in corymb.
- 57a. Pedicel and hypanthium glabrous; leaflets 7–9, ovate or oblong, rarely long elliptic-ovate; petals pink; styles free 28. *R. banksiopsis*
- 57b. Pedicel and hypanthium glandular pubescent; leaflets 5–9, oblong-ovate, ovate-lanceolate, or ovate; petals pink or white; styles free or connate.
- 58a. Petals pink; styles free, slightly exserted 27. *R. davidii*
- 58b. Petals white; styles connate in column.
- 59a. Leaflets (5–)7–9, oblong-ovate or ovate-lanceolate, 2.5–4.5 cm 77. *R. helenae*
- 59b. Leaflets 5–7, ovate to oblong-ovate, 1.5–3.6 cm 68. *R. taiwanensis*
- 56b. Flowers solitary, rarely 2 or 3.
- 60a. Pedicel and hypanthium often glandular pubescent, rarely glabrous.
- 61a. Leaflets 7–13, ovate, elliptic, or oblong-ovate, apex acute or rounded-obtuse; petals deep red; sepals often pinnately lobed; hip orange-red or purple-red, oblong-ovoid or ovoid, to 5 cm 41. *R. moyesii*
- 61b. Leaflets 9–11(–13), oblong or elliptic-ovate, apex acute, rarely rounded-obtuse; petals red; sepals entire; hip deep red, oblong-ovoid or long ovoid, 1.5–3 cm 43. *R. macrophylla*
- 60b. Pedicel and hypanthium glabrous.
- 62a. Leaflets oblong or broadly lanceolate, abaxially usually glandular, apex acute or rounded-obtuse 30. *R. davurica*

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- 62b. Leaflets ovate or ovate-lanceolate or oblong-lanceolate, abaxially eglandular.
- 63a. Leaflets ovate or ovate-lanceolate, apex acuminate or acute; flowers solitary, rarely 2, pedicel 1.5–2.5 cm 36. *R. saturata*
- 63b. Leaflets ovate-lanceolate or oblong-lanceolate, apex acuminate or caudate; flowers 2, pedicel 0.5–1 cm 39. *R. sinobiflora*
- 40b. Leaflets less than 1.5(–2) cm.
- 64a. Leaflets doubly serrate at margin.
- 65a. Leaflets abaxially glabrous, not glandular; branches prickly, bristly, or setose; leaflets (5–)7–9(–11), suborbicular or oblong-ovate; flowers solitary, or 2 or 3 and fasciculate; petals yellow, white, or pink; hip subglobose, black 2. *R. spinosissima*
- 65b. Leaflets abaxially glandular or pubescent; branches prickly, sometimes also bristly and setose; leaflets 5–15, oblong, obovate, ovate, or elliptic; flowers 1–5; petals white, yellow, pink, or red; hip obovoid or subglobose, red or red-brown.
- 66a. Branches prickly, bristly, and setose.
- 67a. Leaflets 7–9(–13), oblong or obovate, both surfaces densely pubescent, abaxially glandular; petals 4, white; hip red, subglobose 18. *R. sikangensis*
- 67b. Leaflets 5–13, ovate, elliptic, obovate, or oblong, abaxially pubescent, adaxially glabrous; petals 5, white or yellow; hip red, dark purple, or red-brown, globose, subglobose, or obovoid.
- 68a. Leaflets 11–13, elliptic or oblong; petals white; hip red-brown, obovoid 12. *R. tsinglingensis*
- 68b. Leaflets 5–9, oblong, ovate, elliptic, or obovate; petals white or yellow; hip red or dark purple, globose or subglobose.
- 69a. Leaflets oblong, abaxially glandular; flower with bracts; petals white; hip red, globose 55. *R. tibetica*
- 69b. Leaflets ovate, elliptic, or obovate, abaxially glandular or pubescent; flower without bracts; petals white or yellow; hip dark purple, subglobose 5. *R. kokanica*
- 66b. Branches only prickly, not bristly and setose.
- 70a. Leaflets hairy on both surfaces or only abaxially hairy.
- 71a. Leaflets abaxially brown hirsute, densely so along veins, elliptic or oblong-elliptic 33. *R. fargesiana*
- 71b. Leaflets pubescent on both surfaces, broadly ovate, obovate, ovate, or elliptic.
- 72a. Leaflets broadly ovate or obovate; flower double, solitary, rarely several, without bracts 10. *R. foetida*
- 72b. Leaflets ovate or elliptic; flowers 3–5 in corymb, with 3–5 bracts 31. *R. hezhangensis*
- 70b. Leaflets abaxially glabrous or subglabrous.
- 73a. Leaflets apically acute or rounded-obtuse.
- 74a. Leaflets (7–)9–15, elliptic, elliptic-obovate, or long elliptic, abaxially glandular, margin obtusely serrate; petals yellowish; hip black-brown, subglobose 9. *R. primula*
- 74b. Leaflets 9–11, ovate or elliptic, abaxially pubescent or glabrous, margin acutely serrate; petals pink; hip red, obovoid 11. *R. graciliflora*
- 73b. Leaflets apically rounded-obtuse or truncate.
- 75a. Sepals and petals 4; leaflets obovate, abaxially not glandular or only glandular along veins 19. *R. zhongdianensis*
- 75b. Sepals and petals 5; leaflets ovate or obovate, abaxially sparsely glandular or not glandular.
- 76a. Styles free, slightly exserted; leaflets 5–7(–9), subrounded, ovate or obovate, abaxially not or sometimes glandular pubescent 46. *R. forrestiana*
- 76b. Styles connate, exserted; leaflets usually 7, obovate, abaxially sparsely glandular pubescent 80. *R. deqenensis*
- 64b. Leaflets simply serrate, rarely partly doubly serrate at margin.
- 77a. Leaflets abaxially glabrous, rarely pubescent when young and wholly soon glabrate.
- 78a. Branches prickly, bristly, and setose.
- 79a. Leaflets entire near base of margin, 7–11, elliptic or ovate; petals pink; hip bright red 3. *R. farreri*
- 79b. Leaflets serrate from base to apex, 5–13, suborbicular to ovate, elliptic, or obovate; petals white or yellow; hip black or purple-red.
- 80a. Leaflets (5–)7–9(–11), suborbicular or oblong-ovate; petals white, pink, or yellow; hip black 2. *R. spinosissima*
- 80b. Leaflets 5–13, ovate, elliptic, or obovate; petals yellow; hip purple-red 7. *R. hugonis*
- 78b. Branches only prickly, not bristly and setose.
- 81a. Prickles slender, straight; styles free.
- 82a. Leaflets serrate from base to apex, 9–15, elliptic, oblong, or obovate, apex mostly acute; petals pink; hip densely prickly 93. *R. roxburghii*

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- 82b. Leaflets entire near base of margin, 5–13, elliptic, ovate-elliptic, suborbicular, oblong, or broadly obovate, apex mostly rounded-obtuse or truncate; petals pink or white; hip glabrous or stipitate glandular.
- 83a. Branches with prickles often in pairs; leaflets 7–11(–13), oblong or broadly obovate; petals white; hip red 15. *R. morrisonensis*
- 83b. Branches sparsely prickly; leaflets 5–11, elliptic, ovate-elliptic, or suborbicular, obovate, or broadly elliptic; petals pink; hip deep red or reddish.
- 84a. Leaflets 7–15, elliptic or ovate-elliptic; pedicel 1.5–3 cm; hip deep red, ovoid 52. *R. sertata*
- 84b. Leaflets 5–9, suborbicular, obovate or broadly elliptic; pedicel 1–1.5 cm; hip reddish, subglobose 53. *R. webbiana*
- 81b. Prickles dilated at base; styles connate, exserted.
- 85a. Styles connate, exserted.
- 86a. Leaflets usually 7, obovate or oblong; flowers 2 or 3 and fasciculate, simple 84. *R. shangchengensis*
- 86b. Leaflets 5–7, elliptic, rarely oblong; flowers double, 10–15 in panicle 71. *R. miyiensis*
- 85b. Styles free, slightly exserted.
- 87a. Leaflets serrate from base to apex at margin.
- 88a. Prickles straight; leaflets 7–13, broadly ovate or suborbicular, rarely elliptic, margin obtusely serrate; petals yellow; hip purple-brown; sepals persistent 8. *R. xanthina*
- 88b. Prickles hooked; leaflets 5–9, broadly elliptic or elliptic-obovate, margin acutely serrate; petals white or pinkish; hip red at first, then becoming black-purple; sepals deciduous 20. *R. beggeriana*
- 87b. Leaflets entire near base of margin.
- 89a. Branches with prickles often in pairs; leaflets 7–11, oblong or broadly obovate, apex truncate; petals 4, white; hip red, glabrous outside 15. *R. morrisonensis*
- 89b. Branches sparsely prickly; leaflets 5–9, suborbicular or ovate, apex rounded-obtuse; petals 5, yellow or white, rarely pink; hip deep red or purple-brown, glandular pubescent or glabrous outside.
- 90a. Leaflets 5–7, suborbicular, obovate, or oblong; petals yellow; flowers without bracts; hip glabrous 6. *R. platyacantha*
- 90b. Leaflets (5–)7(–9), suborbicular or ovate; petals white, rarely pink; flowers with bracts; hip densely glandular pubescent 54. *R. fedtschenkoana*
- 77b. Leaflets abaxially or only along midvein pubescent.
- 91a. Branches prickly, sometimes densely bristly or setose.
- 92a. Leaflets serrate from base to apex at margin.
- 93a. Petals 4, white; hip bright red or yellow; fruiting pedicel short, thickened 14. *R. omeiensis*
- 93b. Petals 5, white or pinkish white; fruiting pedicel slender, not thickened.
- 94a. Branchlets densely prickly; leaflets 7–11; petals pinkish white 4. *R. koreana*
- 94b. Branchlets sparsely prickly, occasionally bristly; leaflets 11–13; petals white 12. *R. tsinglingensis*
- 92b. Leaflets serrate at upper margin, entire at lower margin.
- 95a. Leaflets densely pubescent on both surfaces, 5–9(–11), oblong-obovate or obovate; petals white; hip red; fruiting pedicel slender 17. *R. mairei*
- 95b. Leaflets only abaxially pubescent, 7–15, elliptic, oblong, ovate, or obovate; petals pinkish, yellowish, or white; hip orange-yellow or red; fruiting pedicel stout or slender.
- 96a. Sepals deciduous when fruit ripens; leaflets 7–15, elliptic or oblong, apex obtuse or acute; petals pinkish; pedicel and hypanthium often glandular pubescent 22. *R. prattii*
- 96b. Sepals persistent; leaflets 7–13, ovate or obovate, apex truncate, rounded-obtuse or acute; petals yellowish or white; pedicel and hypanthium glabrous or villous.
- 97a. Leaflets 7–9(–13), obovate or oblong-obovate; petals yellowish; hip orange-yellow; fruiting pedicel turgid at base 13. *R. taronensis*
- 97b. Leaflets 7–9(–11), ovate or obovate, rarely obovate-oblong; petals white; hip red; fruiting pedicel slender 16. *R. sericea*
- 91b. Branches with straight, slender or broad, plain prickles, not bristly and setose.
- 98a. Leaflets 7–13, obovate or broadly elliptic, densely pubescent on both surfaces; petals red; hip sparsely glandular prickly, rarely glabrous 95. *R. praelucens*
- 98b. Leaflets 5–11, pubescent abaxially or only along veins; petals white or red; hip usually prickly.
- 99a. Leaflets apically acute or acuminate, rarely rounded-obtuse.
- 100a. Flowers solitary, or 3–5 in a cyme, without bracts; petals white 66. *R. transmorrisonensis*
- 100b. Flowers numerous in corymb or rarely in panicle; petals red or white.

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- 101a. Leaflets ovate, obovate, or suborbicular, apex rounded-obtuse; petals red; flowers in a corymb, rarely in panicle; bracts many, in 2 whorls: 1 of ovate and 1 of lanceolate bracts; styles free, slightly exerted 47. *R. multibracteata*
- 101b. Leaflets oblong-ovate or ovate-lanceolate, apex shortly acuminate; petals white; flowers in a corymb; bracts caducous, narrowly lanceolate; styles connate, exerted 77. *R. helenae*
- 99b. Leaflets apically usually rounded-obtuse, rarely acute.
- 102a. Sepals deciduous when fruit ripens; leaflets 7–9(–11) 23. *R. willmottiae*
- 102b. Sepals persistent; leaflets 5–9.
- 103a. Bracts 3–5, leaflike, ovate, persistent; leaflets usually 5, rarely 3 or 7 48. *R. calyptopoda*
- 103b. Bracts 1 or 2, membranous, ovate-lanceolate, deciduous, rarely persistent; leaflets 7–9.
- 104a. Leaflets serrate from base to apex at margin; petals pink; pedicel not exceeding 1 cm; hip ovoid; prickles shorter 51. *R. giraldii*
- 104b. Leaflets entire near base of margin; petals reddish; pedicel 1–1.5 cm; hip subglobose; prickles longer, yellowish 53. *R. webbiana*

1. Rosa subgen. Hulthemia (Dumortier) Focke in Engler & Prantl, Nat. Pflanzenfam. 3(3): 47. 1888.

单叶蔷薇亚属 dan ye qiang wei ya shu

Hulthemia Dumortier, Not. *Hulthemia*, 13. 1824.

Leaves exstipulate; leaf blade simple. Flower solitary. Hypanthium globose, bristly.

Two species: Asia; one species in China.

1. Rosa berberifolia Pallas, Nova Acta Acad. Sci. Imp. Petrop. Hist. Acad. 10: 379. 1797.

小槲叶蔷薇 xiao bo ye qiang wei

Hulthemia berberifolia (Pallas) Dumortier.

Shrubs diffuse, dwarf, 30–50 cm tall. Branchlets yellow, smooth when young, becoming dark brown and rough when old, glabrous; prickles in pairs at leaf bases, sparse, yellow, curved, somewhat hooked. Leaves simple, exstipulate, sessile or subsessile; leaf blade elliptic, oblong, rarely ovate, 1–2 × 0.5–1 cm, leathery, glabrous or abaxially sparsely puberulous

when young, base subrounded or cordate, rarely broadly cuneate, margin coarsely serrate, becoming entire toward base, apex rounded-obtuse or acute. Flower solitary, 2–2.5 cm in diam.; pedicel 1–1.5 cm, glabrous; bracts absent. Hypanthium globose, abaxially long bristly. Sepals 5, lanceolate, abaxially puberulous, sparsely long bristly, adaxially grayish tomentose, margin entire, apex caudate or long acuminate. Petals 5, yellow, purple-red spotted at base, obovate, slightly longer than sepals. Stamens purple. Styles free, slightly protruding, densely villous. Hip purple-brown, subglobose, ca. 1 cm in diam., densely setose, with persistent sepals. Fl. May–Jun, fr. Jul–Sep.

Slopes, waste fields; 100–600 m. Xinjiang [Kazakhstan, Russia].

2. Rosa subgen. Rosa

蔷薇亚属 qiang wei ya shu

Leaves stipulate; leaf blade pinnate. Flowers numerous in corymbs, or solitary. Hypanthium urceolate, rarely cupular.

Between 150 and 200 species: N Africa, Asia, Europe, North America; 94 species (65 endemic) in China.

1. Rosa sect. Pimpinellifoliae Candolle ex Seringe, Mus. Helv. Bot. 1: 3. 1818.

芹叶组 qin ye zu

Shrubs erect. Branches often with straight prickles and bristles. Leaflets 7–9, rarely 15–17, often small; stipules narrow, adnate to petiole, auriculate. Flower solitary, without bracts. Sepals persistent, erect, margin entire.

About 25 species: Asia, Europe; 18 species (12 endemic) in China.

2. Rosa spinosissima Linnaeus, Sp. Pl. 1: 491. 1753.

密刺蔷薇 mi ci qiang wei

Shrubs low, ca. 1 m tall. Branches spreading or curved, glabrous; branchlets of present year purple-brown or red-brown; prickles dense to sparse, terete, straight or slightly curved, to 4 mm, fine, bristlelike, abruptly broadening at base, intermixed with smaller bristles. Leaves including petiole 4–8 cm; stipules mostly adnate to petiole, free part ovate, margin entire or ser-

rate, teeth often glandular apically; rachis and petiole sparsely prickly and glandular pubescent; leaflets (5–)7–9(–11), oblong, oblong-ovate, or suborbicular, 1–2.2 × 0.6–1.2 cm, glabrous, base rounded or broadly cuneate, margin simply serrate or partly doubly serrate, teeth glandular apically when young, apex rounded-obtuse or acute. Flowers solitary, or 2 or 3 and fasciculate, axillary, 2–6 cm in diam.; pedicel 1.5–3.5 cm, sparsely pubescent or glabrescent, glandular pubescent or not; bracts absent. Hypanthium subglobose, glabrous. Sepals lan-

ceolate, abaxially glabrous, adaxially pubescent, margin entire, apex acuminate or caudate-acuminate. Petals 5, white, pink, or yellowish, broadly obovate, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, pubescent. Hip black or dark brown, subglobose, 1–1.6 cm in diam., glabrous, shiny, with persistent sepals; pedicel to 4 cm, often glandular. Fl. May–Jun, fr. Oct–Sep.

Scrub in forests, grassy slopes, river sides; 1100–2300 m. Xinjiang [Russia (Siberia); C and SW Asia, Europe].

- 1a. Branchlets densely prickly; flowers smaller, 2–5 cm in diam.; petals white, pink, or yellowish; pedicel pubescent and glandular when young 2a. var. *spinosissima*
 1b. Branchlets slightly prickly; flowers larger, 4–6 cm in diam.; petals white; pedicel glabrous 2b. var. *altaica*

2a. *Rosa spinosissima* var. *spinosissima*

密刺蔷薇(原变种) mi ci qiang wei (yuan bian zhong)

Branchlets densely bristly. Flowers white, pink, or yellowish, 2–5 cm in diam.; pedicel pubescent and glandular when young.

Scrub in forests, grassy slopes, river sides; 1100–2300 m. Xinjiang (Altay Shan, Diqun Xian) [Russia (Siberia); C and SW Asia, Europe].

2b. *Rosa spinosissima* var. *altaica* (Willdenow) Rehder in L. H. Bailey, *Cycl. Amer. Hort.* 4: 1557. 1902.

大花密刺蔷薇 da hua mi ci qiang wei

Rosa altaica Willdenow, *Enum. Pl. Hort. Berol.* 543. 1809.

Branchlets slightly bristly. Flowers white, 4–6 cm in diam.; pedicel glabrous.

Xinjiang [Russia (Siberia)].

3. *Rosa farreri* Cox, *Pl. Introd. Reginald Farrer*, 49. 1930.

刺毛蔷薇 ci mao qiang wei

Rosa farreri f. *persetosa* Stapf.

Shrubs small, 1–2 m tall. Branchlets terete, slender; bristles dense; prickles sparse. Leaves including petiole 3–5 cm; stipules mostly adnate to petiole, free parts lanceolate, glabrous, margin glandular; rachis and petiole glandular pubescent and sparsely prickly; leaflets 7–9(–11), ovate or elliptic, 5–18 × 3–10 mm, glabrous or abaxially along midvein sparsely pubescent, base cuneate or subrounded-obtuse or acute, margin entire near base. Flower solitary, axillary, 1.5–2 cm in diam.; pedicel 1–2.6 cm, glabrous, glandular or not; bracts absent, rarely present, then at base of pedicel, ovate, small. Hypanthium oblong, glabrous. Sepals 5, ovate-lanceolate, abaxially glabrous, adaxially tomentose, margin entire, apex attenuate into a linear part. Petals 5, pink, pinkish, or white, obovate or oblong, apex emarginate. Styles not exerted, much shorter than stamens, densely pubescent. Hip deep red, ellipsoid or ovoid-oblong, 8–12 mm, glabrous, with a short neck at apex and persistent sepals; pedicel 1–2.6 cm, glabrous. Fl. May–Jun, fr. Jun–Sep.

• Scrub; 1500–2800 m. Gansu, Sichuan.

One of us (Robertson) has seen no specimens of this species.

4. *Rosa koreana* Komarov, *Trudy Imp. S.-Peterburgsk. Bot. Sada* 18: 434. 1901.

长白蔷薇 chang bai qiang wei

Shrubs small, ca. 1 m tall, dense. Branchlets dense, dark purple-red, prickles paired below each node and densely scattered, terete, straight, bristlelike, to 6 mm, fine, abruptly flaring to an elliptic base; branches of present year sparsely prickly. Leaves including petiole 4–7 cm; stipules mostly adnate to petiole, free parts ovate-lanceolate, glabrous, margin glandular serrate; rachis and petiole sparsely prickly and glandular; leaflets 7–11(–15), elliptic, obovate-elliptic, or oblong-elliptic, 6–15 × 4–8 mm, abaxially subglabrous or along veins sparsely pubescent, rarely sparsely glandular, adaxially glabrous, base subrounded or broadly cuneate, margin acutely glandular serrate, partly doubly serrate, apex rounded-obtuse. Flower solitary, axillary, 2–3 cm in diam.; pedicel 1.2–2 cm, glandular pubescent; bracts absent. Hypanthium oblong. Sepals 5, lanceolate, abaxially glabrous, adaxially sparsely pubescent, not glandular, rarely sparsely glandular at margin, apex long acuminate or caudate-acuminate. Petals 5, tinged with pinkish, obovate, base cuneate, apex emarginate. Styles free, much shorter than stamens, slightly exerted. Hip orange-red, oblong, 1.5–2 cm, shiny, with persistent, erect sepals; pedicel 1.2–2 cm, glandular pubescent. Fl. May–Jun, Jul–Sep.

Forest margins, scrub, rocky places on slopes; 600–1200 m. Heilongjiang, Jilin, Liaoning [Korea].

- 1a. Abaxial surface of leaflets, petiole, and rachis usually eglandular 4a. var. *koreana*
 1b. Abaxial surface of leaflets, petiole, and rachis densely glandular 4b. var. *glandulosa*

4a. *Rosa koreana* var. *koreana*

长白蔷薇(原变种) chang bai qiang wei (yuan bian zhong)

Abaxial surface of leaflets, petiole, and rachis usually eglandular.

Forest margins, scrub, rocky places on slopes; 600–1200 m. Heilongjiang, Jilin, Liaoning [Korea].

4b. *Rosa koreana* var. *glandulosa* T. T. Yu & T. C. Ku, *Bull. Bot. Res.*, Harbin 1(4): 6. 1981.

腺叶长白蔷薇 xian ye chang bai qiang wei

Abaxial surface of leaflets, petiole, and rachis densely glandular.

• Mixed forest margins. E Jilin.

Based on its original description, the present authors suspect that *R. ussuriensis* Juzepczuk (in Komarov Fl. URSS 10: 451, 637. 1941) may be identical with *R. koreana* var. *glandulosa*, although Juzepczuk compared it with *R. oxyacantha*. The status of *R. ussuriensis* needs further study.

5. *Rosa kokanica* (Regel) Regel ex Juzepczuk in Komarov, Fl. URSS 10: 476. 1941.

腺叶蔷薇 xian ye qiang wei

Rosa platyacantha Schrenk var. *kokanica* Regel, *Trudy*

Imp. S.-Peterburgsk. Bot. Sada 5: 313. 1878; *R. platyacantha* var. *variabilis* Regel; *R. xanthina* Lindley var. *kokanica* (Regel) Boulenger.

Shrubs small, 1.5–2 m tall. Branchlets spreading, straight, rough; prickles dense, straight, fine, firm, flat, tapering to an elliptic base, intermixed with glandular hairs on young branches. Leaves including petiole 4.5–8 cm; stipules mostly adnate to petiole, free parts ovate, margin serrate and glandular; rachis and petiole with short bristles, glandular; leaflets 5–7(–9), ovate, elliptic, or obovate, 1–2.2 × 0.6–1.3 cm, abaxially glandular or sparsely pubescent, with prominent midvein, adaxially glabrous or subglabrous, base broadly cuneate or subrounded, margin acutely doubly serrate, teeth often glandular apically, rounded-obtuse, rarely acute. Flower solitary, axillary, 2–4(–6) cm in diam.; pedicel 1.5–3 cm, glandular or not, glabrous; bracts absent. Hypanthium subglobose, abaxially glandular hispid, with short prickles, or glabrous. Sepals 5, lanceolate, abaxially glandular or not, adaxially sparsely puberulous, irregularly 2- or 3-pinnately lobed, apex long acuminate. Petals 5, pale yellow or white, broadly obovate, apex emarginate. Styles free, much shorter than stamens, slightly exerted, densely pubescent. Hip dark purple or dark brown, subglobose, ca. 1 cm in diam., with persistent, spreading or erect sepals; pedicel 1.5–3 cm, glandular hispid, with short prickles or glabrous. Fl. May–Jul, fr. Aug–Nov.

Slopes at forest margins, an important species in *Larix* forests; 1500–2500 m. Xinjiang [Afghanistan, Kazakhstan, Mongolia; SW Asia (Iran)].

6. *Rosa platyacantha* Schrenk, Bull. Sci. Acad. Imp. Sci. Saint-Pétersbourg 10: 252. 1842.

宽刺蔷薇 kuan ci qiang wei

Shrubs small, 1–2 m tall. Branchlets spreading, robust, glabrous; prickles abundant, yellow, straight or curved, to 8 mm, firm, flat, widening to a broad elliptic base. Leaves including petiole 3–5 cm; stipules mostly adnate to petiole, free parts lanceolate, glandular serrate; rachis and petiole glandular when young; leaflets 5–7(–9), suborbicular, obovate, or oblong, 8–15 × 5–10 mm, leathery, glabrous or abaxially along veins sparsely pubescent, base broadly cuneate or subrounded, margin 4–6-serrate at upper part, entire below, apex rounded-obtuse. Flower solitary, or 2 or 3 and fasciculate, axillary, 3–5 cm in diam.; pedicel 1–3.5 cm, usually glabrous; bracts absent. Hypanthium globose or ovoid, abaxially glabrous. Sepals 5, lanceolate, ca. 2 × as long as hypanthium, adaxially pubescent, margin entire, apex acuminate. Petals 5, yellow, obovate, base cuneate, apex emarginate. Styles free, shorter than stamens, slightly exerted, yellowish white villous. Hip dark red or purple-brown, globose or ovoid, ca. 1 cm in diam., shiny, with persistent, erect sepals; pedicel 1–3.5 cm, usually glabrous. Fl. May–Aug, fr. Aug–Nov. $2n = 14^*$.

Forests, forest margins, scrub, stream sides, arid slopes, waste fields; 1100–1800 m. Xinjiang [Kazakhstan, Mongolia].

7. *Rosa hugonis* Hemsley, Bot. Mag. 131: t. 8004. 1905.

黄蔷薇 huang qiang wei

Shrubs small, ca. 2.5 m tall. Branchlets purple-red, terete,

glabrous, robust when old; prickles scattered, straight, to 1.2 cm, stout, flat, gradually tapering to a broad, elliptic base, base often ca. as long as prickles, intermixed with smaller prickles and bristles. Leaves including petiole 4–8 cm; stipules elongate, mostly adnate to petiole, free parts short, auriculate, glabrous, margin sparsely glandular pubescent; rachis and petiole glandular when young; leaflets 5–13, ovate, elliptic, or obovate, 8–20 × 5–12 mm, glabrous, abaxially with prominent midvein, adaxially concave, base broadly cuneate or subrounded, margin entire or acutely serrate, apex acuminate. Flowers axillary, solitary, 4–5.5 cm in diam.; pedicel 1–2 cm, glabrous; bracts absent. Hypanthium subglobose, abaxially glabrous. Sepals 5, lanceolate, ca. 2 × as long as hypanthium, abaxially glabrous, adaxially slightly pubescent, midvein conspicuous, margin entire, apex acuminate. Petals 5, light yellow, broadly obovate, base broadly cuneate, apex emarginate. Styles free, shorter than stamens, slightly exerted, white villous. Hip purple-red or black-brown, depressed-globose, 1.2–1.5 cm in diam., glabrous, shiny, with persistent, reflexed sepals; pedicel 1–2 cm, glabrous. Fl. May–Jun, fr. Jul–Aug.

• Scrub at forest margins, thickets, open slopes; 600–2300 m. Gansu, Qinghai, Shaanxi, Shanxi, Sichuan.

8. *Rosa xanthina* Lindley, Ros. Monogr. 132. 1820

黄刺玫 huang ci mei

Rosa xanthinoides Nakai.

Shrubs erect, 2–3 m tall. Branchlets diffuse, dense, glabrous, robust when old; prickles paired below some leaves, frequently opposite elsewhere, straight, to 1.2 cm, stout, flat, abruptly flaring to an elliptic base, small prickles and bristles absent. Leaves including petiole 3–5 cm; stipules mostly adnate to petiole, free parts linear-lanceolate, margin serrate and glandular; rachis and petiole sparsely pubescent, sometimes with small prickles; leaflets 7–13, broadly ovate or suborbicular, rarely elliptic, 6–18 × 5–10, abaxially sparsely pubescent when young, glabrescent, adaxially glabrous, base broadly cuneate or subrounded, margin crenate or obtusely serrate, apex rounded-obtuse. Flower solitary, axillary, 3–4(–5) cm in diam.; pedicel 1–1.5 cm, glabrous, not glandular; bracts absent. Hypanthium subglobose or obovate, abaxially glabrous. Sepals 5, lanceolate, abaxially glabrous, adaxially sparsely pubescent, margin entire, apex acuminate. Petals 5 or double, yellow, broadly obovate, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, slightly exerted, villous. Hip purple-brown or black-brown, subglobose or obovoid, 8–10 mm in diam., glabrous, with persistent, reflexed sepals; pedicel 1–1.5 cm, glabrous. Fl. Apr–Jun, fr. Jul–Aug. $2n = 14^*$.

• Scrub, open slopes. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi; also frequently cultivated in N and NE China.

Two forms may be recognized: *Rosa xanthina* f. *normalis* Rehder & E. H. Wilson (in Sargent, Pl. Wilson. 2: 342. 1915; *R. xanthina* f. *spontanea* Rehder), which has single flowers with 5 petals, and f. *xanthina*, which has double or semidouble flowers and is frequently planted in gardens and parks.

9. *Rosa primula* Boulenger, Bull. Jard. Bot. État 14: 121. 1936.

樱草蔷薇 ying cao qiang wei

Shrubs erect, small, 1–2 m tall. Branchlets terete, slender, glabrous; prickles sparse to numerous, paired below some leaves, frequently opposite elsewhere, straight, to 1.5 cm, stout, flat, gradually tapering to a broad elliptic base, small prickles and bristles absent. Leaves including petiole 3–7 cm; stipules mostly adnate to petiole, free parts ovate-lanceolate, glabrous, margin inconspicuously serrate and glandular; rachis and petiole sparsely glandular; leaflets (7–)9–15, elliptic, elliptic-obovate, or long elliptic, 6–15 × 3–8 mm, glabrous, abaxially with prominent midvein, densely glandular punctate, base subrounded or broadly cuneate, margin doubly obtusely serrate, apex rounded-obtuse or acute. Flower solitary, axillary, 2.5–4 cm in diam.; pedicel 8–10 mm, glabrous; bracts absent. Hypanthium ovoid or subglobose, glabrous. Sepals 5, lanceolate, abaxially glabrous, adaxially sparsely villous, margin entire, apex acuminate. Petals 5, yellowish or yellow-white, obovate, base broadly cuneate, apex emarginate. Styles free, shorter than stamens, slightly exerted, villous. Hip red or black-brown, ovoid or subglobose, ca. 1 cm in diam., glabrous, with persistent, reflexed sepals; pedicel to 1.5 cm, glabrous. Fl. May–Jul, fr. Jul–Nov.

• Forests, scrub, slopes; 800–2500 m. Gansu, Hebei, Henan, Shaanxi, Shanxi, Sichuan.

10. *Rosa foetida* Herrmann var. *persiana* (Lemaire) Rehder, Mitt. Deutsch. Dendrol. Ges. 24: 222. 1916.

异味蔷薇 *yi wei qiang wei*

Rosa lutea Miller var. *persiana* Lemaire, Fl. Serres Jard. Eur. 4: t. 374. 1848.

Shrubs 1.5–3 m tall. Branchlets red-brown, slender, glabrous; prickles sparse, terete, straight, to 7 mm, abruptly flaring at base, sometimes intermixed with small prickles and bristles. Leaves including petiole 4–6 cm; stipules mostly adnate to petiole, free parts ovate-lanceolate, margin glandular pubescent, apex acuminate; rachis and petiole pubescent and glandular pubescent; leaflets 5–9, rarely 11, dark green adaxially, broadly ovate or obovate, abaxially sparsely pubescent and glandular pubescent, adaxially pubescent or subglabrous, base subrounded or broadly cuneate, margin doubly serrate, apex acute or truncate. Flowers solitary, rarely several, double, 4–6.5 cm in diam.; pedicel 4–5 cm, glabrous; bracts absent. Hypanthium depressed-globose, glabrous. Sepals 5, ca. 2 × as long as hypanthium, triangular-lanceolate, leaflike, abaxially sparsely pubescent and glandular pubescent, adaxially densely villous, margin entire or outer ones with a few fine lateral appendages. Petals 5, deep yellow. Styles free, not exerted, pubescent. Hip red, globose, with persistent, erect sepals.

Cultivated. S Xinjiang (Yutian Xian) [native to SW Asia].

11. *Rosa graciliflora* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 330. 1915.

细梗蔷薇 *xi geng qiang wei*

Shrubs erect, small, ca. 4 m tall. Branchlets terete, slender, glabrous or subglabrous, sometimes glandular pubescent; prickles sparse, terete, mostly straight, to 1 cm, fine, abruptly flaring to a broad base. Leaves including petiole 5–8 cm; stipules mostly adnate to petiole, free parts auriculate, glabrous, margin glandular

serrate; rachis and petiole shortly prickly and glandular pubescent; leaflets 9–11, rarely 7, ovate or elliptic, 8–20 × 7–12 mm, abaxially glabrous or sparsely pubescent, often glandular, adaxially glabrous, base cuneate or subrounded, margin acutely doubly serrate or partly simply serrate, teeth sometimes glandular apically, apex acute or rounded-obtuse. Flower solitary, axillary, 2.5–3.5 cm in diam.; pedicel 1.5–2.5 cm, glabrous, sometimes sparsely glandular pubescent; bracts absent. Hypanthium oblong-ovoid, glabrous. Sepals 5, ovate-lanceolate, leaflike, abaxially glabrous, adaxially white tomentose, margin entire or sometimes serrate. Petals 5, pink or deep red, obovate, base cuneate, apex emarginate. Styles free, slightly exerted, slightly shorter than stamens, densely pubescent. Hip red, obovoid or oblong-obovoid, 2–3 cm, with persistent, erect sepals; pedicel 1.5–2.5 cm, glabrous. Fl. Jul–Aug, fr. Sep–Oct.

• *Picea* forests, scrub at forest margins, slopes; 3300–4500 m. Sichuan, Xizang, Yunnan.

12. *Rosa tsinglingensis* Pax & Hoffmann, Repert. Spec. Nov. Regni Veg. Beih. 12: 414. 1922.

秦岭蔷薇 *qin ling qiang wei*

Shrubs small, 2–3 m tall. Branchlets slender; prickles sparse, occasionally bristly and glandular pubescent. Leaves including petiole 5–11 cm; stipules mostly adnate to petiole, apical free parts auriculate, glabrous, margin glandular serrate; rachis and petiole sparsely prickly and glandular pubescent; leaflets 11–13, rarely 9, elliptic or oblong, 1–2 × 0.8–1.2 cm, abaxially glabrous or subglabrous, along midvein glandular pubescent, adaxially glabrous, with concave veins, base subrounded or broadly cuneate, margin doubly or simply serrate, teeth glandular apically when young, apex rounded-obtuse or acute. Flower solitary, axillary, 2.5–3 cm in diam.; pedicel 1.5–2 cm, sparsely glandular pubescent; bracts present or not. Hypanthium glabrous. Sepals 5, triangular-lanceolate, leaflike, abaxially glabrous, adaxially densely pubescent, margin entire or serrate. Petals 5, white, obovate, base cuneate, apex emarginate. Styles free, slightly exerted, much shorter than stamens, densely pubescent. Hip red-brown, obovoid or oblong-obovoid, 2–3 cm, with persistent, erect sepals; pedicel 1.5–2 cm, sparsely glandular pubescent. Fl. Jul–Aug, fr. Sep.

• *Betula* forests, scrub; 2800–3700 m. Gansu, Shaanxi.

One of us (Robertson) has seen no specimens of this species.

13. *Rosa taronensis* T. T. Yu, Bull. Bot. Res., Harbin 1(4): 6. 1981.

球江蔷薇 *qiu jiang qiang wei*

Shrubs 1–2.5 m tall. Branchlets terete, often glabrous; prickles paired at leaf bases, terete, straight, to 8 mm, abruptly flaring to a broad base; bristles dense, much shorter than prickles. Leaves including petiole 4–10 cm; stipules broad, mostly adnate to petiole, free parts ovate, glabrous, apex caudate; rachis and petiole glabrous, with numerous small prickles; leaflets 7–9(–13), oblong or oblong-obovate, 1–3 × 0.5–1.2 cm, glabrous or abaxially along midvein sparsely pubescent and with small prickles, base broadly cuneate or subrounded, margin acutely serrate at upper 1/3–1/2 part, entire at lower part, apex

truncate. Flower solitary, 3.5–4 cm in diam.; pedicel to 1.2 cm, glabrous; bracts absent. Hypanthium obconic, glabrous. Sepals 4, broadly ovate, abaxially pubescent or subglabrous, adaxially densely yellow-white villous, margin entire, apex shortly caudate. Petals 4, yellowish, broadly obovate, base broadly cuneate, apex emarginate. Styles free, slightly exerted, shorter than stamens. Hip orange-yellow, obconic, ca. 1 cm in diam., usually with persistent, erect sepals; pedicel turgid at base, to 1.2 cm, glabrous.

- Mixed forests, grassy places; 2400–3300 m. NW Yunnan.

14. *Rosa omeiensis* Rolfe, Bot. Mag. 138: t. 8471. 1912.

峨眉蔷薇 e mei qiang wei

Rosa sericea Lindley f. *aculeatoglandulosa* Focke; *R. sericea* f. *inermieglandulosa* Focke; *R. sorbus* H. Léveillé.

Shrubs erect, 1–4 m tall. Branchlets slender; prickles absent or if present, paired below leaves, terete, straight, to 7 mm, abruptly flaring to a broad base, or prickles winglike, to 1.5 cm and 3 cm in diam.; bristles absent or if present, dense. Leaves including petiole 3–6 cm; stipules mostly adnate to petiole, free parts triangular-ovate, margin serrate or entire, sometimes glandular; rachis and petiole with a few small prickles; leaflets (5–)9–13(–17), oblong or elliptic-oblong, 8–30 × 4–10 mm, abaxially glabrous or pubescent, glandular or not, adaxially glabrous, with concave midvein, base rounded-obtuse or broadly cuneate, margin acutely serrate, apex acute or rounded-obtuse. Flower solitary, axillary, 2.5–3.5 cm in diam.; pedicel 6–20 mm, glabrous; bracts absent. Hypanthium obovoid or pyriform, glabrous. Sepals 4, lanceolate, abaxially subglabrous, adaxially sparsely pubescent, margin entire, apex acuminate or long caudate. Petals 4, white, obtriangular-ovate, base broadly cuneate, apex emarginate. Styles free, shorter than stamens, villous. Hip bright to deep red or yellow, obovoid or pyriform, 8–15 mm in diam., glabrous or glandular pubescent, with persistent, erect sepals; pedicel yellow, tapering to hip, 6–20 mm, stout, fleshy, glabrous. Fl. May–Jun, fr. Jul–Sep.

- *Abies* forests, thickets, scrub, pastures, hillsides, slopes; 700–4000 m. Gansu, Guizhou, Hubei, Ningxia, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

Four forms can be recognized: *R. omeiensis* f. *omeiensis*, which has leaflets abaxially pubescent to subglabrous and non-glandular; f. *glandulosa* T. T. Yu & T. C. Ku (Bull. Bot. Res., Harbin 1(4): 7. 1981), which has abaxially densely glandular leaflets; f. *pteracantha* Rehder & E. H. Wilson (in Sargent, Pl. Wilson. 2: 332. 1915), which has branches with purple, broad, flat, winglike prickles; and f. *paucijuga* T. T. Yu & T. C. Ku (Acta Phytotax. Sin. 18: 502. 1986), which has only 5–9 glabrous leaflets, slightly turgid fruiting pedicels, and is intermediate between *R. omeiensis* and *R. sericea*.

The root bark, which contains about 16% tannin, is used for tanning. The sweet, edible fruit are used medicinally and to ferment wine.

15. *Rosa morrisonensis* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 97. 1911.

玉山蔷薇 yu shan qiang wei

Rosa sericea Lindley var. *morrisonensis* (Hayata) Masamune.

Shrubs small, 1–2 m tall. Branchlets glabrous; prickles in pairs below leaves, straight, to 1.3 cm, flat; bristles sometimes present and dense. Leaves including petiole 3–5 cm; stipules adnate to petiole, free parts oblong-lanceolate, glabrous, margin entire or sparsely crenate and glandular, apex acuminate; rachis and petiole with a few short prickles, glandular pubescent; leaflets 7–11(–13), obovate or oblong, 6–12 × 5–8 mm, glabrous, base subrounded or broadly cuneate, margin acutely serrate in upper part, entire below, apex rounded-obtuse or truncate. Flower solitary at tips of short branches, axillary, ca. 2.5 cm in diam.; pedicel 1–1.5 cm, glabrous or subglabrous; bracts absent. Hypanthium pyriform or oblong, glabrous. Sepals 4, lanceolate, abaxially glabrous, sometimes sparsely glandular, adaxially densely pubescent, margin entire, apex long acuminate. Petals 4, white, slightly long obovate, base cuneate, apex rounded. Styles free, exerted, much shorter than stamens, stout, villous. Hip red, pyriform or obovoid, 6–8(–15) mm in diam., with persistent, spreading sepals; pedicel ca. 1.5 cm, glabrous. Fl. Jun–Jul.

- Alpine regions; 3200–4200 m. Taiwan (Yushan).

16. *Rosa sericea* Lindley, Ros. Monogr. 105. 1820.

绢毛蔷薇 juan mao qiang wei

Rosa tetrapetala Royle; *R. wallichii* Trattinnick.

Shrubs erect, 1–2 m tall. Branchlets purple-red or purple-brown, glabrous, robust when old; prickles absent or in pairs below leaves and scattered, terete, to 1.2 cm, fine to robust, abruptly flaring to a broad base, or prickles winglike, to 1.2 cm and 3.5 cm in diam.; bristles sometimes dense. Leaves including petiole 3.5–8 cm; stipules mostly adnate to petiole, free parts auriculate, pubescent or glabrous, margin glandular; rachis and petiole pubescent, sometimes sparsely prickly and glandular pubescent; leaflets (5–)7–11(–13), ovate or obovate, rarely obovate-oblong, 8–20 × 5–8 mm, abaxially sericeous-villous or subglabrous to glabrous, glandular or not, adaxially glabrous, rugose, base broadly cuneate, margin serrate in upper part, entire below, apex rounded-obtuse or acute. Flower solitary, axillary, 2.5–5 cm in diam.; pedicels 1–2 cm, glabrous; bracts absent. Hypanthium obovoid or globose, subglabrous. Sepals 4, ovate-lanceolate, abaxially sparsely pubescent or subglabrous, adaxially villous, margin entire, apex acuminate or acute. Petals 4, white, broadly obovate, base broadly cuneate, apex emarginate. Styles free, shorter than stamens, slightly exerted, villous. Hip red or purple-brown, obovoid or globose, 8–15 mm in diam., glabrous, with persistent, erect sepals; pedicel 1–2 cm, glabrous, usually not fleshy. Fl. May–Jun, fr. Jul–Aug. $2n = 14$.

Sparse woods, forest margins, scrub, valley slopes, dry valleys, cliffs, mountain summits, gravels, dry sunny places; 2000–4400 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Sikkim].

Four forms can be recognized: f. *sericea*, which has leaflets abaxially pubescent, non-glandular; f. *glandulosa* T. T. Yu & T. C. Ku (Acta Phytotax. Sin. 18: 503. 1980), which has leaflets abaxially pubescent and glandular; f. *glabrescens* Franchet (Pl. Delavay. 220. 1890), which has leaflets abaxially glabrous or subglabrous; and f. *pteracantha* Franchet (loc. cit.), which has branches with broad, flat, winglike prickles.

17. *Rosa mairei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 299. 1912.

毛叶蔷薇 mao ye qiang wei

Shrubs small, 0.5–2 m tall. Branchlets red-purple or brown-purple, terete, robust; prickles in pairs below leaves, straight, to 1 cm, fine to stout or winglike on same plant, gradually tapering to thickened base, winged prickles to 2 cm in diam.; bristles scattered to dense on older stems. Leaves including petiole 2–7 cm; stipules mostly adnate to petiole, free parts ovate, pubescent, margin serrate or entire; rachis and petiole sericeous; leaflets 5–9(–11), oblong-ovate or obovate, sometimes oblong, 6–20 × 4–10 mm, both surfaces sericeous, base cuneate or subrounded, margin serrate at upper 1/3–2/3 part, apex rounded-obtuse or truncate. Flower solitary, axillary, 2–3 cm in diam.; pedicel 8–15 mm, pubescent; bracts absent. Hypanthium ovoid, glabrous. Sepals 4, ovate or lanceolate, abaxially sparsely pubescent, adaxially densely pubescent, margin entire, apex acuminate. Petals 4, white, broadly obovate, base cuneate, apex undulate. Styles free, much shorter than stamens, slightly exerted, pubescent. Hip red or brown, ovoid-globose, ca. 1 cm in diam., glabrous, with persistent, erect or reflexed sepals; pedicel 8–15 mm, pubescent. Fl. May–Jul, fr. Jul–Oct.

• Stream sides in forests, sunny slopes; 2300–4200 m. Guizhou, Sichuan, Xizang, Yunnan.

18. *Rosa sikangensis* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 501. 1980.

川西蔷薇 chuan xi qiang wei

Shrubs small, 1–1.5 m tall. Branchlets terete, subglabrous; prickles in pairs below leaves, or sparse and intermixed with dense slender bristles; bristles glandular apically when young. Leaves including petiole 3–5 cm; stipules broad, mostly adnate to petiole, free parts ovate or hooked, pubescent or glabrous, margin glandular; rachis and petiole pubescent and glandular pubescent, sparsely small prickly; leaflets 7–9(–13), oblong or obovate, 6–10 × 4–8 mm, abaxially pubescent and glandular, adaxially glabrous or pubescent, base subrounded or broadly

cuneate, margin densely doubly serrate, apex rounded-obtuse or truncate. Flower solitary, axillary, ca. 2.5 cm in diam.; pedicel 8–12 mm, glandular pubescent; bracts absent. Hypanthium ovoid, glabrous. Sepals 4, ovate-lanceolate, abaxially sparsely pubescent and glandular, adaxially densely pubescent, margin entire, apex long acuminate. Petals 4, white, obovate, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, villous. Hip red, subglobose, ca. 1 cm in diam., abaxially glandular pubescent; pedicel 8–12 mm, slender, glandular pubescent. Fl. May–Jun, fr. Jul–Sep.

• Scrub, river sides, roadsides; 2900–4200 m. Sichuan, Xizang, Yunnan.

One of us (Robertson) has seen no specimens of this species.

Two forms may be recognized: f. *sikangensis*, which has leaflets adaxially glandular and f. *pilosa* T. C. Ku (Bull. Bot. Res., Harbin 10(1): 1. 1990), which has leaflets adaxially eglandular or glandular only along the veins.

19. *Rosa zhongdianensis* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 1. 1990.

中甸蔷薇 zhong dian qiang wei

Shrubs small, ca. 2 m tall. Branchlets red-brown, terete, usually glabrous; prickles in pairs below leaves, rarely sparse, flat, broad at base. Leaves including petiole 1.5–2.8 cm; stipules mostly adnate to petiole, free parts oblong, glandular pubescent or glabrous abaxially, margin glandular pubescent, apex rounded; rachis and petiole pubescent and glandular pubescent; leaflets (5–)7, obovate, 5–8 × 3–5 mm, abaxially glabrous, glandular often along veins, adaxially densely pubescent, base cuneate, margin densely doubly serrate, densely glandular apically, apex rounded or truncate. Flower solitary, axillary; pedicel 5–7 mm, glabrous; bracts absent. Hypanthium obovoid, glabrous. Sepals 4, lanceolate, 9–12 mm, both surfaces densely pubescent, margin entire, apex long acuminate, caudate. Petals 4, white. Styles free, shortly exerted, shorter than stamens, pilose. Hip dark red, obovoid, glabrous; pedicel glabrous. Fr. Jul–Sep.

• About 2600 m. NW Yunnan (Zhongdian Xian).

2. *Rosa* sect. *Cinnamomeae* Candolle ex Seringe, Mus. Helv. Bot. 1: 2.1818.

桂味组 gui wei zu

Shrubs erect, with prickles in pairs or scattered, often bristly. Stipules broad or narrow, adnate to petiole; leaflets 5–15. Flowers usually numerous, rarely solitary, with large, broad bracts. Sepals often entire, after anthesis erect, persistent, rarely deciduous; styles free, not or slightly exerted.

About 50 species: Asia, Europe, North America; 36 species (26 endemic) in China.

20. *Rosa beggeriana* Schrenk in Fischer & C. A. Meyer, Enum. Pl. Nov. 1: 73. 1841.

弯刺蔷薇 wan ci qiang wei

Shrubs 1.5–3 m tall. Branchlets purple-brown, terete, slightly curved, glabrous; prickles scattered and in pairs below leaves, yellowish, hooked, to 8 mm, slender to stout, gradually tapering to broad base. Leaves including petiole 3–9 cm; stipules mostly adnate to petiole, free parts ovate, margin glandular serrate, apex acuminate; rachis and petiole pubescent, sometimes with small prickles; leaflets 5–9, broadly elliptic or ellip-

tic-obovate, 8–25 × 5–12 mm, both surfaces pubescent, densely so, or glabrous, midvein prominent abaxially, concave adaxially, base subrounded or broadly cuneate, margin acutely simply serrate, near base entire, apex acute or rounded-obtuse. Flowers several or numerous in corymb or panicle, rarely solitary, 2–3 cm in diam.; pedicel 1–2 cm, glabrous or pubescent, occasionally sparsely glandular pubescent; bracts 1–3(or 4), ovate, margin glandular serrate, apex acuminate. Hypanthium subglobose, pubescent, densely so, or glabrous. Sepals 5, deciduous, lanceolate, leaflike, abaxially glandular pubescent, adaxially densely puberulous, margin entire, apex caudate. Petals 5, white, rarely

pink, broadly obovate, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, villous. Hip red, becoming black-purple, subglobose, rarely ovoid, 6–10 mm in diam., glabrous, after ripening apical part of hypanthium and sepals deciduous together. Fl. May–Jul, fr. Jul–Oct. $2n = 14^*$.

Slopes, valleys, river sides, roadsides; 500–2200 m. Gansu, Xinjiang [Afghanistan, Kazakhstan, Mongolia].

- 1a. Leaflets adaxially glabrous, abaxially pubescent or glabrous; pedicels and hypanthium glabrous, or pedicels occasionally sparsely glandular pubescent 20a. var. *beggeriana*
 1b. Leaflets densely pubescent on both surfaces; pedicels and hypanthium densely pubescent 20b. var. *lioui*

20a. *Rosa beggeriana* var. *beggeriana*

弯刺蔷薇(原变种) wan ci qiang wei (yuan bian zhong)

Leaflets abaxially pubescent or glabrous, adaxially glabrous. Pedicel and hypanthium glabrous, or pedicels occasionally sparsely glandular pubescent.

Slopes, valleys, river sides, roadsides; 900–2000 m. Gansu, Xinjiang [Afghanistan, Mongolia, Kazakhstan].

20b. *Rosa beggeriana* var. *lioui* (T. T. Yu & H. T. Tsai) T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 8. 1981.

毛叶弯刺蔷薇 mao ye wan ci qiang wei

Rosa lioui T. T. Yu & H. T. Tsai, Bull. Fan. Mem. Inst. Biol., Bot. Ser., 7: 115. 1936.

Leaflets densely pubescent on both surfaces. Pedicel and hypanthium densely pubescent.

- Valleys, river sides; 500–2200 m. Xinjiang.

21. *Rosa albertii* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 8: 278. 1883.

腺齿蔷薇 xian chi qiang wei

Shrubs 1–2 m tall. Branchlets gray-brown or purple-brown, glabrous; prickles scattered, straight, slender, usually densely bristly; bristles with rounded disk basally. Leaves including petiole 3–8 cm; stipules mostly adnate to petiole, free parts ovate-lanceolate, margin glandular pubescent, apex acuminate; rachis and petiole puberulous, glandular pubescent, and sparsely prickly; leaflets 5–7, ovate, elliptic, obovate, or suborbicular, 8–30 × 5–18 mm, abaxially puberulous, adaxially glabrous, base subrounded or broadly cuneate, margin doubly or simply serrate, apex rounded-obtuse or acute. Flower solitary, or 2 or 3 and fasciculate, 3–4 cm in diam.; pedicel 1.5–3 cm, glandular pubescent or not; bracts ovate, glabrous or sometimes abaxially glandular pubescent, margin glandular pubescent, apex acuminate. Hypanthium oblong, glabrous. Sepals 5, ovate-lanceolate, sometimes leaflike, abaxially glabrous, sometimes glandular pubescent, adaxially densely pubescent, apex caudate. Petals 5, white, broadly obovate, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, vil-

lous. Hip orange-red, pyriform or ellipsoid, 8–18 mm in diam., after ripening apical part of hypanthium and sepals deciduous together. Fl. Jun–Aug, fr. Aug–Oct.

Picea or *Pinus* forests, forest margins, slopes; 1200–2000 m. Gansu, Qinghai, Xinjiang [Kazakhstan, Mongolia, Russia (W Siberia)].

22. *Rosa prattii* Hemsley, J. Linn. Soc., Bot. 29: 307. 1892.

铁杆蔷薇 tie gan qiang wei

Shrubs 1–2.5 m tall. Branchlets purple-brown or red-brown, terete, slightly curved, slender; prickles scattered, yellow, straight, to 1 cm, sometimes intermixed with numerous bristles; bristles sometimes glandular. Leaves including petiole 5–10 cm; stipules mostly adnate to petiole, free parts ovate, margin glandular serrate, apex acuminate; rachis and petiole pubescent and glandular pubescent, occasionally with small prickles; leaflets 7–15, elliptic or oblong, 6–20 × 4–10 mm, abaxially pubescent along prominent midvein, adaxially glabrous, with concave midvein, base subrounded or broadly cuneate, margin serrulate, sometimes near base entire, slightly revolute, apex acute or obtuse. Flowers 2–7, in umbel-like corymb, rarely solitary, ca. 2 cm in diam.; pedicel 8–30 mm, glandular pubescent; bracts ovate, margin glandular serrate, apex acuminate or caudate. Hypanthium fusiform, glabrous or glandular pubescent. Sepals 5, deciduous, ovate-lanceolate, abaxially sparsely pubescent and glandular pubescent, adaxially densely pubescent, margin entire, apex dilated and caudate. Petals 5, pink, broadly obovate, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, densely villous. Hip deep red, ovoid or ellipsoid, 5–8 mm in diam., with a short neck, after ripening apical part of hypanthium and sepals deciduous together. Fl. May–Jul, fr. Aug–Oct.

- Broad-leaved and coniferous forests, scrub on open slopes; 1900–3000 m. Gansu, Sichuan, Yunnan.

23. *Rosa willmottiae* Hemsley, Bull. Misc. Inform. Kew 1907: 317. 1907.

小叶蔷薇 xiao ye qiang wei

Shrubs 1–3 m tall. Branchlets slender, glabrous; prickles in pairs below leaves, numerous, terete, straight, to 1.2 cm, slender, abruptly flaring at base, old branches rarely bristly. Leaves including petiole 2–4 cm; stipules mostly adnate to petiole, free parts ovate-lanceolate, margin glandular serrate or entire; apex acute; rachis and petiole glabrous or sparsely pubescent, glandular pubescent and shortly prickly; leaflets 7–9, rarely 11, elliptic, obovate, or suborbicular, 6–17 × 4–12 mm, abaxially glabrous or puberulous along midvein, glandular or not, adaxially glabrous, base subrounded, rarely broadly cuneate, margin simply serrate, doubly serrate above middle, apex rounded-obtuse. Flower solitary, ca. 3 cm in diam.; pedicel 1–1.5 cm, often glandular pubescent; bracts ovate-lanceolate, abaxially with distinct midvein, margin glandular serrate, apex caudate. Hypanthium oblong to subglobose, glabrous. Sepals 5, triangular-lanceolate, abaxially glabrous, adaxially densely pubescent, margin entire, apex elongate. Petals 5, pink, obovate, base cuneate, apex emarginate. Styles free, much shorter than stamens, densely pubescent. Hip orange-red, oblong or subglobose, ca. 1

cm in diam., glabrous, shiny, when ripening apical part of hypanthium and sepals deciduous together. Fl. May–Jun, fr. Jul–Sep.

• Thickets, scrub, open slopes, stream sides, roadsides; 1300–3800 m. Gansu, Qinghai, Shaanxi, Sichuan.

- 1a. Leaflets doubly serrate at upper margin, simply serrate at lower margin, abaxially glabrous or puberulous along midvein, not glandular 23a. var. *willmottiae*
 1b. Leaflets doubly serrate along whole margin, abaxially unevenly glandular, margin teeth glandular apically 23b. var. *glandulifera*

23a. *Rosa willmottiae* var. *willmottiae*

小叶蔷薇(原变种) xiao ye qiang wei (yuan bian zhong)

Leaflets doubly serrate at upper margin, simply serrate at lower margin, abaxially glabrous or puberulous along midvein, not glandular.

• Scrub on open slopes, thickets; 2500–3800 m. Gansu, Sichuan, Xizang, Yunnan.

23b. *Rosa willmottiae* var. *glandulifera* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 503. 1980.

多腺小叶蔷薇 duo xian xiao ye qiang wei

Rosa willmottiae var. *glandulosa* T. T. Yu & T. C. Ku.

Leaflets doubly serrate along whole margin, abaxially unevenly glandular, margin teeth glandular apically.

• Scrub on open slopes, roadsides; 2500–3800 m. Gansu, Sichuan, Xizang, Yunnan.

24. *Rosa setipoda* Hemsley & E. H. Wilson, Bull. Misc. Inform. Kew 1906: 158. 1906.

刺梗蔷薇 ci geng qiang wei

Rosa hemsleyana Tackholm; *R. macrophylla* Lindley var. *crasseaculeata* Vilmorin.

Shrubs to 3 m tall. Branchlets terete, slightly curved, glabrous; prickles sparse to absent, straight or slightly curved, to 1 cm, stout, flat, evenly tapering to a broader base. Leaves including petiole 8–19 cm; stipules broad, mostly adnate to petiole, free parts auriculate, triangular-lanceolate, abaxially and at margin glandular, apex acuminate; rachis and petiole densely glandular pubescent and sparsely shortly prickly; leaflets 5–9, ovate, elliptic, or broadly elliptic, 2.5–5.2 × 1.2–3 cm, abaxially pubescent and glandular, with prominent midvein and lateral veins, adaxially glabrous, base subrounded or broadly cuneate, margin doubly serrate, teeth often glandular apically, apex acute or rounded-obtuse. Flowers in lax corymb, 3.5–5 cm in diam.; pedicel 1.3–2.4 cm, glandular; bracts 2 or 3, ovate, abaxially reticulate, pubescent and glandular, margin irregularly serrate and glandular, apex acuminate. Hypanthium oblong or ovoid, densely stipitate glandular, glands to 2 mm. Sepals 5, ovate, leaflike, abaxially glandular, margin pinnately lobed or serrate, adaxially tomentose, teeth glandular apically, apex long caudate. Petals 5, pink or rose-purple, broadly obovate,

abaxially slightly pubescent, base cuneate, apex emarginate. Styles free, slightly exerted, much shorter than stamens, pubescent. Hip deep red, oblong-ovoid, 1–2 cm in diam., with a neck at apex, glandular pubescent or not, with persistent, erect sepals. Fl. May–Jul, fr. Jul–Oct.

• Scrub, slopes; 1800–2600 m. Hubei, Sichuan.

25. *Rosa corymbulosa* Rolfe, Bot. Mag. 140: t. 8566. 1914.

伞房蔷薇 san fang qiang wei

Shrubs small, 1.3–2 m tall. Branchlets terete, straight or slightly curved, glabrous; prickles absent or sparse, straight, short, to 5 mm, stout, gradually tapering to base. Leaves including petiole 5–13 cm; stipules mostly adnate to petiole, flat, free parts ovate, margin glandular pubescent, apex acuminate; rachis and petiole sparsely puberulous, glandular pubescent, often with tiny prickles; leaflets 3–5, rarely 7, ovate-oblong or elliptic, 2.5–6 × 1.5–3.5 cm, abaxially pubescent and paler, adaxially glabrous, base cuneate or subrounded, margin doubly or simply serrate, apex acute or rounded-obtuse. Flowers numerous or several, in umbel-like corymb, rarely solitary, 2–2.5 cm in diam.; pedicel 2–4 cm, pubescent and glandular pubescent; bracts ovate or ovate-lanceolate, margin glandular pubescent, apex long acuminate. Hypanthium subglobose or ovoid, pubescent, glandular. Sepals 5, ovate-lanceolate, leaflike, both surfaces pubescent, margin entire or inconspicuously serrate, glandular pubescent, apex expanding. Petals 5, red, white at base, broadly obcordate, apex emarginate. Styles free, exerted, slightly shorter than or equaling stamens, densely yellowish white villous. Hip bright red, globose or ovoid, ca. 8 mm in diam., with persistent, erect sepals. Fl. Jun–Jul, fr. Aug–Oct.

• Forests, thickets, scrub, slopes, river sides; 1600–2000 m. Gansu, Hubei, Shaanxi, Sichuan.

26. *Rosa caudata* Baker in E. Willmott, *Rosa* 2: 495. 1914.

尾萼蔷薇 wei e qiang wei

Shrubs to 4 m tall. Branchlets spreading, terete, glabrous; prickles scattered, triangular, straight, stout. Leaves including petiole 10–20 cm; stipules broad, mostly adnate to petiole, free parts ovate, glandular pubescent or not, margin entire, apex acuminate; rachis and petiole sparsely glandular pubescent, shortly prickly; leaflets 7–9, ovate, oblong-ovate, or elliptic-ovate, 3–10 × 1–6 cm, glabrous or sparsely puberulous abaxially along veins, with prominent midvein and lateral veins, base rounded or broadly cuneate, margin simply serrate, apex acute or shortly acuminate. Flowers numerous, in corymb, 3.5–6 cm in diam.; pedicel 1.5–4 cm, densely glandular pubescent or not; bracts several, ovate, margin glandular or not, apex caudate. Hypanthium oblong, densely glandular pubescent or glabrous. Sepals 5, triangular-ovate, to 3 cm, leaflike, abaxially glabrous, adaxially densely puberulous, margin entire, apex caudate. Petals 5, red, broadly obovate, abaxially glabrous or sericeous, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, pubescent. Hip orange-red, oblong, 2–2.5 cm, with persistent, often erect sepals. Fl. Jun–Jul, fr. Jul–Nov.

• Valley forests, scrub, slopes; 1200–2500 m. Hubei, Shaanxi, Sichuan.

- 1a. Flowers 3.5–5 cm in diam., numerous in corymb; petals abaxially glabrous; leaflets $3-7 \times 1-3$ cm 26a. var. *caudata*
 1b. Flowers larger, 4–6 cm in diam., 8–10 in corymb; petals abaxially sericeous; leaflets larger, $8-10 \times 4-6$ cm 26b. var. *maxima*

26a. *Rosa caudata* var. *caudata*

尾萼蔷薇(原变种) wei e qiang wei (yuan bian zhong)

Leaflets $3-7 \times 1-3$ cm. Flowers numerous in corymb, 3.5–5 cm in diam. Petals abaxially glabrous.

- Scrub, slopes; 1600–2000 m. Hubei, Shaanxi, Sichuan.

26b. *Rosa caudata* var. *maxima* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 8. 1981.

大花尾萼蔷薇 da hua wei e qiang wei

Leaflets large, $8-10 \times 4-6$ cm. Flowers 8–10 in corymb, large, 4–6 cm in diam. Petals abaxially sericeous.

- Valley forests, open slopes; 1200–2500 m. Shaanxi (Gouchang Xian), C Sichuan (Tianquan Xian).

27. *Rosa davidii* Crépin, Bull. Soc. Roy. Bot. Belgique 13: 253. 1873.

西北蔷薇 xi bei qiang wei

Shrubs 1.5–4 m tall. Branchlets spreading, terete, slender, glabrous; prickles sparse to scattered, triangular, straight or slightly curved, flat, gradually tapering to broad base. Leaves including petiole 7–14 cm; stipules mostly adnate to petiole, free parts ovate, margin glandular, apex apiculate; rachis and petiole puberulous, glandular pubescent, sparsely shortly prickly; leaflets 7–9, rarely 11 or 5, $2.5-7 \times 1-2(-3)$ cm, abaxially densely puberulous or sparsely pubescent, rarely glabrous, adaxially usually glabrous, base subrounded or broadly cuneate, margin acutely simply serrate, apex acute. Flowers 3 to numerous in corymb, 2–3 cm in diam.; pedicel 1.5–2.5 cm, pubescent and stipitate glandular, glands to 3 mm; bracts large, ovate or lanceolate, both surfaces puberulous, margin entire, apex acuminate. Hypanthium elliptic or long ovoid, densely stipitate glandular. Sepals 5, ovate, leaflike, both surfaces puberulous, abaxially glandular pubescent, margin entire. Petals 5, deep pink, broadly obovate, base broadly cuneate, apex emarginate. Styles free, slightly exerted, shorter than or nearly equaling stamens, densely pubescent. Hip deep red or orange-red, long ellipsoid or long obovoid, $1-1.5 \times 1.8-2.5$ cm, with a long neck at apex, glandular pubescent or not, with persistent, erect sepals. Fl. Jun–Jul, fr. Sep.

- Forest margins, scrub; 1500–3000 m. Gansu, Ningxia, Shaanxi, Sichuan, Yunnan.

- 1a. Leaflets $2.5-4(-6) \times 1-2(-3)$ cm, abaxially densely puberulous or sparsely pubescent; flowers numerous in corymb; hip long ellipsoid or long obovoid, fruiting pedicel 1–2 cm 27a. var. *davidii*
 1b. Leaflets larger, $5-7 \times 1.5-3$ cm, abaxially pubescent, rarely glabrous; flowers 3–7,

in corymb; hip long ellipsoid, to 2.5 cm, projecting at apex and base, fruiting pedicel 3–4 cm 27b. var. *elongata*

27a. *Rosa davidii* var. *davidii*

西北蔷薇(原变种) xi bei qiang wei (yuan bian zhong)

Leaflets $2.5-4(-6) \times 1-2(-3)$ cm, abaxially densely puberulous or sparsely pubescent. Flowers numerous in corymb. Hip long ellipsoid or long obovoid; pedicel 1–2 cm.

- Forest margins, scrub; 1500–2600 m. Gansu, Ningxia, Shaanxi, Sichuan, Yunnan.

27b. *Rosa davidii* var. *elongata* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 323. 1915.

长果西北蔷薇 chang guo xi bei qiang wei

Rosa parmentieri H. Léveillé

Leaflets large, $5-7 \times 1.5-3$ cm, abaxially pubescent, rarely glabrous. Flowers 3–7 in corymb. Hip long ellipsoid, to 2.5 cm, projecting at apex and base; pedicel 3–4 cm.

- Thickets; 1600–3000 m. Shaanxi, Sichuan.

28. *Rosa banksiopsis* Baker in E. Willmott, *Rosa* 2: 503. 1914.

拟木香 ni mu xiang

Shrubs small, 1–3 m tall. Branchlets terete; prickles mostly absent, or if present, small. Leaves including petiole 5–13 cm; stipules mostly adnate to petiole, free parts ovate, glabrous, auriculate, margin glandular serrate or entire, apex acuminate; rachis and petiole glabrous, or sparsely shortly prickly and glandular pubescent; leaflets 7–9, ovate or oblong, abaxially glabrous or sparsely pubescent, with prominent midvein and lateral veins, adaxially glabrous, with concave midvein and lateral veins, base rounded or broadly cuneate, margin acutely simply serrate, apex acute or shortly acuminate. Flowers numerous in corymb, 2–3 cm in diam.; pedicel 1–2.5 cm, glabrous, sparsely puberulous or stipitate glandular; bracts ovate or lanceolate, sparsely puberulous, margin glandular serrate or entire, apex caudate-acuminate. Hypanthium ovoid. Sepals 5, ovate-lanceolate, leaflike, abaxially glabrous or sparsely pubescent, adaxially densely pubescent, stipitate glandular. Petals 5, pink or rose, obovate, apex emarginate. Styles free, slightly exerted, much shorter than stamens, densely villous. Hip orange-red, ovoid, ca. 8 mm in diam., glabrous or stipitate glandular, with persistent, erect sepals. Fl. Jun–Jul, fr. Jul–Sep.

- Forests, thickets; 1200–2100 m. Gansu, Hubei, Jiangxi, Shaanxi, Sichuan.

29. *Rosa rugosa* Thunberg in Murray, Syst. Veg., ed. 14, 473. 1784.

玫瑰 mei gui

Rosa ferox Lawrence; *R. pubescens* Baker.

Shrubs erect, to 2 m tall. Stems fasciculate, robust; branchlets tomentose; prickles dense, yellowish, terete, straight, greatly variable in size and intermixed, to 5 mm, fine, evenly tapering to base, lower parts tomentose, intermixed with glandular

bristles. Leaves including petiole 5–13 cm, thick; stipules mostly adnate to petiole, free parts ovate, abaxially tomentose, margin glandular pubescent, apex acute; rachis and petiole tomentose, sometimes with a few, short prickles; leaflets 5–7(–9), elliptic or elliptic-obovate, 1.5–4.5 × 1–2.5 cm, abaxially tomentose, reticulate, adaxially glabrous, shiny, rugose due to concave veins, base rounded or broadly cuneate, margin acutely serrate, apex acute or rounded-obtuse. Flower solitary, or several and fasciculate, axillary, 4–5.5 cm in diam.; pedicel 5–25 mm, tomentose and glandular pubescent; bracts ovate, abaxially tomentose, margin glandular pubescent, apex acuminate. Hypanthium subglobose, glabrous. Sepals 5, ovate-lanceolate, often leaflike, abaxially pubescent and stipitate glandular, adaxially sparsely pubescent, pinnately lobed, apex caudate-acuminate. Petals 5, semidouble, or double, purple-red, dark pink, or white, obovate, base cuneate, apex emarginate. Styles free, slightly exerted, much shorter than stamens. Hip dark red, depressed-globose, 2–2.5 cm in diam., smooth, with persistent, erect sepals. Fl. May–Jun, fr. Aug–Sep. $2n = 14^*$.

Coastal hillsides, sandy soils on sea shores, offshore islands; below 100 m. Native in E Jilin (Hunchun Xian), Liaoning, NE Shandong (Yantai Shi); widely cultivated elsewhere in China [Japan, Korea, Russia (Far East)].

This species has many horticultural forms widely cultivated in China. According to Fu (China Plant Red Data Book 1: 558–559. 1992), it is endangered as a wild plant by picking and uprooting.

30. *Rosa davurica* Pallas, Fl. Ross. 1(2): 61. 1789.

山刺玫 shan ci mei

Shrubs erect, ca. 1.5 m tall. Branchlets purple-brown or gray-brown, terete, glabrous; prickles paired below leaves, yellowish, terete, slightly curved, abruptly flaring to broad base. Leaves including petiole 4–10 cm; stipules mostly adnate to petiole, free parts ovate, abaxially pubescent, margin glandular serrate, apex acute; rachis and petiole pubescent, glandular pubescent, sparsely prickly; leaflets 7–9, oblong or broadly lanceolate, 1.5–3.5(–4) × 0.5–1.5 cm, abaxially glandular punctate or not, sparsely puberulous or glabrous with prominent midvein and lateral veins, adaxially glabrous, with concave midvein and lateral veins, base rounded or broadly cuneate, margin simple and doubly serrate, apex acute or rounded-obtuse. Flowers solitary, or 2 or 3 and fasciculate, axillary, 3–4 cm in diam.; pedicel 5–8 mm, glabrous or glandular pubescent; bracts ovate, abaxially pubescent and glandular punctate, margin glandular serrate, apex acuminate. Hypanthium subglobose, glabrous. Sepals 5, lanceolate, leaflike, abaxially sparsely pubescent and shortly glandular pubescent, adaxially pubescent, margin irregularly serrate or glandular pubescent. Petals 5, pink, obovate, base broadly cuneate, apex rounded. Styles free, much shorter than stamens, pubescent. Hip red, globose or ovoid, 1–1.5 cm in diam., with a distinct neck, glabrous, with persistent, erect sepals. Fl. Jun–Jul, fr. Aug–Sep.

Sunny places at forest margins, grassy places on hills, slopes; 400–2500 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Japan, Korea, S Mongolia, Russia (E Siberia)].

- 1a. Branchlets densely prickly, prickles unequal 30c. var. *setacea*

- 1b. Branchlets sparsely prickly, prickles equal.
 2a. Leaflets usually smaller, 1.5–3.4(–4) cm, abaxially glandular punctate, sparsely pubescent or glabrous 30a. var. *davurica*
 2b. Leaflets to 4 cm, abaxially not glandular punctate, glabrous or pubescent only along veins 30b. var. *glabra*

30a. *Rosa davurica* var. *davurica*

山刺玫(原变种) shan ci mei (yuan bian zhong)

Rosa willdenowii Sprengel.

Branches sparsely prickly. Leaflets usually smaller, 1.5–3.4(–4) cm, abaxially glandular punctate, sparsely pubescent or glabrous.

Sunny places at forest margins, grassy places on hills, slopes; 400–2500 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Japan, Korea, S Mongolia, Russia (E Siberia)].

The roots and fruit are used medicinally.

30b. *Rosa davurica* var. *glabra* Liou, Fl. Pl. Herb. Chin. Bor.-Orient. 314. 1955.

光叶山刺玫 guang ye shan ci mei

Branches sparsely prickly. Leaflets to 4 cm, abaxially not glandular punctate, glabrous or pubescent along veins.

Heilongjiang, Jilin, Liaoning [N Korea].

This variety is cultivated for ornament and as a grafting stock for various roses in NE China. The succulent fruit are edible, and the roots, flowers, and fruit are used medicinally.

30c. *Rosa davurica* var. *setacea* Liou, Fl. Pl. Herb. Chin. Bor.-Orient. 314. 1955.

多刺山刺玫 duo ci shan ci mei

Branchlets prickly; prickles unequal. Leaflets abaxially glandular punctate or not, usually glabrous or pubescent only along veins.

• Slopes; ca. 900 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol.

31. *Rosa hezhangensis* T. L. Xu, Acta Phytotax. Sin. 38: 74. 2000.

赫章蔷薇 he zhang qiang wei

Shrubs low, ca. 1 m tall. Branches terete, glabrous, densely prickly; prickles broad, turgid at base. Leaves 4–8 cm including petiole; stipules mostly adnate to petiole, free parts auriculate or ovate-lanceolate, glabrous, margin glandular serrate, apex acuminate; leaflets (5–)9, pale green abaxially, deep green adaxially, ovate or oblong, 0.8–2 × 0.4–1 cm, abaxially pubescent and glandular punctate, adaxially glabrous, midvein and other veins prominent, base subrounded or broadly cuneate, margin doubly serrate, apex obtuse or acute. Flowers 3–5 in a corymb, rarely solitary; pedicel 0.8–2 cm, stipitate glandular; bracts 3–5, broadly ovate, glabrous, margin glandular serrate, apex acuminate. Hypanthium ellipsoid or ovoid. Sepals ovate-lanceolate, abaxially glandular pilose, adaxially densely yellowish tomentose.

tose, margin entire, apex acute or acuminate. Petals unknown. Stamens numerous. Styles free, shorter than stamens, densely white pubescent at base. Hip red, ovoid-globose, 0.7–1.1 cm in diam., apex with a short neck and persistent, erect sepals; pedicel to 2.2 cm, stipitate glandular. Fr. Oct.

- 2400–2800 m. W Guizhou (Hezhang Xian).

One of us (Robertson) has seen no specimens of this species.

32. *Rosa acicularis* Lindley, Ros. Monogr. 44. 1820.

刺蔷薇 ci qiang wei

Rosa acicularis var. *albiflora* X. Lin & Y. L. Lin; *R. acicularis* var. *glandulifolia* Y. B. Chang; *R. acicularis* var. *glandulosa* Liou; *R. acicularis* var. *gmelinii* (Bunge) C. A. Meyer; *R. acicularis* var. *pubescens* Liou; *R. acicularis* var. *setacea* Liou; *R. fauriei* H. Léveillé; *R. gmelinii* Bunge; *R. granulosa* Keller; *R. korsakoviensis* H. Léveillé.

Shrubs 1–3 m tall. Branchlets red-brown or purple-brown, terete, slightly curved, glabrous; prickles sparse to dense, terete, straight, to 4 mm, fine, evenly tapering to small base. Leaves including petiole 7–14 cm; stipules mostly adnate to petiole, free parts broadly ovate, abaxially pubescent, margin glandular serrate, apex acuminate; rachis and petiole pubescent, glandular pubescent, and sparsely prickly; leaflets 3–7, broadly elliptic or oblong, 1.5–5 × 0.8–2.5 cm, abaxially pubescent, with prominent midvein and lateral veins, adaxially glabrous, with slightly concave midvein and lateral veins, base subrounded, rarely broadly cuneate, margin simply serrate or inconspicuously doubly serrate, apex acute or rounded-obtuse. Flowers solitary, or 2 or 3 and fasciculate, 3.5–5 cm in diam.; pedicel 2–3.5 cm, densely glandular pubescent; bracts ovate or ovate-lanceolate, margin glandular serrate or incised, apex acuminate or caudate. Hypanthium ellipsoid, usually glabrous, rarely glandular pubescent. Sepals 5, lanceolate, leaflike, abaxially pubescent, glandular, and sparsely bristly, adaxially densely pubescent, margin entire. Petals 5, pink, rarely white, fragrant, obovate, base broadly cuneate, apex emarginate. Styles free, shorter than stamens, pubescent. Hip red, pyriform, long ellipsoid, or obovoid, 1–1.5 cm in diam., with a distinct neck, shiny, glabrous or rarely slightly glandular, with persistent, erect sepals. Fl. Jun–Jul, fr. Jul–Sep. $2n = 28, 56$.

Betula forests, scrub, sunny slopes, roadsides; 400–1800 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Xinjiang [Japan, Kazakhstan, Korea, Mongolia, Russia; N Europe, North America].

This species is widely distributed in the N temperate zone and has a great morphological variation. The varieties described by various authors are difficult to distinguish, owing to the presence of intermediate forms, and are all reduced to synonymy for the time being in this account.

33. *Rosa fargesiana* Boulenger, Bull. Jard. Bot. Étât 14: 182. 1936.

川东蔷薇 chuan dong qiang wei

Shrubs deciduous. Branchlets purple-brown, terete, slender, glabrous; prickles scattered, straight, short. Leaves 7–10 cm including petiole; stipules mostly adnate to petiole, free

parts ovate or lanceolate, ca. 3 mm, glabrous, abaxially and at margin glandular pubescent; rachis and petiole densely glandular pubescent; leaflets (5 or) 7–11, pale green abaxially, deep green adaxially, elliptic or oblong-elliptic, 1.5–4 × 1–2.5 cm, abaxially brown hirsute, densely so along veins, adaxially subglabrous, base cuneate to broadly so, margin acutely doubly serrate; teeth glandular apically when young. Flowers 1–3, 1.5–2 cm in diam.; peduncle ca. 2 cm, slightly glandular pubescent or subglabrous; pedicel 3–4 cm, glandular hairy; bracts ovate-lanceolate, ca. 2 mm, abaxially and at margin glandular pubescent, apex acute or acuminate. Hypanthium campanulate, abaxially glandular pubescent. Sepals lanceolate, ca. 1 cm, margin glandular pubescent, sometimes pinnately lobed, apex long acuminate or caudate-acuminate. Petals white, broadly obovate, 1.2–1.5 × 1–1.3 cm, base broadly cuneate, apex emarginate or 2-lobed. Styles free, slightly exerted, shorter than stamens, pubescent. Hip unknown. Fl. Jun–Aug.

- Chongqing (Chengkou Xian).

One of us (Robertson) has seen no specimens of this species.

34. *Rosa oxyacantha* Marschall von Bieberstein, Fl. Taur.-Caucas. 3: 338. 1819.

尖刺蔷薇 jian ci qiang wei

Rosa pimpinellifolia Linnaeus var. *subalpina* Bunge ex Marschall von Bieberstein.

Shrubs small, 1–2 m tall. Branchlets red-brown, glabrous; prickles numerous, yellowish, straight, unequally long and thick, abruptly tapering to broadened base. Leaves including petiole 4–9 cm; stipules mostly adnate to petiole, free parts lanceolate, margin entire, glandular pubescent, apex acute; rachis and petiole sparsely shortly prickly, glandular pubescent; leaflets 7–9, oblong or elliptic, 1.5–2.5 × 0.8–1.7 cm, glabrous, abaxially with prominent veins, base subrounded or broadly cuneate, margin doubly serrate, apex acute or rounded-obtuse. Flowers solitary, rarely 2 or 3 and fasciculate, 2.5–3 cm in diam.; pedicel 1.5–2 cm, glabrous or glandular pubescent; bracts ovate, margin glandular pubescent, apex long caudate. Hypanthium ovoid or oblong, glabrous or sparsely stipitate glandular. Sepals 5, lanceolate, leaflike, abaxially densely glandular pubescent, adaxially densely pubescent, margin entire. Petals 5, pink, obovate, base broadly cuneate, apex emarginate. Styles shorter than stamens, pubescent. Hip bright red, oblong or ovoid, 1–1.5 cm in diam., glabrous or sparsely stipitate glandular, with persistent, erect sepals. Fl. Jun–Jul, fr. Jul–Sep.

Scrub; 1100–1400 m. Xinjiang [Mongolia, Russia (Siberia)].

One of us (Robertson) has seen no specimens of this species.

35. *Rosa laxa* Retzius in Hoffmann, Phytogr. Bl. 39. 1803.

疏花蔷薇 shu hua qiang wei

Shrubs 1–2 m tall. Branchlets terete, straight or slightly curved, glabrous; prickles in pairs below leaves or scattered, yellowish, strongly hooked, to 1.5 cm, flat, gradually tapering to broad base, often densely intermixed with small prickles and bristles. Leaves including petiole 4.5–10 cm; stipules mostly adnate to petiole, free parts ovate, glabrous, auriculate, margin

glandular serrate, apex acute; rachis and petiole sparsely prickly, glandular pubescent, puberulous; leaflets 7–9, elliptic, oblong, or ovate, rarely obovate, ca. 1.5 × 0.8–2 cm, glabrous or pubescent, with prominent midvein and lateral veins, base subrounded or broadly cuneate, margin simply serrate, rarely doubly serrate, apex acute or rounded-obtuse. Flowers often 3–6 in corymb, sometimes solitary, ca. 3 cm in diam.; pedicel 1–1.8(–3) cm, glandular; bracts ovate, pubescent, glandular hispid, apex acuminate. Hypanthium oblong or ovoid, glabrous, rarely glandular hispid. Sepals 5, ovate-lanceolate, leaflike, abaxially sparsely pubescent and glandular hispid, adaxially densely pubescent, margin entire. Petals 5, white or pink, obovate, apex erose. Styles free, much shorter than stamens, densely villous. Hip red, oblong or ovoid, 1–1.8 cm in diam, glabrous, often shiny, apex with a short neck and persistent, erect sepals. Fl. Jun–Aug, fr. Aug–Sep. *2n* = 14*.

Populus forests, scrub, valleys, damp grassy places, river and stream sides; 500–1500 m. Xinjiang [Mongolia, Russia (C Siberia); C Asia].

- 1a. Leaflets glabrous on both surfaces or abaxially pubescent 35a. var. *laxa*
 1b. Leaflets densely pubescent on both surfaces 35b. var. *mollis*

35a. *Rosa laxa* var. *laxa*

疏花蔷薇(原变种) *shu hua qiang wei* (yuan bian zhong)

Rosa gebleriana Schrenk; *R. soongarica* Bunge.

Leaflets glabrous on both surfaces or abaxially pubescent.

Scrub, valleys, stream sides; 500–1500 m. Xinjiang [Mongolia, Russia (C Siberia); C Asia].

35b. *Rosa laxa* var. *mollis* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 9. 1981.

毛叶疏花蔷薇 *mao ye shu hua qiang wei*

Leaflets densely pubescent on both surfaces.

• *Populus* forests, damp grassy places, river sides; 600–1100 m. N Xinjiang.

36. *Rosa saturata* Baker in E. Willmott, *Rosa* 2: 503. 1914.

大红蔷薇 *da hong qiang wei*

Shrubs 1–2 m tall. Branchlets erect or spreading, terete, glabrous, often densely bristly when old; prickles usually absent, or if present, straight, small. Leaves including petiole 7–16 cm; stipules broad, adnate to petiole to 2/3 part, free parts ovate, subglabrous, auriculate, margin entire, apex acute; rachis and petiole pubescent, sparsely small prickly; leaflets 7(–9), ovate or ovate-lanceolate, 2.5–6.5 × 1.5–4 cm, abaxially pubescent along veins or subglabrous, glandular punctate or not, with prominent midvein and lateral veins, adaxially glabrous, base subrounded or broadly cuneate, margin simply serrate or partly doubly serrate, apex acute or shortly acuminate. Flowers solitary, or 2(or 3), 3.5–5 cm in diam.; pedicel 1.5–2.5(–3) cm, glabrous or sparsely glandular pubescent; bracts 1 or 2, ovate-lanceolate, large, 1.5–3 cm, apex caudate. Hypanthium ovoid,

glabrous. Sepals 5, ovate-lanceolate, leaflike, abaxially subglabrous, adaxially densely pubescent, margin entire or sometimes sparsely serrate apically. Petals 5, red, obovate, base broadly cuneate, apex rounded-obtuse. Styles free, much shorter than stamens, densely pubescent. Hip deep red, ovoid, 1.5–2 cm in diam., glabrous, with persistent, erect sepals. Fl. Jun, fr. Jul–Oct.

• Scrub, stream sides; 2200–2400 m. Hubei, Sichuan, Zhejiang.

- 1a. Leaflets abaxially not glandular punctate, margin acutely simply serrate, not glandular 36a. var. *saturata*
 1b. Leaflets abaxially densely glandular punctate, margin partly doubly serrate, teeth glandular apically 36b. var. *glandulosa*

36a. *Rosa saturata* var. *saturata*

大红蔷薇(原变种) *da hong qiang wei* (yuan bian zhong)

Leaflets abaxially not glandular punctate, margin acutely simply serrate, teeth not glandular.

• Scrub, stream sides; 2200–2400 m. Hubei, Sichuan, Zhejiang.

36b. *Rosa saturata* var. *glandulosa* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 9. 1981.

腺叶大红蔷薇 *xian ye da hong qiang wei*

Leaflets abaxially densely glandular punctate, margin partly doubly serrate, teeth glandular apically.

• C Sichuan (Baoping Xian).

37. *Rosa bella* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 341. 1915.

美蔷薇 *mei qiang wei*

Shrubs 1–3 m tall. Branchlets terete, slender; prickles scattered, terete, straight or slightly curved, to 1 cm, abruptly tapering to base; old branches often densely bristly. Leaves including petiole 4–11 cm; stipules broad, mostly adnate to petiole, free parts ovate, glabrous, margin glandular serrate, apex acute; rachis and petiole glabrous or sparsely pubescent, prickly, or sparsely glandular and shortly prickly; leaflets 7–9, rarely 5, elliptic, ovate, or oblong, 1–3 × 0.6–2 cm, glabrous or abaxially along veins sparsely pubescent and glandular pubescent, base subrounded, margin simply serrate, apex acute or rounded-obtuse. Flowers solitary, or 2 or 3 and fasciculate, 2–5 cm in diam.; pedicel 5–10 mm, stipitate glandular pubescent or not; bracts ovate-lanceolate, glabrous, margin glandular serrate, apex acuminate. Hypanthium ellipsoid-ovoid. Sepals 5, ovate-lanceolate, leaflike, abaxially stipitate glandular, adaxially densely pubescent, margin entire. Petals 5, pink, obovate, base cuneate, apex emarginate. Styles free, much shorter than stamens, densely villous. Hip deep red, ellipsoid-ovoid, 1–1.5 cm in diam., with a short neck at apex, stipitate glandular or not, with persistent sepals. Fl. May–Jul, fr. Aug–Oct.

• Scrub, bases of mountains, stream sides; ca. 1700 m. Hebei, Henan, Jilin, Nei Mongol, Shanxi.

Essential oils are extracted from the flowers, and the fruit are used to make jam. Both the flowers and fruit are used medicinally.

- 1a. Flowers 4–5 cm in diam.; pedicels and hypanthium glandular pubescent 37a. var. *bella*
 1b. Flowers smaller, 2–3 cm in diam.; pedicels and hypanthium glabrous, not glandular pubescent 37b. var. *nuda*

37a. *Rosa bella* var. *bella*

美蔷薇(原变种) *mei qiang wei* (yuan bian zhong)

Rosa bella f. *pallens* Rehder & E. H. Wilson.

Flowers 4–5 cm in diam.; pedicel and hypanthium glandular pubescent.

• Scrub, bases of mountains, stream sides; ca. 1700 m. Hebei, Henan, Jilin, Nei Mongol, Shanxi.

37b. *Rosa bella* var. *nuda* T. T. Yu & H. T. Tsai, Bull. Fan. Mem. Inst. Biol., Bot. Ser., 7: 114. 1936.

光叶美蔷薇 *guang ye mei qiang wei*

Flowers 2–3 cm in diam.; pedicel and hypanthium glabrous, not glandular pubescent.

• Scrub. NC Henan (Song Shan), SC Shaanxi (Zhongnan Shan).

38. *Rosa chengkouensis* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 9. 1981.

城口蔷薇 *cheng kou qiang wei*

Shrubs 1.5–2 m tall. Branchlets terete, slender; prickles scattered or in pairs below leaves, straight. Leaves including petiole 5–8 cm; stipules mostly adnate to petiole, free parts ovate or ovate-lanceolate, abaxially and margin densely glandular pubescent, apex acute; rachis and petiole pubescent, glandular pubescent, shortly prickly; leaflets usually 5, rarely 7 or 3, elliptic, oblong, or ovate, 1.5–3.5 × 1–1.8 cm, abaxially sparsely pubescent and glandular punctate, distinctly reticulate, adaxially glabrous, base broadly cuneate or subrounded, margin doubly serrate, teeth often glandular apically, apex acute or rounded-obtuse. Flowers solitary or several, 2.5–3 cm in diam.; pedicel 1.5–3 cm, glandular pubescent; bracts ovate-lanceolate, margin glandular pubescent, apex long acuminate. Sepals 5, oblong-lanceolate, leaflike, both surfaces densely pubescent, margin entire, glandular pubescent. Petals 5, pink, broadly obovate, base cuneate, apex rounded. Styles free, slightly exerted, much shorter than stamens, densely pubescent. Hip dark red, ovoid or obovoid, 7–8 mm in diam., sparsely glandular pubescent, with persistent, erect sepals. Fl. May–Jun, fr. Aug–Oct.

• Scrub, river sides; 1300–2100 m. Chongqing (Chengkou Xian, Wuxi Xian).

One of us (Robertson) has seen no specimens of this species.

39. *Rosa sinobiflora* T. C. Ku, *nom. nov.*

双花蔷薇 *shuang hua qiang wei*

Replaced synonym: *Rosa biflora* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 3. 1990, not Aublet (1775), nor Krockner (1790).

Shrubs small, ca. 2 m tall. Branchlets red-brown, terete, slender, glabrous; prickles subulate. Leaves including petiole 8–14 cm; stipules hooked, large and broad, mostly adnate to petiole,

free parts triangular or ovate, both surfaces glabrous, margin densely stipitate glandular, apex shortly acuminate; rachis and petiole glabrous, laxly glandular pubescent and with small prickles; leaflets 7–9, yellow-green abaxially, deep green adaxially, ovate-lanceolate or oblong-lanceolate, 1.5–5.5 cm × 7–21 mm, abaxially pubescent only along midvein, adaxially glabrous, base suborbicular or broadly cuneate, margin shallowly serrate, and often reflexed, apex acuminate or caudate-acuminate. Flowers 2, fasciculate; pedicel short, 5–10 mm, nearly glabrous; bracts caducous, ovate. Hypanthium obovoid, glabrous. Sepals 5, ovate-lanceolate, 7–13 mm, abaxially nearly glabrous, adaxially densely tomentose-pubescent. Petals unknown. Stamens numerous. Styles slightly exerted, much shorter than stamens, pubescent. Hip red-brown, obovoid or subglobose, 1–1.2 cm in diam., glabrous; with persistent sepals. Fr. Aug–Oct.

• *Tsuga* forests; ca. 2600 m. NW Yunnan (Gongshan Xian).

One of us (Robertson) has seen no specimens of this species.

40. *Rosa sweginzowii* Koehne, Repert. Spec. Nov. Regni Veg. 8: 22. 1910.

扁刺蔷薇 *bian ci qiang wei*

Shrubs 3–5 m tall. Branchlets terete, glabrous or sparsely puberulous, prickly; prickles paired below leaves, sometimes scattered, straight or slightly curved, to 1.5 cm, stout, flat, gradually tapering to broad base, sometimes intermixed with smaller prickles and bristles, old branches sometimes intermixed with bristles. Leaves including petiole 6–11 cm; stipules mostly adnate to petiole, free parts ovate-lanceolate, margin glandular serrate, apex acuminate; rachis and petiole pubescent, glandular pubescent, sparsely shortly prickly; leaflets 7–11, elliptic or ovate-oblong, 2–5 × 0.8–2 cm, abaxially pubescent or glandular, with prominent midvein and lateral veins, adaxially glabrous, base subrounded or broadly cuneate, margin doubly serrate, apex acute, rarely rounded-obtuse. Flowers solitary, or 2 or 3 and fasciculate, 3–5 cm in diam.; pedicel 1.5–3 cm; bracts 1 or 2, ovate-lanceolate, abaxially with distinct midvein, margin glandular serrate, sometimes pinnately lobed, apex caudate. Hypanthium oblong or obovoid, often stipitate glandular. Sepals 5, ovate-lanceolate, leaflike, abaxially subglabrous, stipitate glandular or not, adaxially puberulous, margin entire or sometimes pinnately lobed. Petals 5, pink, broadly obovate or suborbicular, glabrous or abaxially tomentose, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, densely pubescent. Hip purple-red, oblong or obovoid-oblong, 1.5–2.5 × 1–1.7 cm, with a short neck at apex, often glandular hirsute, with persistent, erect sepals. Fl. Jun–Jul, fr. Aug–Nov.

• *Pinus* forest margins, scrub, roadsides; 2300–4600 m. Gansu, Hubei, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

- 1a. Petals tomentose abaxially; sepals entire 40c. var. *stevensii*
 1b. Petals glabrous; sepals usually pinnately lobed.
 2a. Leaflets abaxially pubescent or only along veins pubescent, not glandular; pedicel 1.5–2 cm, glandular pubescent 40a. var. *sweginzowii*

- 2b. Leaflets abaxially with dense, stalked glands; pedicel longer, 2–3 cm, densely pubescent 40b. var. *glandulosa*

40a. *Rosa sweginzowii* var. *sweginzowii*

扁刺蔷薇(原变种) *bian ci qiang wei* (*yuan bian zhong*)

Leaflets abaxially pubescent or only along veins pubescent, not glandular. Pedicel 1.5–2 cm, glandular pubescent. Sepals usually pinnately lobed. Petals glabrous.

- Scrub, roadsides; 2300–3600 m. Gansu, Hubei, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

40b. *Rosa sweginzowii* var. *glandulosa* Cardot, Notul. Syst. (Paris) 3: 269. 1916.

腺叶扁刺蔷薇 *xian ye bian ci qiang wei*

Leaflets abaxially with dense stalked glands. Pedicel 2–3 cm, densely pubescent. Sepals usually pinnately lobed. Petals glabrous.

- *Pinus* forest margins, scrub; 2300–3800 m. Gansu, Sichuan, Xizang, Yunnan.

40c. *Rosa sweginzowii* var. *stevensii* (Rehder) T. C. Ku, **comb. et stat. nov.**

毛瓣扁刺蔷薇 *mao ban bian ci qiang wei*

Basionym: *Rosa stevensii* Rehder, J. Arnold Arbor. 11: 162. 1930.

Sepals entire. Petals tomentose abaxially.

- 2700–4600 m. Sichuan.

41. *Rosa moyesii* Hemsley & E. H. Wilson, Bull. Misc. Inform. Kew 1906: 159. 1906.

华西蔷薇 *hua xi qiang wei*

Shrubs 1–4 m tall. Branchlets terete, glabrous or sparsely puberulous; prickles absent or if present, paired below leaves, straight or slightly curved, to 5 mm, stout, flat, tapering below to broad base. Leaves including petiole 7–13 cm; stipules broad, mostly adnate to petiole, free parts long ovate, glabrous, margin glandular serrate, apex acute; rachis and petiole puberulous, glandular pubescent, sparsely small prickly, leaflets 7–13, ovate, elliptic, or oblong-ovate, 1–5 × 0.8–2.5 cm, abaxially densely pubescent or only along prominent veins pubescent, adaxially glabrous, base subrounded or broadly cuneate, margin acutely simply serrate, apex acute or rounded-obtuse. Flowers solitary, or 2 or 3 and fasciculate, 4–6 cm in diam.; pedicel 1–3 cm, usually densely stipitate glandular, rarely glabrous; bracts 1 or 2, oblong-ovate, to 2 cm, margin glandular pubescent, apex acute or acuminate. Hypanthium ovoid. Sepals 5, ovate, leaf-like, abaxially glabrous or with a few glandular bristles at base, adaxially pubescent, pinnately lobed. Petals 5, deep red, broadly obovate, base broadly cuneate, apex emarginate. Styles free, shorter than stamens, pubescent. Hip purple-red or orange-red, globose-ovoid, to 5 cm, 1–2 cm in diam., with a short neck at apex, stipitate glandular, with persistent, erect sepals. Fl. Jun–Jul; fr. Aug–Oct.

- Scrub, slopes; 2700–3800 m. Shaanxi, Sichuan, Yunnan.

- 1a. Leaflets abaxially pubescent only along veins, rachis puberulous 41a. var. *moyesii*
 1b. Leaflets abaxially and rachis densely pubescent 41b. var. *pubescens*

41a. *Rosa moyesii* var. *moyesii*

华西蔷薇(原变种) *hua xi qiang wei* (*yuan bian zhong*)

Leaflets abaxially only along veins pubescent, rachis puberulous.

- Scrub, slopes; 2700–3800 m. Shaanxi, Sichuan, Yunnan.

41b. *Rosa moyesii* var. *pubescens* T. T. Yu & H. T. Tsai, Bull. Fan. Mem. Inst. Biol., Bot. Ser., 7: 116. 1936.

毛叶华西蔷薇 *mao ye hua xi qiang wei*

Leaflets abaxially and rachis densely pubescent.

- Sichuan.

42. *Rosa persetosa* Rolfe, Bull. Misc. Inform. Kew 1913: 263. 1913.

全针蔷薇 *quan zhen qiang wei*

Rosa elegantula Rolfe.

Shrubs ca. 1.5 m tall. Branches numerous; branchlets waxy farinose; prickles sparse, straight or slightly curved, flat, densely bristly, or sparsely prickly; prickles straight or slightly curved, flat, sometimes turgid at base. Leaves including petiole 5–10 cm; stipules mostly adnate to petiole, free parts narrowly oblong, margin entire, apex rounded-obtuse; rachis and petiole sparsely puberulous, glandular pubescent, shortly prickly; leaflets 7–9, rarely 11, elliptic or ovate-elliptic, 1.2–3 × 0.6–1.7 cm, glabrous or abaxially sparsely pubescent, with prominent midvein and lateral veins, base subrounded or broadly cuneate, margin simply serrate or inconspicuously doubly serrate, apex rounded-obtuse or acute. Flowers several in corymb, rarely solitary, 2.5–3 cm in diam.; pedicel 1.2–3 cm, glabrous; bracts 3–5, ovate, margin entire or glandular serrate, apex caudate. Hypanthium ovoid, glabrous. Sepals 5, ovate-lanceolate, abaxially subglabrous, glandular or not, adaxially densely puberulous, margin entire, apex caudate. Petals 5, red, broadly obovate, base broadly cuneate, apex rounded-obtuse. Styles free, shorter than stamens, puberulous. Hip bright red, ovoid, 1–1.5 cm, glabrous, with persistent sepals. Fl. May–Jun, fr. Jul–Oct.

- Scrub; 1300–2800 m. Sichuan.

One of us (Robertson) has seen no specimens of this species.

43. *Rosa macrophylla* Lindley, Ros. Monogr. 35. 1820.

大叶蔷薇 *da ye qiang wei*

Shrubs 1.5–3 m tall. Branchlets purple-brown, robust; prickles absent or in pairs below leaves, straight. Leaves including petiole 7–15 cm; stipules broad, mostly adnate to petiole, free parts ovate, usually glabrous, margin glandular serrate, apex shortly acuminate; rachis and petiole villous, sparsely glandular pubescent, sometimes shortly prickly; leaflets (7 or 9–11(–13)), oblong or elliptic-ovate, 2.5–6 cm, abaxially villous,

glandular or not, with prominent veins, adaxially glabrous, with concave midvein, base rounded, rarely broadly cuneate, margin simple or doubly serrate, apex acute, rarely rounded-obtuse. Flowers solitary, or 2 or 3 and fasciculate, 3.5–5 cm in diam.; pedicel 1.5–2.5 cm, densely stipitate glandular or not; bracts 1 or 2, long ovate, 1.5–2.5 cm, abaxially puberulous along midvein or glabrous, with prominent midvein and lateral veins, margin glandular pubescent, apex acuminate. Hypanthium ovoid or long obovoid, densely stipitate glandular. Sepals 5, ovate-lanceolate, 2–3.5(–5) cm, abaxially stipitate glandular, sparsely pubescent or not, adaxially densely pubescent, margin entire, apex long caudate. Petals 5, deep red, obtriangular-obovate, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, pubescent. Hip purple-red, oblong-ovoid or long obovoid, 1.5–3 × ca. 1.5 cm, stipitate glandular or not, shiny, with a short neck at apex, with persistent, erect sepals. Fl. Jun–Jul, fr. Aug–Nov. $2n = 14$.

Forest margins, scrub, slopes; 2400–3700 m. S Xizang, NE Yunnan [Bhutan, India, Kashmir, Sikkim].

In populations of Yunnan, the leaves often have 7–9 smaller leaflets and the flowers are smaller, 2.8–3.5 cm in diameter.

- 1a. Leaflets abaxially not glandular, margin simply serrate, rarely doubly serrate 43a. var. *macrophylla*
 1b. Leaflets abaxially glandular, margin usually doubly serrate 43b. var. *glandulifera*

43a. *Rosa macrophylla* var. *macrophylla*

大叶蔷薇(原变种) da ye qiang wei (yuan bian zhong)

Rosa alpina Linnaeus var. *macrophylla* (Lindley) Boulenger.

Leaflets abaxially not glandular, margin simply serrate, rarely doubly serrate.

Scrub, slopes; 3000–3700 m. S Xizang, NE Yunnan [Bhutan, India, Kashmir, Sikkim].

43b. *Rosa macrophylla* var. *glandulifera* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 502. 1980.

腺果大叶蔷薇 xian guo da ye qiang wei

Leaflets abaxially glandular, margin usually doubly serrate.

- Forest margins, scrub, open slopes; 2400–3400 m. S Xizang.

44. *Rosa murielae* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 326. 1915.

西南蔷薇 xi nan qiang wei

Shrubs 1.5–3 m tall. Branchlets erect or spreading, terete, slender, glabrous; prickles sparse, straight, to 6 mm, fine, tapering to a broad base; bristles and small, slender prickles often dense. Leaves including petiole 9–14 cm; stipules mostly adnate to petiole, free parts ovate, auriculate, margin glandular serrate, apex acuminate; rachis and petiole sparsely pubescent and shortly prickly, sometimes glandular pubescent; leaflets 9–15, elliptic or oblong, rarely ovate or broadly elliptic, 1–4.5 × 0.8–2.5 cm, abaxially pubescent, with prominent midvein and

lateral veins, adaxially glabrous, base subrounded or broadly cuneate, margin simple glandular serrate, apex acute or shortly acuminate. Flowers 2–5(–7), in corymb, sometimes solitary, 2–3 cm in diam.; pedicel 2–4 cm, subglabrous or sparsely pubescent and glandular pubescent; bracts and bracteoles ovate-lanceolate, abaxially puberulous or not, margin glandular serrate, apex caudate. Hypanthium ellipsoid, glabrous or villous toward apex. Sepals 5, longer than petals, triangular-ovate, abaxially subglabrous, adaxially puberulous, margin entire, apex long caudate. Petals 5, white, or pink and white at base, obovate, apex emarginate. Styles free, much shorter than stamens, densely pubescent. Hip orange-red, ellipsoid or pyriform, ca. 1 cm in diam., glabrous, with a short neck at apex, with persistent sepals. Fl. Jun–Jul, fr. Aug–Nov.

- Scrub; 2300–3800 m. Sichuan, Yunnan.

45. *Rosa pinnatisepala* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 2. 1990.

羽萼蔷薇 yu e qiang wei

Shrubs small, ca. 2 m tall. Branchlets red-brown, terete, slender, glabrous, prickly; prickles scattered or in pairs below leaves, erect, terete. Leaves including petiole 2.5–4 cm; stipules mostly adnate to petiole, free part ovate or lanceolate, abaxially sometimes glandular, margin stipitate glandular, apex shortly acuminate; rachis and petiole glandular pubescent; leaflets usually 5, rarely 7, obovate or oblong, 5–11 × 3–6 mm, abaxially glandular pubescent, adaxially glabrous, base cuneate or subrounded, margin doubly serrate, teeth glandular apically, apex truncate, rarely rounded. Flowers 2 or 3 and fasciculate, rarely solitary, ca. 2.5 cm in diam.; pedicel 1–1.4 cm, glabrous or glandular pubescent; bracts caducous, unknown. Hypanthium oblong, usually glabrous or glandular pubescent abaxially. Sepals 5, triangular-lanceolate, 6–8 mm, abaxially glabrous or stipitate glandular, adaxially pubescent, margin pinnately lobed; lobes stipitate glandular apically, apex caudate-acuminate. Petals 5, pink, broadly obovate, base broadly cuneate, apex rounded-obtuse. Styles free, slightly exerted, much shorter than stamens, hairy. Hip purple-brown, oblong or obovoid-oblong, 1–2 cm in diam., glabrous. Fl. Jun–Jul, fr. Aug–Nov.

- 1400–2300 m. C and SW Sichuan (Luding Xian, Muli Xian).

Two forms may be recognized: f. *pinnatisepala*, which has hypanthium and sepals usually glabrous, and f. *glandulosa* T. C. Ku (Bull. Bot. Res., Harbin 10(1): 3. 1990), which has hypanthium and sepals densely glandular pubescent. One of us (Robertson) has seen no specimens of either form.

46. *Rosa forrestiana* Boulenger, Bull. Jard. Bot. État 14: 126. 1936.

滇边蔷薇 dian bian qiang wei

Shrubs small, 1–2 m tall. Branchlets terete, slightly curved, slender; prickles scattered or in pairs below leaves, yellowish, straight, stout. Leaves including petiole 2.2–6 cm; stipules broad, mostly adnate to petiole, free parts ovate, rarely lanceolate, glabrous, margin glandular serrate, apex acuminate; rachis and petiole sparsely glandular pubescent and shortly prickly; leaflets 5–7, rarely 9, suborbicular, ovate, or obovate,

6–18 × 4–15 mm, abaxially sparsely puberulous along veins or glandular pubescent, adaxially glabrous, base subrounded, margin doubly serrate, teeth often glandular apically, apex rounded-obtuse or truncate. Flowers solitary or to 5, in corymb, 2–3.5 cm in diam.; pedicel 1.5–2.5 cm, glandular pubescent; bracts 1–3, at base or middle of pedicel, orbicular or ovate, glabrous, margin glandular serrate, apex apiculate. Hypanthium ovoid, glandular pubescent. Sepals 5, ovate-lanceolate, abaxially glandular, adaxially puberulous, leaflike, margin entire, sometimes serrate, apex slightly elongate. Petals 5, deep red, broadly ovate, base broadly cuneate, apex emarginate. Styles free, slightly exerted, nearly equaling stamens, densely yellow-white villous. Hip red, ovoid, 9–13 mm in diam., with a short neck at apex, glabrous, with persistent, erect sepals. Fl. May, fr. Jul–Oct.

- Scrub; 2400–3000 m. Sichuan, NW Yunnan.

Two forms may be recognized: f. *forrestiana*, which has leaflets abaxially eglandular and f. *glandulosa* T. C. Ku (Bull. Bot. Res., Harbin 10(1): 3. 1990), which has leaflets abaxially glandular pubescent. One of us (Robertson) has seen no specimens of either form.

47. *Rosa multibracteata* Hemsley & E. H. Wilson, Bull. Misc. Inform. Kew 1906: 157. 1906.

多苞蔷薇 duo bao qiang wei

Rosa latibracteata Boulenger; *R. orbicularis* Baker; *R. reducta* Baker; *R. rotundibracteata* Cardot.

Shrubs to 2.5 m tall. Branchlets terete, slender, glabrous; prickles scattered and in pairs below leaves, terete, straight, to 1 cm, abruptly tapering to turgid base. Leaves including petiole 5–9 cm; stipules large, mostly adnate to petiole, free parts ovate, glabrous, margin glandular serrate, apex shortly acuminate; rachis and petiole glabrous or sparsely glandular pubescent and puberulous, sparsely shortly prickly; leaflets (5–)7–9, ovate, obovate, or suborbicular, 8–15 × 5–10 mm, glabrous or abaxially sparsely pubescent along veins, sometimes glandular, with prominent midvein and lateral veins, base subrounded or broadly cuneate, margin simply serrate, entire near base, apex rounded-obtuse or acute. Flowers 2 or 3, or several in corymb or panicle, rarely solitary, (2–)3–5 cm in diam.; pedicel 0.5–3 cm, densely stipitate glandular; bracts 3–5 or 8–10 in two whorls at base of corymb, those of external whorl ovate, those of internal one lanceolate, glabrous, margin glandular serrulate. Hypanthium subglobose, stipitate glandular. Sepals 5, triangular-lanceolate, 1.1–1.5 cm, leaflike, abaxially glabrous or sparsely to densely stipitate pubescent, adaxially densely pubescent, margin entire. Petals 5, reddish, obovate, base broadly cuneate, apex emarginate. Styles free, slightly exerted, nearly equaling stamens, villous. Hip red, subglobose, 6–10 mm in diam.; stipitate glandular, with persistent, erect sepals. Fl. May–Jul, fr. Jul–Oct.

- Open places near forest margins; 2100–2500 m. Sichuan, Yunnan.

48. *Rosa calyptopoda* Cardot, Notul. Syst. (Paris) 3: 270. 1916.

短角蔷薇 duan jiao qiang wei

Shrubs small, 1–2 m tall. Branchlets purple-brown, slightly curved, robust, glabrous; prickles scattered, to 1 cm, slightly turgid at base. Leaves including petiole 1.5–4 cm; stipules mostly adnate to petiole, free parts oblong, margin glandular pubescent, apex shortly acuminate; rachis and petiole glandular pubescent, sparsely shortly prickly; leaflets usually 5, rarely 7 or 3, suborbicular or broadly obovate, 4–8 × 3–7 mm, abaxially sparsely pubescent along veins, adaxially glabrous, base broadly cuneate, rarely subrounded, margin acutely serrate at upper part, near base entire, apex truncate. Flower solitary, 2–2.5 cm in diam.; pedicel short or nearly absent; bracts 3–5, ovate, leaflike, margin glandular pubescent, apex shortly acuminate. Hypanthium subglobose, glandular pubescent. Sepals 5, ovate, abaxially glandular pubescent, adaxially densely pubescent, margin entire, apex cuspidate or elongate and linear. Petals 5, pink, obcordate, base broadly cuneate, apex emarginate. Styles free, slightly exerted, equaling or slightly longer than stamens, densely pubescent. Hip red-brown, subglobose, 6–8 mm in diam., with an inconspicuous neck at apex, with persistent sepals. Fl. May–Jun, fr. Jul–Sep.

- Scrub; 1600–1800 m. W Sichuan.

One of us (Robertson) has seen no specimens of this species.

49. *Rosa pseudobanksiae* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 11. 1981.

粉蕾木香 fen lei mu xiang

Shrubs climbing, small. Branchlets gray-brown or gray-green, slightly curved; prickles slightly curved, short, flat. Leaves including petiole 2–3 cm; stipules mostly adnate to petiole, free parts lanceolate, both surfaces sparsely pubescent, margin glandular pubescent, apex acuminate; rachis and petiole pubescent; leaflets 3–5, rhomboid-ovate or oblong, 1–1.5 cm × 5–8 mm, abaxially sparsely pubescent, with prominent midvein and lateral veins, adaxially glabrous, base cuneate or broadly cuneate, margin crenate or obtusely serrate, apex acute or rounded-obtuse. Flowers 3–5 in corymb, ca. 2 cm in diam.; pedicel ca. 1 cm, subglabrous; bracts deciduous, ovate-lanceolate, both surfaces pubescent, margin glandular pubescent, apex broadly caudate. Hypanthium obovoid, subglabrous. Sepals 5, lanceolate, abaxially sparsely glandular pubescent, adaxially densely pubescent, apex acuminate. Petals 5, white, before and at beginning of anthesis pink, obovate, base broadly cuneate, apex erose. Styles 5 or 6, free, exerted, slightly shorter than stamens, pubescent. Hip unknown.

- W Yunnan (Midu Xian).

One of us (Robertson) has seen no specimens of this species.

50. *Rosa baiyushanensis* Q. L. Wang, Bull. Bot. Res., Harbin 4(4): 207. 1984.

白玉山蔷薇 bai yu shan qiang wei

Shrubs. Branchlets yellow-brown when young, brown-purple when old, terete, glabrous, prickly; prickles yellow-brown, robust, to 8 mm, inflated at base. Leaves including petiole 3–6 cm; stipules mostly adnate to petiole, free part triangular, sometimes abaxially glandular, margin glandular, apex acute; rachis and petiolule densely glandular and prickly; leaf-

lets 5(–7), pale green abaxially, green adaxially, ovate or obovate-elliptic, 8–15(–18) × 6–10(–13) mm, abaxially densely glandular and pilose, adaxially slightly pubescent, base subrounded or broadly cuneate, margin doubly serrate, teeth glandular apically, apex acute. Flower solitary, rarely 2 or 3 and fasciculate, ca. 2.5 cm in diam.; pedicel 7–10 mm, glandular; bracts 1 or 2, ovate or ovate-lanceolate, margin glandular, apex acuminate. Hypanthium subellipsoid, abaxially slightly glandular or glabrous. Sepals 5, reflexed, ovate-lanceolate, 1–1.5 cm, adaxially pubescent, margin shallowly pinnately lobed and serrate, teeth glandular apically, apex caudate-acuminate. Petals 5, pink, obovate, ca. 1.2 cm in diam., apex emarginate. Styles free, slightly exerted, shorter than stamens, white pubescent. Hip yellow-red, subellipsoid, ca. 1.4 cm, ca. 1 cm in diam., glabrous, with a short neck at apex, with persistent, erect sepals. Fl. Jun–Jul, fr. Aug–Oct.

- Dry slopes. S Liaoning (Lüshun).

One of us (Robertson) has seen no specimens of this species.

51. *Rosa giraldii* Crépín, Bull. Soc. Bot. Ital. 1897: 232. 1897.

陕西蔷薇 shan xi qiang wei

Shrubs to 2 m tall. Branchlets erect or spreading, slender; prickles paired at base of leaves, sparse, terete, straight, to 8 mm, slender, abruptly narrowing to elliptic base. Leaves including petiole 4–8 cm; stipules mostly adnate to petiole, free parts ovate, margin glandular serrate, shortly acuminate; rachis and petiole sparsely pubescent, glandular pubescent, shortly prickly; leaflets 7–9, suborbicular, obovate, or elliptic, 1–2.5 × 0.6–1.5 cm, abaxially pubescent or rarely puberulous along midvein, adaxially glabrous or pubescent, base rounded or broadly cuneate, margin simple or doubly serrate, teeth glandular or not, apex rounded-obtuse or acute. Flowers solitary, or 2 or 3 and fasciculate, 2–3 cm in diam.; pedicel not exceeding 1 cm, glandular pubescent or not; bracts 1 or 2, ovate, glabrous, margin glandular serrate, apex acute or shortly caudate. Hypanthium obovate, glandular pubescent. Sepals 5, ovate-lanceolate, abaxially glandular pubescent, adaxially puberulous, margin entire or 1- or 2-lobed, apex caudate. Petals 5, pink, broadly obovate, base cuneate, apex emarginate. Styles free, shorter than stamens, densely yellowish pubescent. Hip dark red, ovoid, ca. 1 cm in diam., glandular pubescent or not, with a short neck at apex, often with persistent, erect sepals. Fl. May–Jul, fr. Jul–Oct.

- Scrub, slopes; 700–2000 m. Gansu, Henan, Hubei, Shaanxi, Shanxi, Sichuan.

Three varieties are recognized here. *Rosa nanothamnus* Boulenger (Bull. Jard. Bot. État 13: 206. 1935), described from Xinjiang, is very similar to *R. giraldii* and differs only in having larger prickles, equaling or longer than the largest leaflets, and crenate leaflet margins. Further study is needed to ascertain whether *R. nanothamnus* should be treated as a separate species or a fourth variety of *R. giraldii*.

- 1a. Leaflets abaxially along midvein pubescent, sparsely glandular, and shortly prickly, margin irregularly doubly serrate, teeth glandular apically 51c. var. *bidentata*
- 1b. Leaflets abaxially not glandular pubescent and not prickly, margin simply serrate,

not glandular.

- 2a. Leaflets adaxially glabrous, abaxially puberulous or only along midvein puberulous, not reticulate 51a. var. *giraldii*
- 2b. Leaflets adaxially pubescent, abaxially densely pubescent, distinctly reticulate 51b. var. *venulosa*

51a. *Rosa giraldii* var. *giraldii*

陕西蔷薇(原变种) shan xi qiang wei (yuan bian zhong)

Leaflets abaxially puberulous or only along midvein puberulous, not reticulate, adaxially glabrous.

- Scrub, slopes; 700–2000 m. Gansu, Henan, Hubei, Shaanxi, Shanxi, Sichuan.

51b. *Rosa giraldii* var. *venulosa* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 328. 1915.

毛叶陕西蔷薇 mao ye shan xi qiang wei

Leaflets abaxially densely pubescent, distinctly reticulate, adaxially pubescent.

- Scrub; 1000–1600 m. W Hubei, S Shaanxi, Sichuan.

51c. *Rosa giraldii* var. *bidentata* T. T. Yu & T. C. Ku, var. nov.

重齿陕西蔷薇 chong chi shan xi qiang wei

Type: China. Shaanxi: Chang'an Xian, Zhongnan Shan, s.d., *Anonymous s.n.* (holotype, PE).

A var. *giraldii foliolis margine irregulariter duplicato-serratis, serraturis apice glandulosis, foliorum rhachidibus et foliolis subtus ad costam pubescentibus sparse glandulosis et breve aculeatis, differt.*

Leaflets abaxially along midvein pubescent, sparsely glandular, and shortly prickly, leaflet margin irregularly doubly serrate, teeth glandular apically.

- Rocky slopes; ca. 1700 m. SC Shaanxi (Zhongnan Shan).

This variety was accepted in FRPS (p. 418), with the place of publication cited as “Bull. Bot. Res. [Harbin] 1(4): 1981,” i.e., without a page number. The name was published nowhere in that journal, and no validating description, diagnosis, nor indication of type was included in FRPS. It is therefore validated here. One of us (Robertson) has seen no specimens of this variety.

52. *Rosa sertata* Rolfe, Bot. Mag. 139: t. 8473. 1913.

钝叶蔷薇 dun ye qiang wei

Shrubs 1–2 m tall. Branchlets terete, slender, glabrous; prickles paired below leaves, and sometimes sparsely scattered, terete, straight, to 8 mm, fine, abruptly tapering to a disclike base. Leaves including petiole 5–8 cm; stipules mostly adnate to petiole, free parts ovate, glabrous, auriculate, margin glandular pubescent, apex acuminate; rachis and petiole sparsely pubescent, glandular pubescent, and shortly prickly; leaflets 7–15, broadly elliptic or ovate-elliptic, (0.6–)1–2.5 × 0.7–1.5 cm, glabrous or abaxially along midvein sparsely pubescent, with prominent midvein and lateral veins, base subrounded,

margin simply serrate to doubly serrate, entire near base, apex acute or rounded-obtuse. Flowers solitary, or 2 or 3 or more in a corymb, 2–3.5 cm in diam.; pedicel 1.5–3 cm, glabrous or sparsely glandular pubescent; bracteoles 1–3; bracts ovate, margin glandular pubescent, apex shortly acuminate. Hypanthium ovoid, glabrous or rarely sparsely stipitate glandular. Sepals 5, ovate-lanceolate, leaflike, abaxially glabrous, adaxially densely yellowish white pubescent, margin entire, apex elongate. Petals 5, pink or rose, broadly obovate, base broadly cuneate, apex emarginate. Styles free, shorter than stamens, pubescent. Hip deep red, ovoid, 1.2–2 × ca. 1 cm, glabrous or rarely sparsely stipitate glandular, with a short neck at apex; sepals persistent, erect. Fl. Jun, fr. Aug–Oct.

• Sparse woods, slopes, stream sides, roadsides; 1400–2200 m. Anhui, Gansu, Henan, Hubei, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Yunnan, Zhejiang.

- 1a. Leaflets 7–11, margin simply serrate, teeth not aristate 52a. var. *sertata*
 1b. Leaflets 9–15, margin tending to doubly serrate, teeth irregularly aristate apically 52b. var. *multijuga*

52a. *Rosa sertata* var. *sertata*

钝叶蔷薇(原变种) *dun ye qiang wei* (*yuan bian zhong*)

Rosa hwangshanensis P. S. Hsu; *R. iochanensis* H. Léveillé.

Leaflets 7–11, margin simply serrate, teeth not aristate.

• Sparse woods, slopes, stream sides, roadsides; 1400–2200 m. Anhui, Gansu, Henan, Hubei, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Yunnan, Zhejiang.

52b. *Rosa sertata* var. *multijuga* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 12. 1981.

多对钝叶蔷薇 *duo dui dun ye qiang wei*

Leaflets 9–15, margin tending to doubly serrate, teeth irregularly aristate apically.

• Sichuan (Dawu Xian).

53. *Rosa webbiana* Wallich ex Royle, Ill. Bot. Himal. Mts. 1: 208. 1835.

藏边蔷薇 *zang bian qiang wei*

Shrubs 1–2 m tall. Branchlets purple-brown, slender; prickles in pairs below leaves, and scattered, yellow, terete, straight, to 1 cm, stout, gradually tapering below to a broad base. Leaves including petiole 3–4 cm; stipules mostly adnate to petiole, free parts ovate, margin glandular, apex acute; rachis and petiole glabrous but very sparsely small prickly; leaflets 5–9, suborbicular, obovate, or broadly elliptic, 6–20 × 4–12 mm, glabrous or abaxially sparsely puberulous along veins, base subrounded or cuneate, margin simply serrate at upper part, near base entire, apex rounded-obtuse, rarely acute. Flowers solitary, rarely 2 or 3 and fasciculate, 3.5–5 cm in diam.; pedicel 1–1.5 cm, glabrous or glandular pubescent; bracts ovate, margin glandular serrate, midvein and lateral veins abaxially conspicuous. Hypanthium subglobose or ovoid, glabrous or

glandular puberulous. Sepals 5, triangular-lanceolate, abaxially glandular pubescent, adaxially densely puberulous, margin entire, apex elongate. Petals 5, reddish or rose, broadly obovate, base cuneate, apex emarginate. Styles free, shorter than stamens, pubescent. Hip nodding, bright red, subglobose or ovoid, 1.5–2 cm in diam., glabrous, with persistent, spreading sepals. Fl. Jun–Jul, fr. Jul–Sep.

Forests, scrub, grassy places, valleys, slopes, farmland; 2000–4500 m. Xizang [Afghanistan, N India, Kashmir, Mongolia, W Nepal].

Rosa dawoensis Pax & Hoffmann (Repert. Spec. Nov. Regni Veg. Beih. 12: 414. 1922), described from Sichuan (Dawu Xian), is similar to *R. webbiana* and requires further study.

54. *Rosa fedtschenkoana* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 314. 1878.

腺果蔷薇 *xian guo qiang wei*

Shrubs large, to 6 m tall. Branchlets purple-brown, terete, prickly; prickles yellowish, straight, to 7 mm, rigid, gradually tapering to broad base. Leaves including petiole 3–4.5 cm; stipules mostly adnate to petiole, free parts lanceolate or ovate, margin glandular pubescent, apex acute; rachis and petiole glabrous or sparsely glandular pubescent; leaflets usually 7, rarely 5 or 9, suborbicular or ovate, glabrous, leathery, abaxially with prominent veins, base subrounded or broadly cuneate, margin simply serrate, entire near base, apex rounded-obtuse. Flowers solitary, sometimes 2–4 and fasciculate, 3–4 cm in diam.; pedicel 1–2 cm, stipitate glandular pubescent; bracts ovate or ovate-lanceolate, margin glandular pubescent, apex caudate or acute. Hypanthium ovoid, stipitate glandular, rarely glabrous. Sepals 5, lanceolate, abaxially stipitate glandular, adaxially densely pubescent, apex acuminate. Petals 5, white, rarely pink, broadly obovate, base broadly cuneate, apex erose. Styles free, shorter than stamens, pubescent. Hip deep red, oblong or ovoid, 1.5–2 cm in diam., densely glandular pubescent, with persistent sepals. Fl. Jul–Aug, fr. Aug–Oct.

Scrub, slopes, stream sides in valleys; 2400–2700 m. Xinjiang [Kazakhstan].

55. *Rosa tibetica* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 500. 1980.

西藏蔷薇 *xi zang qiang wei*

Shrubs small. Branchlets slightly curved, glabrous; prickles scattered or in pairs, yellowish, straight, often intermixed with bristles. Leaves including petiole ca. 4 cm; stipules mostly adnate to petiole, free parts ovate, margin glandular pubescent, apex acute; rachis and petiole sparsely glandular pubescent and shortly prickly; leaflets 5–7, oblong, 1–1.3 × 0.5–0.8 cm, abaxially glandular pubescent, with prominent midvein and lateral veins, adaxially glabrous, base subrounded or broadly cuneate, margin doubly serrate, teeth often glandular apically, apex rounded-obtuse. Flower solitary, 3.5–4 cm in diam.; pedicel ca. 2 cm, glabrous; bracts ovate, ca. 1.5 cm, abaxially and margin glandular pubescent, 3-lobed at apex. Hypanthium ovoid, glabrous. Sepals 5, ovate-lanceolate, abaxially subglabrous, adaxially densely pubescent, margin entire or inconspicuously serrate near apex, apex caudate. Petals 5, white, slightly broadly

obovate, base cuneate, apex rounded-obtuse. Styles free, slightly exserted, shorter than stamens, densely white villous. Hip red-brown, ovoid or globose, 1–1.2 cm in diam., glabrous and smooth, with persistent, erect sepals. Fl. Jul–Aug, fr. Aug–Oct.

• Coniferous forests, secondary *Populus-Betula* forests; 3800–4000 m. S Xizang.

One of us (Robertson) has seen no specimens of this species.

3. Rosa sect. Chinenses Candolle ex Seringe, Mus. Helv. Bot. 1: 2. 1818.

月季组 yue ji zu

Shrubs erect or climbing, with curved prickles. Leaflets 3–5, rarely 7; stipules narrow, adnate to petiole. Flowers 1 to numerous. Sepals entire or with a few lobes, after anthesis reflexed and deciduous. Styles free, exserted, nearly equaling stamens.

Three species: China, Myanmar, N Thailand, N Vietnam, widely cultivated elsewhere; three species (two endemic) in China.

56. Rosa chinensis Jacquin, Observ. Bot. 3: 7. 1768.

月季花 yue ji hua

Shrubs erect, 1–2 m tall. Branchlets purple-brown, terete, robust, subglabrous; prickles abundant to absent, curved, stout, flat. Leaves including petiole 5–11 cm; stipules mostly adnate to petiole, free parts auriculate, margin entire, often glandular pubescent, apex acuminate; rachis and petiole sparsely prickly and glandular pubescent; leaflets 3–5, rarely 7, greenish abaxially, dark green adaxially, broadly ovate or ovate-oblong, 2.5–6 × 1–3 cm, both surfaces subglabrous, adaxially often shiny, base subrounded or broadly cuneate, margin acutely serrate, apex long acuminate or acuminate. Flowers 4 or 5 and fasciculate, rarely solitary, slightly fragrant or not, 4–5 cm in diam.; pedicel 2.5–6 cm, subglabrous or glandular pubescent; bracts 1–3, linear, glabrous, margin glandular or entire, apex acute. Hypanthium ovoid-globose or pyriform, glabrous. Sepals 5, deciduous, ovate, sometimes leaflike, abaxially glabrous, adaxially densely villous, margin entire or pinnately few lobed, occasionally parted, apex acuminate or caudate. Petals 5, semi-double, or double, red, pink, white, or purple, obovate, base cuneate, apex emarginate. Styles free, exserted, nearly equaling stamens, pubescent. Hip red, ovoid or pyriform, 1–2 cm in diam., glabrous. Fl. Apr–Sep, fr. Jun–Nov. $2n = 21^*$, 28^* .

• Native in Guizhou, Hubei, Sichuan; also widely cultivated in China [widely cultivated elsewhere].

1a. Flowers single 56b. var. *spontanea*

1b. Flowers double or semidouble.

2a. Branches robust, often with hooked prickles; leaflets 3–5, rarely 7, abaxially dark green; flowers several, rarely solitary; petals red, pink, or white 56a. var. *chinensis*

2b. Branches slender, with short prickles; leaflets 5–7, thinner, often tinged with purple-red; flowers often solitary, or 2 or 3 and fasciculate; petals deep red or deep purple 56c. var. *semperflorens*

56a. Rosa chinensis var. *chinensis*

月季花(原变种) yue ji hua (yuan bian zhong)

Rosa nankinensis Loureiro; *R. sinica* Linnaeus.

Branches robust, often with hooked prickles. Flowers double or semidouble, several, rarely solitary. Leaflets 3–5, rarely

7, abaxially dark green. Petals red, pink, or white. Sepals often with a few lobes.

Cultivated in China [widely cultivated elsewhere, of cultivated origin].

A famous Chinese ornamental plant with many widely cultivated horticultural forms.

56b. Rosa chinensis var. *spontanea* (Rehder & E. H. Wilson) T. T. Yu & T. C. Ku in T. T. Yu, Fl. Reipubl. Popularis Sin. 37: 423. 1985.

单瓣月季花 dan ban yue ji hua

Rosa chinensis f. *spontanea* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 320. 1915.

Branches with broad prickles. Flowers single, often solitary. Leaflets 3–5. Petals red. Sepals often entire, rarely with a few lobes.

• Native in Guizhou, Hubei, Sichuan.

56c. Rosa chinensis var. *semperflorens* (Curtis) Koehne, Deut. Dendrol. 281. 1893.

紫月季花 zi yue ji hua

Rosa semperflorens Curtis, Bot. Mag. 8: t. 284. 1794.

Branchlets slender, with short prickles. Flowers double or semidouble, often solitary, or 2 or 3 and fasciculate. Leaflets 5–7, thinner, often tinged with purple-red. Petals deep red or deep purple. Sepals often with a few lobes. $2n = 14^*$.

Cultivated in China [widely cultivated elsewhere; of cultivated origin].

57. Rosa odorata (Andrews) Sweet, Hort. Suburb. Lond. 119. 1818.

香水月季 xiang shui yue ji

Shrubs evergreen or semi-evergreen, climbing or scrambling, with long repent branches. Branches robust, glabrous; prickles scattered, curved, to 7 mm, stout, flat, gradually tapering to broad base. Leaves including petiole 5–10 cm; stipules mostly adnate to petiole, free parts auriculate, glabrous, glandular at margin or only at base, apex acuminate; rachis and petiole sparsely shortly prickly and glandular pubescent; leaflets 5–9, elliptic, ovate, or oblong-ovate, 2–7 × 1.5–3 cm, leathery, both surfaces glabrous, base cuneate or subrounded, margin appressed-serrate, apex acute or acuminate. Flowers solitary, or 2 or 3 and fasciculate, very fragrant, 3–10 cm in diam.; pedicel 2–3

cm, glabrous or glandular pubescent; bracts 1–3, linear, margin entire or sparsely glandular, apex attenuate. Hypanthium depressed-globose. Sepals 5, lanceolate, abaxially glabrous, adaxially densely villous, margin entire, rarely few pinnately lobed, apex long acuminate, after anthesis reflexed, deciduous. Petals 5, semidouble, or double, white or tinged with pink, yellow, or orange, fragrant, obovate, base cuneate, apex emarginate. Styles free, exserted, nearly equaling stamens, pubescent. Hip red, depressed-globose, rarely pyriform, glabrous. Fl. Jun–Sep.

Mixed forests, thickets, scrub on hillsides, pastures, grassy slopes, roadsides; 1400–2700 m. Native in Yunnan; cultivated in Jiangsu, Sichuan, Yunnan, Zhejiang [Myanmar, N Thailand, N Vietnam].

According to Fu (China Plant Red Data Book 1: 556–557. 1992), this is a rare species threatened by habitat loss.

- 1a. Flowers single, 8–10 cm in diam.; petals white 57b. var. *gigantea*
 1b. Flowers double or semidouble, usually smaller, 3–8 cm in diam.; petals yellow, orange, or white, or white tinged pinkish.
 2a. Petals yellow or orange; flowers ca. 8 cm in diam. 57c. var. *pseudoindica*
 2b. Petals white or tinged pinkish; flowers 5–8 cm in diam.
 3a. Petals white or tinged pinkish; flowers 5–8 cm in diam. 57a. var. *odorata*
 3b. Petals pale pink; flowers 3–6 cm in diam. 57d. var. *erubescens*

57a. *Rosa odorata* var. *odorata*

香水月季(原变种) xiang shui yue ji (yuan bian zhong)

Rosa indica Linnaeus var. *odorata* Andrews, *Roses* 2: t. 77. 1810; *R. gechouitangensis* H. Léveillé; *R. indica* var. *fragrans* Thory; *R. odoratissima* Sweet ex Lindley; *R. oulengensis* H. Léveillé; *R. thea* Savi; *R. tongtchouanensis* H. Léveillé.

Flowers double or semidouble, 5–8 cm in diam. Petals white or pinkish.

Cultivated. Jiangsu, Sichuan, Yunnan, Zhejiang [widely cultivated elsewhere; of cultivated origin].

57b. *Rosa odorata* var. *gigantea* (Crépin) Rehder & E. H. Wilson in Sargent, *Pl. Wilson*. 2: 338. 1915.

大花香水月季 da hua xiang shui yue ji

Rosa gigantea Collett ex Crépin, *Bull. Soc. Roy. Bot. Belgique* 27: 148. 1888; *R. duclouxii* H. Léveillé; *R. macrocarpa* Watt ex Crépin; *R. xanthocarpa* Watt ex E. Willmott.

Flowers single, 8–10 cm in diam. Petals white. $2n = 21^*$.

4. *Rosa* sect. *Synstylae* Candolle, *Cat. Pl. Horti Monsp.* 137. 1813.

合柱组 he zhu zu

Shrubs climbing, rarely erect; prickles curved. Leaflets 5–9, rarely 3; stipules adnate to petiole, margin entire, serrate, or pectinately lobed. Flowers numerous in corymb. Sepals often pinnately lobed, rarely entire, after anthesis reflexed and deciduous. Styles connate into a column, exserted.

About 35 species: N Africa, Asia, Europe, North America; 30 species (22 endemic) in China.

Mixed forests, thickets, scrub on hillsides, pastures, grassy slopes, roadsides; 1400–2700 m. Yunnan [Myanmar, N Thailand, N Vietnam].

57c. *Rosa odorata* var. *pseudoindica* (Lindley) Rehder, *Mitt. Deutsch. Dendrol. Ges.* 24: 221. 1916.

橘黄香水月季 ju huang xiang shui yue ji

Rosa pseudoindica Lindley, *Ros. Monogr.* 132. 1820; *R. chinensis* Jacquin var. *pseudoindica* (Lindley) E. Willmott.

Flowers double, ca. 8 cm in diam. Petals yellow or orange.

• NW Yunnan.

57d. *Rosa odorata* var. *erubescens* (Focke) T. T. Yu & T. C. Ku in T. T. Yu, *Fl. Reipubl. Popularis Sin.* 37: 424. 1985.

粉红香水月季 fen hong xiang shui yue ji

Rosa gigantea f. *erubescens* Focke, *Notes Roy. Bot. Gard. Edinburgh* 7: 68. 1911; *R. odorata* var. *gigantea* f. *erubescens* (Focke) Rehder & E. H. Wilson.

Flowers double, 3–6 cm in diam. Petals pale pink.

• 2000–2500 m. NW Yunnan (Dali Xian, Lijiang Xian).

58. *Rosa lucidissima* H. Léveillé, *Repert. Spec. Nov. Regni Veg.* 9: 444. 1911.

亮叶月季 liang ye yue ji

Rosa anemonoides Rehder; *R. boisii* Cardot; *R. lucidissima* f. *setosa* Cardot.

Shrubs evergreen or semi-evergreen, climbing. Branchlets robust, glabrous when old; prickles sparse, curved, flat, gradually tapering to base; bristles sometimes dense. Leaves including petiole 6–11 cm; stipules mostly adnate to petiole, free parts lanceolate, glabrous, margin glandular, apex acuminate; rachis and petiole shortly prickly, sparsely glandular pubescent; leaflets usually 3, rarely 5, pale green abaxially, deep green adaxially, often purple-brown when old, oblong-ovate or long elliptic, 4–8 × 2–4 cm, glabrous, base subrounded or broadly cuneate, margin acutely depressed serrate, apex caudate-acuminate or acute. Flower solitary, 3–3.5 cm in diam.; pedicel 6–12 mm, glabrous or sparsely pubescent when young, rarely glandular pubescent; bracts absent. Hypanthium pyriform or obovoid. Sepals 5, oblong-lanceolate, abaxially glabrous, adaxially densely pubescent, margin entire or slightly incised, apex caudate-acuminate, after anthesis reflexed, deciduous. Petals 5, purple-red, broadly obovate, base cuneate, apex emarginate. Styles free, exserted, purple-red, equaling stamens, pubescent. Hip often black-purple, pyriform or obovoid, smooth. Fl. Apr–Jun, fr. May–Aug.

• Mixed forests, scrub; 400–1400 m. Guizhou, Hubei, Sichuan.

Rosa alexandrae Buzunova (Novon 4: 209. 1994) was described from a single specimen collected in Gansu in 1885: *Potanin s.n.* (LE). It apparently has no close relatives within *R. sect. Synstylae*, but may be remotely related to *R. weisiensis*, which differs from *R. alexandrae* in its straight, basally dilated prickles and narrower leaflets.

59. *Rosa langyashanica* D. C. Zhang & J. Z. Shao, Acta Phytotax. Sin. 35: 265. 1997.

琅琊山蔷薇 lang ya shan qiang wei

Shrubs deciduous, ca. 2 m tall. Branchlets dark purple or grayish brown, terete, glabrous, sparsely prickly; prickles yellowish, curved or straight, flat, turgid at base. Leaves 7–10 cm including petiole; stipules mostly adnate to petiole, free parts pectinately parted to base, margin glandular pubescent or not; rachis and petiole glandular pubescent or subglabrous; leaflets (5 or) 7 or 9, sessile or subsessile, pale green abaxially, deep green adaxially, rhomboid-elliptic, 2.5–3 × 0.8–1.8 cm, midvein and lateral veins prominent abaxially, impressed adaxially, both surfaces glabrous, base cuneate or broadly so, margin sharply deeply serrate, apex acute or acuminate; teeth triangular-ovate. Compound corymb 5–9-flowered; peduncle sparsely glandular pubescent. Flowers 2–3 cm in diam.; pedicel 2–2.5 cm; bracts unknown. Hypanthium obovoid, abaxially glabrous. Sepals lanceolate or ovate-lanceolate, ca. 2 × as long as hypanthium, abaxially subglabrous, adaxially densely pubescent, margin entire, usually glandular pubescent, apex caudate-acuminate. Petals pink, broadly obovate, 6–7 × 4–5 mm, base cuneate, apex emarginate. Stamens numerous. Styles connate into a column, exerted, slightly longer than stamens, glabrous. Hip ovoid-globose, glabrous when young. Fl. May.

- Forest margins; 100–200 m. E Anhui (Chu Xian).

One of us (Robertson) has seen no specimens of this species.

60. *Rosa multiflora* Thunberg in Murray, Syst. Veg., ed. 14, 474. 1784.

野蔷薇 ye qiang wei

Shrubs climbing. Branchlets terete, usually glabrous; prickles paired below leaves, sometimes sparsely scattered, curved, to 6 mm, stout, flat, gradually tapering to broad base. Leaves including petiole 5–10 cm; stipules pectinate, mostly adnate to petiole, margin glandular pubescent or not; rachis and petiole pubescent or glabrous, glandular pubescent, shortly prickly; leaflets (3–)5–9, obovate, oblong, or ovate, 1–5 × 0.8–2.8 cm, abaxially pubescent, adaxially glabrous, base rounded or cuneate, margin simply serrate, apex acute or rounded-obtuse. Flowers numerous in corymb, 1.5–4 cm in diam.; pedicel 1.5–2.5 cm, puberulous, glabrous, or glandular pubescent, margin sometimes pectinate; bracts at base of pedicel, small. Hypanthium subglobose, glabrous. Sepals 5, deciduous, lanceolate, abaxially glabrous, adaxially pubescent, margin entire or with 2 linear lobes at middle. Petals 5, semidouble, or double, white, pinkish, or pink (in some cultivated plants), fragrant, obovate, base cuneate, apex emarginate. Styles connate in column, exerted, slightly longer than stamens, glabrous. Hip red-brown or purple-brown, subglobose, 6–8 mm in diam., glabrous, shiny. $2n = 14^*$, 21.

Thickets, scrub, slopes, river sides; 300–2000 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, S Hebei, Henan, Hunan, Jiangsu, Jiangxi, S Shaanxi, Shandong, Taiwan, ?Yunnan, Zhejiang [Japan, Korea].

Two varieties are recognized here. Plants of this species from Taiwan are usually called var. *formosana* Cardot (Notul. Syst. (Paris) 3: 263. 1916), which is characterized by small leaflets, 1–3 × 0.8–1.5 cm, but this taxon seems to fall within the overall range of variation for var. *multiflora*. Two other varieties are cultivated in China, but do not occur spontaneously: var. *albopena* T. T. Yu & T. C. Ku (Bull. Bot. Res., Harbin 1(4): 12. 1981), which has white, double flowers, and var. *carnea* Thory (in Redouté, Roses 2: 67. 1821; *Rosa blinii* H. Léveillé; *R. lebrunei* H. Léveillé), which has pink, double flowers.

1a. Petals white; flowers 1.5–2 cm in diam.

..... 60a. var. *multiflora*

1b. Petals pink; flowers to 4 cm in diam.

..... 60b. var. *cathayensis*

60a. *Rosa multiflora* var. *multiflora*

野蔷薇(原变种) ye qiang wei (yuan bian zhong)

Flowers 1.5–2 cm in diam. Petals white.

Henan, Jiangsu, Shandong [Japan, Korea].

60b. *Rosa multiflora* var. *cathayensis* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 304. 1915.

粉团蔷薇 fen tuan qiang wei

?*Rosa adenoclada* H. Léveillé (1912), not Hy (1895); *R. calva* (Franchet & Savatier) Boulenger var. *cathayensis* (Rehder & E. H. Wilson) Boulenger; *R. cathayensis* (Rehder & E. H. Wilson) L. H. Bailey; ?*R. damascena* Miller f. *brachyacantha* Focke; *R. gentiliana* H. Léveillé & Vaniot; *R. kwangsiensis* H. L. Li; *R. macrophylla* Lindley var. *hypoleuca* H. Léveillé; ?*R. multiflora* var. *brachyacantha* (Focke) Rehder & E. H. Wilson; *R. multiflora* var. *gentiliana* (H. Léveillé & Vaniot) T. T. Yu & H. T. Tsai.

Flowers to 4 cm in diam. Petals pink. $2n = 14^*$, 28*.

• Thickets, scrub, slopes, river sides; 300–2000 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, S Hebei, Henan, Hunan, Jiangxi, S Shaanxi, S Shandong, ?Yunnan, Zhejiang.

The root, which contains 23–25% tannin, is used for tanning. The fresh flowers, from which essential oils can be extracted, are used in the cosmetic industry. The roots, leaves, flowers, and seeds are all used medicinally.

61. *Rosa daishanensis* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 11. 1990.

岱山蔷薇 dai shan qiang wei

Shrubs climbing, small, to 1 m tall. Branchlets terete, slightly curved, slender, subglabrous; prickles short, slightly flat, inflated at base. Leaves including petiole 5.5–7 cm; stipules mostly adnate to petiole, margin pectinate and glandular; rachis and petioles densely stipitate glandular and sparsely pubescent; leaflets 5–7, pale green abaxially, deep green adaxially, usually obovate-oblong or elliptic, 1.3–2 × 0.9–1.5 cm, abaxially glabrous or sparsely glandular or pubescent along midvein, adaxially subglabrous, base broadly cuneate or rounded, margin doubly serrate, apex acuminate. Flowers 8–12-flow-

ered in panicle, 2–2.5 cm in diam.; pedicel 5–10 mm, glandular; bracts caducous. Hypanthium ovoid-globose, subglabrous, sparsely villous and glandular pubescent. Sepals 5, lanceolate, abaxially stipulate-glandular, adaxially densely villous, margin pinnately lobed; lobules lanceolate to linear, apex long acuminate. Petals 5, white, unknown. Styles connate in column, exserted, slightly shorter than stamens, glabrous. Hip unknown.

- NE Zhejiang (Daishan Xian).

One of us (Robertson) has seen no specimens of this species.

62. *Rosa uniflorella* Buzunova, *Novon* 4: 209. 1994.

单花合柱蔷薇 dan hua he zhu qiang wei

Rosa uniflora T. T. Yu & T. C. Ku, *Bull. Bot. Res.*, Harbin 1(4): 12. 1981, not Galushko (1959).

Shrubs small. Branchlets brown or purple-brown, terete, curved, slender, striate, subglabrous; prickles scattered or in pairs, short, flat. Leaves including petiole 2.5–3.5 cm; stipules pectinate, mostly adnate to petiole, both surfaces and margin sparsely pubescent, densely glandular pubescent; rachis and petiole densely pubescent and glandular pubescent; leaflets 5–7, obovate or broadly elliptic, 7–10 × 5–7 mm, abaxially pubescent, with prominent midvein, adaxially sparsely pubescent, base broadly cuneate or subrounded, margin simply serrate or nearly doubly serrate, apex acute or obtuse. Flower solitary, axillary, 2–2.5 cm in diam.; pedicel less than 1 cm, sparsely pubescent and glandular pubescent; bracts 2 or 3, at base of pedicel, ovate-lanceolate, abaxially and margin densely glandular pubescent. Hypanthium oblong, abaxially densely glandular pubescent. Sepals 5, lanceolate, ca. 5 mm, abaxially densely glandular pubescent, adaxially densely pubescent, margin entire or rarely lobed, apex acuminate. Petals 5, white, oblong-obovate, base cuneate, apex emarginate. Styles connate into column, slightly shorter than stamens, glabrous. Hip unknown.

- Sunny sea shores. NE Zhejiang (Daishan Xian).

One of us (Robertson) has seen no specimens of this species.

63. *Rosa kunmingensis* T. C. Ku, *Bull. Bot. Res.*, Harbin 10(1): 10. 1990.

昆明蔷薇 kun ming qiang wei

Shrubs ca. 3 m tall. Branchlets red-brown, terete, robust, glabrous, glandular; prickles sparse, straight or slightly curved, to 9 mm, robust, flat, gradually tapering to broad base. Leaves including petiole 6–8 cm; stipules usually partly adnate to petiole, margin pectinate; rachis and petioles densely tomentose-pubescent, laxly prickly; leaflets 7–9, pale green abaxially, deep green adaxially, elliptic or obovate-oblong, 1.2–2.5 cm × 6–14 mm, abaxially densely tomentose-pubescent, adaxially subglabrous or sparsely pubescent, base cuneate or broadly cuneate, margin sharply serrate, apex acute. Flowers 5–7-flowered, in corymb, ca. 2.8 cm in diam.; pedicel 1.7–2.3 cm, densely glandular pubescent; bracts caducous. Hypanthium ovoid-globose, glabrous. Sepals 5, oblong or lanceolate, 8–11 cm, abaxially densely tomentose-pubescent, margin entire except for 1 pair of lobes, adaxially pubescent and glandular pubescent, apex long caudate. Petals double, white, long obovate, base cuneate, apex

rounded-obtuse. Styles connate in column, exserted, slightly longer than stamens, densely pubescent. Hip unknown.

- Mountain slopes; ca. 2300 m. Yunnan (Kunming Shi).

64. *Rosa kwangtungensis* T. T. Yu & H. T. Tsai, *Bull. Fan. Mem. Inst. Biol., Bot. Ser.*, 7: 114. 1936.

广东蔷薇 guang dong qiang wei

Shrubs climbing, small, with long repent branches. Branchlets dark gray or red-brown, terete, when young puberulous, soon glabrescent; prickles scattered, curved, to 7 mm, stout, flat, gradually tapering to broad base. Leaves including petiole 3.5–6 cm; stipules mostly adnate to petiole, free parts lanceolate, pubescent, margin irregularly serrate to fimbriate, glandular, apex shortly acuminate; leaflets 5–7(–9), greenish abaxially, dark green adaxially, elliptic, long elliptic, or elliptic-ovate, 1.5–3 × 0.8–1.5 cm, abaxially pubescent, along prominent midvein densely pubescent, sparsely shortly prickly and glandular pubescent, adaxially along midvein pubescent, base broadly cuneate or subrounded, margin serrulate, apex acute or acuminate. Flowers 4–15, 1.5–3 cm in diam., in terminal corymb 5–7 cm in diam.; pedicel 1–3 cm, densely pubescent and glandular pubescent or subglabrous; bracts 1–3, ovate, margin glandular, lacinate or serrate, apex acuminate. Hypanthium ovoid, puberulous and glandular pubescent, glabrate. Sepals 5, deciduous, ovate-lanceolate, both surfaces pubescent or subglabrous, abaxially intermixed with glandular hairs, margin entire, apex long acuminate. Petals 5 or double, white or red, fragrant, obovate, base broadly cuneate, apex emarginate or rounded-obtuse. Styles connate into column, exserted, slightly longer than stamens, pubescent. Hip purple-brown, globose, 7–10 mm in diam., shiny. Fl. Mar–May, fr. Jun–Jul.

- Scrub, slopes, river sides, roadsides; 100–500 m. Fujian, Guangdong, Guangxi.

- 1a. Flowers single, 1.5–2 cm in diam. 64a. var. *kwangtungensis*
- 1b. Flowers double, 1–3 cm in diam.
 - 2a. Pedicels and sepals tomentose-pubescent; flowers 1–1.5 cm in diam. 64b. var. *mollis*
 - 2b. Pedicels and sepals subglabrous; flowers 2.5–3 cm in diam. 64c. var. *plena*

64a. *Rosa kwangtungensis* var. *kwangtungensis*

广东蔷薇(原变种) guang dong qiang wei (yuan bian zhong)

Flowers single, 1.5–2 cm in diam.

- Scrub, slopes, river sides, roadsides; 100–500 m. Fujian, Guangdong, Guangxi.

64b. *Rosa kwangtungensis* var. *mollis* Metcalf, *J. Arnold Arb. Bor.* 21: 111. 1940.

毛叶广东蔷薇 mao ye guang dong qiang wei

Rosa multiflora Thunberg var. *nanningensis* Y. Wan & Z. R. Huang.

Flowers double, 1–1.5 cm in diam. Pedicels and sepals tomentose-pubescent.

- Ravine slopes. S Fujian (Xiamen Shi), Guangdong, Guangxi.

64c. *Rosa kwangtungensis* var. *plena* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 13. 1981.

重瓣广东蔷薇 chong ban guang dong qiang wei

Flowers double, 2.5–3 cm in diam. Pedicels and sepals subglabrous.

- Fujian (Cangqian Shan); cultivated in Guangdong.

65. *Rosa lichiangensis* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 14. 1981.

丽江蔷薇 li jiang qiang wei

Shrubs climbing, ca. 2 m tall. Branchlets terete, slender; prickles scattered, slightly curved, short, stout. Leaves including petiole 3–5 cm; stipules mostly adnate to petiole, free parts lanceolate, abaxially pubescent, margin entire, often sparsely glandular pubescent, apex long acuminate; rachis and petiole pubescent and sparsely shortly prickly; leaflets 3–5(–7), elliptic or obovate, 1–2.3 × 0.5–1.3 cm, abaxially glabrous, adaxially sparsely pubescent or glabrous, base cuneate or broadly cuneate, rarely subrounded, margin simply serrate, teeth often glandular apically when young, apex acute or rounded-obtuse. Flowers 2–4 in umbel-like corymb, 2.5–3 cm in diam.; pedicel 1–1.5 cm, glabrous or sparsely glandular pubescent; bracts unknown. Hypanthium obovate-oblong, abaxially glabrous or sparsely glandular pubescent. Sepals 5, ovate-lanceolate, abaxially glabrous or sparsely glandular pubescent, adaxially densely pubescent, margin glandular pubescent, often with 2–4 linear lobes, apex long acuminate. Petals 5, pink, obovate, base broadly cuneate, apex emarginate. Styles connate in column, exerted, nearly equaling stamens, densely pubescent. Hip unknown.

- Scrub. NW Yunnan (Lijiang Xian).

One of us (Robertson) has seen no specimens of this species.

66. *Rosa transmorrisonensis* Hayata, Icon. Pl. Formosan. 3: 97. 1913.

高山蔷薇 gao shan qiang wei

Shrubs evergreen, dwarf. Branchlets glabrous; prickles sparse or in pairs below leaves, to 7 mm, flat. Stipules mostly adnate to petiole, free parts lanceolate, ca. 1 cm, both surfaces subglabrous or sparsely pubescent, margin filiform-dissected and glandular pubescent; rachis and petiole pubescent, glandular pubescent, sparsely prickly; leaflets 5–7, rarely 3, elliptic or oblong, 5–25 × 5–15 mm, abaxially puberulous along midvein, adaxially subglabrous, sometimes sparsely glandular pubescent, margin acutely simply serrate, apex rounded-obtuse, pubescent, apex acute, or truncate. Flowers solitary or 3–5 in cyme, 1.8–2.5 cm in diam.; pedicel ca. 1.5 cm, glandular pubescent or not; bracts absent. Hypanthium subglobose to urceolate, glabrous. Sepals 5, triangular-ovate, abaxially pubescent and glandular pubescent, adaxially tomentose, margin lacinate and glandular minate. Petals 5, white, obovate, ca. 10 × 5 mm, apex emarginate. Styles connate into column, subequaling stamens, villous. Hip subglobose, ca. 6 mm in diam.

Alpine regions; ca. 2400 m. Taiwan [Philippines].

67. *Rosa sambucina* Koidzumi var. *pubescens* Koidzumi, Bot. Mag. (Tokyo) 31: 130. 1917.

山蔷薇 shan qiang wei

Shrubs climbing. Branchlets purple-brown, slender, glabrous; prickles sparse to scattered, to 2 mm, flat, gradually tapering to a broad base 2–3 × height, often with shortly stipitate glands. Leaves including petiole 7–16 cm; stipules mostly adnate to petiole, free parts lanceolate, both surfaces glabrous, margin glandular pubescent, apex acuminate; rachis and petioles sparsely pubescent or glabrous, sparsely shortly prickly, shortly stipitate glandular; leaflets 5, sometimes 3, subleathery, oblong to oblong-lanceolate, 4–8 × 1.5–3 cm, both surfaces glabrous, base truncate to rounded, margin serrate, apex acuminate. Flowers 4 to several, in terminal corymbs, 2.5–3.5 mm in diam.; pedicel 2–3 cm, slightly pubescent, shortly stipitate glandular; bracts lanceolate, small. Hypanthium ellipsoid, sparsely pubescent, shortly stipitate glandular. Sepals 5, deciduous, reflexed, lanceolate, shorter than petals, abaxially mostly glabrous, shortly stipitate glandular, adaxially densely pubescent, margin entire or with 2 small lobes, apex acuminate. Petals 5, white or pink, broadly ovate, base cuneate, apex emarginate. Styles connate into a column, slightly longer than stamens, villous or glabrous. Hip red or black, ellipsoid, ca. 1 cm in diam., glabrous, sometimes with a few shortly stipitate glands.

- Broad-leaved forests (climbing in the crowns of trees), roadside slopes; 1500–1700 m. Taiwan.

Rosa sambucina var. *sambucina* is endemic to Japan.

68. *Rosa taiwanensis* Nakai, Bot. Mag. (Tokyo) 30: 238. 1916.

小金樱子 xiao jin ying zi

Shrubs climbing. Branchlets slender; prickles scattered, hooked. Leaves including petiole 5–15 cm; stipules 1/2 or more adnate to petiole, free parts triangular to linear, margin ciliate-serrate, glandular pubescent, apex acuminate; rachis and petiole mostly glabrous but sparsely prickly and sparsely shortly stipitate glandular; leaflets 5–7, elliptic or ovate, 1.5–3.6 × 0.8–1.5 cm, terminal one larger than lateral ones, both surfaces glabrous or sparsely pubescent along midvein, base obtuse to acute, margin simply serrate, especially in upper 1/2, apex acute or acuminate to obtuse. Flowers many, in large terminal corymbs, ca. 2.5 cm in diam.; pedicel ca. 1 cm, pubescent, shortly stipitate glandular; bracts linear, margin ciliate. Hypanthium globose, glandular pubescent. Sepals 5, deciduous, reflexed, shorter than petals, ovate-oblong, abaxially pubescent, stipitate glandular, adaxially tomentose, margin entire or occasionally with small, linear lobes, apex acute. Petals 5, white, broadly ovate, apex emarginate. Styles connate in column, exerted, longer than stamens, villous. Hip red, globose, 6–8 mm in diam.

- Mountain ranges; below 2500 m. Taiwan.

69. *Rosa pricei* Hayata, Icon. Pl. Formosan. 5: 58. 1915.

太鲁阁蔷薇 tai lu ge qiang wei

Shrubs, erect. Branchlets yellow-brown when young, subglabrous; prickles scattered, curved, to 3 mm, gradually tapering to broad base; bristles sometimes present, glandular. Leaves

including petiole 5–8 cm; stipules mostly adnate to petiole, free parts triangular, both surfaces glabrous, margin glandular pubescent, apex acuminate; rachis and petioles glabrous, sparsely shortly prickly; leaflets 5–7, ovate to elliptic, 1–2 × 0.6–0.8 cm, slightly leathery, both surfaces glabrous, base rounded, margin simply serrulate, especially in upper 1/2, apex acuminate. Flowers few in cymes, 1.5–2 cm in diam.; pedicel 0.8–1.5 mm, pubescent and glandular pubescent; bracts ca. 5 mm. Hypanthium ovoid-globose, ca. 2.5 mm, often glandular bristly. Sepals 5, reflexed, nearly equaling petals, lanceolate, abaxially glabrous and sometimes glandular bristly, adaxially puberulous, margin entire, apex attenuate. Petals 5, white, obovate, base broadly cuneate, apex emarginate. Styles connate into a column, slightly longer than stamens, villous. Hips unknown.

- 1500–2000 m. Taiwan.

70. *Rosa luciae* Franchet & Roehbrune, Bull. Soc. Roy. Bot. Belgique 10: 324. 1871.

光叶蔷薇 *guang ye qiang wei*

Shrubs prostrate, sprawling, or procumbent, 3–5 m. Branches often prostrate, sometimes rooting at nodes; branchlets red-brown, terete, pubescent when young, soon glabrate; prickles scattered, sometimes paired, often tinged with purple-red, curved or nearly straight, to 5 mm, flat, gradually tapering to broad base. Leaves including petiole 5–10 cm; stipules mostly adnate to petiole, free parts lanceolate, margin glandular serrate or dentate, apex shortly acuminate; rachis and petiole shortly prickly, sparsely glandular pubescent; leaflets 5–7, rarely 9, greenish abaxially, dark green adaxially, elliptic, ovate, or obovate, 1–3 × 0.7–1.5 cm, glabrous, abaxially with prominent midvein, base rounded or broadly cuneate, margin remotely serrate, apex rounded-obtuse or acute. Flowers numerous in corymb or solitary, 1.5–3 cm in diam.; pedicel 6–10 mm, with peduncle sparsely pubescent when young, soon glabrescent, rarely sparsely glandular pubescent; bracts caducous, ovate. Hypanthium subglobose, sparsely glandular pubescent. Sepals 5, tardily deciduous, lanceolate or ovate-lanceolate, abaxially subglabrous, adaxially densely pubescent, margin entire, apex acuminate. Petals 5, white or pink, fragrant, obovate, base cuneate, apex rounded-obtuse. Styles connate into column, exserted, slightly longer than stamens, pubescent. Hip purple-black-brown, globose or subglobose, 6–18 mm in diam., shiny, sparsely glandular pubescent. Fl. Apr–Jul, fr. Oct–Nov.

Thickets, sea cliffs, coasts, on limestone; sea level to 500 m. Fujian, Guangdong, Guangxi, Taiwan, Zhejiang [Japan (Ryukyu Islands), Korea, Philippines].

- 1a. Petals white; flowers 2–3 cm in diam. 70a. var. *luciae*
1b. Petals pink; flowers ca. 1.5 cm in diam. 70b. var. *rosea*

70a. *Rosa luciae* var. *luciae*

光叶蔷薇(原变种) *guang ye qiang wei* (yuan bian zhong)

Rosa acicularis Lindley var. *taquetii* (H. Léveillé) Nakai; *R. luciae* var. *wichurana* (Crépin) Koidzumi; *R. taquetii* H. Léveillé; *R. wichurana* Crépin (as “*wichuriana*”).

Flowers 2–3 cm in diam. Petals white.

Thickets, sea cliffs; sea level to 500 m. Fujian, Guangdong, Guangxi, Taiwan, Zhejiang [Japan (Ryukyu Islands), Korea, Philippines].

70b. *Rosa luciae* var. *rosea* H. L. Li, Lloydia 14: 235. 1952.

粉花光叶蔷薇 *fen hua guang ye qiang wei*

Flowers ca. 1.5 cm in diam. Petals pink.

- Coasts, on limestone; near sea level. Taiwan.

This variety is evidently known only from the type.

71. *Rosa miyiensis* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 9. 1990.

米易蔷薇 *mi yi qiang wei*

Shrubs small, 1–2 m tall. Branchlets red-brown, slightly recurved, glabrous but glandular pubescent; prickles usually sparse, robust, inflated at base. Leaves including petiole 5.5–9 cm; stipules mostly adnate to petiole, margin unequally serrate and glandular pubescent, abaxially glandular, free parts lanceolate, apex long acuminate, rachis and petioles glabrous but glandular pubescent and sparsely shortly prickly; leaflets 5–7, yellow-green abaxially, deep green adaxially, elliptic, rarely oblong, 2–3.5 × 1.2–2.2 cm, both surfaces glabrous, base rounded or subrounded, margin serrate or nearly doubly serrate, apex acute or shortly acuminate. Flowers 10–15 in panicle, 2.7–3 cm in diam.; pedicel 2–3 cm, densely glandular pubescent; bracts caducous, unknown. Hypanthium obovoid, subglabrous or very sparsely glandular. Sepals 5, ovate-lanceolate, ca. 1 cm, abaxially glandular, adaxially densely tomentose-pubescent, margin glandular, apex acuminate. Petals double, white, obovate, base cuneate, apex rounded-obtuse. Styles connate in column, exserted, longer than stamens, pubescent. Hip unknown.

- About 1700 m. S Sichuan (Miyi Xian).

One of us (Robertson) has seen no specimens of this species.

72. *Rosa maximowicziana* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 378. 1878.

伞花蔷薇 *san hua qiang wei*

Shrubs small, with long repent branches. Branchlets terete; prickles scattered, curved, to 6 mm, flat, gradually tapering to broad base; bristles and smaller prickles sometimes present. Leaves including petiole 4–11 cm; stipules mostly adnate to petiole, free parts lanceolate, margin irregularly serrate and glandular pubescent; leaflets 7–9, rarely 5, deep green adaxially, ovate, elliptic, or oblong, 1.5–3(–6) × 1–2 cm, abaxially glabrous or along midvein sparsely pubescent, or shortly prickly and glandular pubescent, adaxially glabrous, base broadly cuneate or subrounded, margin acutely serrate, apex acute or acuminate. Flowers several in corymb, 3–3.5 cm in diam.; pedicel 1–2.5 cm, glandular pubescent; bracts long ovate, margin glandular pubescent. Hypanthium ovoid, abaxially glandular pubescent. Sepals 5, deciduous, triangular-ovate, both surfaces pubescent, abaxially glandular pubescent, margin entire, sometimes 1- or 2-lobed, apex long acuminate. Petals 5, white or tinged with pink, obovate, base cuneate, apex rounded-obtuse. Styles connate into column, exserted, nearly equaling stamens,

glabrous. Hip black-brown, ovoid, 8–10 mm in diam., shiny. Fl. Jun–Jul, fr. Sep. $2n = 14$.

Scrub, open slopes, stream sides, roadsides. Liaoning, Shandong [Korea, Russia (Far East)].

73. *Rosa anemoniflora* Fortune ex Lindley, J. Hort. Soc. London 2: 315. 1874.

银粉蔷薇 yin fen qiang wei

Rosa sempervirens Linnaeus var. *anemoniflora* (Fortune ex Lindley) Regel; *R. triphylla* Roxburgh ex Hemsley.

Shrubs climbing, small. Branchlets purple-brown, terete, slender, glabrous; prickles sparse, curved, to 2 mm, flat, gradually tapering to base, sometimes intermixed with smaller prickles, bristles, and glandular trichomes. Leaves including petiole 4–11 cm; stipules narrow, mostly adnate to petiole, apical free parts lanceolate, margin glandular serrate, apex acuminate; rachis and petiole sparsely shortly prickly and glandular pubescent; leaflets 3, rarely 5, ovate-lanceolate or oblong-lanceolate, 2–6 × 0.8–2 cm, glabrous, midvein prominent abaxially, concave adaxially, base rounded or broadly cuneate, margin depressed-serrulate, apex acuminate. Flowers solitary or several in corymb, rarely in corymb-panicle, 2–2.5 cm in diam.; pedicel 1–3.5 cm, sparsely glandular pubescent; bracts ovate-oblong, margin glandular pubescent, apex acuminate. Hypanthium ovoid, glabrous. Sepals 5, lanceolate, abaxially glabrous, adaxially puberulous, margin sparsely glandular pubescent, entire, apex acuminate. Petals 5, pink or white, obovate, base cuneate, apex emarginate. Styles connate into column, exserted, slightly longer than stamens, pubescent. Hip purple-brown, ovoid, ca. 7 mm in diam., glabrous, with persistent sepals. Fl. Mar–May, fr. Jun–Aug.

- Slopes, river sides, roadsides, waste fields; 400–1000 m. Fujian.

74. *Rosa brunonii* Lindley, Ros. Monogr. 120. 1820.

复伞房蔷薇 fu san fang qiang wei

Rosa clavigera H. Léveillé; *R. moschata* Herrmann var. *nepalensis* Lindley; *R. pubescens* Roxburgh.

Shrubs climbing or scandent, 4–6 m. Branchlets red-brown or purple-brown, terete, pubescent when young, glabrate; prickles scattered, curved, to 5 mm, flat, gradually tapering to broad base. Leaves including petiole 6–9 cm; stipules mostly adnate to petiole, free parts lanceolate, both surfaces pubescent, margin glandular, apex acuminate; rachis and petiole densely pubescent, with scattered small, curved prickles; leaflets 7, often 5 or 3 on leaves near corymb, oblong or oblong-lanceolate, 3–5 × 1–1.5 cm, abaxially glabrous, adaxially sparsely pubescent or rarely glabrous, base subrounded or broadly cuneate, margin serrate, apex acuminate or acute. Flowers numerous in compound corymb, 3–5 cm in diam.; pedicel 2.8–3.5 cm, pubescent and sparsely glandular pubescent; bracts sometimes a unifoliate leaf at base of inflorescence; bracteoles tiny or absent. Hypanthium obovoid, abaxially pubescent. Sepals 5, deciduous, lanceolate, both surfaces pubescent, often with 1 or 2 pairs of lobes, apex acuminate. Petals 5, white, fragrant, broadly obovate, base broadly cuneate, apex emarginate. Styles connate into column, exserted, slightly longer than stamens, pubescent.

Hip purple-brown or dark red, ovoid, ca. 1 cm in diam., glabrous, shiny. Fl. Jun, fr. Jul–Nov.

Forests, thickets, scrub at forest margins, valleys; 1900–2800 m. Sichuan, Xizang, Yunnan [Bhutan, N India, Kashmir, Myanmar, Nepal, Pakistan].

75. *Rosa glomerata* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 309. 1915.

绣球蔷薇 xiu qiu qiang wei

Shrubs diffuse, scandent, or vines to 9 m. Branches repent, terete, long, glabrous; branchlets sometimes pubescent; prickles scattered, curved, to 4 mm, flat, gradually tapering to broad base. Leaves including petiole 10–15 cm; stipules mostly adnate to petiole, free parts auriculate, margin entire, glandular pubescent, apex acuminate; rachis and petiole with small, curved prickles, densely pubescent; leaflets 5–7, rarely 3 or 9, oblong or oblong-obovate, 4–10 × 1.8–4.5 cm, leathery, abaxially densely gray-white pubescent, with prominent veins, adaxially glabrous, rugose, base rounded, rarely subcordate, slightly oblique, margin serrulate or nearly entire, apex acuminate or shortly acuminate. Flowers numerous, 1.5–2 cm in diam., in corymb 4–10 cm in diam.; peduncle 2–4 cm; pedicel 1–1.5 cm, densely gray pubescent and sparsely glandular pubescent; bracts unknown. Hypanthium subglobose, gray pubescent, sparsely glandular pubescent. Sepals 5, deciduous, ovate-lanceolate, abaxially pubescent and sparsely glandular pubescent, adaxially densely pubescent, margin entire, apex acuminate. Petals 5, white or pink, fragrant, broadly obovate, abaxially sericeous, base cuneate, apex emarginate. Styles connate into column, exserted, slightly longer than stamens, densely pubescent. Hip orange-red, subglobose or ovoid, 8–10 mm in diam., sparsely pubescent and glandular pubescent when young, glabrate, shiny. Fl. Jul, fr. Aug–Oct.

- Forest margins, thickets, scrub, slopes; 1300–3000 m. Guizhou, Hubei, Sichuan, Yunnan.

76. *Rosa rubus* H. Léveillé & Vaniot, Bull. Soc. Bot. France 55: 55. 1908.

悬钩子蔷薇 xuan gou zi qiang wei

Rosa ernestii Stapf ex Bean; *R. gentiliana* H. Léveillé & Vaniot f. *puberula* Handel-Mazzetti; *R. henryi* Boulenger var. *puberula* (Handel-Mazzetti) Metcalf; *R. moschata* Herrmann var. *hupehensis* Pampanin; *R. rubus* var. *yunnanensis* H. Léveillé.

Shrubs creeping or scandent, or vines to 5–6 m. Branchlets terete, pubescent when young, glabrate when old; prickles scattered, curved, to 2 mm, stout, flat, gradually tapering to broader base. Leaves including petiole 8–15 cm; stipules mostly adnate to petiole, free parts lanceolate, pubescent, margin entire, often glandular, apex acuminate; rachis and petiole pubescent, with sparse small hooked prickles; leaflets 5 or 3, ovate-elliptic, obovate, or elliptic, 3–6(–9) × 2–4.5 cm, abaxially densely or sparsely pubescent or glandular, adaxially usually glabrous, rarely pubescent, base subrounded or broadly cuneate, margin acutely serrate, apex caudate, acute, or acuminate. Flowers 10–25 in a paniculate corymb, 2.5–3 cm in diam.;

peduncle with pedicels 1.5–2 cm, pubescent and glandular pubescent; bracts narrowly ovate, small, margin glandular, apex acuminate. Hypanthium globose or obovoid, pubescent and sparsely glandular pubescent. Sepals 5, deciduous, lanceolate, both surfaces densely pubescent, abaxially glandular pubescent, margin entire or with a few small lobes, apex long acuminate. Petals 5, white, fragrant, obovate, base broadly cuneate, apex emarginate. Styles connate into column, exerted, slightly longer than stamens, pubescent. Hip bright red, purple-brown, or orange-brown, subglobose, 8–10 mm in diam., shiny, mostly glabrous. Fl. Apr–Jun, fr. Jul–Sep.

• Scrub, grassy places, slopes, montane regions, cliffs, river banks, roadsides; 500–1300 m. Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

Two forms may be recognized: f. *rubus*, which has leaflets abaxially eglandular, and f. *glandulifera* T. T. Yu & T. C. Ku (Bull. Bot. Res., Harbin 1(2): 15. 1981), which has leaflets abaxially densely glandular.

77. *Rosa helenae* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 310. 1915.

卵果蔷薇 luan guo qiang wei

Rosa floribunda Baker.

Shrubs diffuse or scandent, with long repent branches to 9 m. Branches purple-brown, robust; branchlets of present year red-brown, glabrous; prickles scattered, yellowish, curved, to 4 mm, stout, flat, tapering gradually to broad base. Leaves including petiole 8–17 cm; stipules 1.5–2.5 cm, mostly adnate to petiole, apical free parts auriculate, margin glandular pubescent, apex acuminate; rachis and petiole pubescent, with scattered small prickles; leaflets (5–)7–9, oblong-ovate or ovate-lanceolate, 2.5–3.5(–4.5) × 1–2.5 cm, abaxially pubescent, with prominent veins, adaxially glabrous, base rounded or broadly cuneate, margin appressed-serrate, apex acute or shortly acuminate. Flowers 2.5–3.1 cm in diam., in terminal corymbs 6–15 cm in diam., partly umbel-like; pedicel 1.5–2 cm, densely pubescent and glandular pubescent; bracts caducous, lanceolate. Hypanthium ovoid, ellipsoid, or obovoid, pubescent and glandular pubescent. Sepals 5, deciduous, ovate-lanceolate, abaxially villous and glandular pubescent, adaxially densely villous, margin often lobed, apex acuminate. Petals 5, fragrant, white, obovate, base cuneate, apex emarginate. Styles connate into column, exerted, nearly equaling stamens, densely villous. Hip deep red, ovoid, ellipsoid, or obovoid, 1–1.5 × 0.8–1 cm, shiny; sepals reflexed after anthesis and deciduous. Fl. May–Jul, fr. Sep–Oct.

Wood margins, thickets, scrub, slopes, stream sides; 1000–3000 m. Gansu, Guizhou, Hubei, Shaanxi, Sichuan, Yunnan [Thailand, Vietnam].

Three forms may be recognized: f. *helenae*, which has singly serrate, abaxially eglandular leaflets; f. *duplicata* T. C. Ku (Bull. Bot. Res., Harbin 10(1): 12. 1990), which has doubly serrate, abaxially eglandular leaflets; and f. *glandulifera* T. C. Ku (Bull. Bot. Res., Harbin 10(1): 12. 1990), which has singly serrate, abaxially glandular leaflets.

78. *Rosa longicuspis* Bertoloni, Mem. Reale Accad. Sci. Ist. Bologna 11: 101. 1861.

长尖叶蔷薇 chang jian ye qiang wei

Shrubs usually evergreen, climbing or scrambling, 1.5–6 m tall. Branchlets purple-brown; prickles sparse or scattered, curved, to 5 mm, stout, flat, gradually tapering to a broad base. Leaves including petiole 7–14 cm; stipules mostly adnate to petiole, free parts lanceolate, often glandular pubescent; rachis and petiole glabrous, with a few hooked prickles; leaflets 5–9, ovate, elliptic, or ovate-oblong, 3–7(–11) × 1–3.5(–5) cm, leathery, both surfaces glabrous, abaxially with prominent midvein, adaxially shiny, rugose or not, base subrounded or broadly cuneate, margin acutely serrate, apex acuminate or long acuminate. Flowers numerous, in corymb, 3–4(–5) cm in diam.; pedicel 1.5–3.5 cm, sparsely pubescent, densely glandular pubescent; bracts ovate-oblong, margin glandular pubescent. Hypanthium ovoid or obovoid, sparsely pubescent and glandular pubescent. Sepals 5, deciduous, lanceolate, 0.8–1.2 cm, both surfaces pubescent, abaxially intermixed with glandular hairs, margin entire or few pinnately lobed, apex long acuminate. Petals 5, fragrant, white or creamy-white, broadly obovate, abaxially sericeous, base broadly cuneate, apex erose. Styles connate into column, exerted, slightly longer than stamens, pubescent. Hip dark red, obovoid, 1–1.2 cm in diam., glabrous; sepals reflexed, deciduous at hip ripening. Fl. May–Jul, fr. Jul–Nov.

Mixed evergreen forests, thickets, scrub, dry open areas; 400–2700 m. Guizhou, Sichuan, Yunnan [N India].

One of us (Robertson) would prefer not to recognize varieties in this species, and notes that the distinguishing characters given below are not those used by Rehder (Man. Cult. Trees, ed. 2, 447. 1940, as species).

- 1a. Leaflets 7–9, leaves near corymb often with 5 leaflets, adaxially not rugose 78a. var. *longicuspis*
- 1b. Leaflets 5(or 7), adaxially slightly rugose 78b. var. *sinowilsonii*

78a. *Rosa longicuspis* var. *longicuspis*

长尖叶蔷薇(原变种) chang jian ye qiang wei (yuan bian zhong)

Rosa charbonneaui H. Léveillé; *R. lucens* Rolfé; *R. moschata* Herrmann var. *yunnanensis* Crépin; *R. willmottiana* H. Léveillé; *R. yunnanensis* (Crépin) Boulenger

Leaflets 7–9, leaves near corymb often with 5 leaflets, adaxially not rugose. Flowers in corymbs.

Mixed evergreen forests, thickets, scrub, dry open areas; 400–2700 m. Guizhou, Sichuan, Yunnan [N India].

78b. *Rosa longicuspis* var. *sinowilsonii* (Hemsley) T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 15. 1981.

多花长尖叶蔷薇 duo hua chang jian ye qiang wei

Rosa sinowilsonii Hemsley, Bull. Misc. Inform. Kew 1906: 158. 1906.

Leaflets 5(or 7), abaxially glabrous or slightly pubescent, adaxially slightly rugose. Compound corymb 30-flowered.

• Guizhou, Sichuan, Yunnan.

79. *Rosa lasiosepala* Metcalf, J. Arnold Arbor. 21: 274. 1940.

毛萼蔷薇 mao e qiang wei

Shrubs climbing, ca. 10 m tall. Branchlets purple-brown, curved, robust, angulate, glabrous; prickles scattered, hooked, short, stout, flat. Leaves including petiole 17–25 cm; stipules mostly adnate to petiole, free parts ovate-lanceolate, margin pubescent and glandular pubescent, glabrate; rachis and petiole glabrous; leaflets usually 5, rarely 7, often 3 on leaves near corymb, elliptic, rarely ovate-oblong, 7–12 × 3–6 cm, leathery, glabrous, abaxially midvein and lateral veins prominent, adaxially midvein concave, base rounded, margin acutely serrate, apex acuminate or shortly caudate. Flowers numerous, in compound corymbs, 3–4 cm in diam.; pedicel 2.5–4 cm; densely puberulous; bracts unknown. Hypanthium subglobose, abaxially densely pubescent. Sepals 5, reflexed, deciduous, lanceolate, 1.5–2 cm, both surfaces densely whitish tomentose, margin entire, apex acuminate. Petals 5, white, obovate, abaxially sparsely pubescent, base cuneate, apex erose. Styles connate into column, exerted, slightly longer than stamens, densely white pubescent. Hip purple-brown, subglobose or ovoid, 1.8–2.3 cm in diam., sparsely pubescent; sepals deciduous at hip ripening. Fl. May–Jul, fr. Jul–Nov.

• Valleys in forests, stream sides, roadsides; 900–1800 m. Guangxi.

80. *Rosa degenensis* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 5. 1990.

德钦蔷薇 de qin qiang wei

Shrubs small, ca. 1 m tall, glabrous. Branchlets gray-green, red-brown when old, terete, glabrous; prickles sparse, subulate, straight or slightly curved. Leaves including petiole 2–2.5 cm; stipules mostly adnate to petiole; rachis and petioles glabrous, sparsely glandular pubescent, with small, straight or curved prickles; leaflets usually 7, obovate, 7–10 × 5–8 mm, both surfaces glabrous, abaxially sparsely glandular pubescent, base cuneate, margin doubly serrate, apex rounded. Flowers 2 or 3 and fasciculate; bracts caducous, unknown. Hypanthium compressed-globose, sparsely glandular. Sepals 5, deciduous, ovate-lanceolate, 8–10 mm, abaxially sparsely pubescent and glandular pubescent, adaxially densely tomentose-pubescent, margin glandular, with 1–3 pairs of lobules, apex acuminate or caudate. Petals unknown. Styles connate into column, exerted, equaling stamens, sparsely pubescent. Hip red-brown, subglobose, 8–10 mm in diam., sparsely glandular pubescent or densely so; sepals reflexed, very late deciduous. Fr. Jul.

• Stream sides; 2000–2100 m. NW Yunnan (Dêqên Xian).

One of us (Robertson) has seen no specimens of this species.

81. *Rosa filipes* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 311. 1915.

腺梗蔷薇 xian geng qiang wei

Shrubs climbing, 3–5 m tall, with long repent branches. Branchlets purple-brown, terete, glabrous; prickles scattered, curved, to 5 mm, stout, flat, gradually tapering to a broad base. Leaves including petiole 8–14 cm; stipules narrow, mostly adnate to petiole, free parts lanceolate, margin entire, sparsely glandular pubescent, apex acuminate; rachis and petiole sparse-

ly pubescent, glandular pubescent, with scattered, small hooked prickles; leaflets 5–7, rarely 3 or 9, oblong or lanceolate, rarely obovate, 4–7 × 1.5–3 cm, abaxially subglabrous or puberulous along prominent veins, glandular punctate, adaxially glabrous, base subrounded or broadly cuneate, sometimes slightly oblique, margin simply serrate, rarely inconspicuously doubly serrate, apex acuminate. Flowers 25–35, 2–2.5 cm in diam., in compound corymb or panicle ca. 15 cm in diam.; pedicel sparsely glandular pubescent, 2–3 cm; bracts ovate-lanceolate or lanceolate, margin glandular pubescent, apex acuminate. Hypanthium ovoid, glandular pubescent. Sepals 5, deciduous, ovate-lanceolate, abaxially sparsely pubescent and glandular pubescent, adaxially densely pubescent, margin entire, apex acuminate. Petals 5, fragrant, white, obovate. Styles connate into column, exerted, nearly equaling stamens, pubescent. Hip deep red, subglobose, ca. 8 mm in diam.; sepals reflexed, eventually deciduous. Fl. Jun–Jul, fr. Jul–Nov.

• Thickets, roadsides; 1300–2300 m. Gansu, Shaanxi, Sichuan, Xizang, Yunnan.

One of us (Gu) wonders if *Rosa tatsienlouensis* Cardot (Notul. Syst. (Paris) 3: 264. 1916), described from Sichuan (Kangding Xian), is identical with *R. filipes*. Further study is required.

82. *Rosa ludingensis* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 4. 1990.

泸定蔷薇 lu ding qiang wei

Shrubs small. Branches red-brown, robust, glabrous, Branchlets terete, slightly curved, usually glabrous; prickles curved, flat, inflated at base. Leaves including petiole 9–17 cm; stipules mostly adnate to petiole, abaxially and margin glandular pubescent, free parts triangular, margin glandular pubescent, apex acuminate; rachis and petioles subglabrous or sparsely pubescent, densely glandular pubescent; leaflets usually 7, pale green abaxially, deep green adaxially, elliptic or ovate, 3–6 × 1.5–3 cm, abaxially subglabrous, glandular pubescent, adaxially subglabrous, base rounded, margin doubly serrate, apex acute or shortly caudate. Flowers numerous, 1.8–3.2 cm in diam., in corymb-panicle; pedicel 1.5–1.8 cm, densely glandular pubescent, bracts caducous, unknown. Hypanthium ovate-globose, glabrous, glandular pubescent. Sepals 5, ovate-lanceolate, 8–10 mm, margin entire, 2–4-lobulate, apex long caudate, acuminate. Petals 5, white, broadly obovate, base cuneate, apex rounded-obtuse. Styles connate into a column, exerted, nearly equaling stamens, pubescent. Hips unknown. Fl. May–Jul, fr. Jul–Oct.

• About 1500 m. C Sichuan (Luding Xian).

One of us (Robertson) has seen no specimens of this species.

83. *Rosa derongensis* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 7. 1990.

得荣蔷薇 de rong qiang wei

Shrubs small. Branchlets purple-brown or red-brown, terete, curved, glabrous; prickles often yellowish or gray-brown, straight or slightly curved, robust, inflated at base. Leaves including petiole 2.5–3.2 cm; stipules mostly adnate to petiole, free parts shortly triangular or ovate, glabrous, margin glandular

serrate, rachis and petioles glabrous, sparsely glandular pubescent and with small, curved prickles; leaflets 5, rarely 7, yellow-green abaxially, deep green adaxially, obovate, 9–15 × 6–10 mm, both surfaces glabrous, base cuneate or subrounded, margin sharply serrate, apex rounded. Flowers 2 or 3 and fasciculate, rarely solitary; bracts caducous, unknown. Hypanthium ovoid. Sepals 5, lanceolate or ovate-lanceolate, 7–9 mm, abaxially pubescent and glandular pubescent, adaxially tomentose-pubescent, margin with 1 or 2 pairs of lobes, apex acuminate, after anthesis reflexed. Petals unknown. Style connate in column, exserted, slightly shorter than stamen, glabrous. Hip red-brown, subglobose or obovoid, ca. 8 mm in diam., sparsely glandular. Hip unknown.

- About 2100 m. W Sichuan (Dêrong Xian).

One of us (Robertson) has seen no specimens of this species.

84. *Rosa shangchengensis* T. C. Ku, Bull. Bot. Res., Harbin 10(1): 8. 1990.

商城蔷薇 shang cheng qiang wei

Shrubs. Branchlets red-brown, terete, often curved, glabrous; prickles subulate, straight. Leaves including petiole 4–5.5 cm; stipules mostly adnate to petiole, free parts lanceolate, margin entire, sometimes glandular serrate, apex acuminate; rachis and petiole glabrous, with sparse, short, curved prickles; leaflets usually 7, obovate or oblong, 1–2 × 0.5–1.5 cm, both surfaces glabrous, base cuneate or broadly cuneate, margin serrate, apex acute or truncate. Flowers 2 or 3 and fasciculate, ca. 2.8 cm in diam.; pedicel 2–2.5 cm, densely stipitate glandular, bracts caducous. Hypanthium obovoid-oblong, abaxially densely stipitate glandular. Sepals 5, ovate-lanceolate, 1–1.3 cm, abaxially densely stipitate glandular, adaxially densely yellow-white pubescent, margin entire, apex acuminate or caudate-acuminate. Petals 5, white, long obovate, base cuneate, apex rounded. Styles connate in column, exserted, nearly equaling or slightly shorter than stamens, pubescent. Hip unknown.

- SE Henan (Shangcheng Xian).

One of us (Robertson) has seen no specimens of this species.

85. *Rosa soulieana* Crépín, Bull. Soc. Roy. Bot. Belgique 35: 21. 1896.

川滇蔷薇 chuan dian qiang wei

Shrubs erect, 2–4 m tall. Branchlets spreading, usually green, terete, often curved, glabrous, often glaucous; prickles scattered, straight or slightly curved, flat, gradually tapering to turgid base. Leaves including petiole 3–8 cm; stipules mostly adnate to petiole, free parts very short, triangular, sometimes glandular, margin entire, apex acute; rachis and petiole sparsely shortly prickly, glabrous or sparsely pubescent; leaflets (5–)7(–9), elliptic or obovate, 1–3 × 0.7–2 cm, abaxially glabrous or puberulous with prominent midvein, adaxially glabrous, with concave midvein, base subrounded or broadly cuneate, margin appressed-serrate, near base often entire, apex rounded-obtuse, acute, or truncate. Flowers numerous, 3–5 cm in diam., in corymb 3–4 cm in diam., or solitary and terminal; pedicel less than 1 cm, glabrous, sometimes shortly glandular pubescent; bracteoles less than 1 cm. Hypanthium subglobose or ovoid,

glabrous, sometimes shortly glandular pubescent. Sepals 5, deciduous, ovate, abaxially sparsely puberulous, sometimes shortly glandular pubescent, adaxially densely puberulous, margin 1- or 2-lobed near base, apex acuminate. Petals 5, yellow-white, obovate, base cuneate, apex emarginate. Styles connate into column, exserted, slightly longer than stamens, pubescent or glabrous. Hip orange-red initially, becoming black-purple, subglobose or ovoid, ca. 1 cm in diam., shiny. Fl. May–Jul, fr. Aug–Sep.

- Scrub, slopes, stream sides, farmland; 2500–3700 m. S Anhui, Chongqing, Sichuan, Xizang, Yunnan.

- 1a. Flower solitary; styles glabrous or subglabrous; leaflets small, not exceeding 8 mm 85d. var. *microphylla*
- 1b. Flowers numerous in corymb or in corymbose panicle, rarely solitary; styles pubescent; leaflets more than 1 cm.
 - 2a. Leaflets ca. 3.5 cm; flowers in corymbose panicle; pedicel glabrous, not glandular 85c. var. *sungpanensis*
 - 2b. Leaflets 1–3 cm; flowers in corymb, rarely solitary; pedicel glabrous or pubescent, sometimes glandular.
 - 3a. Rachis and abaxial leaflet glabrous or subglabrous; pedicel glabrous, occasionally glandular 85a. var. *soulieana*
 - 3b. Rachis and abaxial leaflet pubescent; pedicel pubescent and glandular 85b. var. *yunnanensis*

85a. *Rosa soulieana* var. *soulieana*

川滇蔷薇(原变种) chuan dian qiang wei (yuan bian zhong)

Rachis and leaflet abaxially glabrous or subglabrous, occasionally glandular. Flowers numerous, in corymbs, rarely solitary.

- Scrub, slopes, stream sides; 2500–3000 m. S Anhui (Jiuhua Shan), Sichuan, Xizang, Yunnan.

85b. *Rosa soulieana* var. *yunnanensis* C. K. Schneider, Bot. Gaz. (Crawfordsville) 64: 77. 1917.

毛叶川滇蔷薇 mao ye chuan dian qiang wei

Rachis and leaflet abaxially pubescent. Flowers numerous, in corymbs, rarely solitary; pedicel pubescent and glandular.

- Chongqing (Nanchuan Xian), C Sichuan (Kangding Xian), NW Yunnan (Lijiang Xian, Zhongdian Xian).

85c. *Rosa soulieana* var. *sungpanensis* Rehder, J. Arnold Arbor. 11: 161. 1930.

大叶川滇蔷薇 da ye chuan dian qiang wei

Leaflets large, ca. 3.5 cm. Flowers in corymbose panicle; pedicel glabrous, not glandular.

- N Sichuan (Songpan Xian).

85d. *Rosa soulieana* var. *microphylla* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 502. 1980.

小叶川滇蔷薇 xiao ye chuan dian qiang wei

Leaflets small, not exceeding 8 mm. Flower solitary. Styles glabrous, or subglabrous.

- Scrub on slopes, farmland; 3200–3700 m. Xizang, Yunnan.

86. *Rosa henryi* Boulenger, Ann. Soc. Sci. Bruxelles, sér. B, 53: 143. 1933.

软条七蔷薇 ruan tiao qi qiang wei

?*Rosa gentiliana* H. Léveillé & Vaniot var. *australis* Rehder & E. H. Wilson; ?*R. henryi* var. *australis* (Rehder & E. H. Wilson) F. P. Metcalf; ?*R. henryi* var. *glandulosa* Ze M. Wu & Z. L. Cheng; *R. moschata* Herrmann var. *densa* Vilmorin; *R. paucispinosa* H. L. Li.

Shrubs climbing, 3–8 m, with long repent branches. Branchlets purple-brown, terete, glabrous; prickles scattered, curved, to 3 mm, flat, gradually tapering to a broad base, or prickles absent. Leaves including petiole 9–14 cm; stipules mostly adnate to petiole, free parts lanceolate, glabrous or sparsely glandular pubescent, margin entire, apex acuminate; rachis and petiole glabrous, sparsely shortly prickly; leaflets mostly 5, leaves near corymb often with 3 leaflets, oblong, ovate, elliptic, or elliptic-ovate, 3.5–9 × 1.5–5 cm, papery, both surfaces glabrous, abaxially with prominent midvein, base subrounded or broadly cuneate, margin acutely simply serrate, apex long acuminate or caudate. Flowers 5–15, 3–4 cm in diam., in umbel-like corymb 3–4 cm in diam.; pedicel 1.5–2 cm, glabrous, but shortly glandular pubescent; bracts caducous, lanceolate. Hypanthium globose, glabrous, but shortly glandular pubescent. Sepals 5, deciduous, lanceolate, abaxially subglabrous, sparsely glandular punctate, adaxially villous, margin few lobed, apex acuminate. Petals 5, white, fragrant, broadly obovate, abaxially glabrous, base broadly cuneate, apex emarginate. Styles connate into column, exserted, slightly longer than stamens, pubescent. Hip brown-red, subglobose, 8–10 mm in diam., shiny. Fl. Apr–Jul, fr. Jul–Sep.

- Forest margins, thickets, scrub, valleys, farmland; 1700–2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

87. *Rosa duplicata* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 18: 501. 1980.

重齿蔷薇 chong chi qiang wei

Shrubs small, 1.5–2 m tall. Branchlets purple-brown when young, later gray-brown, terete, curved, slender, glabrous; prickles sparse, yellowish. Leaves including petiole 2–2.5 cm; free parts lanceolate, glabrous or sparsely glandular pubescent, margin entire, apex acuminate; rachis and petiole shortly

prickly, glandular pubescent; leaflets 3–5, obovate or elliptic, 8–15 × 5–8 mm, glabrous, abaxially glandular, base subrounded or broadly cuneate, margin doubly serrate, apex rounded-obtuse or truncate. Flowers solitary or 2 or 3 and fasciculate, ca. 1 cm in diam.; pedicel 5–10 mm, glandular pubescent; bracts unknown. Hypanthium subglobose, abaxially sparsely pubescent and glandular pubescent. Sepals 5, deciduous, ovate-lanceolate, abaxially sparsely pubescent and glandular pubescent, adaxially densely puberulous, margin entire, apex shortly caudate. Petals 5, yellowish or white, obovate, base broadly cuneate, apex rounded-obtuse. Styles connate into column, exserted, slightly longer than stamens, sparsely pubescent or subglabrous. Hip purple-red, subglobose, ca. 5 mm in diam., sparsely glandular; sepals very late deciduous. Fl. May–Jul, fr. Aug–Sep.

- Farmland, roadsides; 2400–2600 m. Xizang.

One of us (Robertson) has seen no specimens of this species.

88. *Rosa weisiensis* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 16. 1981.

维西蔷薇 wei xi qiang wei

Shrub climbing, small. Branchlets purple-brown, terete, glabrous, those of present year glandular pubescent and sparsely pubescent; prickles scattered, short, flat. Leaves including petiole 4–4.5 cm; stipules membranous, mostly adnate to petiole, free parts lanceolate, abaxially and margin glandular, apex acuminate; rachis and petiole sparsely glandular pubescent and pubescent; leaflets 3–5, pale green abaxially, deep green adaxially, ovate or elliptic, rarely oblong, 1.2–2.5 × 0.4–1.4 cm, abaxially glandular pubescent and sparsely pubescent, adaxially glabrous, base subrounded, margin doubly serrate, teeth often glandular apically when young, apex acute or shortly acuminate. Flowers 5–10 in corymb, ca. 1.5 cm in diam.; pedicel 8–12 mm, densely glandular pubescent, sparsely pubescent; bracts caducous, unknown. Hypanthium oblong or ovate-oblong, abaxially glandular pubescent and sparsely pubescent. Sepals 5, lanceolate, abaxially glandular pubescent and sparsely pubescent, adaxially densely pubescent, margin entire, apex long acuminate. Petals 5, fragrant, white, broadly obovate, base cuneate, apex emarginate. Styles connate into column, nearly equaling stamens, exserted, densely pubescent. Hip unknown. Fl. May–Jul, fr. Aug–Oct.

- Scrub; 1800–2300 m. NW Yunnan (Weixi Xian).

One of us (Robertson) has seen no specimens of this species.

5. *Rosa* sect. *Banksianae* Lindley, Ros. Monogr. 39. 1820.

木香组 mu xiang zu

Shrubs evergreen, climbing, prickly or not. Leaflets 3–7; stipules caducous, free, subulate. Flowers numerous in umbels or in compound corymbs. Sepals deciduous, reflexed, margin entire or lobed. Styles free, slightly exserted.

Two species: China, Laos, Vietnam; two species (one endemic) in China.

89. *Rosa banksiae* W. T. Aiton, Hortus Kew. 3: 258. 1811.

木香花 mu xiang hua

Rosa banksiae var. *alboplana* Rehder.

Shrubs evergreen, climbing, to 6 m tall. Old branches with large, rigid prickles; branchlets red-brown, terete, glabrous;

prickles scattered, curved, short, to 5 mm, flat, gradually tapering to a broad base; branches of cultivated plants sometimes not prickly. Leaves including petiole 4–6 cm; stipules caducous, free, linear-lanceolate, membranous, margin entire, apex acuminate; rachis and petiole sparsely pubescent, usually lacking small prickles; leaflets 3–5, rarely 7, elliptic-ovate or oblong-lanceolate, 2–5 × 0.8–1.8 cm, leathery, abaxially pubescent along veins, with prominent midvein, adaxially glabrous, shiny, base subrounded or broadly cuneate, margin depressed-serrulate, apex acute or slightly acute. Flowers 4–15, in simple umbels or corymbs, 1.5–2.5 cm in diam.; pedicel 2–3 cm, glabrous; bracts caducous, linear, small. Hypanthium globose or ovoid, glabrous. Sepals 5, deciduous, ovate, abaxially glabrous, adaxially white pubescent, margin entire, apex long acuminate. Petals 5, semidouble, or double, fragrant or not, white or yellow, obovate, base cuneate, apex rounded. Carpels numerous; styles free, much shorter than stamens, densely pubescent. Hip orange or black-brown, globose or ovoid, 5–7 mm in diam., glabrous, with deciduous sepals. Fl. Apr–May, fr. Aug–Oct. *2n* = 14*, 28*.

• Thickets, scrub, valleys, stream sides, roadsides; 500–2200 m. Gansu, Guizhou, Henan, Hubei, Jiangsu, Sichuan, Yunnan; also widely cultivated in China.

- 1a. Flowers double or semidouble, not fragrant 89a. var. *banksiae*
 1b. Flowers single, fragrant or not 89b. var. *normalis*

89a. Rosa banksiae var. *banksiae*

木香花(原变种) mu xiang hua (yuan bian zhong)

Flowers double or semidouble, not fragrant.

• Thickets, scrub, stream sides, roadsides; 500–2200 m. Sichuan, Yunnan; also widely cultivated in China.

Rosa banksiae var. *banksiae* f. *lutea* (Lindley) Rehder (Bibliogr. 316. 1949; *R. banksiae* var. *lutea* Lindley, Bot. Reg. 13: 1105. 1827) has yellow flowers.

89b. Rosa banksiae var. *normalis* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 376. 1878.

单瓣木香花 dan ban mu xiang hua

Flowers single, fragrant or not.

• Valleys; 500–1500 m. Gansu, Guizhou, Henan, Hubei, Sichuan, Yunnan.

Rosa banksiae var. *normalis* f. *lutescens* Voss (Blumengart. 1: 49. 1896) has yellow, non-fragrant flowers.

90. Rosa cymosa Trattinnick, Ros. Monogr. 1: 87. 1823.

小果蔷薇 xiao guo qiang wei

Rosa amoyensis Hance; *R. banksiae* W. T. Aiton var. *microcarpa* Regel; *R. bodinieri* H. Léveillé & Vaniot; *R. cavaleriei* H. Léveillé; *R. chaffonjonii* H. Léveillé & Vaniot; *R. esquirolii* H. Léveillé & Vaniot; *R. fukienensis* Metcalf; *R. indica* Linnaeus, p.p.; *R. microcarpa* Lindley; *R. sorbiflora* Focke.

Shrubs evergreen, climbing or scandent, 2–5 m. Branchlets terete, glabrous or pubescent; prickles scattered, hooked, to 6 mm, flat, gradually tapering to a broad base. Leaves including petiole 5–10 cm; stipules caducous, free, linear, membranous, margin entire, apex acuminate; rachis and petiole glabrous or pubescent, often sparsely prickly, rarely glandular pubescent; leaflets 3–5, rarely 7, ovate-lanceolate or elliptic, 2.5–6 × 0.8–2.5 cm, leathery, both surfaces glabrous, abaxially puberulous along midvein or both surfaces densely puberulous, midvein prominent, adaxially shiny, base subrounded, margin acutely serrulate, apex acuminate. Flowers numerous, 2–2.5 cm in diam., in compound corymbs; pedicel ca. 1.5 cm, pubescent when young, glabrescent; bracts lanceolate, margin sparsely glandular pubescent, apex acuminate. Hypanthium globose or ovoid, glabrous. Sepals 5, deciduous, ovate, abaxially subglabrous, rarely setose, adaxially sparsely white tomentose, margin often pinnately lobed, apex acuminate. Petals 5, fragrant, white or yellow, obovate, base cuneate, apex emarginate. Styles free, slightly exerted, nearly equaling stamens, densely white pubescent. Hip red, black, purple, or black-brown, globose, 4–7 mm in diam. Fl. May–Jun, fr. Jul–Nov.

Hills, open slopes, stream sides, roadsides; 200–1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, E Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Laos, Vietnam].

- 1a. Branchlets, petioles, and both surfaces of leaflets glabrous or leaflets abaxially sparsely pubescent 90a. var. *cymosa*
 1b. Branchlets, petioles, and both surfaces of leaflets densely puberulous 90b. var. *puberula*

90a. Rosa cymosa var. *cymosa*

小果蔷薇(原变种) xiao guo qiang wei (yuan bian zhong)

Branchlets, petioles, and both surfaces of leaflets glabrous or leaflets abaxially sparsely pubescent.

Hills, open slopes, stream sides, roadsides; 200–1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Laos, Vietnam].

90b. Rosa cymosa var. *puberula* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 17. 1981.

毛叶山木香 mao ye shan mu xiang

Branchlets, petioles, and both surfaces of leaflets densely puberulous.

• S Anhui (Huang Shan), E Hubei (Wuchang Xian), W Jiangsu (Jiangpu Xian), S Shaanxi (Lantian Xian).

金樱子组 *jin ying zi zu*

Shrubs evergreen, climbing, with scattered, curved prickles. Leaflets 3; stipules free or with base adnate to petiole, caducous, serrate. Flower solitary, large; pedicel and hypanthium densely glandular bristly; bracts absent. Sepals persistent, erect, margin entire. Styles free, not exerted.

One species: China, Vietnam, cultivated elsewhere.

91. *Rosa laevigata* Michaux, Fl. Bor.-Amer. 1: 295. 1803.

金樱子 *jin ying zi*

Rosa amygdalifolia Seringe; *R. argyi* H. Léveillé; *R. cucumerina* Trattinnick; *R. laevigata* var. *kaiscianensis* Pampanini; *R. laevigata* var. *leiocarpa* Y. Q. Wang & P. Y. Chen; *R. nivea* Candolle; *R. ternata* Poiret; *R. triphylla* Roxburgh.

Shrubs evergreen, climbing, to 5 m. Branchlets purple-brown, terete, robust; prickles scattered, curved, to 4 mm, flat, gradually tapering to a broad base; bristles glandular, dense on young stems, to 4 mm. Leaves including petiole 5–10 cm; stipules caducous, free or with base adnate to petiole, lanceolate, glandular serrate, apex acuminate; rachis and petiole shortly prickly and glandular bristly; leaflets 3, rarely 4, elliptic-ovate, obovate, or lanceolate-ovate, 2–6 × 1.2–3.5 cm, leathery, sometimes abaxially minutely prickly and glandular bristly along midvein when young, glabrescent, adaxially glabrous, base broadly cuneate, margin acutely serrate, apex acute or rounded-obtuse. Flower solitary, axillary, 5–10 cm in diam.; pedicel 1.8–2.5(–3) cm, densely glandular bristly; bracts absent.

Hypanthium ovoid, densely glandular bristly. Sepals 5, persistent, slightly shorter than petals, ovate-lanceolate, leaflike, abaxially glabrous, adaxially densely pubescent, margin entire, often glandular bristly. Petals 5, semidouble, or double, white, broadly obovate, base broadly cuneate, apex emarginate. Styles free, much shorter than stamens, pubescent. Hip purple-brown, pyriform or obovoid, rarely subglobose, 0.8–1.5 cm in diam., densely glandular bristly, with persistent, erect sepals. Fl. Apr–Jun, fr. Jul–Nov.

Thickets, scrub, open montane areas, open fields, farmland; 200–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Vietnam; cultivated elsewhere].

Two forms may be recognized: f. *laevigata*, which has flowers single, 5–7 cm in diam., and f. *semitplena* T. T. Yu & T. C. Ku (Bull. Bot. Res., Harbin 1(4): 17. 1981), which has flowers semidouble, 5–10 cm in diam.

The root bark contains tannin, and is used for tanning. Sugar is extracted from the fruit, which is also used to ferment wine. The roots, leaves, and fruit are all used medicinally.

7. *Rosa* sect. *Bracteatae* Thory, Prodr. Monogr. Rosier, 124. 1820.

硕苞组 *shuo bao zu*

Shrubs evergreen, climbing, with curved prickles in pairs below leaves. Leaflets 5–9; stipules with base adnate to petiole, pectinate. Flower solitary, with large bracts. Hypanthium tomentose. Sepals reflexed after anthesis, margin entire. Styles free, slightly exerted.

Two species: E and S Asia; one species in China.

92. *Rosa bracteata* J. C. Wendland, Bot. Beob. 50. 1798.

硕苞蔷薇 *shuo bao qiang wei*

Rosa macartnea Dumont de Courset; *R. sinica* Linnaeus var. *braamiana* Regel.

Shrubs evergreen, diffuse, 0.5–3 m tall, with long repent branches. Branchlets purple-brown, terete, robust, tomentose; prickles often in pairs below stipules, straight to slightly curved, to 9 mm, flat, smaller prickles and glandular bristles often present and dense to scattered. Leaves including petiole 4–9 cm; stipules mostly free, or with base adnate to petiole, densely pubescent, margin pectinate, densely glandular pubescent; rachis and petiole sparsely pubescent, glandular pubescent and shortly prickly; leaflets 5–9, elliptic or obovate, 1–2.5 × 0.5–1.5 cm, leathery, abaxially glabrous or pubescent along veins, adaxially glabrous, shiny, base broadly cuneate or subrounded, margin crenate, apex truncate, rounded-obtuse, or slightly acute. Flowers solitary or 2 or 3 and fasciculate, 4.5–9 cm in diam.; pedicel less than 1 cm, densely villous, sparsely glandular pubescent; bracts several, large, broadly ovate, abaxially densely tomentose, adaxially subglabrous, margin irregularly incised serrate, lacinate, or pectinate. Hypanthium depressed-globose, abaxially densely tawny pubescent and glandu-

lar pubescent. Sepals 5, broadly ovate, abaxially densely tawny pubescent, adaxially sparsely pubescent, apex caudate-acuminate. Petals 5, white or yellowish white, obovate, base broadly cuneate, apex emarginate. Styles free, slightly exerted, slightly shorter than stamens, densely pubescent. Hip globose, 1.3–2.7 cm in diam., densely tawny pubescent, with persistent, reflexed sepals. Fl. May–Jul, fr. Aug–Nov.

Mixed forests, scrub, sandy hills, stream sides, seashores, roadsides; sea level to 300 m. Fujian, Guizhou, Hunan, Jiangsu, Jiangxi, Taiwan, Yunnan, Zhejiang [S Japan].

- 1a. Branchlets densely tawny pubescent, intermixed with scattered bristles and glandular bristles 92a. var. *bracteata*
- 1b. Branchlets densely bristly and glandular bristly 92b. var. *scabriacaulis*

92a. *Rosa bracteata* var. *bracteata*

硕苞蔷薇(原变种) *shuo bao qiang wei* (*yuan bian zhong*)

Branchlets densely tawny pubescent, intermixed with bristles and glandular bristles.

Scrub, sandy hills, stream sides, seashores, roadsides; sea level to 300 m. Fujian, Guizhou, Hunan, Jiangsu, Jiangxi, Taiwan, Yunnan,

Zhejiang [S Japan].

In warm regions this variety is easily propagated and is often cultivated as a hedge; it also has ornamental use owing to its abundant, beautiful flowers.

92b. *Rosa bracteata* var. *scabriacaulis* Lindley ex Koidzumi, J. Coll. Sci. Imp. Univ. Tokyo 24(2): 227. 1913.

8. *Rosa* sect. *Microphyllae* Crépín, J. Hort. Soc. London 11: 227. 1889.

小叶组 xiao ye zu

Shrubs diffuse, with paired prickles below leaves. Leaflets 5–9; stipules adnate to petiole, narrow, with subulate auricles. Flowers 1 or 2 or in compound corymbs, with small deciduous bracts, or bracts absent. Hypanthium cupular, densely prickly. Sepals persistent, erect, pinnately lobed or entire. Carpels on projected torus at base of hypanthium; styles free, not exserted.

Three species: E Asia; three species (two endemic) in China.

93. *Rosa roxburghii* Trattinnick, Ros. Monogr. 2: 233. 1823.

刺梨 ci li

Juzepczukia roxburghii (Trattinnick) Chrshanovski; *Rosa microphylla* Desfontaines var. *glabra* Regel.

Shrubs diffuse, 1–2.5 m tall. Bark gray-brown; branchlets ascending-spreading, purple-brown, terete; prickles paired at nodes, mostly straight, to 5 mm, somewhat flat, abruptly narrowing to broad base. Leaves including petiole 5–11 cm; stipules mostly adnate to petiole, free parts subulate, margin glandular pubescent; rachis and petioles with scattered small prickles; leaflets 9–15, elliptic or oblong, rarely obovate, 1–2 × 0.6–1.2 cm, glabrous, abaxially with prominent veins, conspicuously reticulate, base broadly cuneate, margin acutely simply serrulate, apex acute or rounded-obtuse. Flowers solitary, or 2 or 3 and fasciculate apically on branches, 4–6 cm in diam.; pedicel short; bracts 2 or 3, small, margin glandular pubescent. Hypanthium depressed-globose, densely bristly. Sepals 5, usually broadly ovate, abaxially densely prickly, adaxially tomentose, pinnately lobed, apex acuminate. Petals 5, semidouble, or double, slightly fragrant, pink to rose-purple or reddish, obovate. Carpels on projected torus at base of hypanthium; styles free, not exserted, shorter than stamens, pubescent. Hip green-red, depressed-globose, 1.5–2 cm in diam., densely prickly, with persistent, erect sepals. Fl. Mar–Jul, fr. Aug–Oct.

Mountain forests, thickets, slopes, stream sides, also cultivated; 500–1400 m, Anhui, Fujian, S Gansu, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, S Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang [Japan].

Two forms may be recognized: f. *roxburghii*, which has double or semidouble, reddish or pink flowers 5–6 cm in diam., and f. *normalis* Rehder & E. H. Wilson (in Sargent, Pl. Wilson. 2: 318. 1915; *Rosa forrestii* Focke), which has simple, pink flowers 4–6 cm in diam. The specific epithet was spelled “*roxbourgii*” in the protologue.

The edible fruit are very rich in vitamins and have a sweet, sour taste; they are used medicinally and to ferment wine. The roots are also used medicinally. The species is also cultivated for ornament, for its showy flowers, or as a hedge because of its abundant prickles.

94. *Rosa kweichowensis* T. T. Yu & T. C. Ku, Bull. Bot. Res., Harbin 1(4): 17. 1981.

贵州刺梨 gui zhou ci li

Shrubs evergreen or semi-evergreen, climbing, small. Branchlets purple-brown, terete, curved, glabrous; prickles

密刺硕苞蔷薇 mi ci shuo bao qiang wei

Branchlets densely bristly and glandular bristly.

• Mixed forests, stream sides, seashores. Fujian, Taiwan, Zhejiang.

One of us (Robertson) has seen no specimens of this variety.

short, flat. Leaves including petiole 5–10 cm; stipules with 1/3 part adnate to petiole, free parts lanceolate, margin glandular

serrate, apex acuminate, and petiole with scattered, small prickles, leaflets 7–9, elliptic, obovate, or ovate, 1.5–3.5 × 0.8–2 cm, glabrous, abaxially with prominent midvein and lateral veins, base broadly cuneate or subrounded, margin acutely simply serrate, apex acuminate or acute. Flowers 7–17 in compound corymb, 2.5–3 cm in diam.; peduncle and pedicels pubescent, pedicel 7–10 mm; bracts unknown. Hypanthium depressed-globose, abaxially subglabrous, densely prickly. Sepals 5, usually broadly ovate, abaxially densely prickly, adaxially tomentose, margin irregularly pinnately lobed, apex acuminate. Petals 5, white, slightly longer than sepals, obovate, base cuneate, apex erose. Carpels on projected torus at base of hypanthium; styles free, slightly exerted, pubescent. Hip unknown. Fl. May–Jul.

- Shady places. C Guizhou (Qingzhen Xian).

One of us (Robertson) has seen no specimens of this species.

95. *Rosa praelucens* Byhouwer, J. Arnold Arbor. 10: 97. 1929.

中甸刺玫 zhong dian ci mei

Shrubs 2–3 m tall. Branchlets purple-brown, terete, robust; prickles few, scattered, straight or curved at tip, to 1.5 cm, robust, flat, gradually tapering to base to 2 cm across. Leaves

including petiole 5–13(–20) cm; stipules mostly adnate to petiole, free parts triangular or lanceolate, both surfaces pubescent, margin glandular pubescent, apex acuminate; rachis and petioles tomentose, sparsely shortly prickly; leaflets 7–13, obovate or elliptic, 1–3.5(–6) × 0.7–1.2(–2.3) cm, both surfaces densely puberulous, abaxially villous along veins, base rounded or broadly cuneate, margin simply serrate in upper 1/2, or inconspicuously doubly serrate, apex rounded-obtuse or acute. Flower solitary, (5–)8–9 cm in diam.; pedicel 3–6 cm, tomentose, sometimes sparsely glandular pubescent; bracts at base, leaflike. Hypanthium depressed-globose, pubescent, glandular bristly. Sepals 5, slightly shorter than petals, ovate-lanceolate, leaflike, both surfaces tomentose-villous, sometimes abaxially glandular bristly at base, margin entire. Petals 5, red, broadly obovate, base broadly cuneate, apex rounded or emarginate. Carpels on projected torus at base of hypanthium; styles free, not exerted, shorter than stamens, densely villous. Hip green-brown, depressed-globose, 1–1.5 cm in diam., sparsely glandular prickly, with persistent, erect sepals. Fl. Jun–Jul.

- Woods on open slopes; 2700–3000 m. NW Yunnan (Zhongdian Xian).

42. POTANINIA Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 27: 465. 1882.

绵刺属 mian ci shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Shrublets with thick, subterranean stock. Stems much branched; branchlets spinelike. Stipules adnate to petiole, ovate, hyaline; petiole hard, persistent, spinelike; leaf blade (1 or)3- or palmately 5-foliolate; leaflets minute. Flowers solitary, axillary, bracteate, bisexual, minute. Hypanthium funnellform. Sepals 3, deltoid, persistent. Petals 3, ovate, scarcely larger than sepals, deciduous. Stamens 3, opposite petals; filaments shorter than petals, inserted at glabrous margin of swollen disk; anthers dorsifixed, not exerted, introrse, ovoid. Carpel 1, central, ovoid; ovule inserted laterally next to style, ascending; style basal, persistent; stigma capitate. Achene cylindrical. Seed cylindrical, thickened proximally.

One species: China, Mongolia.

1. *Potaninia mongolica* Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 27: 466. 1882.

绵刺 mian ci

Shrublets 30–40 cm tall, long sericeous throughout. Stems gray-brown. Stipules 1.5–2 mm; petiole 1–1.5 mm; leaflets ca. 2 × 0.5 mm, base narrowed, margin entire, apex acute. Flowers ca. 3 mm in diam.; pedicel 3–5 mm; bracts ovate, ca. 1 mm.

Hypanthium densely sericeous adaxially. Sepals ca. 1.5 mm, apex acute. Petals white or tinged pink, ca. 1.5 mm. Filaments adaxially densely sericeous. Carpel densely sericeous. Achene tinged yellow, ca. 2 mm, hairy, enclosed by persistent sepals. Fl. Jun–Sep, fr. Aug–Oct.

Gravelly deserts. Nei Mongol [Mongolia].

This species is used for forage.

43. AGRIMONIA Linnaeus, Sp. Pl. 1: 448. 1753.

龙芽草属 long ya cao shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial, tall, with creeping rhizome. Leaves stipulate, imparipinnate. Flowers usually in terminal, spikelike racemes, bisexual, rather small. Hypanthium turbinate, sulcate, with hooked prickles or 5 teeth below limb abaxially, constricted at throat. Sepals 5, imbricate, persistent. Petals 5, larger than sepals. Disk lining hypanthium, margin thickened, annular, glandular. Stamens 5–15 or more, inserted at mouth of hypanthium, 1-seriate. Carpels usually 2, included in hypanthium, sessile; ovule pendulous; style terminal, exerted, filiform; stigma dilated. Achenes 1 or 2, included in closed hypanthium, distally with hooked prickles. Seed pendulous; testa membranous. $x = 7$.

About ten species: N temperate zone, alpine regions of tropics; four species in China.

- 1a. Flowers 12–13 mm in diam.; fruiting hypanthium 8–10 × ca. 5 mm including prickles, outer prickles recurved, innermost ones spreading 4. *A. eupatoria*
- 1b. Flowers 4–10 mm in diam.; fruiting hypanthium 5–8 × 2–4 mm including prickles, prickles spreading, erect, or connivent.
- 2a. Stipules flabellate or broadly ovate, margin obtusely dentate; stamens 17–24 3. *A. coreana*
- 2b. Stipules falcate or semiorbicular, margin acutely serrate; stamens 5–15.
- 3a. Flowers 6–9 mm in diam.; fruiting hypanthium 7–8 × 3–4 mm including prickles, prickles erect when young, connivent when old; leaflets obovate to obovate-lanceolate, abaxially appressed pubescent on veins 1. *A. pilosa*
- 3b. Flowers 4–5 mm in diam.; fruiting hypanthium 4–5 × 2–2.5 mm including prickles, prickles spreading; leaflets rhombic-elliptic or elliptic, usually widest at middle, abaxially sparsely spreading hirsute on veins 2. *A. nipponica*

1. Agrimonia pilosa Ledebour, Index Seminum Hort. Dorpat., Suppl. 1. 1823.

龙芽草 long ya cao

Herbs 30–120 cm tall. Rhizome short, usually tuberous, with many lateral roots and 1 to several underground buds. Stems sparsely pilose and pubescent, or densely rigidly hairy (rarely sparsely hirsute) in lower part. Stipules green, falcate, rarely ovate or ovate-lanceolate, herbaceous, margin sharply serrate or lobed, rarely entire, apex acute or acuminate; petiole sparsely pilose or pubescent; leaf blade interrupted imparipinnate with (2 or)3 or 4 pairs of leaflets, reduced to 3 leaflets on upper leaves; leaflets sessile or shortly petiolulate, obovate, obovate-elliptic, or obovate-lanceolate, 1.5–5 × 1–2.5 cm, abaxially appressed pilose on veins, or densely pubescent or tomentose-pubescent between veins, rarely glabrescent, markedly or sparsely glandular punctate, adaxially pilose, or hirsute or hirtellous on veins, rarely glabrescent, base cuneate to broadly so, margin acutely to obtusely serrate, apex rounded to acute, rarely acuminate. Inflorescence terminal, spicate-racemose, branched or not; rachis pilose. Flowers 6–9 mm in diam.; pedicel 1–5 mm, pilose; bract usually 3-parted with segments linear; bracteoles in 1 pair, ovate, margin entire or lobed. Sepals 5, triangular-ovate. Petals yellow, oblong. Stamens (5–)8–15. Style filiform; stigma capitate. Fruiting hypanthium obovoid-conic, 7–8 × 3–4 mm including prickles, abaxially 10-ribbed, pilose, with a multiseriate crown of prickles; prickles erect when young, connivent at maturity. Fl. and fr. May–Dec.

Thinned forests, forest margins, thickets, meadows, stream banks, roadsides; 100–3800 m. Throughout China [Bhutan, N India, Japan, N Laos, Korea, Mongolia, Myanmar, Nepal, Russia, Sikkim, N Thailand, N Vietnam; E Europe].

- 1a. Stems sparsely pilose and pubescent, rarely sparsely hirsute in lower part; leaflets abaxially usually appressed pilose on veins, rarely glabrescent, markedly glandular punctate, adaxially pilose, rarely glabrescent 1a. var. *pilosa*
- 1b. Stems densely rigidly hairy in lower part; leaflets abaxially densely pubescent or tomentose-pubescent between veins, sparsely glandular punctate, adaxially hirsute or hirtellous on veins 1b. var. *nepalensis*

1a. Agrimonia pilosa var. **pilosa**

龙芽草(原变种) long ya cao (yuan bian zhong)

Agrimonia eupatoria Linnaeus var. *japonica* (Miquel) Masamune; *A. japonica* (Miquel) Koidzumi; *A. obtusifolia* A. I. Baranov & Skvortsov; *A. pilosa* subsp. *japonica* (Miquel) H. Hara; *A. pilosa* var. *japonica* (Miquel) Nakai; *A. pilosa* var. *viscidula* (Bunge) Komarov; *A. viscidula* Bunge; *A. viscidula* var. *japonica* Miquel.

Stems sparsely pilose and pubescent, rarely sparsely hirsute in lower part. Leaflets abaxially usually appressed pilose on veins, rarely glabrescent, markedly glandular punctate, adaxially pilose, rarely glabrescent. Fl. and fr. May–Dec. 2n = 56.

Thinned forests, forest margins, thickets, meadows, stream banks, roadsides; 100–3800 m. Throughout China [Japan, Korea, Mongolia, Russia, N Vietnam; E Europe].

1b. Agrimonia pilosa var. **nepalensis** (D. Don) Nakai, Bot. Mag. (Tokyo) 47: 247. 1933.

黄龙尾 huang long wei

Agrimonia nepalensis D. Don, Prodr. Fl. Nepal. 229. 1825; *A. eupatoria* Linnaeus var. *nepalensis* (D. Don) O. Kuntze.

Stems densely rigidly hairy in lower part. Leaflets abaxially densely pubescent or tomentose-pubescent between veins, sparsely glandular punctate, adaxially hirsute or hirtellous on veins.

Thinned forests, meadows on mountain slopes, stream banks; 100–3500 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [Bhutan, N India, N Laos, Myanmar, Nepal, Sikkim, N Thailand, N Vietnam].

This species is used medicinally.

2. Agrimonia nipponica Koidzumi var. **occidentalis** Skalický ex J. E. Vidal in Aubréville, Fl. Cambodge Laos Vietnam 6: 133. 1968.

小花龙芽草 xiao hua long ya cao

Herbs 30–90 cm tall. Rhizome long, with many slender lateral roots and usually 1 to several underground buds. Stems densely yellow hirsute in lower part, densely pubescent in upper part. Stipules falcate or semiorbicular, rarely oblong, margin acutely serrate, on stipules of lower part of stem usually entire; petiole sparsely pilose and pubescent; leaf blade inter-

rupted imparipinnate, on lower leaves usually with 3 pairs of leaflets, rarely 2 pairs with basal pair very small, on middle leaves with 2 pairs, on uppermost leaves with 1 or 2 pairs; leaflets sessile or shortly petiolulate, elliptic or rhombic-elliptic, 1.5–4 × 1–2 cm, widest at or near middle, abaxially sparsely spreading hirsute on veins, sparsely glandular punctate or inconspicuously so, adaxially appressed pilose, base broadly cuneate, margin crenate, apex usually obtuse or acute. Inflorescence usually branched, with slender branches. Flowers 4–5 mm in diam.; pedicel 1–3 mm; bract small, 3-parted; bracteoles in 1 pair, ovate, margin entire or shallowly lobed, apex shortly acuminate. Stamens 5(–10). Carpels 2, usually 1 well developed; stigma capitate. Fruiting hypanthium campanulate, 4–5 × 2–2.5 mm including prickles, abaxially 10-ribbed, sparsely pilose, with a multiseriate crown of prickles; prickles spreading. Fl. and fr. Aug–Nov.

Thinned forests, forest margins, thickets, grassy mountain slopes, stream banks; 200–1500 m. Anhui, Guangdong, Guangxi, SE Guizhou Jiangxi, Zhejiang [Laos, Vietnam].

Agrimonia nipponica var. *nipponica* occurs in Japan and Korea.

3. *Agrimonia coreana* Nakai, Rep. Veg. Diamond Mount. 71. 1918.

托叶龙芽草 tuo ye long ya cao

Agrimonia pilosa Ledebour var. *coreana* (Nakai) Liou & Cheng; *A. velutina* Juzepczuk.

Herbs 70–100 cm tall. Rhizome horizontal, woody, with many lateral roots, often with 1 to several underground buds. Stems pilose and pubescent. Stipules broadly flabellate or broadly ovate, margin coarsely crenate or lobed; petiole sparsely pilose and pubescent; leaf blade interrupted imparipinnate with 3 or 4 pairs of leaflets, on upper leaves with 1 or 2 pairs; leaflets sessile, rhombic-elliptic or obovate-elliptic, 2–6 × 1.5–3 cm, abaxially densely pubescent between veins, spreading pilose on veins, adaxially appressed pilose or glabrescent, base cuneate or broadly so, margin coarsely crenate, apex obtuse to acute. Inflorescence rather lax, with 1.5–4 cm intervals between flowers; rachis slender, pubescent and pilose. Flowers 7–9 mm in diam.; pedicel 1–3 mm; bract 3-parted with segments fasciated; bracteoles in 1 pair, ovate, margin serrate or entire. Sepals triangular-ovate. Petals yellow, obovate-oblong. Stamens 17–24. Stigma capitate. Fruiting hypanthium conic-hemispheric, ca. 5 × 4 mm including prickles, abaxially 10-ribbed, pilose, with a multiseriate crown of prickles; prickles spreading. Fl. and fr. Jul–Aug. $2n = 28$.

Forest margins, thickets on mountain slopes; 500–800 m. Jilin, Liaoning, Shandong, Zhejiang [Japan, Korea, E Russia].

4. *Agrimonia eupatoria* Linnaeus subsp. *asiatica* (Juzepczuk) Skalický, Feddes Repert. 79: 35. 1968.

大花龙芽草 da hua long ya cao

Agrimonia asiatica Juzepczuk, Weeds URSS 3: 138. 1934.

Herbs 35–120 cm tall. Rhizome ± short, rather thick. Stems densely hirsute. Stipules semiorbicular, herbaceous, margin coarsely acutely serrate or lobed; petiole pilose and pubes-

cent; leaf blade interrupted imparipinnate with 3–5 pairs of leaflets, on uppermost leaves with 1 or 2 pairs; leaflets sessile or occasionally shortly petiolulate, elliptic, oblong, or obovate-elliptic, 2–7 × 1.5–4 cm, abaxially pubescent and pilose, adaxially appressed pilose, base rounded or broadly cuneate, margin coarsely crenate, apex obtuse or acute. Inflorescence usually simple; rachis thick, pubescent and villous. Flowers 12–13 mm in diam.; pedicel ca. 1 mm; bract 3- or 4-parted with segments fasciated; bracteoles in 1 pair, ovate, margin 3-serrate. Sepals 5, triangular-ovate. Petals yellow, obovate-elliptic. Stamens 11–

12. Stigma prominently dilated. Fruiting hypanthium campanulate, 8–10 × ca. 5 mm including prickles, abaxially 10-ribbed, pilose, with a multiseriate crown of prickles; outer prickles reflexed, inner ones spreading. Fl. Jun, fr. Jul.

Mountains, river banks; 500–1300 m. Xinjiang [C and SW Asia].

Agrimonia eupatoria subsp. *eupatoria* occurs in N and W Africa (including Macaronesia) and Europe.

44. SPENCERIA Trimen, J. Bot. 17: 97. 1879.

马蹄黄属 ma ti huang shu

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial, white villous throughout. Rhizome woody, densely covered with remains of old petioles. Stems erect, terete, simple. Radical leaves: stipules ovate, herbaceous, adnate to petiole; petiole sheathing at base; leaf blade imparipinnate; leaflets opposite, rarely alternate, broadly elliptic or obovate-oblong; cauline leaves few, with few leaflets, or simple and then margin 3-lobed or 2- or 3-serrate. Inflorescences terminal, laxly racemose; bract entire or 3-lobed; involucre close to petals, cupular, 7- or 8-lobed, lobes narrowly ovate to lanceolate. Hypanthium obconic. Sepals 5, valvate, broadly linear to lanceolate, persistent; epicalyx segments 5, semiobicular or triangular. Petals 5, golden or cream, oblanceolate to obovate. Stamens 30–40, in 2 or 3 series; filaments dilated and connate at base, persistent. Carpels (1 or)2, at base of hypanthium, apically villous; ovary ovoid-cylindric; ovule 1, pendulous; style subterminal, filiform, long exerted from hypanthium; stigma minute. Fruit composed of flower parts excluding deciduous petals, dry and somewhat hardened. Achene 1, subglobose, with thin coat, enclosed in hypanthium. Seed lacking endosperm; cotyledons subsquare, large.

One species: Bhutan, China.

1. *Spenceria ramalana* Trimen, J. Bot. 17: 97. 1879.

马蹄黄 ma ti huang

Herbs 18–32 cm tall. Stems red-brownish, sparsely white villous or sericeous. Radical leaves 4.5–13 cm including petiole; stipules ca. 1 cm; petiole 1–6 cm; leaf blade with 13–21 leaflets; leaflets 1–2.5 × 0.5–1 cm, papery, lateral veins obscure, base rounded, margin entire, apex 2- or 3-lobed. Inflorescences 5–20 cm, 12–15-flowered; bract 8–20 mm; involucre abaxially with long, simple hairs and short, glandular hairs, adaxially glabrous, lobes acute at apex, 2 opposite ones longer than others, 2–3 × 0.8–1 mm. Flowers 1–2 cm in diam.; pedicel erect, 1.5–4 cm. Hypanthium ca. 2 mm. Sepals 3–6 × 1–1.8 mm, apex acute; epicalyx segments 1.2–3.5 × 1–3 mm, abaxially with long, simple hairs throughout and short, glandular hairs near apex, adaxially glabrous, apex obtuse or acute. Petals 4–10 × 2.5–6 mm, tapering into a short claw at base, apex rounded or subobtusate. Filaments yellow, 3–6 mm. Achene yellow-brown, 3–4 mm in diam. Fl. Jul–Aug, fr. Sep–Oct.

Alpine meadows, limestone mountain slopes; 3000–5000 m. Sichuan, Xizang, Yunnan [Bhutan].

This species (both varieties) is used medicinally.

- 1a. Flowers 1.5–2 cm in diam.; sepals 4–6 × 1.2–1.8 mm, epicalyx segments 2–3.5 × 1.5–3 mm; petals 6–10 × 4–6 mm 1a. var. *ramalana*
 1b. Flowers ca. 1 cm in diam.; sepals 3–4 × ca. 1 mm, epicalyx segments 1.2–1.8 × 1–1.5 mm; petals 4–4.5 × 2.5–3 mm 1b. var. *parviflora*

1a. *Spenceria ramalana* var. *ramalana*

马蹄黄(原变种) ma ti huang (yuan bian zhong)

Flowers 1.5–2 cm in diam. Sepals 4–6 × 1.2–1.8 mm; epicalyx segments 2–3.5 × 1.5–3 mm. Petals 6–10 × 4–6 mm.

• Alpine meadows, limestone mountain slopes; 3000–5000 m. Sichuan, Xizang, Yunnan.

1b. *Spenceria ramalana* var. *parviflora* (Stapf) Kitamura, Acta Phytotax. Geobot. 15: 172. 1953.

小花马蹄黄 xiao hua ma ti huang

Spenceria parviflora Stapf, Bot. Mag. 149: t. 9007. 1923.

Flowers ca. 1 cm in diam. Sepals 3–4 × ca. 1 mm; epicalyx segments 1.2–1.8 × 1–1.5 mm. Petals 4–4.5 × 2.5–3 mm.

Alpine meadows; 3000–5000 m. Xizang [Bhutan].

45. SANGUISORBA Linnaeus, Sp. Pl. 1: 116. 1753.

地榆属 di yu shu

Li Chaoluan (李朝銮 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Poterium Linnaeus.

Herbs perennial. Rootstock robust, bearing many fusiform, cylindric roots in lower part. Stipules sheathing, adnate to petiole, petiole sheathing and imbricate at base; leaf blade imparipinnate; leaflets serrate at margin. Inflorescences terminal on elongate scapes, densely capitate or spicate, bracteate and bracteolate. Flowers bisexual, rarely unisexual (when plants monoecious). Hypanthium with a constricted throat. Sepals 4(–7), imbricate, petaloid, purple, red, pink, or white, rarely greenish. Petals absent. Disk lining hypanthium. Stamens usually 4, rarely more, inserted in throat of hypanthium; filaments free, rarely partly connate; anthers

didymous. Carpel 1(or 2), included in hypanthium; ovule pendulous; style terminal, filiform; stigma penicillate. Achene dry, included in hardened, muricate or winged hypanthium. Cotyledons planoconvex. $x = 7$.

About 30 species: Asia, Europe, North America; seven species (one endemic) in China.

- 1a. Inflorescences flowering from base upward.
 - 2a. Leaflets of radical leaves usually truncate to subcordate at base; inflorescences usually nodding, thick; sepals white or pinkish; bracts longer than hypanthium in bud, densely hairy; filaments gradually dilated from base, broadest near middle, then gradually attenuate toward apex, narrower than anther, or sometimes little dilated 6. *S. alpina*
 - 2b. Leaflets of radical leaves cordate or deeply so at base; inflorescences usually erect, long, slender; sepals white; bracts nearly equaling hypanthium in bud, abaxially sparsely hairy or subglabrous, margin ciliate; filaments compressed-dilated from middle to apex, broadest at apex, nearly as broad as anther 7. *S. stipulata*
- 1b. Inflorescences flowering from apex downward.
 - 3a. Inflorescences capitate; sepals white.
 - 4a. Plants less than 35 cm tall; leaflets of radical leaves broadly ovate to suborbicular; flowers unisexual (females in center, males surrounding); style $0.5-1 \times$ as long as sepals; fruiting hypanthium with 4 ribs 4. *S. filiformis*
 - 4b. Plants to 85 cm tall; leaflets of radical leaves ovate, elliptic, or long elliptic; flowers bisexual; style equaling sepals; fruiting hypanthium with 4 winged ribs 5. *S. diandra*
 - 3b. Inflorescences ellipsoid, cylindric, or elongate; sepals purple, red, pink, or white.
 - 5a. Filaments filiform, subequaling sepals 1. *S. officinalis*
 - 5b. Filaments compressed-dilated, $0.5-2 \times$ as long as sepals.
 - 6a. Leaflets of radical leaves linear-lanceolate, base subcordate or rounded to obliquely broadly cuneate, margin acutely incised serrate 2. *S. tenuifolia*
 - 6b. Leaflets of radical leaves ovate, elliptic, or oblong, base cordate, margin coarsely obtusely serrate 3. *S. applanata*

1. *Sanguisorba officinalis* Linnaeus, Sp. Pl. 1: 116. 1753.

地榆 di yu

Herbs perennial, 30–120 cm tall. Rootstock brown or purple-brown, robust, usually fusiform, rarely terete, cross section yellow-white or purple. Stems erect, angular, glabrous, or base pilose or sparsely glandular hairy. Radical leaves: stipules brown, membranous, glabrous or abaxially sparsely glandular hairy; petiole long, glabrous or sparsely glandular, base sheathing and imbricate, sometimes sparsely glandular hairy; leaf blade with 4–6 pairs of leaflets; leaflets petiolulate, green on both surfaces, ovate, oblong-ovate, fasciated oblong, or fasciated lanceolate, $1-7 \times 0.5-3$ cm, base cordate to broadly cuneate, margin coarsely obtusely or rarely acutely serrate, both surfaces glabrous or abaxially sparsely pilose; cauline leaves: stipules large, semiovate, herbaceous, margin acutely serrate; leaflets shortly petiolulate or sessile, oblong to oblong-lanceolate, base subcordate to rounded, apex acute. Inflorescences erect, spicate, ellipsoid, cylindric, or ovoid, usually $1-6 \times 0.5-1$ cm, flowering from apex to base; rachis glabrous or occasionally sparsely glandular hairy; bracts lanceolate, shorter than or nearly equaling sepals, membranous, abaxially pilose, apex acuminate to caudate. Sepals 4, purple, red, pink, or white, elliptic to broadly ovate, abaxially pilose, with faint longitudinal midvein, usually with shortly acute apex. Stamens 4; filaments filiform, $0.5-1 \times$ as long as sepals, exerted beyond them or not. Ovary glabrous or puberulous; stigma dilated, discoid, margin fimbriate-papillate. Fruiting hypanthium longitudinally 4-ribbed. Fl. and fr. Jul–Nov.

Thinned forests, forest margins, thickets, meadows, grasslands, grassy mountain slopes, damp places in ravines, stream banks; near sea level to 3000 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan,

Xinjiang, Xizang, Yunnan, Zhejiang [Asia, Europe].

This species is used medicinally.

- 1a. Filaments $0.5-1 \times$ as long as sepals, exerted beyond them 1e. var. *longifolia*
- 1b. Filaments nearly equaling sepals.
 - 2a. Leaflets of radical leaves fasciated oblong to fasciated lanceolate, base subcordate or rounded to broadly cuneate 1d. var. *longifolia*
 - 2b. Leaflets of radical leaves ovate or oblong-ovate, base cordate to subcordate.
 - 3a. Sepals pink or white 1c. var. *carnea*
 - 3b. Sepals purple, red, or tinged purple.
 - 4a. Leaflets glabrous on both surfaces, base of petiole or stem sometimes sparsely glandular hairy 1a. var. *officinalis*
 - 4b. Leaflets abaxially sparsely pilose, base of petiole or stem sparsely glandular hairy 1b. var. *glandulosa*

1a. *Sanguisorba officinalis* var. *officinalis*

地榆(原变种) di yu (yuan bian zhong)

Poterium officinale (Linnaeus) A. Gray; *Sanguisorba montana* Jordan; *S. officinalis* var. *longa* Kitagawa; *S. officinalis* var. *montana* (Jordan) Focke; *S. officinalis* var. *microcephala* Kitagawa; *S. officinalis* var. *polygama* (Nylander) Sergievskaja; *S. polygama* Nylander.

Base of petiole or stem sometimes sparsely glandular hairy; leaflets of radical leaves ovate or oblong-ovate, glabrous on both surfaces, base cordate to subcordate. Sepals purple, red, or tinged purple. Filaments nearly equaling sepals. Fl. and fr.

Jul–Oct.

Thinned forests, thickets, meadows, grasslands, grassy mountain slopes; near sea level to 3000 m. Anhui, Gansu, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang [Asia, Europe].

1b. *Sanguisorba officinalis* var. *glandulosa* (Komarov) Vorschilov, Fl. Far East URSS 265. 1966.

腺地榆 xian di yu

Sanguisorba glandulosa Komarov, Bot. Mater. Gerb. Glavn. Bot. Sada SSSR 6: 10. 1926.

Base of petiole or stem sparsely glandular hairy; leaflets of radical leaves ovate or oblong-ovate, abaxially sparsely pilose, base cordate to subcordate. Sepals purple, red, or tinged purple. Filaments nearly equaling sepals. Fl. and fr. Jul–Sep.

Forest margins, damp places in ravines; 600–1900 m. Gansu, Heilongjiang, Shaanxi [Mongolia, E Russia].

1c. *Sanguisorba officinalis* var. *carnea* (Fischer ex Link) Regel ex Maximowicz, Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 9: 154. 1877.

粉花地榆 fen hua di yu

Sanguisorba carnea Fischer ex Link, Enum. Hort. Berol. Alt. 1: 144. 1821.

Leaflets of radical leaves ovate or oblong-ovate, base cordate to subcordate. Sepals pink or white. Filaments nearly equaling sepals.

Heilongjiang, Jilin [Korea].

1d. *Sanguisorba officinalis* var. *longifolia* (Bertoloni) T. T. Yu & C. L. Li, Acta Phytotax. Sin. 17(1): 9. 1979.

长叶地榆 chang ye di yu

Sanguisorba longifolia Bertoloni, Mem. Reale Accad. Sci. Ist. Bologna 12: 234. 1861; *Poterium longifolium* (Bertoloni) J. D. Hooker; *S. formosana* Hayata; *S. officinalis* subsp. *longifolia* (Bertoloni) K. M. Purohit & Panigrahi; *S. rectispicata* Kitagawa.

Leaflets of radical leaves fasciated oblong to fasciated lanceolate, base subcordate or rounded to broadly cuneate. Filaments nearly equaling sepals. Fl. and fr. Aug–Nov.

Thinned forests, thickets, damp meadows, grassy mountain slopes, stream banks; 100–3000 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Korea, Mongolia, Russia].

1e. *Sanguisorba officinalis* var. *longifila* (Kitagawa) T. T. Yu & C. L. Li, Acta Phytotax. Sin. 17(1): 10. 1979.

长蕊地榆 chang rui di yu

Sanguisorba rectispicata var. *longifila* Kitagawa, Bot. Mag. (Tokyo) 50: 136. 1936; *S. longifolia* var. *longifila* (Kitagawa) Kitagawa.

Leaflets of radical leaves fasciated oblong to fasciated lanceolate. Filaments 0.5–1 × as long as sepals, exerted beyond

them. Fl. and fr. Aug–Sep.

• Damp meadows, ditch banks; 100–1300 m. Heilongjiang, Nei Mongol.

2. *Sanguisorba tenuifolia* Fischer ex Link, Enum. Hort. Berol. Alt. 1: 144. 1821.

细叶地榆 xi ye di yu

Herbs perennial, to 1.5 m tall. Rootstock branched, robust, with many long, slender roots. Stems angular, glabrous. Radical leaves: stipules brown, membranous, abaxially glabrous; petiole glabrous; leaf blade with 7–9 pairs of leaflets; leaflets petiolulate, green on both surfaces, fasciated or fasciated lanceolate, 5–7 × 1.5–1.7 cm, both surfaces glabrous, base subcordate to obliquely truncate or rounded, margin acutely incised serrate, apex rounded to acute; cauline leaves: stipules green, falcate, herbaceous, margin incised serrate; leaf blade resembling that of radical leaves but leaflets fewer and narrower higher up stem. Inflorescences usually nodding, spicate, long cylindrical, 2–7 × 0.5–0.8 cm; peduncle subglabrous; bracts lanceolate, shorter than sepals, abaxially and at margin densely hairy. Sepals red, whitish red, or white, long elliptic, abaxially glabrous. Stamens 4; filaments compressed-dilated, 0.5–2 × as long as sepals, apex narrower than or nearly as broad as anther. Ovary glabrous or pubescent near base; stigma dilated, discoidal. Fruiting hypanthium longitudinally 4-ribbed, glabrous. Fl. and fr. Jul–Sep.

Forests, forest margins, meadows, grassy mountain slopes, damp places; 200–1700 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia].

- 1a. Sepals red, sometimes whitish red; filaments 0.5–1 × as long as sepals 2a. var. *tenuifolia*
 1b. Sepals white; filaments 1–2 × as long as sepals 2b. var. *alba*

2a. *Sanguisorba tenuifolia* var. *tenuifolia*

细叶地榆(原变种) xi ye di yu (yuan bian zhong)

Sanguisorba tenuifolia var. *purpurea* Trautvetter & C. A. Meyer; *S. affinis* C. A. Meyer ex Regel & Tiling; *Poterium tenuifolium* (Fischer ex Link) Franchet & Savatier.

Sepals red, sometimes whitish red. Filaments 0.5–1 × as long as sepals. Fl. and fr. Aug–Sep.

Forest margins, meadows, grassy mountain slopes; 300–1500 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia].

2b. *Sanguisorba tenuifolia* var. *alba* Trautvetter & C. A. Meyer in Middendorff, Reise Sibir. 1(3): 35. 1856.

小白花地榆 xiao bai hua di yu

Sanguisorba parviflora (Maximowicz) Takeda; *S. tenuifolia* var. *parviflora* Maximowicz.

Sepals white. Filaments 1–2 × as long as sepals. Fl. and fr. Jul–Sep.

Forests, forest margins, meadows, damp places; 200–1700 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia].

3. *Sanguisorba applanata* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 17(1): 11. 1979.

宽蕊地榆 kuan rui di yu

Herbs perennial, 75–120 cm tall. Rootstock robust, terete. Stems subglabrous. Lower cauline leaves: stipules semiorbicular, margin incised serrate; petiole sparsely pilose; leaf blade with 3–5 pairs of leaflets; petiolules 0.5–2.5 cm; leaflets green on both surfaces, ovate, elliptic, or oblong, 1.5–5 × 1–4 cm, both surfaces glabrous or abaxially densely villous, base cordate, margin coarsely dentate, apex rounded, rarely truncate; upper cauline leaves: leaflets narrowly oblong, base truncate to broadly cuneate. Inflorescences spicate, long cylindrical, 4–7.5 × 0.6–1 cm; bracts elliptic-ovate, abaxially pubescent. Sepals pale pink or white, elliptic. Stamens 4; filaments gradually compressed-dilated distally, ca. 2 × as long as sepals, as broad as anther. Style filiform; stigma dilated, discoidal, papillate. Fl. and fr. Jul–Oct.

• Thinned forests, marshy banks of ravines and streams; 100–500 m. Hebei, Jiangsu, Shandong.

- 1a. Stipules and leaflets glabrous on both surfaces; sepals pale pink or white 3a. var. *applanata*
 1b. Stipules and leaflets abaxially densely villous; sepals pale pink 3b. var. *villosa*

3a. *Sanguisorba applanata* var. *applanata*

宽蕊地榆(原变种) kuan rui di yu (yuan bian zhong)

Stipules and leaflets glabrous on both surfaces. Sepals pale pink or white. Fl. and fr. Jul–Oct.

• Thinned forests, marshy banks of ravines and streams; 100–500 m. Hebei, Jiangsu, Shandong.

3b. *Sanguisorba applanata* var. *villosa* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 17(1): 11. 1979.

柔毛宽蕊地榆 rou mao kuan rui di yu

Stipules and leaflets abaxially densely villous. Sepals pale pink. Fl. Aug.

• Shandong.

4. *Sanguisorba filiformis* (J. D. Hooker) Handel-Mazzetti, Symb. Sin. 7: 524. 1933.

虫蓬 chong liang

Poterium filiforme J. D. Hooker, Fl. Brit. India 2: 362. 1878.

Herbs perennial, monoecious, 8–35 cm tall. Rootstock brown, terete. Stems slender, glabrous. Radical leaves: stipules brown, membranous, abaxially glabrous; petiole glabrous; leaf blade with 3–5 pairs of leaflets; leaflets shortly petiolulate, rarely sessile, broadly ovate or suborbicular, 0.4–1.5 cm, both surfaces glabrous, base subcordate to rounded, margin obtusely serrate, apex rounded, rarely truncate; cauline leaves: stipules green, herbaceous, margin entire or serrate; leaf blade resembling that of radical leaves but leaflets fewer higher up stem. Inflorescences capitate, subglobose, 3–7 mm in diam., with male flowers surrounding females; bracts ovate, minute,

membranous, glabrous, margin entire or sparsely ciliate. Sepals 4, white, narrowly elliptic to long obovate, abaxially glabrous. Stamens 7 or 8; filaments filiform, nearly 2 × as long as sepals. Style filiform, 0.5–1.5 × as long as sepals; stigma dilated, papillate. Fruiting hypanthium longitudinally 4-ribbed; sepals deciduous when mature. Fl. and fr. Jun–Sep.

Meadows on mountain slopes, marshes; 1200–4500 m. Sichuan, Xizang, Yunnan [Bhutan, Sikkim].

This species is used medicinally.

5. *Sanguisorba diandra* (J. D. Hooker) Nordborg, Opera Bot. 11(2): 60. 1966.

疏花地榆 shu hua di yu

Poterium diandrum J. D. Hooker, Fl. Brit. India 2: 362. 1878; *Sanguisorba dissita* T. T. Yu & C. L. Li.

Herbs perennial, 40–85 cm tall. Rootstock stout, terete. Stems glandular pubescent or glabrescent. Radical leaves: petiole glandular pubescent or glabrescent; leaf blade with 5–8 pairs of leaflets; petiolules 0.5–2 cm; leaflets alternate or subopposite, abaxially tinged green, adaxially green, ovate, elliptic, or long elliptic, 1–3 × 0.8–2.5 cm, abaxially sparsely pilose, adaxially glabrous, base cordate to truncate, margin obtusely or acutely incised serrate, apex rounded; middle cauline leaves: stipules falcate, margin incised serrate. Inflorescences capitate, lax after anthesis; bracts lanceolate, margin ciliate; flowers long pedicellate at base of inflorescence, gradually becoming subsessile toward apex. Hypanthium abaxially pilose. Sepals 4, tinged green. Stamens 2; filaments filiform, nearly equaling sepals. Style slender; stigma dilated, papillate, much branched. Fruiting hypanthium hardened, with 4 longitudinal, winged ribs; sepals persistent; style deciduous. Fl. and fr. Jun–Aug.

Forest margins, thickets, meadows on mountain slopes; 3200–3900 m. Xizang [Bhutan, ?N India (Uttar Pradesh), Nepal, Sikkim].

6. *Sanguisorba alpina* Bunge in Ledebour, Fl. Altaic. 1: 142. 1829.

高山地榆 gao shan di yu

Sanguisorba linostemon Handel-Mazzetti.

Herbs perennial, 30–80 cm tall. Rootstock robust, terete. Stems glabrous or subglabrous. Radical leaves: stipules yellow-brown, membranous, glabrous; petiole glabrous; leaf blade with 4–7(–9) pairs of leaflets; leaflets petiolulate, green on both surfaces, elliptic or long elliptic, rarely ovate, 1.5–7 × 1–4 cm, both surfaces glabrous, base subcordate to truncate, margin acutely incised serrate, apex rounded or subrounded; cauline leaves: stipules green, ovate or falcate-semiorbicular, leathery, margin sharply incised serrate; leaf blade resembling that of radical leaves but leaflets fewer higher up stem with base rounded to broadly cuneate. Inflorescence nodding, spiate, cylindrical, rarely ellipsoid, usually 1–4 × 0.6–1.2 cm, elongated to 5 cm after anthesis, flowering from base to apex; peduncle usually pilose, later glabrescent; bracts tinged yellow-brown, ovate-lanceolate or spatulate-lanceolate, longer than flower buds before anthesis, 1–2 × as long as sepals, abaxially and at

margin densely pubescent. Sepals white or slightly pinkish, ovate. Stamens 4; filaments gradually dilated from base, broadest near middle, then gradually attenuate toward apex, 2–3 × as long as sepals, narrower than anther, or sometimes little dilated. Fruiting hypanthium pilose; sepals persistent. Fl. and fr. Jul–Aug.

Forest margins, mountain slopes, ravines, marshes; 1200–2700 m. Gansu, N Ningxia (Helan Shan), Xinjiang [Korea, Mongolia, Russia].

7. *Sanguisorba stipulata* Rafinesque, Herb. Raf. 47. 1833.

大白花地榆 da bai hua di yu

Poterium sitchense (C. A. Meyer) S. Watson; *Sanguisorba canadensis* Torrey & A. Gray subsp. *latifolia* (Hooker) Calder; *S. canadensis* var. *latifolia* Hooker; *S. canadensis* var. *sitchensis* (C. A. Meyer) Koidzumi; *S. latifolia* (Hooker) Coville; *S. sitchensis* C. A. Meyer; *S. stipulata* var. *latifolia* (Hooker) H. Hara.

Herbs perennial, 35–80 cm tall. Rootstock robust, deep, long. Stems glabrous. Radical leaves: stipules yellow-brown, membranous, glabrous; petiole angular, glabrous; leaf blade with 4–6 pairs of leaflets; leaflets petiolulate, green on both surfaces, abaxially more deeply so, elliptic or ovate-elliptic, both surfaces glabrous, base cordate to deeply so, rarely slightly so, margin coarsely acutely incised serrate, apex rounded; cauline leaves 2–4; stipules green, ovate, herbaceous, margin incised serrate; leaf blade resembling that of radical leaves but leaflets fewer higher up stem. Inflorescence erect, spicate; peduncle glabrous; bracts narrowly fasciated, nearly equaling sepals, glabrous or abaxially pilose. Sepals 4, elliptic-ovate, glabrous. Stamens 4; filaments compressed-dilated from middle to apex, broadest at apex, 2–3 × as long as sepal, nearly as broad as anther. Fruiting hypanthium pilose; sepals persistent. Fl. and fr. Jul–Sep.

Thinned forests, forest margins, mountains, ravines, marshy places; 1400–2300 m. Jilin, Liaoning [Japan, Korea, Russia; North America].

This species is used medicinally.

46. *ALCHEMILLA* Linnaeus, Sp. Pl. 1: 123. 1753.

羽衣草属 yu yi cao shu

Li Chaoluan (李朝銓 Li Chao-luang); Hiroshi Ikeda, Hideaki Ohba

Herbs perennial (rarely annual), with woody rhizome. Stems decumbent to erect. Leaves stipulate, long petiolate; stipules adnate to sheathing petiole; leaf blade simple, ± orbicular, margin lobed, digitate, or palmately parted. Inflorescences usually dense corymbs, rarely lax cymes or a solitary flower, ebracteate. Flowers very small, bisexual. Hypanthium urceolate, persistent, with constricted throat. Sepals 4(or 5), valvate; epicalyx segments 4(or 5), alternating with sepals. Petals absent. Disk lining hypanthium, margin thickened. Stamens (1–)4; filaments free, short. Carpel 1(–4), sessile or substipitate, free; ovule ascending from base of locule; style basal or adaxial, filiform, glabrous; stigma capitate. Achene 1(–4), enclosed in membranous hypanthium. Seed basal; testa membranous; cotyledons cylindric-obovoid. $x = 8$.

Between 100 and 300 species: frigid and temperate regions of Africa, Asia, Europe, and America, extending to alpine areas in the tropics; three species in China.

- 1a. Stems and petioles glabrous, or stem only declinate hairy in lower part 3. *A. glabra*
- 1b. Stems and petioles covered with ascending, spreading, or declinate hairs.
 - 2a. Pedicel glabrous or subglabrous; hypanthium abaxially densely or sparsely villous; basal sinus of leaf blade deep and narrow, sometimes with 2 lobes meeting 1. *A. japonica*
 - 2b. Pedicel and hypanthium glabrous; basal sinus of leaf blade broad, sometimes base subtruncate 2. *A. gracilis*

1. *Alchemilla japonica* Nakai & H. Hara, J. Jap. Bot. 13: 177. 1937.

羽衣草 yu yi cao

Herbs perennial, 10–30 cm tall. Rhizome thick, fleshy, woody. Stems solitary or tufted, decumbent to erect, densely white villous. Radical leaves: stipules brown, membranous, abaxially villous; petiole 3–15 cm, densely spreading villous; leaf blade cordate-orbicular, 2–3 × 3–7 cm, both surfaces sparsely pilose, more densely so on veins, base deeply cordate, sinus narrow, sometimes with 2 lobes meeting, margin 7–9-lobed and serrulate; cauline leaves shortly petiolate or subsessile; stipules connate at base, abaxially villous, margin serrate; leaf blade small. Inflorescences densely corymbose-cymose. Flowers 3–4 mm in diam.; pedicel 2–3 mm, glabrous or subglabrous. Hypanthium abaxially densely or sparsely villous. Sepals

yellow-green, triangular-ovate, 1–1.5 mm, slightly larger than epicalyx segments, abaxially sparsely pilose; epicalyx segments oblong-lanceolate. Stamens nearly 1/2 as long as sepals. Style filiform, slightly longer than stamens. Achene included in membranous receptacle, ovoid, ca. 1.5 mm, glabrous, apex subacute.

Alpine grasslands; 2500–3500 m. Gansu, Nei Mongol, Qinghai, Shaanxi, Sichuan, Xinjiang [Japan].

2. *Alchemilla gracilis* Opiz in Berchtold & Opiz, Oekon.-Techn. Fl. Böhm. 2(1): 14. 1838.

纤细羽衣草 xian xi yu yi cao

Herbs perennial, 20–30 cm tall. Radical leaves: stipules brown, membranous, abaxially sparsely villous; petiole 5–14 cm, densely spreading villous; leaf blade reniform-orbicular, 2–4 × 4–8 cm, both surfaces sparsely villous, abaxially densely so

on veins, base subcordate with broad sinus or subtruncate, margin 7–9-lobed and serrulate; cauline leaves 2–5, shortly petiolate or subsessile; stipules connate at base, margin serrate; leaf blade gradually smaller higher up stem. Inflorescences laxly corymbiform-cymose. Pedicel 3–4 mm, glabrous. Hypanthium glabrous, base slightly decurrent. Epicalyx segments ca. 1/2 as long as sepals. Achene ovoid, 1–2 mm, glabrous, apex subobtusate.

Thinned forests, alpine grasslands; 1700–3500 m. Gansu, Shaanxi, Shanxi, Sichuan, Xinjiang [Mongolia, Russia (W Siberia); Europe].

3. *Alchemilla glabra* Neygenfind, Ench. Bot. 67. 1821.

无毛羽衣草 wu mao yu yi cao

Herbs perennial, 30–60 cm tall. Rhizome robust. Stems

tufted, erect, taller than the leaves, glabrous or only declinate hairy in lower part. Radical leaves many; stipules membranous, brown, glabrous; petiole 10–18 cm, glabrous; leaf blade cordate-orbicular, 3–5 × 6–8 cm, both surfaces glabrous, rarely slightly appressed hairy and margin ciliate, base cordate, margin 7–9-lobed and serrulate; cauline leaves 2–5, shortly petiolate or subsessile; stipules connate at base, glabrous, margin serrate; leaf blade small, margin 3–5-lobed. Inflorescences laxly corymbiform-cymose. Flowers ca. 3 mm in diam.; pedicel 1–2 mm, glabrous. Hypanthium glabrous, base slightly decurrent. Sepals yellow-green, triangular-ovate, subglabrous; epicalyx segments oblong-lanceolate, nearly 1/2 as long as sepals, subglabrous.

Alpine grasslands; ca. 4000 m. NW Sichuan [Russia (W Siberia); Europe].

4. Subfam. PRUNOIDEAE

李亚科 li ya ke

Trees or shrubs. Stipules present. Leaves simple; leaf blade margin serrate or rarely entire. Ovary superior; carpels 1(–5), with 2 pendulous anatropous ovules per carpel. Fruit a drupe; mesocarp succulent, fleshy, or dry, not splitting or more rarely splitting when ripe.

Ten genera and ca. 400 species: Africa, America, Asia, NE Australia, Europe, Pacific Islands; nine genera and 117 species (70 endemic, nine introduced) in China.

The genera *Amygdalus*, *Armeniaca*, *Cerasus*, *Laurocerasus*, *Padus*, and *Prunus* are often treated at the subgeneric or sectional level within the genus *Prunus*. *Pygeum* is usually treated as a distinct genus but has sometimes also been included within *Prunus*. The three cherry genera (*Cerasus*, *Laurocerasus*, and *Padus*) are probably more closely related to each other than they are to the other genera in the Prunoideae. Recent phylogenetic studies based on molecular data show that none of these three cherry genera are monophyletic, and their separation is probably not justified (Bortiri et al., Syst. Bot. 26: 797–807. 2001).

- 1a. Style lateral; branches with regularly produced axillary spines with a few or no leaves; petals white, cream, or yellow 47. *Prinsepia*
- 1b. Style terminal; branches unarmed or with leafy spine-tipped branchlets; petals white, pink, light red, or purple (yellowish white in *Laurocerasus undulata*).
 - 2a. Sepals and petals minute and ± indistinguishable.
 - 3a. Plants evergreen; leaf blade margin entire or minutely serrulate 54. *Pygeum*
 - 3b. Plants deciduous; leaf blade margin with simple, double, or incised gland-tipped teeth 55. *Maddenia*
 - 2b. Sepals and petals large and clearly differentiated.
 - 4a. Drupe grooved, hairy or glabrous but if glabrous usually glaucous; endocarp distinctly compressed.
 - 5a. Axillary winter buds 3 with 2 lateral flower buds and 1 central leaf bud; terminal winter bud present; leaves conduplicate when young; endocarp often pitted, rarely smooth 48. *Amygdalus*
 - 5b. Axillary winter buds single; terminal winter buds absent; leaves convolute [or conduplicate] when young; endocarp usually smooth or inconspicuously pitted.
 - 6a. Flowers sessile or shortly pedicellate; ovary and fruit usually pubescent 49. *Armeniaca*
 - 6b. Flowers distinctly pedicellate; ovary and fruit glabrous, often glaucous 50. *Prunus*
 - 4b. Drupe not grooved, glabrous but not glaucous; endocarp not or hardly compressed.
 - 7a. Inflorescences usually with conspicuous bracts; flowers solitary to several in short racemes or corymbs 51. *Cerasus*
 - 7b. Inflorescences with small bracts; flowers 10 or more in racemes.
 - 8a. Plants deciduous; rachis base usually with leaves, rarely leafless 52. *Padus*
 - 8b. Plants evergreen; rachis base leafless 53. *Laurocerasus*

47. PRINSEPIA Royle, Ill. Bot. Himal. Mts. 206. 1835.

扁核木属 bian he mu shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Bruce Bartholomew

Plagiospermum Oliver (1886), not Cleve (1868), nor Pierre (1892); *Sinoplagiospermum* Rauschert.

Shrubs, erect or scandent, deciduous. Branches with leafless or few-leaved axillary spines, pith lamellate. Winter buds small,

with a few hairy scales. Stipules small, soon caducous. Leaves alternate, sometimes fascicled on short shoots, simple; petiole short, often ill-defined, with or without slender and inconspicuous nectaries; leaf blade glabrous, margin entire or serrulate. Inflorescences solitary or fascicled on short branchlets in leaf axils of previous year's branches, racemose, or 1-flowered. Flowers bisexual. Pedicel absent or essentially so. Hypanthium mouth with an annular disk. Sepals 5, unequal, persistent in fruit. Petals 5, white, cream, or yellow, suborbicular, base clawed. Stamens 10 or more, in 2 or more whorls, inserted on hypanthium rim; filaments short. Ovary superior, glabrous, 1-loculed; ovules 2, parallel, pendulous. Style lateral; stigma capitate. Fruit a drupe; mesocarp fleshy; endocarp leathery, smooth or slightly furrowed.

About five species: Bhutan, China, N India, Nepal, Pakistan, Sikkim; four species (three endemic) in China.

- 1a. Spines leafy, rarely leafless; flowers in racemes, rarely solitary or fascicled; stamens more than 10, in several whorls.
 2a. Racemes with many flowers 1. *P. utilis*
 2b. Racemes with few flowers or flowers solitary 2. *P. scandens*
 1b. Spines leafless; flowers in a fascicle or solitary; stamens 10, in 2 whorls.
 3a. Hypanthium campanulate; petals yellow 3. *P. sinensis*
 3b. Hypanthium turbinate; petals white 4. *P. uniflora*

1. *Prinsepia utilis* Royle, Ill. Bot. Himal. Mts. 206. 1835.

东北蕤核 dong bei rui he

扁核木 bian he mu

Plagiospermum sinense Oliver, Hooker's Icon. Pl. 16: t. 1526. 1886; *Sinoplagiospermum sinense* (Oliver) Rauschert.

Shrubs 1–5 m tall. Branches grayish green, robust; branchlets green to grayish green, angled, brown pubescent to subglabrous; spines to 3.5 cm, subglabrous, usually leafy. Winter buds purplish red, ovoid to oblong, subglabrous. Stipules not seen. Petiole ca. 5 mm, glabrous; leaf blade oblong to ovate-lanceolate, 3.5–9 × 1.5–3 cm, base broadly cuneate to subrounded, margin serrulate, apex acute to acuminate. Racemes axillary or on short branchlets, 3–6 cm, many flowered; peduncle brown pubescent, soon glabrescent; bracts and bracteoles lanceolate, brown pubescent, glabrescent. Flowers ca. 1 cm in diam. Pedicel 4–8 mm, to 1 cm in fruit, brown pubescent, soon glabrescent. Hypanthium cup-shaped, outside brown pubescent. Sepals semiorbicular to broadly ovate, outside brown pubescent when young and densely so on margin. Petals white, broadly obovate, base shortly clawed, margin apically erose. Stamens in 2 or 3 whorls. Ovary glabrous. Style short. Drupe purplish brown to blackish purple, oblong to obovoid-oblong, ca. 8 mm in diam. Fl. Apr–May, fr. Aug–Sep.

Shrubs to 2 m tall. Branches grayish green to purplish brown, robust, glabrous; branchlets reddish brown, longitudinally angled, glabrous; spines erect to recurved, 6–10 mm, usually leafless. Winter buds purplish red, ovoid, pubescent. Petiole 5–10 mm, glabrous; leaf blade ovate-lanceolate, lanceolate, or very rarely lorate, 3–6.5 × 0.6–2 cm, abaxially pale green, adaxially dark green, base subrounded to broadly cuneate, margin remotely serrate, apex acute, acuminate, or caudate; secondary veins abaxially prominent, adaxially impressed. Inflorescences in leaf axils, 1-flowered or to a 4-flowered fascicle; bracts small, membranous, lanceolate, adaxially pubescent, glabrescent. Flowers ca. 1.5 cm in diam. Pedicel 1–1.8 cm, to 2 cm in fruit, glabrous. Hypanthium campanulate, outside glabrous. Sepals triangular-ovate, short, outside glabrous, margin ciliate. Petals yellow, obovate, base shortly clawed, apex obtuse. Stamens ca. 10, in 2 whorls. Ovary glabrous. Style short. Drupe purplish red to purplish brown, subglobose to oblong, 1–1.5 cm in diam., glabrous. Fl. Apr–May, fr. May–Sep.

Slopes, wastelands, valleys, along trails; 1000–2600 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, N India, Nepal, Pakistan, Sikkim].

• Mixed forests, forests of shady slopes, open places on slopes, stream sides. Heilongjiang, Jilin, Liaoning, Nei Mongol.

2. *Prinsepia scandens* Hayata, Icon. Pl. Formosan. 5: 69. 1915.

4. *Prinsepia uniflora* Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 12: 167. 1892.

台湾扁核木 tai wan bian he mu

蕤核 rui he

Sinoplagiospermum uniflorum (Batalin) Rauschert.

Shrubs 2–8 m tall, scandent. Branchlets greenish, angled; spines 1–1.5 cm, glabrous, sometimes leafy. Winter buds ovoid, glabrous. Stipules not seen. Petiole 5–10 mm, glabrous; leaf blade ovate-lanceolate, 3.5–5.5 × 1.2–2 cm, thinly leathery, glabrous, abaxially slightly lighter green than adaxial surface, base narrowly cuneate to cuneate, margin crenate-serrate, apex acuminate; midvein abaxially raised, adaxially slightly impressed. Inflorescences terminal or axillary, solitary, fascicled, or racemose; bracts glandular. Flowers ca. 1 cm in diam. Pedicel 5–7 mm. Hypanthium cup-shaped, outside glabrous. Sepals suborbicular, 3–5 mm in diam., outside glabrous, apex rounded. Petals white, suborbicular, ca. 5 mm in diam. Stamens ca. 30. Stigma inflated. Drupe oblong. Fl. Apr–Jun.

Shrubs 1–2 m tall. Branches purplish brown, robust, glabrous; branchlets grayish green to grayish brown, longitudinally angled, glabrous or pubescent; spines usually erect, 6–10 mm, usually leafless. Winter buds purplish red, ovoid, glabrous. Petiole short to leaf subsessile, subglabrous; leaf blade oblong-lanceolate, narrowly oblong, oblong, ovate-oblong, ovate-lanceolate, narrowly lanceolate, or narrowly elliptic, 2–5.5 × 0.6–0.8 cm, abaxially pale green, adaxially dark green, base cuneate to broadly cuneate, margin repand to conspicuously serrulate, apex obtuse to acute. Inflorescences 1-flowered or to 3-flowered fascicle; bracts not seen. Flowers 8–10 mm in diam. Pedicel 3–15 mm, glabrous. Hypanthium turbinate, outside glabrous. Sepals triangular-ovate to semiorbicular, reflexed in

• Thickets in mountains; 1500–3000 m. Taiwan.

3. *Prinsepia sinensis* (Oliver) Oliver ex Bean, Bull. Misc. Inform. Kew 1909: 354. 1909.

fruit, outside glabrous, margin entire, apex obtuse. Petals white with purple veins, obovate, 5–6 mm, base broadly cuneate and shortly clawed, margin apically erose. Stamens 10, in 2 whorls. Ovary glabrous. Style short. Drupe reddish brown to blackish brown, globose, 0.8–1.2 cm in diam., glabrous, lustrous. Fl. May, fr. Jun–Sep.

• Slopes, ravines in valleys, bases of hills; 800–2200 m. Gansu, W Henan, S Nei Mongol, Ningxia, E Qinghai, Shaanxi, Shanxi, W Sichuan.

- 1a. Leaf oblong-lanceolate to narrowly lanceolate, margin repand or inconspicuously serrulate; pedicel 3–5 mm 4a. var. *uniflora*
- 1b. Leaf ovate-lanceolate to ovate-oblong on sterile shoot, oblong to narrowly elliptic on flowering shoots, margin conspicuously serrulate; pedicel 5–15 mm 4b. var. *serrata*

4a. Prinsepia uniflora var. uniflora

蕤核(原变种) rui he (yuan bian zhong)

Leaf blade oblong-lanceolate to narrowly lanceolate, margin repand or inconspicuously serrulate. Pedicel 3–5 mm.

• Sunny slopes, bases of hills; 900–1100 m. Gansu, W Henan, S Nei Mongol, Shaanxi, Shanxi, W Sichuan.

4b. Prinsepia uniflora var. serrata Rehder, J. Arnold Arbor. 22: 575. 1941.

齿叶蕤核 chi ye rui he

Leaf blade ovate-lanceolate to ovate-oblong on sterile shoots, oblong to narrowly elliptic on flowering shoots, margin conspicuously serrate. Pedicel 5–15 mm.

• Slopes, ravines in valleys; 800–2200 m. Gansu, Ningxia, E Qinghai, S Shaanxi, S Shanxi, W Sichuan.

48. AMYGDALUS Linnaeus, Sp. Pl. 1: 472. 1753.

桃属 tao shu

Lu Lingdi (陆玲娣 Lu Ling-ti); Bruce Bartholomew

Persica Miller.

Trees or shrubs, deciduous. Branches unarmed or spiny. Axillary winter buds (2 or)3, lateral ones flower buds, central one a leaf bud; terminal winter buds present. Stipules present. Leaves simple, alternate, sometimes fascicled on short branchlets, conduplicate when young; petiole usually with 2 nectaries or sometimes nectaries at base of leaf blade margin; leaf blade margin often serrate. Inflorescences borne on axillary short branches, 1(or 2)-flowered. Flowers bisexual, regular, opening before or rarely with leaves. Pedicel nearly absent or short, rarely long. Hypanthium caducous in fruit. Sepals 5, imbricate. Petals 5, pink or white, inserted on rim of hypanthium, imbricate. Stamens 15 to many, inserted with petals; filaments filiform, free. Ovary superior, hairy, 1-loculed; ovules 2, collateral, pendulous. Style terminal, elongated. Fruit a drupe, hairy, glabrous in some cultivated *Amygdalus persica*, with a conspicuous longitudinal groove; mesocarp fleshy and not splitting or dry and splitting when ripe; endocarp hard, 2-valved, globose or ellipsoid, usually compressed, surface furrowed, pitted, rugose, or smooth.

About 40 species; C, E, and SW Asia, S Europe; 11 species (four endemic, one introduced) in China.

Many species and cultivars are grown for their edible fruit or as garden ornamentals, and a few species are also grown for their edible seeds.

- 1a. Mesocarp fleshy or rarely dry, not splitting when ripe.
 - 2a. Endocarp smooth, only with shallow furrows, without pits.
 - 3a. Sepals outside pubescent or rarely subglabrous; endocarp subglobose, longitudinally and transversely shallowly furrowed, apex obtuse 10. *A. kansuensis*
 - 3b. Sepals outside glabrous; endocarp compressed ovoid-globose, inconspicuously and longitudinally sparsely shallowly furrowed only on dorsal and ventral sides, apex acute 11. *A. mira*
 - 2b. Endocarp deeply furrowed and pitted.
 - 4a. Leaf blade abaxially glabrous; calyx outside glabrous; mesocarp thin and dry; endocarp usually not laterally compressed, apex obtuse 9. *A. davidiana*
 - 4b. Leaf blade abaxially sparsely pubescent in vein axils, rarely glabrous; calyx outside pubescent; mesocarp thick and succulent; endocarp laterally compressed, apex acuminate.
 - 5a. Endocarp irregularly longitudinally and transversely furrowed and pitted; leaf blade secondary veins anastomosing at margin 7. *A. persica*
 - 5b. Endocarp longitudinally furrowed and very sparsely pitted; leaf blade secondary veins continuing to margin 8. *A. ferganensis*
- 1b. Mesocarp dry, splitting when ripe.
 - 6a. Branchlets spiny.
 - 7a. Branchlets glabrous; leaf blade long elliptic, oblong, or obovate-oblong, 1.5–4 cm, secondary veins 5–8 on either side of midvein; drupe subglobose to ovoid-globose, 1.5–2 cm in diam. 5. *A. tangutica*
 - 7b. Branchlets pubescent; leaf blade broadly elliptic, suborbicular, or obovate, 0.8–1.5 cm, secondary veins ca. 4 on either side of midvein; drupe broadly ovoid-globose, 1–1.2 cm in diam. 6. *A. mongolica*
 - 6b. Branchlets unarmed.

- 8a. Leaf blade lanceolate, elliptic-lanceolate, oblong, or oblong-lanceolate, glabrous or sparsely pubescent when young; pedicel 2–4 mm; hypanthium cylindrical.
- 9a. Trees or shrubs, (2–)3–6(–8) m tall; petiole 1–2(–3) cm; leaf blade lanceolate to elliptic-lanceolate, slightly pilose when young, glabrescent; drupe obliquely ovoid to oblong-ovoid; endocarp pitted and with or without shallow furrows 1. *A. communis*
- 9b. Shrubs, 1–1.5 m tall; petiole 0.4–0.7 cm; leaf blade narrowly oblong, oblong-lanceolate, or lanceolate, glabrous; drupe ovoid to ovoid-globose; endocarp not pitted but only with irregular shallow reticulate furrows 2. *A. nana*
- 8b. Leaf blade suborbicular, broadly elliptic, or obovate, pubescent; pedicel 4–8 mm; hypanthium broadly campanulate.
- 10a. Shrubs, rarely trees, 2–3 m tall; leaf blade apically 3-lobed, margin coarsely serrate or biserrate; endocarp subglobose, surface reticulate, apex obtuse 3. *A. triloba*
- 10b. Shrubs, 1–2 m tall; leaf blade apically not lobed, margin irregularly coarsely serrate; endocarp broadly ovoid, surface smooth to slightly rugose, apex mucronulate 4. *A. pedunculata*

1. *Amygdalus communis* Linnaeus, Sp. Pl. 1: 473. 1753.

扁桃 bian tao

Amygdalus amara Duhamel; *A. communis* var. *amara* (Duhamel) Candolle; *A. communis* var. *dulcis* (Miller) Candolle; *A. communis* var. *fragilis* (Borkhausen) Seringe; *A. dulcis* Miller; *A. fragilis* Borkhausen; *A. sativa* Miller; *Prunus amygdalus* (Linnaeus) Batsch; *P. amygdalus* var. *amara* (Duhamel) Focke; *P. amygdalus* var. *dulcis* (Miller) Koehne; *P. amygdalus* var. *fragilis* (Borkhausen) Focke; *P. amygdalus* var. *sativa* (Miller) Focke; *P. communis* (Linnaeus) Arcangeli (1882), not Hudson (1762); *P. communis* var. *dulcis* (Miller) Borkhausen; *P. communis* var. *fragilis* (Borkhausen) Focke; *P. communis* var. *sativa* (Miller) Focke; *P. dulcis* (Miller) D. A. Webb; *P. dulcis* var. *amara* (Duhamel) H. L. Moore.

Trees or shrubs, (2–)3–6(–8) m tall. Branches erect or horizontally spreading, unarmed, with many short branchlets, glabrous; previous year's branchlets brownish, grayish brown to grayish black with age. Winter buds brownish, ovoid, 3–5 mm, glabrous. Leaves variable, those on long branchlets usually alternate, those on short branchlets approximate and often fascicled; petiole 1–2(–3) cm, glabrous, with 2 to 4 nectaries at apex or at base of leaf blade; leaf blade lanceolate to elliptic-lanceolate, 3–6(–9) × 1–2.5 cm, slightly pilose when young, glabrescent, base broadly cuneate to rounded, margin shallowly densely serrate, apex acute to shortly acuminate. Flowers solitary, opening before leaves. Pedicel 3–4 mm, 4–10 mm in fruit, glabrous. Hypanthium cylindrical, (5–)6–8 × 3–5 mm, outside glabrous. Sepals broadly oblong to broadly lanceolate, 5–6 mm, outside glabrous, margin pubescent, apex obtuse. Petals white or pinkish, oblong to obovate-oblong, 1.2–2 × 0.7–1.1 cm, base tapering to a narrow claw, apex obtuse to emarginate. Stamens unequal in length. Ovary densely tomentose. Style longer than stamens. Drupe obliquely ovoid to oblong-ovoid, compressed, 3–4.3 × 2–3 cm, densely pubescent, base mostly subtruncate, apex pointed to somewhat obtuse; mesocarp thin, splitting at maturity; endocarp yellowish white to brown, ovoid, broadly ellipsoid, or shortly oblong, asymmetric on both sides, 2.5–3(–4) cm, hard to fragile, ventral suture curved and ± acutely keeled, dorsal suture generally straight, surface smooth and pitted with or without shallow furrows, base obliquely truncate to orbicular-truncate. Seed sweet or bitter. Fl. Mar–Apr, fr. Jul–Aug.

Cultivated in Gansu, Shaanxi, Shandong, and Xinjiang [probably native to SW Asia].

Cultivated varieties of almonds have been named for whether the seeds are sweet or bitter and whether the endocarp is hard or fragile.

2. *Amygdalus nana* Linnaeus, Sp. Pl. 1: 473. 1753.

矮扁桃 ai bian tao

Amygdalus ledebouriana Schlechtendal; *Prunus nana* (Linnaeus) Stokes (1812), not Du Roi (1772); *P. tenella* Batsch.

Shrubs 1–1.5 m tall. Branches erect-divaricate, with many short branchlets; first year's branchlets grayish white to reddish brown; older branchlets reddish gray or gray, glabrous. Winter buds brown, ovoid, 2–4 mm, glabrous, apex obtuse to acute. Stipules linear to linear-lanceolate, 5–10 × 1.5–3 mm, margin entire or slightly dentate. Leaves on short branchlets sessile and in clusters, those on long branchlets often solitary and alternate; petiole 4–7 mm, glabrous; leaf blade narrowly oblong, oblong-lanceolate, or lanceolate, 2.5–6 × 0.8–3 cm, both surfaces glabrous, base narrowly cuneate to attenuate, margin minutely and shallowly obtusely serrate, apex acute to ± obtuse. Flowers solitary, opening at same time as leaves, ca. 2 cm in diam. Pedicel 3–6 mm, 5–7 mm in fruit, yellowish pubescent, surrounded by brown bud scales. Hypanthium purplish brown, cylindrical, 5–8 × 2–4 mm, outside glabrous. Sepals ovate to ovate-lanceolate, 3–4 mm, outside glabrous, margin slightly serrate and with ± remote glands. Petals pink, irregularly obovate to oblong, 10–17 × 4–8 mm, base cuneate, apex obtuse to shallowly emarginate. Stamens many, shorter than petals. Ovary densely villous. Style nearly as long as stamens. Drupe ovoid to ovoid-globose, 1–2(–2.5) × 1.2–1.8(–2) cm, densely straw yellow villous; mesocarp dry, splitting when ripe; endocarp ovoid-globose to elongate ovoid-globose, compressed, 0.8–1.8(–2.2) × 1–1.5(–1.7) cm, with thick curved ventral and ± keeled dorsal sutures, surface with irregular shallow reticulate furrows, base somewhat oblique, apex obtuse. Fl. Apr–May, fr. Jun–Jul.

Grasslands, valleys, hollows, dry slopes; below 1200 m. Xinjiang [Russia; SW Asia, Europe].

3. *Amygdalus triloba* (Lindley) Ricker, Proc. Biol. Soc. Wash. 30: 18. 1917.

榆叶梅 yu ye mei

Prunus triloba Lindley, Gard. Chron. 1857: 268. 1857;

Amygdalus triloba var. *plena* (Dippel) S. Q. Nie; *A. triloba* var. *truncata* (Komarov) S. Q. Nie; *Cerasus triloba* A. I. Baranov & Liou; *C. triloba* var. *plena* (Dippel) A. I. Baranov & Liou; *C. triloba* var. *truncata* (Komarov) A. I. Baranov & Liou; *Prunus triloba* var. *plena* Dippel; *P. triloba* var. *truncata* Komarov.

Shrubs, rarely trees, 2–3 m tall. Branches spreading, much branched; current year's branchlets gray to grayish black; previous year's branchlets grayish brown, glabrous or slightly pubescent when young, glabrescent. Winter buds brown, 2–3 mm, apex acute; scale margins pubescent. Leaves on short branchlets often fasciculate, those on long branches alternate; petiole 5–10 mm, pubescent; leaf blade broadly elliptic to obovate, 2–6 × 1.5–3(–4) cm, abaxially pubescent, adaxially pilose or glabrous, base broadly cuneate, margin coarsely serrate or biserrate, apex shortly acuminate and usually 3-lobed. Flowers 1 or 2, opening before leaves, 2–3 cm in diam. Pedicel 4–8 mm, 5–10 mm in fruit, glabrous or initially puberulous. Hypanthium broadly campanulate, 3–5 mm, outside glabrous or puberulous. Sepals ovate to ovate-lanceolate, nearly as long as hypanthium, outside glabrous or puberulous, margin sparsely minutely serrate near apex. Petals pink, suborbicular to broadly obovate, 6–10 mm, apex obtuse to emarginate. Stamens 25–30, shorter than petals. Ovary densely pubescent. Style somewhat longer than stamens. Drupe subglobose, 1–1.8 cm in diam., pubescent, apex mucronulate; mesocarp thin, splitting when ripe; endocarp subglobose, ± uncompressed on both sides, 1–1.6 cm in diam., surface irregularly reticulate, apex obtuse. Fl. Apr–May, fr. May–Jul.

Forests, thickets; 600–2500 m. Anhui, Gansu, Hebei, Henan, Heilongjiang, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Zhejiang [Korea, Russia].

Single- and double-flowered cultivars are cultivated as garden ornamentals.

4. *Amygdalus pedunculata* Pallas, Nova Acta Acad. Sci. Imp. Petrop. Hist. Acad. 7: 353. 1789.

长梗扁桃 chang geng bian tao

Amygdalus pilosa Turczaninow; *Prunus pedunculata* (Pallas) Maximowicz; *P. pilosa* (Turczaninow) Maximowicz.

Shrubs 1–2 m tall. Branches spreading, with many short branchlets; branchlets brownish to dark grayish brown, pubescent initially, glabrescent. Winter buds often 3, collateral in leaf axil on short branchlets, lateral ones flower buds, central one a leaf bud. Stipules linear, narrow, 2–4 mm. Leaves on short branchlets densely fascicled, those on long branchlets alternate; petiole 2–5(–10) mm, pubescent; leaf blade elliptic, suborbicular, or obovate, 1–4 × 0.7–2 cm, both surfaces pilose, abaxially greenish, adaxially dark green, base broadly cuneate, margin irregularly coarsely serrate, apex acute to ± obtuse; secondary veins 4–6 on either side of midvein. Flowers solitary, opening slightly before leaves, 1–1.5 cm in diam. Pedicel 4–8 mm, not much elongated in fruit, pubescent. Hypanthium broadly campanulate, 4–6 mm, outside glabrous or puberulous. Sepals triangular-ovate, 2–3 mm, outside glabrous or puberulous, margin sometimes shallowly serrate, apex ± obtuse. Petals pink, suborbicular, 7–10 mm in diam., apex occasionally emar-

ginate. Stamens many, unequal in length. Ovary densely pubescent. Style nearly as long as shorter stamens. Drupe dark purplish red, subglobose to ovoid-globose, 1–1.5 cm in diam., densely pubescent, apex mucronulate; mesocarp thin and dry, separating from endocarp and splitting at maturity; endocarp brownish, broadly ovoid, slightly compressed laterally, 0.8–1.2 cm in diam., surface smooth, scabrous, or slightly rugose, base orbicular, apex mucronulate. Seed brownish yellow, broadly ovoid. Fl. May–Jun, fr. Jul–Aug.

Sunny pebbly slopes, steppes. Nei Mongol, Ningxia, Shaanxi [Mongolia, Russia].

5. *Amygdalus tangutica* (Batalin) Korshinsky, Izv. Imp. Akad. Nauk. 14: 94. 1901.

西康扁桃 xi kang bian tao

Amygdalus communis Linnaeus var. *tangutica* Batalin, Trudy Imp. S.-Peterburgsk Bot. Sada 12: 163. 1892; *Persica tangutica* (Batalin) Kovalev & Kostina; *Prunus dehiscens* Koehne; *P. tangutica* (Batalin) Koehne.

Shrubs 1–2(–4) m tall, dense. Branches spreading, spiny; branchlets grayish brown, glabrous, with many inconspicuous lenticels. Leaves on short branchlets mostly in clusters, those on long branchlets usually alternate; petiole 5–10 mm, glabrous; leaf blade elliptic, oblong, or obovate-oblongate, 1.5–4 × 0.5–1.5 cm, both surfaces glabrous, abaxially greenish, adaxially dark green, base cuneate, margin minutely obtusely dentate, apex obtuse to acute and mucronate; secondary veins 5–8 on either side of midvein. Flowers solitary, 2–2.5 cm in diam., sessile or subsessile. Hypanthium outside glabrous. Sepals long elliptic, 3–4 mm, outside glabrous, margin indistinctly minutely serrate. Petals pink, fading almost to white, obovate, 7–10 mm. Stamens 25–30, in 2 whorls. Ovary ovoid, ca. 1 mm, pubescent. Style over 5 mm, hairy. Drupe purplish red, subglobose to ovoid-globose, 1.5–2 cm in diam., densely pubescent; mesocarp thin and dry, splitting at maturity; endocarp subglobose, 1.3–1.8 cm in diam., surface inconspicuously shallowly furrowed but not pitted, ventral suture compressed and broad, base subtruncate, apex ± obtuse to ± acute. Fl. Apr–May, fr. Jun–Jul.

• Sunny slopes, stream sides; 1500–2600 m. S Gansu, NW Sichuan.

6. *Amygdalus mongolica* (Maximowicz) Ricker, Proc. Biol. Soc. Wash. 30: 17. 1917.

蒙古扁桃 meng gu bian tao

Prunus mongolica Maximowicz, Bull. Soc. Imp. Naturalistes Moscou 54: 16. 1879.

Shrubs 1–2 m tall. Branches spreading, much branched; branchlets reddish brown when young, grayish brown with age, pubescent, often spine-tipped. Leaves on short branchlets mostly fascicled, those on long branchlets usually alternate; petiole 2–5 mm, glabrous; leaf blade broadly elliptic, suborbicular, or obovate, 8–15 × 6–10 mm, both surfaces glabrous, base cuneate, margin shallowly obtusely serrate, apex obtuse and sometimes mucronate; secondary veins ca. 4 on either side of midvein. Flowers solitary, rarely several fascicled on short branchlets. Pedicel very short, not much elongated in fruit,

glabrous. Hypanthium campanulate, 3–4 mm, outside glabrous. Sepals oblong, nearly as long as hypanthium, outside glabrous, apex abruptly mucronate. Petals pink, obovate, 5–7 mm. Stamens many, unequal in length. Ovary pubescent. Style slender, \pm as long as stamens, pubescent. Drupe broadly ovoid-globose, $1.2\text{--}1.5 \times 1\text{--}1.2$ cm, pubescent, apex acute; mesocarp thin, separating from endocarp and splitting at maturity; endocarp ovoid, 0.8–1.3 cm, surface smooth, shallowly furrowed but not pitted, ventral suture flattened, base asymmetric, apex mucronulate. Seed pale brown, broadly compressed ovoid. Fl. May–Jun, fr. Aug–Sep.

Hill lands in desert or desert grasslands, stony slopes, dry river beds; 1000–2400 m. Gansu, Nei Mongol, Ningxia [Mongolia].

7. *Amygdalus persica* Linnaeus, Sp. Pl. 1: 472. 1753.

桃 tao

Amygdalus persica [unranked] *aganonucipersica* Schübler & Martens; *A. persica* var. *aganonucipersica* (Schübler & Martens) T. T. Yu & L. T. Lu; *A. persica* [unranked] *aganopersica* Reichenbach; *A. persica* var. *compressa* (Loudon) T. T. Yu & L. T. Lu; *A. persica* [unranked] *scleronucipersica* Schübler & Martens; *A. persica* var. *scleronucipersica* (Schübler & Martens) T. T. Yu & L. T. Lu; *A. persica* [unranked] *scleropersica* Reichenbach; *A. persica* var. *scleropersica* (Reichenbach) T. T. Yu & L. T. Lu; *Persica platycarpa* Decaisne; *P. vulgaris* Miller; *P. vulgaris* var. *compressa* Loudon; *Prunus persica* (Linnaeus) Batsch; *P. persica* var. *compressa* (Loudon) Bean; *P. persica* subsp. *platycarpa* (Decaisne) D. Rivera et al.; *P. persica* var. *platycarpa* (Decaisne) L. H. Bailey.

Trees 3–8 m tall, with a broad and \pm horizontally spreading crown. Bark dark reddish brown, scabrous and squamose with age. Branchlets green but reddish on exposed side, slender, glabrous, lustrous, with many small lenticels. Winter buds often 2 or 3 in a fascicle, conical, pubescent, apex obtuse. Petiole robust, 1–2 cm, with or without 1 to several nectaries; leaf blade oblong-lanceolate, elliptic-lanceolate, or obovate-oblong-lanceolate, $7\text{--}15 \times 2\text{--}3.5$ cm, abaxially with or without a few hairs in vein axils, adaxially glabrous, base broadly cuneate, margin finely to coarsely serrate, apex acuminate. Flowers solitary, opening before leaves, 2–3.5 cm in diam. Pedicel very short to flower subsessile. Hypanthium green with a red tinge, shortly campanulate, 3–5 mm, outside pubescent or rarely subglabrous. Sepals ovate to oblong, \pm as long as hypanthium, outside pubescent to rarely subglabrous, apex obtuse. Petals pink or white, oblong-elliptic to broadly obovate, $1\text{--}1.7 \times 0.9\text{--}1.2$ cm. Stamens 20–30; anthers purplish red. Ovary pubescent. Style nearly as long as stamens. Drupe color varies from greenish white to orangish yellow, usually with a red tinge on exposed side, ovoid, broadly ellipsoid, or compressed globose, (3–)5–7(–12) cm in diam. and usually nearly as long, densely pubescent, very rarely glabrous, ventral suture conspicuous; mesocarp white, greenish white, yellow, orangish yellow, or red, succulent, sweet to sour-sweet, fragrant; endocarp large, ellipsoid to suborbicular, compressed on both sides, surface longitudinally and transversely furrowed and pitted, free from mesocarp or compactly adnate to it, apex acuminate. Seed bitter, rarely sweet. Fl. Mar–Apr, fr. Aug–Sep.

• Cultivated throughout China, escaped from cultivation in waste fields or on disturbed slopes; 1500–2200 m. Escaped from cultivation in at least Gansu, Hebei, and Shanxi.

Although native to N China, truly wild peaches no longer exist. Peaches are important, fruit-bearing and ornamental plants cultivated throughout temperate and subtropical zones. Cultivated varieties have been named for whether the fruit are compressed or not, whether the fruit surface is pubescent or glabrous, and whether the endocarp is free or adnate to the mesocarp.

8. *Amygdalus ferganensis* (Kostina & Rjabov) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 38: 20. 1986.

新疆桃 xin jiang tao

Prunus persica (Linnaeus) Batsch subsp. *ferganensis* Kostina & Rjabov, Trudy Prikl. Bot., Ser. 8, Plodovolye Yagodye Kul't 1: 323. 1932; *Persica ferganensis* (Kostina & Rjabov) Kovalev & Kostina.

Trees to 8 m tall. Branchlets smooth, glabrous, lenticellate; current year's branchlets reddish on exposed side, greenish on shady side, shiny; previous year's branchlets reddish brown, squamose, with many lenticels. Winter buds 2 or 3 in leaf axils, pubescent. Petiole robust, 0.5–2 cm, with 2–8 nectaries; leaf blade lanceolate, $7\text{--}15 \times 2\text{--}3$ cm, abaxially pilose in vein axils, adaxially glabrous, base broadly cuneate to rounded, margin crenate with gland-tipped teeth, apex acuminate; secondary veins 12–14 on either side of midvein. Flowers solitary, opening before leaves, 3–4 cm in diam. Pedicel very short. Hypanthium shortly campanulate, outside green with a reddish tinge. Sepals ovate to ovate-oblong, outside pubescent. Petals pink, suborbicular to oblong, $1.5\text{--}1.7$ cm in diam. Stamens many, unequal in length, shorter than petals. Ovary pubescent. Style shorter than stamens. Drupe greenish white, rarely golden yellow, sometimes with a reddish tinge, compressed globose, rarely subglobose, $3.5\text{--}6 \times 4.4\text{--}7$ cm, pubescent, very rarely glabrous, occasionally slightly glaucous; mesocarp succulent, sour-sweet, fragrant, separating from endocarp, not splitting when ripe; endocarp flattened globose, rarely subglobose to broadly ellipsoid, compressed on both sides, $1.7\text{--}3.5 \times 1.3\text{--}3$ cm, surface longitudinally furrowed and very sparsely pitted, base subtruncate, apex long acuminate. Seed bitter to slightly sweet. Fl. Mar–Apr, fr. Jul–Aug.

Cultivated in Xinjiang [cultivated in Kyrgyzstan and Uzbekistan].

This species is cultivated for its fruit, and the original, native distribution is uncertain.

9. *Amygdalus davidiana* (Carrière) de Vos ex L. Henry, Rev. Hort. 1902: 290. 1902.

山桃 shan tao

Trees to 10 m tall, crown \pm spreading. Bark dark purplish red, smooth. Branchlets brown with age, slender, erect, glabrous when young. Winter buds reddish brown, ovoid, 2–5 mm, glabrous, apex acute. Petiole 1–2 cm, glabrous, usually with nectaries; leaf blade ovate-lanceolate, $5\text{--}13 \times 1.5\text{--}4$ cm, both surfaces glabrous, base cuneate to rounded, margin acutely or obtusely serrate, apex acuminate. Flowers solitary, opening before leaves, 2–3 cm in diam. Pedicel very short to flower subsessile. Hypanthium campanulate, outside glabrous. Sepals

ovate to ovate-oblong, purplish red, nearly as long as hypanthium, outside glabrous, apex obtuse. Petals pink, obovate to suborbicular, 1–1.5 × 0.8–1.2 cm, apex obtuse or rarely emarginate. Stamens many, nearly as long as petals. Ovary pubescent. Style longer than or ± as long as stamens. Drupe yellowish, globose, subglobose, ellipsoid, or oblong, 2.5–3.5 cm in diam., densely pubescent; mesocarp thin, dry, not splitting when ripe; endocarp globose, subglobose, ellipsoid, or oblong, not compressed on both sides, surface longitudinally and transversely furrowed and pitted, separating from mesocarp, base truncate, apex obtuse. Fl. Mar–Apr, fr. Jul–Aug.

• Forests, thickets, slopes, mountain valleys, waste fields; 800–3200 m. Gansu, Hebei, Heilongjiang, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan.

- 1a. Leaf blade base cuneate, margin acutely serrate; drupe and endocarp subglobose to globose 9a. var. *davidiana*
 1b. Leaf blade base broadly cuneate to rounded, margin obtusely serrate; drupe and endocarp ellipsoid to oblong 9b. var. *potaninii*

9a. *Amygdalus davidiana* var. *davidiana*

山桃(原变种) shan tao (yuan bian zhong)

Persica davidiana Carrière, Rev. Hort. 1872: 74. 1872; *Prunus davidiana* (Carrière) Franchet; *P. persica* (Linnaeus) Batsch var. *davidiana* (Carrière) Maximowicz.

Leaf blade base cuneate, margin acutely serrate. Drupe and endocarp subglobose to globose.

• Forests, thickets, slopes, mountain valleys, waste fields; 800–3200 m. Gansu, Hebei, Heilongjiang, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan.

9b. *Amygdalus davidiana* var. *potaninii* (Batalin) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 38: 22. 1986.

陕甘山桃 shan gan shan tao

Prunus persica (Linnaeus) Batsch var. *potaninii* Batalin, Trudy Imp. S.-Peterburgsk Bot. Sada 12: 164. 1892; *Amygdalus persica* Linnaeus var. *potaninii* (Batalin) Ricker; *Persica potaninii* (Batalin) Kovalev & Kostina; *Prunus davidiana* (Carrière) Franchet var. *potaninii* (Batalin) Rehder.

Leaf blade base broadly cuneate to rounded, margin obtusely serrate. Drupe and endocarp ellipsoid to oblong.

• Sparse forests, thickets on slopes; 900–2000 m. Gansu, Shaanxi, Shanxi.

10. *Amygdalus kansuensis* (Rehder) Skeels, Proc. Biol. Soc. Wash. 38: 87. 1925.

甘肃桃 gan su tao

Prunus kansuensis Rehder, J. Arnold Arbor. 3: 21. 1921; *Persica kansuensis* (Rehder) Kovalev & Kostina.

Trees or shrubs, 3–7 m tall. Branchlets greenish brown, later reddish brown on exposed side, slender, glabrous, with indistinct small lenticels. Winter buds ovoid to long ovoid, gla-

brous, apex ± obtuse. Petiole 5–10 mm, glabrous, usually without nectaries; leaf blade ovate-lanceolate to lanceolate, 5–12 × 1.5–3.5 cm, broadest basally from middle, abaxially pubescent on midvein near base or glabrous, adaxially glabrous, base broadly cuneate, margin sparsely thinly serrate with teeth gland-tipped or not, apex acuminate. Flowers solitary, opening before leaves, 2–3 cm in diam. Pedicel very short to nearly absent, 4–5 mm in fruit. Hypanthium campanulate, outside pubescent or rarely subglabrous. Sepals ovate to ovate-oblong, shorter than hypanthium, outside pubescent or rarely subglabrous, apex obtuse. Petals white or pinkish, suborbicular to broadly obovate, base tapering into claws, margin sometimes undulate or shallowly incised, apex obtuse. Stamens 20–30, unequal in length, shorter than petals. Ovary pubescent. Style longer than stamens. Drupe yellowish, ovoid-globose to subglobose, ca. 2 cm in diam., densely pubescent; mesocarp fleshy, not splitting at maturity; endocarp subglobose, compressed, on both sides, surface longitudinally and transversely shallowly furrowed but not pitted, base subtruncate and symmetric, apex obtuse. Fl. Mar–Apr, fr. Aug–Sep.

• Mountain areas; 1000–2300 m. Gansu, Hubei, Qinghai, Shaanxi, Sichuan.

11. *Amygdalus mira* (Koehne) Ricker, Bull. Biol. Soc. Wash. 30: 17. 1917.

光核桃 guang he tao

Prunus mira Koehne in Sargent, Pl. Wilson. 1: 272. 1912; *Persica mira* (Koehne) Kovalev & Kostina.

Trees to 10 m tall. Branchlets green when young, grayish brown with age, slender, spreading, glabrous, with purplish brown small lenticels. Winter buds purplish brown, ovoid, 3–6 mm, glabrous, apex acute. Petiole 0.8–1.5 cm, glabrous, often with flattened purplish red nectaries; leaf blade lanceolate to ovate-lanceolate, 5–11 × 1.5–4 cm, abaxially pubescent along midvein, adaxially glabrous, base broadly cuneate to subrounded, margin shallowly crenate but entire near apex and teeth usually gland-tipped, apex acuminate. Flowers solitary, opening before leaves, 2.2–3 cm in diam. Pedicel 1–3 mm, 4–5 mm in fruit, glabrous. Hypanthium campanulate, purplish brown, outside glabrous. Sepals ovate to narrowly ovate, purplish green, outside glabrous or slightly villous along margin, apex obtuse. Petals pink, broadly obovate, 1–1.5 cm, apex emarginate. Stamens many, much shorter than petals. Ovary densely pubescent. Style longer than or ± as long as stamens. Drupe subglobose, ca. 3 cm in diam., densely pubescent; mesocarp fleshy, not splitting when ripe; endocarp compressed ovoid-globose, ca. 2 cm, slightly flattened on both sides, surface smooth and with few longitudinal shallow furrows only on dorsal and ventral sides, base subtruncate and slightly asymmetric, apex acute. Fl. Mar–Apr, fr. Aug–Sep.

Slopes in mixed forests, mountain valleys, ravines; 2000–4000 m. Sichuan, Xizang, Yunnan [Russia].

This species is cultivated for its fruit and seeds. It is often uncertain whether collections are wild, cultivated, or escaped from cultivation.

49. ARMENIACA Scopoli, Meth. Pl. 15. 1754.

杏属 xing shu

Lu Lingdi (陆玲娣 Lu Ling-ti); Bruce Bartholomew

Trees, rarely shrubs, deciduous. Branches unarmed, rarely spiny. Axillary winter bud solitary; terminal winter bud absent. Stipules present. Leaves simple, alternate, convolute when young; petioles usually with 2 nectaries; leaf blade margin singly or doubly serrate. Inflorescences apparently axillary, 1–3-flowered. Flowers bisexual, regular, solitary or to 3 in a fascicle, opening before leaves or rarely with leaves. Pedicel nearly absent to very short, rarely longer. Hypanthium caducous in fruit. Sepals 5, imbricate. Petals 5, inserted on mouth of hypanthium, imbricate. Stamens 15–45, perigynous; filaments free, filiform. Carpel 1 (or 2); ovary superior, hairy, 1-loculed; ovules 2, collateral, pendulous. Style terminal, elongated. Fruit a drupe, ± laterally compressed, hairy, rarely glabrous, with a conspicuous longitudinal groove; mesocarp succulent or fleshy, not splitting when ripe, rarely dry and splitting when ripe; endocarp hard, 2-valved, compressed on both sides, surface smooth, scabrous, or reticulate, rarely pitted, separating from or adnate to mesocarp. Seeds bitter or sweet.

About 11 species: E to SW Asia; ten species (five endemic) in China.

Armeniaca is widespread in China and is especially common in N China, but its distribution center is the middle and lower reaches of the Huang He. Many species and varieties are cultivated for their edible fruit and a few for their edible seeds. Many species are also grown as ornamentals. The seeds are sweet or bitter and are rich in oil and protein. Seeds are used as food or medicine and the oil is used in light industry. The high quality wood is also used commercially.

- 1a. First year's branchlets green 10. *A. mume*
 1b. First year's branchlets grayish brown to reddish brown.
 2a. Leaf blade margin biserrate 9. *A. mandshurica*
 2b. Leaf blade margin not biserrate.
 3a. Drupe dark purplish red 8. *A. dasycarpa*
 3b. Drupe yellow to yellowish red, rarely white, with or without a red tinge.
 4a. Leaf blade usually glabrous on both surfaces, rarely abaxially pubescent in vein axils (sometimes adaxially white pubescent in *A. vulgaris*).
 5a. Petiole 1.8–2.1 cm; leaf blade elliptic to obovate-elliptic; sepals not reflexed 2. *A. limeixing*
 5b. Petiole 2–3.5 cm; leaf blade ovate, suborbicular, or suborbicular-ovate; sepals apically recurved or reflexed.
 6a. Trees 5–8(–12) m tall; mesocarp succulent, not splitting when ripe 1. *A. vulgaris*
 6b. Shrubs or trees 2–5 m tall; mesocarp dry, splitting when ripe 3. *A. sibirica*
 4b. Leaf blade pubescent on both surfaces, somewhat glabrescent (often adaxially glabrous in *A. hypotrichodes*).
 7a. Leaf blade ovate to elliptic-ovate, pubescent abaxially; fruiting pedicel 4–7 mm 4. *A. holosericea*
 7b. Leaf blade elliptic, oblong, or lanceolate (sometimes elliptic-ovate in *A. hongpingensis*), densely villous abaxially; fruiting pedicel more than 7 mm.
 8a. Leaf blade lanceolate, adaxially usually glabrous, apex acute; sepal margin ciliate-glandular 7. *A. hypotrichodes*
 8b. Leaf blade elliptic to oblong, adaxially sparsely pubescent to pilose, apex acuminate to caudate; sepal margin not ciliate-glandular.
 9a. Petioles densely pubescent; leaf blade elliptic to elliptic-ovate, densely yellowish brown villous abaxially, base rounded; endocarp ellipsoid, pitted 5. *A. hongpingensis*
 9b. Petioles glabrous; leaf blade elliptic to oblong, densely grayish villous abaxially, base truncate, rarely rounded; endocarp narrowly ellipsoid, scabrous, shallowly reticulate, not pitted 6. *A. zhengheensis*

1. *Armeniaca vulgaris* Lamarck, Encycl. 1: 2. 1783.

杏 xing

Trees 5–8(–12) m tall, crown spherical, spherical-flattened, or elongated oblong. Bark grayish brown, longitudinally splitting. Older branchlets brownish, glabrous, transversely lenticellate; young branchlets reddish brown, with many pale lenticels. Winter buds purplish red, ovoid, 2–4 mm, glabrous or puberulous at scale margins, apex obtuse. Petiole 2–3.5 cm, glabrous or white pubescent, basally usually with 1–6 nectaries; leaf blade broadly ovate to orbicular-ovate, 5–9 × 4–8 cm, both

surfaces glabrous, abaxially pubescent in vein axils, or adaxially white pubescent, base cuneate, broadly cuneate, rounded, or subcordate and with several nectaries, margin crenate, apex acute to shortly acuminate. Flowers solitary or occasionally paired, opening before leaves, 2–4.5 cm in diam. Pedicel 1–3 mm, pubescent. Hypanthium purplish green, shortly cylindrical, 5–7 × 3–4 mm, outside pubescent near base. Sepals purplish green, ovate to ovate-oblong, 3–5 mm, reflexed after anthesis, apex acute to rarely obtuse. Petals white, pink, or tinged with red, orbicular to obovate, 0.8–1.2 cm and ± as broad, margin shortly unguiculate, apex rounded. Stamens 20–100, slightly

shorter than petals; filaments white; anthers yellow. Ovary pubescent. Style slightly longer than or nearly as long as stamens, basally pubescent. Drupe white, yellow, orange, often tinged red, globose, ovoid, or rarely obovoid, 1.5 to more than 2.5 cm in diam., usually pubescent, glaucous or not; mesocarp succulent, not splitting when ripe; endocarp globose, ovoid, or ellipsoid, compressed laterally, often obtuse at ventral suture and more straight at dorsal suture, with keel-like ribs on ventral side, surface scabrous or smooth, base symmetric or rarely asymmetric, apex obtuse to ± rounded. Seed bitter or sweet. Fl. Mar–Apr, fr. Jun–Jul.

Sparse forests on mountain slopes, slopes, gullies, also cultivated; sea level to 3000 m. Gansu, Hebei, Henan, Jiangsu, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang [Japan, Korea; C Asia].

Apricots are cultivated for their edible fruit throughout China and in most temperate parts of the world. The seeds are also edible and used medicinally. Because of its long history of cultivation in China, it is difficult to know for certain whether specific collections are really wild or escaped from cultivation, but probably the species originated in C Asia.

- 1a. Petiole and leaf blade yellowish brown pubescent 1e. var. *xiongyueensis*
- 1b. Petiole and leaf blade glabrous or sparsely white pubescent.
- 2a. Flowers double, ca. 4–4.5 cm in diam.; stamens ca. 100 1d. var. *meixianensis*
- 2b. Flowers single, 2–3 cm in diam.; stamens 20–50.
- 3a. Leaf base cuneate to broadly cuneate; flowers usually 2; petals pink; endocarp surface reticulate 1c. var. *ansu*
- 3b. Leaf base rounded to subcordate; flowers usually solitary; petals white or tinged with red; endocarp surface not reticulate.
- 4a. Petioles and adaxial surface of leaf blades glabrous; drupe more than 2.5 cm in diam.; endocarp surface scabrous or smooth, base symmetric or rarely asymmetric 1a. var. *vulgaris*
- 4b. Petioles and adaxial surfaces of leaf blades white pubescent; drupe 1.5–2 cm in diam.; endocarp surface smooth, base asymmetric 1b. var. *zhidanensis*

1a. *Armeniaca vulgaris* var. *vulgaris*

杏(原变种) xing (yuan bian zhong)

Prunus armeniaca Linnaeus; *P. tiliifolia* Salisbury.

Petiole glabrous; leaf base rounded to subcordate, both surfaces sparsely pubescent or adaxially glabrous. Flowers solitary. Drupe more than 2.5 cm in diam.; endocarp surface scabrous or smooth, base usually symmetric or rarely asymmetric.

Sparse forests on mountain slopes, also cultivated; 700–3000 m. Gansu, Hebei, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang [C Asia].

Pure stands of *Armeniaca vulgaris* var. *vulgaris* occur in the Ili prefecture of Xinjiang.

1b. *Armeniaca vulgaris* var. *zhidanensis* (C. Z. Qiao & Y. P. Zhu) L. T. Lu, Acta Phytotax. Sin. 38: 281. 2000.

志丹杏 zhi dan xing

Armeniaca zhidanensis C. Z. Qiao & Y. P. Zhu, Acta Phytotax. Sin. 31: 188. 1993.

Petiole white pubescent; leaf base rounded to subcordate, adaxially white pubescent. Flowers solitary. Drupe 1.5–2 cm in diam.; endocarp surface smooth, base asymmetric.

- Cultivated or wild. Ningxia, Qinghai, Shaanxi, Shanxi.

1c. *Armeniaca vulgaris* var. *ansu* (Maximowicz) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 38: 26. 1986.

野杏 ye xing

Prunus armeniaca Linnaeus var. *ansu* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 29: 87. 1884; *Armeniaca ansu* (Maximowicz) Kostina; *P. ansu* (Maximowicz) Komarov.

Leaf base cuneate to broadly cuneate. Flowers usually 2. Petals pink. Endocarp surface scabrous and reticulate.

Slopes, gullies, also cultivated; 1000–1500 m. Gansu, Hebei, Henan, Jiangsu, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan [Japan, Korea].

1d. *Armeniaca vulgaris* var. *meixianensis* J. Y. Zhang et al., Bull. Bot. Res., Harbin 9(3): 66. 1989.

陕梅杏 shan mei xing

Flowers double, 4–4.5 cm in diam. Petals to 70. Stamens ca. 100.

- About 700 m. WC Shaanxi (Mei Xian).

1e. *Armeniaca vulgaris* var. *xiongyueensis* T. Z. Li et al., Bull. Bot. Res., Harbin 9(3): 65. 1989.

熊岳杏 xiong yue xing

Petiole and leaf blade yellowish brown pubescent.

- Cultivated or wild; near sea level. S Liaoning (Xiongyue).

2. *Armeniaca limeixing* J. Y. Zhang & Z. M. Wang, Acta Phytotax. Sin. 37: 3. 1999.

李梅杏 li mei xing

Trees 3–4 m tall, spreading. Trunk scabrous, bark grayish brown. Perennial branches grayish brown; previous year's branches yellowish brown on exposed side, green to reddish brown on adaxial side, glabrous, with sparse flattened orbicular lenticels. Petiole 1.8–2.1 cm, glabrous, with 2–4 nectaries; leaf blade elliptic to obovate-elliptic, 6–7 × 3–4 cm, both surfaces glabrous or abaxially pubescent in vein axils, base cuneate, margin shallowly obtusely dentate, apex acuminate to caudate; midvein yellowish white. Flowers solitary to 3 in clusters, opening before or at same time as leaves, 1.5–2.5 cm in diam., slightly fragrant. Pedicel 3–8 mm, 4–12 mm in fruit, glabrous or rarely pubescent. Hypanthium yellowish green to reddish brown, campanulate, outside glabrous. Sepals green, rarely

brown, ligulate to broadly ligulate, not reflexed after anthesis, outside glabrous, margin serrate. Petals 5(–8), white, suborbicular to elliptic, 8–10 × 7–8 mm, base shortly clawed, margin undulate, apex emarginate. Stamens 24–30, shorter than pistil; anthers yellowish. Carpel 1(or 2); ovary and base of style pubescent. Drupe yellowish white, orangish yellow, or yellowish red, subglobose to ovoid-globose, pubescent, not glaucous, with a deep suture; mesocarp yellow to orangish yellow, succulent, sweet-sour, fragrant, adnate to endocarp; endocarp compressed globose, ventral ribs obtuse, dorsal ribs acute, lateral ribs nearly absent, surface shallowly reticulate, base longitudinally shallowly furrowed, apex obtuse to acute. Seed bitter. Fl. Apr–May, fr. Jun–Jul.

• Cultivated. Hebei, Heilongjiang, Henan, N Jiangsu, Jilin, Liaoning, Shaanxi, Shandong.

This species is cultivated for its fruit and is unknown in the wild.

3. *Armeniaca sibirica* (Linnaeus) Lamarck, Encycl. 1: 3. 1783.

山杏 shan xing

Shrubs or trees, 2–5 m tall. Bark dark gray. Branches spreading; branchlets grayish brown to reddish brown, sparsely pubescent when young, glabrescent. Winter buds reddish brown, ovoid to conical, 2–4 mm; scale margins pubescent. Petiole 2–3.5 cm, glabrous or pubescent when young, with or without small nectaries; leaf blade ovate to suborbicular, (3–)5–10 × (2.5–)4–7 cm, both surfaces glabrous, pubescent, or abaxially pubescent in vein axils, base rounded to subcordate, margin obtusely minutely serrate, apex long acuminate to caudate. Flowers solitary, opening before leaves, 1.5–3.5 cm in diam. Pedicel 1–2 mm. Hypanthium purplish red outside, campanulate, outside basally glabrous or slightly pubescent. Sepals oblong-elliptic, recurved at anthesis, apex acute to shortly acuminate. Petals white with pink veins or pinkish, suborbicular to obovate. Stamens nearly as long as petals. Ovary pubescent. Drupe yellow to orangish red, sometimes tinged red, compressed globose, 1.5–2.5 cm and as broad, pubescent, glaucous or not; mesocarp 2.5–3 mm thick, dry and compact, bitter, inedible, readily separating from endocarp and splitting along ventral suture at maturity; endocarp laterally compressed globose, 1.2–2.2 cm and nearly as broad, central rib of ventral suture acute and winged, dorsal rib more obtuse, surface more smooth, base asymmetric, apex obtuse. Seed ± bitter. Fl. Mar–Apr, fr. Jun–Jul.

Forests, thickets, mountainous areas, hill grasslands, slopes, river valleys, dry sunny slopes; 400–2500 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi [Korea, Mongolia, Russia].

- 1a. Flowers single, 1.5–2 cm in diam.
 - 2a. Petioles, leaf blades, and pedicels usually glabrous 3a. var. *sibirica*
 - 2b. Petioles, leaf blades, and pedicels pubescent but with age leaf blade only abaxially sparsely pubescent along veins 3b. var. *pubescens*
- 1b. Flowers double, 3–3.5 cm in diam.
 - 3a. Petioles and leaf blades glabrous 3c. var. *multipetala*

- 3b. Petioles and leaf blades pubescent 3d. var. *pleniflora*

3a. *Armeniaca sibirica* var. *sibirica*

山杏(原变种) shan xing (yuan bian zhong)

Prunus sibirica Linnaeus, Sp. Pl. 1: 474. 1753; *Prunus armeniaca* Linnaeus var. *sibirica* (Linnaeus) K. Koch.

Flowers single. Petioles, leaf blades, and pedicels often glabrous.

Forests, thickets, hill grasslands, dry sunny slopes; 700–2000 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Shanxi [Mongolia, Russia].

3b. *Armeniaca sibirica* var. *pubescens* Kostina, Trudy Prikl. Bot., Ser. 8, Plodovolye Yagodnye Kul't 4: 28. 1935.

毛杏 mao xing

Prunus sibirica Linnaeus var. *pubescens* (Kostina) Nakai.

Flowers single. Petioles, leaf blades, and pedicels pubescent but with age leaf blade only abaxially sparsely pubescent along veins.

Sunny slopes in mixed forests, thickets, river valleys, grasslands; 1200–2500 m. Gansu, Hebei, Nei Mongol, Shaanxi, Shanxi [Korea].

3c. *Armeniaca sibirica* var. *multipetala* G. S. Liu & L. B. Zhang, Acta Phytotax. Sin. 27: 394. 1989.

重瓣山杏 chong ban shan xing

Flowers double. Petioles and leaf blades glabrous.

• Slopes; ca. 400 m. E Hebei (Qinglong Xian).

3d. *Armeniaca sibirica* var. *pleniflora* J. Y. Zhang et al., Bull. Bot. Res., Harbin 9(3): 65. 1989.

辽梅杏 liao mei xing

Flowers double. Petioles and leaf blades pubescent.

• Mountainous areas; ca. 800 m. W Liaoning (Beipiao Xian).

4. *Armeniaca holosericea* (Batalin) Kostina, Trudy Prikl. Bot., Ser. 8, Plodovolye Yagodnye Kul't 4: 28. 1935.

藏杏 zang xing

Prunus armeniaca Linnaeus var. *holosericea* Batalin, Trudy Imp. S.-Peterburgsk Bot. Sada 14: 167. 1895.

Trees 4–5 m tall. Branchlets reddish brown to grayish brown, pubescent when young, gradually glabrescent. Winter buds brown, ovoid. Petiole 1.5–2 cm, pubescent, usually with nectaries; leaf blade ovate to elliptic-ovate, 4–6 × 3–5 cm, both surfaces pubescent when young but glabrescent, base rounded to subcordate, margin minutely serrate, apex acuminate. Flowers unknown. Fruiting pedicel 4–7 mm. Drupe ovoid-globose to ovoid-ellipsoid, 2–3 cm in diam., densely pubescent; mesocarp slightly fleshy, not splitting when ripe; endocarp ovoid-ellipsoid to ellipsoid, compressed laterally, ventral rib somewhat obtuse, surface rugose, base subsymmetric to slightly asymmetric, apex acute. Fr. Jun–Jul.

• Thickets, sunny slopes, dry river valleys; 700–3300 m. Qinghai, Shaanxi, Sichuan, SE Xizang.

5. *Armeniaca hongpingensis* C. L. Li, Acta Phytotax. Sin. 23: 209. 1985.

洪平杏 hong ping xing

Armeniaca holosericea (Batalin) Kostina var. *xupuensis* T. Z. Li.

Trees to 10 m tall. Bark grayish brown, irregularly shallowly splitting. Branchlets pale brown to reddish brown, glabrescent. Winter buds small, ovoid. Petiole 1.5–2 cm, densely pubescent; leaf blade elliptic to elliptic-ovate, 6–10 × 2.5–5 cm, abaxially densely yellowish brown villous, adaxially sparsely pubescent, base rounded, margin densely acutely serrulate, apex narrowly acuminate to caudate. Flowers unknown. Fruiting pedicel 7–10 mm. Drupe subglobose, 3.5–4 × 3–3.5 cm, densely yellowish brown pubescent; mesocarp edible; endocarp ellipsoid, compressed on both sides, ventral rib obtuse, longitudinally furrowed on ventral side, surface pitted, base subsymmetric, apex acute. Fr. Jun–Jul.

• Along trails, sometimes cultivated in villages; 200–1800 m. W Hubei, W Hunan (Xupu Xian).

This species is cultivated for its edible fruit.

6. *Armeniaca zhengheensis* J. Y. Zhang & M. N. Lu, Acta Phytotax. Sin. 37: 105. 1999.

政和杏 zheng he xing

Trees 35–40 m tall, erect. Bark dark brown, somewhat smooth, flaking into pieces. Older branchlets grayish brown; younger branchlets reddish brown, smooth, pubescent, with dense and transverse lenticels; new shoots reddish brown on exposed side, green on opposite side. Petiole red, 1.3–1.5 cm, usually glabrous, with 2–4(–6) nectaries apically from middle; leaf blade elliptic to oblong, 7.5–15 × 3.5–4.5 cm, abaxially densely grayish villous, adaxially green and pilose on veins, base mostly truncate to rarely rounded, margin irregularly minutely gland-tipped serrate, apex acuminate to long caudate; midvein adaxially red or sometimes white. Flowers usually solitary, opening before leaves, ca. 3 cm in diam. Pedicel yellowish green, 3–4 mm, glabrous. Hypanthium basally green, apically reddish, campanulate, outside glabrous. Sepals purplish red, ligulate, reflexed after anthesis, outside glabrous. Petals white, elliptic, 1.3–1.5 × 0.8–0.9 cm, base shortly unguiculate, apex obtuse. Stamens 25–30, longer than petals. Drupe yellow, tinged red on exposed side, ovoid-globose, slightly pubescent; mesocarp succulent, sweet, adnate to endocarp and not splitting along suture when ripe; endocarp yellowish brown, narrowly ellipsoid, compressed laterally, 2–2.5 cm, ventral and dorsal ribs obtuse, rarely without lateral ribs, with a deep furrow running from apex to base, surface scabrous and shallowly reticulate but not pitted, base symmetric, apex obtuse. Seed compressed ellipsoid, bitter. Fl. Mar–Apr, fr. Jun–Jul.

• Mountain regions; 700–1000 m. N Fujian (Zhenghe Xian).

7. *Armeniaca hypotrichodes* (Cardot) L. C. Li & S. Y. Jiang, Acta Phytotax. Sin. 36: 367. 1998.

背毛杏 bei mao xing

Prunus hypotrichodes Cardot, Notul. Syst. (Paris) 4(1): 27. 1920.

Shrubs to 3 m tall. Branchlets glabrous, dark brown initially, later brownish gray. Winter buds ovoid, brown; scales orbicular, imbricate, margin pilose. Stipules small, lanceolate, caducous, margin glandular denticulate. Petiole 1–1.5 cm, usually glabrous, with 1–3 nectaries; leaf blade lanceolate, 5–12 × 1.5–4 cm, broadest near middle, abaxially brownish villous, adaxially glabrous or rarely pilose on veins, base narrowly subrounded, margin irregularly minutely gland-tipped serrate, apex acute. Flowers solitary, opening slightly before or with leaves, ca. 3 cm in diam. Pedicel 7–10 mm, glabrous. Hypanthium subcampanulate to obconic, outside glabrous. Sepals ligulate, shorter than hypanthium, reflexed, outside glabrous, margin ciliate glandular. Petals white, long obovate, 1.2–1.5 × 0.8–0.9 cm, base shortly and broadly unguiculate, margin entire, apex obtuse. Stamens ca. 30, arranged in several whorls, outer ones nearly as long as petals, inner ones shorter than petals; filaments slender, glabrous; anthers small, orbicular. Ovary densely villous. Style slender, slightly longer than or nearly as long as stamens, basally hirsute; stigma dilated. Drupe unknown. Fl. Mar–Apr.

• Calcareous mountain areas; ca. 1400 m. Chongqing (Chengkou Xian).

8. *Armeniaca dasycarpa* (Ehrhart) Borkhausen, Arch. Bot. (Leipzig) 1(2): 37. 1797.

紫杏 zi xing

Prunus dasycarpa Ehrhart, Beitr. Naturk. 6: 90. 1791; *Armeniaca atropurpurea* Loiseleur-Deslongchamps; *A. dasycarpa* (Ehrhart) Persoon; *A. fusca* Turpin & Poiteau; *Prunus armeniaca* Linnaeus var. *dasycarpa* (Ehrhart) K. Koch.

Trees 4–7 m tall. Branchlets many, purplish red, somewhat thin, smooth and glabrous when young. Petiole thin, short, with or without small nectaries; leaf blade ovate to elliptic-ovate, 4–7 × 2.5–5 cm, abaxially pubescent along veins or in vein axils, adaxially dark green and glabrous, base cuneate to subrounded, margin irregularly densely minutely crenate, apex shortly acuminate. Flowers usually solitary (or 2), opening before leaves, ca. 2 cm in diam. Pedicel 4–7 mm, 7–12 mm in fruit, thinly pubescent. Hypanthium reddish brown, campanulate, outside subglabrous. Sepals reddish brown, suborbicular to broadly oblong, subglabrous, apex obtuse. Petals white or with pink spots, broadly obovate to spatulate, to 1 cm. Stamens many, nearly as long as petals. Ovary thinly pubescent. Drupe dark purplish red, subglobose, ca. 3 cm in diam., thinly pubescent, glaucous; mesocarp succulent, sour, adnate to endocarp; endocarp ovoid to ellipsoid-ovoid, compressed laterally, ventral and dorsal ribs slightly obtuse, surface longitudinally furrowed and coarsely scabrous or slightly pitted, base subsymmetric, apex acute. Seed bitter, rarely sweet. Fl. Apr–May, fr. Jun–Jul.

Cultivated. Xinjiang [Kashmir, Russia; SW Asia].

This species is cultivated for its edible fruit and seeds and is unknown in the wild.

9. *Armeniaca mandshurica* (Maximowicz) Skvortzov, Trudy Prikl. Bot. 22: 223. 1929.

东北杏 dong bei xing

Trees 5–15 m tall. Bark dark gray, deeply splitting. Branchlets reddish brown to greenish, glabrous. Winter buds purplish brown, ovoid, 2–4 mm, apex obtuse; scale margins glabrous or puberulous. Petiole 1.5–3 cm, puberulous, often with 2 nectaries; leaf blade broadly ovate to broadly elliptic, 5–12(–15) × 3–6(–8) cm, both surfaces glabrous or pubescent but gradually glabrescent and only abaxially pubescent in vein axils with age, base broadly cuneate, rounded, or sometimes cordate, margin irregularly acutely elongately biserrate, apex acuminate to caudate. Flowers solitary, opening before leaves, 2–3 cm in diam. Pedicel 7–10 mm, glabrous or sparsely pubescent when young. Hypanthium reddish brown, campanulate, outside usually glabrous. Sepals reddish brown, oblong to elliptic-oblong, outside usually glabrous, margin inconspicuously minutely serrate, apex obtuse to acute. Petals pink or white, broadly obovate to suborbicular. Stamens many, slightly longer than or nearly as long as petals. Ovary densely pubescent. Drupe yellow, sometimes white tinged red or with reddish spots on exposed side, subglobose, 1.5–2.6 cm in diam., pubescent; mesocarp slightly fleshy to dry, sour or somewhat bitter, edible in large-fruited forms, fragrant; endocarp subglobose to broadly ellipsoid, compressed laterally, 1.3–1.8 × 1.1–1.8 cm, ventral suture smooth, with obtuse median rib, lateral ribs not developed, dorsal rib suborbicular, surface slightly rugose, base subsymmetric, apex obtuse to mucronate. Seed bitter, rarely sweet. Fl. Apr–May, fr. May–Jul.

Mixed forests, thickets, mountain regions, open sunny slopes; 200–1000 m. Heilongjiang, Jilin, Liaoning [Korea, E Russia].

The wood is very hard.

- 1a. Leaf blade pubescent on both surfaces when young, gradually glabrescent and only abaxially pubescent in vein axils with age 9a. var. *mandshurica*
 1b. Leaf blade glabrous on both surfaces 9b. var. *glabra*

9a. *Armeniaca mandshurica* var. *mandshurica*

东北杏(原变种) dong bei xing (yuan bian zhong)

Prunus armeniaca Linnaeus var. *mandshurica* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 29: 87. 1884; *P. mandshurica* (Maximowicz) Koehne.

Leaf blade pubescent on both surfaces when young, gradually glabrescent and only abaxially pubescent in vein axils with age.

Mixed forests, thickets, open sunny slopes; 400–1000 m. Jilin, Liaoning [N Korea, E Russia].

9b. *Armeniaca mandshurica* var. *glabra* (Nakai) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 38: 31. 1986.

光叶东北杏 guang ye dong bei xing

Prunus mandshurica (Maximowicz) Koehne var. *glabra* Nakai, J. Jap. Bot. 15: 679. 1939.

Leaf blade glabrous on both surfaces.

Mountain regions; 200–400 m. Heilongjiang, Jilin, Liaoning [Korea].

10. *Armeniaca mume* Siebold, Verh. Batav. Genootsch. Kunsten 12(1): 69. 1830.

梅 mei

Trees, rarely shrubs, 4–10 m tall. Bark grayish to tinged with green, smooth. First year's branchlets green, smooth, glabrous or densely incanous. Winter buds purplish brown, ovoid, 3–6 mm, glabrous, apex acute. Petiole 1–2 cm, densely incanous or pubescent when young, often with nectaries; leaf blade ovate, ovate-elliptic, elliptic, obovate, or obovate-oblancoelate, 4–8 × 2.5–5 cm, grayish green, both surfaces pubescent when young, gradually glabrescent or only abaxially pubescent in vein axils with age, base broadly cuneate to rounded, margin usually acutely serrulate, apex caudate. Flowers solitary or 2 in a fascicle, opening before leaves, 2–2.5 cm in diam., strongly fragrant. Pedicel 1–10 mm, glabrous. Hypanthium usually reddish brown but green to greenish purple for some cultivated varieties, broadly campanulate, 2.5–4 mm, outside glabrous or sometimes pubescent. Sepals ovate to suborbicular, 3–5 mm, apex obtuse. Petals white or pink, obovate, 0.9–1.4 × 0.8–1.2 cm. Stamens shorter to slightly longer than petals. Ovary densely pubescent. Style shorter to slightly longer than stamens. Drupe yellow to greenish white, subglobose, 2–3 cm in diam., pubescent; mesocarp sour, adnate to endocarp; endocarp ellipsoid to subglobose, slightly compressed on both sides, ventral suture somewhat obtuse, distinctly longitudinally furrowed on ventral and dorsal sides, surface pitted, base cuneate, obtuse, or rounded, apex obtuse and abruptly mucronulate. Fl. winter–spring, fr. May–Jun (or Jul–Aug in N China).

Forested slopes, sparse forests, stream sides, slopes along trails, mountains, also commonly cultivated; below 3100 m. Native in W Sichuan and W Yunnan, perhaps also in N Taiwan; cultivated throughout most of China particularly in areas S of the Chang Jiang [Japan, Korea, N Laos, N Vietnam].

In addition to the varieties listed below, there are many cultivated varieties selected for their flowers or fruit.

- 1a. Branchlets and petioles densely incanous 10d. var. *pubicaulina*
 1b. Branchlets glabrous, petioles pubescent when young but glabrescent.
 2a. Leaf blade obovate to obovate-oblancoelate; pedicel to 1 cm 10c. var. *cernua*
 2b. Leaf blade ovate, ovate-elliptic, or elliptic; pedicel usually not over 0.5 cm.
 3a. Leaf blade thin; endocarp ellipsoid, base cuneate 10a. var. *mume*
 3b. Leaf blade thick; endocarp subglobose, base obtuse to rounded 10b. var. *palescens*

10a. *Armeniaca mume* var. *mume*

梅(原变种) mei (yuan bian zhong)

Prunus anomala Koehne; *P. mume* (Siebold) Siebold & Zuccarini; *P. mume* var. *formosana* Masamune; *P. mume* var. *tonsa* Rehder.

Leaf blade ovate to elliptic, thin. Pedicel short, 1–3 mm. Endocarp ellipsoid, base cuneate.

ROSACEAE

Commonly cultivated throughout most of China particularly in areas S of the Chang Jiang; perhaps native in N Taiwan [native to Japan and Korea].

This variety is cultivated for both its edible fruit and as an ornamental, but is unknown in the wild in China except perhaps for plants in N Taiwan that have been called *Prunus mume* var. *formosana* (Masamune, Annual Rep. Taihoku Bot. Gard. 2: 137. 1932).

10b. *Armeniaca mume* var. *pallescens* (Franchet) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 38: 32. 1986.

厚叶梅 hou ye mei

Prunus mume (Siebold) Siebold & Zuccarini var. *pallescens* Franchet, Pl. Delavay. 197. 1890.

Leaf blade ovate to ovate-elliptic, thick, subleathery. Pedicel not over 5 mm. Endocarp subglobose, base obtuse to rounded.

• Forested slopes, stream sides; 1700–3100 m. W Sichuan, W Yunnan.

10c. *Armeniaca mume* var. *cernua* (Franchet) T. T. Yu & L. T. Lu, Fl. Reipubl. Popularis Sin. 38: 32. 1986.

长梗梅 chang geng mei

Prunus mume (Siebold) Siebold & Zuccarini var. *cernua* Franchet, Pl. Delavay. 198. 1890.

Leaf blade obovate to obovate-oblongate. Pedicel to 1 cm.

Sparse forests, slopes along trails, stream sides; 1900–2600 m. W Yunnan [N Laos, N Vietnam].

10d. *Armeniaca mume* var. *pubicaulina* C. Z. Qiao & H. M. Shen, Bull. Bot. Res., Harbin 14: 150. 1994.

毛茎梅 mao jing mei

Branchlets and petioles densely incanous.

• Mountains; ca. 2500 m. W Yunnan (Yunlong Xian).

50. PRUNUS Linnaeus, Sp. Pl. 1: 473. 1753.

李属 li shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Bruce Bartholomew

Trees or shrubs, deciduous. Branchlets sometimes spine-tipped. Axillary winter bud solitary, ovoid; terminal winter bud absent. Stipules membranous, soon caducous. Leaves simple, alternate, convolute [or conduplicate] when young; petiolate or sessile; petiole apex or base of leaf blade margin with or without nectaries; leaf blade margin variously crenate or coarsely serrate. Inflorescences apparently axillary, solitary or to 3-flowered in a fascicle; bracts small, soon caducous. Flowers opening before or at same time as leaves. Hypanthium campanulate. Sepals 5, imbricate. Petals 5, white, sometimes purple-veined, rarely greenish, inserted on rim of hypanthium, imbricate. Stamens 20–30, in 2 whorls; filaments unequal. Carpel 1; ovary superior, 1-loculed, glabrous or sometimes villous; ovules 2, collateral, pendulous. Style terminal, elongated. Fruit a drupe, glabrous, often glaucous, usually with a longitudinal groove; mesocarp fleshy, not splitting when ripe; endocarp laterally compressed, smooth, rarely grooved or rugose.

About 30 species: Asia, Europe, North America; seven species (two endemic, three introduced) in China.

Prunus mairei H. Léveillé, described from Yunnan, is *Symplocos paniculata* (Thunberg) Miquel in the Symplocaceae (see Fl. China 15: 252. 1996).

Many plum species are cultivated for their edible fruit and some for their flowers.

- 1a. Secondary veins and midvein at a less than 45° angle 1. *P. simonii*
- 1b. Secondary veins and midvein at a 45° angle.
 - 2a. Young branchlets and bracts tomentose or pubescent; pedicel usually pubescent.
 - 3a. Flowers solitary; fruiting pedicel erect; endocarp rugose 2. *P. spinosa*
 - 3b. Flowers usually 2 in a fascicle (but usually solitary in *P. cerasifera*); fruiting pedicel pendulous; endocarp nearly smooth 3. *P. insititia*
 - 2b. Young branchlets and bracts glabrous or sparsely pubescent (densely pubescent in *P. salicina* var. *pubipes*); pedicel glabrous or rarely pubescent.
 - 4a. Leaf blade abaxially pubescent; drupe often glaucous 4. *P. domestica*
 - 4b. Leaf blade abaxially glabrous or sparsely pubescent or pubescent on midvein; drupe not glaucous (slightly glaucous in *P. cerasifera*).
 - 5a. Leaf blade abaxially pubescent only on midvein; flowers usually solitary, very rarely 2 in a fascicle; endocarp smooth or scabrous 5. *P. cerasifera*
 - 5b. Leaf blade abaxially glabrous or sparsely pubescent; flowers (2 or)3 in a fascicle; endocarp rugose or grooved.
 - 6a. Leaf blade glabrous; drupe 3.5–7 cm in diam.; endocarp rugose 6. *P. salicina*
 - 6b. Leaf blade sparsely pubescent; drupe 1.5–2.5 cm in diam.; endocarp conspicuously grooved 7. *P. ussuriensis*

1. *Prunus simonii* Carrière, Rev. Hort. 1872: 111. 1872.

杏李 xing li

Persica simonii Decaisne; *Prunus persica* (Linnaeus) Batsch var. *nectarina* Maximowicz.

Trees 5–8 m tall. Branches purple, glabrous; branchlets pale red, robust, glabrous. Winter buds purplish red, usually glabrous. Stipules linear, margin glandular, apex long acuminate. Petiole 1–1.3 cm, glabrous, apex often with 1 or 2 large nectaries on either side; leaf blade oblong-obovate, oblong-

lanceolate, or rarely elliptic, 7–10 × 3–5 cm, glabrous, abaxially pale green, adaxially dark green, base cuneate to broadly cuneate, margin conspicuously crenate or sometimes inconspicuously biserrate, apex acuminate to acute; midvein and secondary veins abaxially conspicuous, adaxially conspicuously impressed, at a less than 45° angle with each other. Flowers 2 or 3 in a fascicle, rarely solitary, 1.5–2 cm in diam. Pedicel 2–5 mm, glabrous. Hypanthium outside glabrous. Sepals oblong, glabrous, margin glandular, apex obtuse. Petals white, oblong, base cuneate and shortly clawed, apex obtuse. Ovary glabrous. Stigma disk-shaped. Drupe red, appressed globose, 3–5(–6) cm in diam., glabrous; mesocarp pale yellow, fragrant; endocarp small, depressed globose, longitudinally grooved. Fl. May, fr. Jun–Jul.

- Native in Hebei; widely cultivated in N China.

This species is cultivated for its edible fruit and has many cultivars.

2. *Prunus spinosa* Linnaeus, Sp. Pl. 1: 475. 1753.

黑刺李 hei ci li

Prunus domestica Linnaeus var. *spinosa* (Linnaeus) Kuntze.

Shrubs, rarely trees, 4–8 m tall. Branches reddish brown, robust, glabrous, spiny; branchlets reddish brown, densely pubescent. Winter buds purplish red, pubescent. Stipules lanceolate, margin glandular, apex acuminate. Petiole 5–7 mm, pubescent, without nectaries; leaf blade oblong-obovate, elliptic-ovate, or rarely oblong, 2–4 × 0.8–1.8 cm, abaxially yellowish green and pubescent, adaxially dark green and sparsely appressed pubescent, glabrescent, base subrounded to broadly cuneate, margin crenate or sometimes doubly crenate, apex acute to obtuse; secondary veins 4 or 5(–8) on either side of midvein. Flowers solitary, opening before leaves, 1–1.5 cm in diam. Pedicel 6–8(–15) mm, glabrous or sparsely pubescent. Hypanthium outside glabrous. Sepals triangular-ovate, outside glabrous, margin serrulate, apex acute. Petals white with pale purple veins, oblong, base cuneate, apex obtuse. Stamens 20–25. Ovary glabrous. Stigma capitate. Drupe black, globose, broadly ellipsoid, or conical, 1–1.5 cm in diam., glabrous, glaucous; mesocarp green; endocarp brown, ovoid to ellipsoid, ± flattened, rugose. Fl. Apr, fr. Aug.

Cultivated throughout China [native to N Africa, SW Asia, and Europe].

This species is cultivated for its edible fruit and as grafting stock for other species of Prunoideae.

3. *Prunus insititia* Linnaeus, Amoen. Acad. 4: 273. 1759.

乌荆子李 wu jing zi li

Prunus domestica Linnaeus subsp. *insititia* (Linnaeus) C. K. Schneider; *P. domestica* var. *insititia* (Linnaeus) Fiori & Paoletti.

Shrubs or trees, to 6 m tall. Branches grayish black, glabrous, sometimes spiny; branchlets purplish brown, tomentose. Winter buds solitary or 2 parallel, purplish red, sometimes subglabrous or ciliate at scale margins. Stipules lorate, margin

glandular ciliate, apex acuminate. Petiole 1–2(–2.5) cm, pubescent; leaf blade obovate, elliptic, or rarely oblong, 3.5–6(–8) × 2–4 cm, pubescent, soon glabrescent, abaxially pale green, adaxially dark green, base cuneate to broadly cuneate and with a pair of nectaries, margin coarsely serrate with teeth apex obtuse and gland-tipped, apex acute to obtuse; midvein and secondary veins prominent. Flowers 2(or 3) in a fascicle, rarely solitary, 2–2.5 cm in diam. Pedicel 1–1.5 cm, pubescent. Hypanthium outside subglabrous. Sepals narrowly ovate to oblong, outside subglabrous, margin entire or repand, apex obtuse to shortly acute. Petals white and inconspicuously purplish veined, broadly obovate, base broadly cuneate and with a short claw, apex obtuse. Stamens 20–25. Ovary glabrous. Stigma disk-shaped. Drupe bluish black, subglobose to ovoid, 1–2.5 cm in diam., glabrous; endocarp small, ± flattened, nearly smooth. Fl. Apr–May, fr. Jun–Sep.

Cultivated in China [native to SW Asia and Europe].

This species is cultivated for its edible fruit and as grafting stock for other species of Prunoideae.

4. *Prunus domestica* Linnaeus, Sp. Pl. 1: 475. 1753.

欧洲李 ou zhou li

Prunus communis Hudson; *P. domestica* var. *damascena* Linnaeus; *P. domestica* subsp. *oconomica* (Borkhausen) C. K. Schneider; *P. sativa* Rouy & Camus subsp. *domestica* (Linnaeus) Rouy & E. G. Camus.

Trees 6–15 m tall. Branches reddish brown, unarmed or with a few spines, glabrous; branchlets pale red to grayish green, sparsely pubescent. Winter buds reddish brown, usually glabrous. Stipules linear, margin glandular, apex acuminate. Petiole 1–2 cm, densely pubescent; leaf blade dark green, elliptic to obovate, 4–10 × 2.5–5 cm, abaxially pubescent, adaxially glabrous or sparsely pubescent on veins, base cuneate to occasionally broadly cuneate and with a pair of nectaries, margin remote crenate, apex acute to obtuse; secondary veins 5–7 on either side of midvein. Flowers solitary or to 3 in a fascicle, on apex of short branchlets, 1–1.5 cm in diam. Pedicel 1–1.2 cm, glabrous or pubescent. Hypanthium outside pubescent. Sepals ovate, outside pubescent, margin entire, apex acute. Petals white or occasionally greenish, obovate, base cuneate, apex rounded to obtuse. Drupe red, purple, green, or yellow, usually globose to oblong, rarely subglobose, 1–2.5 cm in diam., often glaucous; endocarp broadly ellipsoid, pitted. Fl. Mar, fr. Sep.

Widely cultivated in China [native to SW Asia and Europe].

This species has a long history of cultivation, with many horticultural varieties. It is grown for its fruit, which are eaten fresh or made into juice or preserves.

5. *Prunus cerasifera* Ehrhart, Beitr. Naturk. 4: 17. 1789.

櫻桃李 ying tao li

Prunus cerasifera subsp. *myrobalana* (Linnaeus) C. K. Schneider; *P. domestica* Linnaeus var. *myrobalana* Linnaeus; *P. sogdiana* Vassilczenko.

Shrubs or trees, to 8 m tall. Branches dark gray, sometimes spiny; branchlets dark red, glabrous. Winter buds purple; scale

margins sometimes sparsely ciliate. Stipules lanceolate, margin glandular serrulate, apex acuminate. Petiole 6–12 mm, usually glabrous or sometimes sparsely pubescent when young, without nectaries; leaf blade elliptic, ovate, obovate, or rarely elliptic-lanceolate, (2–)2–6 × 2–6(–6) cm, abaxially pale green and pubescent on midvein, adaxially dark green and glabrous, base cuneate to subrounded, margin crenate or sometimes doubly crenate, apex acute. Flowers solitary, rarely 2 in a fascicle, 2–2.5 cm in diam. Pedicel 1–2.2 cm, glabrous or sparsely pubescent. Hypanthium outside glabrous. Sepals narrowly ovate, outside glabrous, margin shallowly serrate, apex obtuse. Petals white, oblong to spatulate, base cuneate, margin undulate, apex obtuse. Stamens 25–30. Ovary villous. Stigma disk-shaped. Drupe yellow, red, or black, subglobose to ellipsoid, 2–3 cm in diam., slightly glaucous; endocarp ellipsoid to ovoid, smooth or scabrous, sometimes pitted. Fl. Apr, fr. Aug.

Forests, stream sides in valleys, gravelly slopes, also cultivated; 800–2000 m. Xinjiang [Kazakhstan, Turkmenistan, Uzbekistan; SW Asia, S Europe].

This species is widely cultivated throughout much of China for its fruit and flowers, with many horticultural varieties and forms. The purplish-leaved form, *Prunus cerasifera* f. *atropurpurea* (Jacquin) Rehder, is often planted as a garden ornamental in N China.

6. *Prunus salicina* Lindley, Trans. Hort. Soc. London 7: 239. 1830.

李 li

Trees 9–12 m tall; branchlets, petioles, pedicels, outside base of hypanthium glabrous or densely pubescent. Branches purplish brown to reddish brown; branchlets yellowish red. Winter buds purplish red, usually glabrous or rarely hairy at scale margins. Stipules linear, margin glandular, apex acuminate. Petiole 1–2 cm, apex with 2 nectaries; leaf blade oblong-obovate, narrowly elliptic, or rarely oblong-ovate, 6–8(–12) × 3–5 cm, adaxially dark green and lustrous, base cuneate, margin doubly crenate and often mixed with simple gland-tipped teeth when young, apex acute to shortly caudate; secondary veins 6 or 7 on either side of midvein, not extending to leaf margin. Flowers usually 3 in a fascicle, 1.5–2.2 cm in diam. Pedicel 1–1.5 cm. Sepals oblong-ovate, ca. 5 mm, outside glabrous, margin loosely serrate, apex acute to obtuse. Petals white, oblong-obovate, base cuneate, margin erose near apex. Ovary glabrous. Stigma disk-shaped. Drupe yellow or red, sometimes green or purple, globose, ovoid, or conical, 3.5–5 cm in diam., to 7 cm in diam. in horticultural forms, glaucous; endocarp ovoid to oblong, rugose. Fl. Apr, fr. Jul–Aug.

• Sparse forests, forest margins, thickets, scrub, along trails in mountains, stream sides in valleys, also cultivated; 200–2600 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang.

- 1a. Branchlets, petioles, pedicels, and outside surface of hypanthia glabrous; leaf blade abaxially sparsely pubescent on veins or barbate in vein axils 6a. var. *salicina*
 1b. Branchlets, petioles, pedicels, and outside base of hypanthia densely pubescent; leaf blade abaxially densely pubescent 6b. var. *pubipes*

6a. *Prunus salicina* var. *salicina*

李(原变种) li (yuan bian zhong)

Prunus botan André; *P. gymnodonta* Koehne; *P. ichangana* C. K. Schneider; *P. staminata* Handel-Mazzetti; *P. thibetica* Franchet; *P. triflora* Roxburgh; *P. triflora* var. *spinifera* Koehne.

Branchlets, petioles, pedicels, and outside surface of hypanthia glabrous. Leaf blade abaxially sparsely pubescent on veins or barbate in vein axils.

• Sparse forests, thickets, scrub, along trails in mountains, stream sides in valleys, also cultivated; 200–2600 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang.

This variety is an important, temperate fruit tree widely cultivated in China and other regions of Asia, Europe, and North America.

6b. *Prunus salicina* var. *pubipes* (Koehne) L. H. Bailey, Rhodora 18: 155. 1916.

毛梗李 mao geng li

Prunus triflora Roxburgh var. *pubipes* Koehne in Sargent, Pl. Wilson. 1: 280. 1912.

Branchlets, petioles, abaxial surface of leaf blades, pedicels, and outside base of hypanthia densely pubescent.

• Forest margins, thickets; 1600–2000 m. Gansu, Sichuan, Yunnan.

7. *Prunus ussuriensis* Kovalev & Kostina, Trudy Prikl. Bot., Ser. 8, Plodovolye Yagodnye Kul't 4: 75. 1935.

东北李 dong bei li

Prunus salicina Lindley var. *mandshurica* (Skvortzov) Skvortzov & Baranov; *P. triflora* Roxburgh var. *mandshurica* Skvortzov.

Trees 2.5–3 m tall. Branches grayish black, robust, glabrous; branchlets reddish brown, glabrous. Winter buds reddish brown, usually glabrous. Stipules lanceolate, margin glandular serrate, apex acuminate. Petiole glabrous, without nectaries; leaf blade obovate-oblong, rarely elliptic, 4–7(–9) × 2–4 cm, abaxially pale green and basally sparsely pubescent, adaxially dark green and basally sparsely pubescent, base cuneate to rarely broadly cuneate, margin serrate or biserrate with teeth often gland-tipped, apex caudate, acuminate, or acute; midvein and secondary veins abaxially conspicuous and raised, adaxially impressed. Flowers 2 or 3 in a fascicle, rarely solitary, 1–1.2 cm in diam. Pedicel 0.7–1.3 cm, glabrous. Hypanthium outside glabrous. Sepals oblong, glabrous, margin gland-tipped serrulate, apex acute. Petals white, oblong, base cuneate and shortly clawed, margin undulate near apex. Ovary glabrous. Stigma disk-shaped. Drupe purplish red, ovoid, subglobose, or oblong, 1.5–2.5 cm in diam., glabrous; endocarp oblong, conspicuously grooved, inconspicuously pitted. Fl. Apr–May fr. Jun–Sep.

Forest margins, stream sides; 400–800 m. Heilongjiang, Jilin, Liaoning [Russia (Far East, E Siberia)].

This species is resistant to extreme cold and is cultivated in N China as a frost-hardy fruit tree.

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The following taxa have been described from China, but we have seen no specimens and are therefore unable to assign them to genus or treat them in this account. Further revision is necessary.

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|---|--|
| <i>Prunus consociiflora</i> C. K. Schneider (Repert. Spec. Nov. Regni Veg. 1: 54. 1905), described from Hubei: A. Henry 1309. | <i>Prunus nubium</i> Handel-Mazzetti (Symb. Sin. 7: 530. 1933), described from Hunan: T. H. Wang 1. |
| <i>Prunus japonica</i> Thunberg var. <i>fukienensis</i> Rehder (J. Arnold Arbor. 3: 29. 1922), described from Fujian: P. T. Dunn s.n. | <i>Prunus platysepala</i> Koehne (in Sargent, Pl. Wilson. 1: 277. 1912), described from Hubei: E. H. Wilson 2813. |
| <i>Prunus kawakamii</i> Hayata (J. Coll. Agric. Imp. Univ. Tokyo 25: 77. 1908), described from Taiwan: T. Kawakami & U. Mori s.n. | <i>Prunus salicina</i> Lindley var. <i>cordata</i> Y. He & J. Y. Zhang (Bull. Bot. Res., Harbin 9(3): 71. 1989), described from Fujian: J. Y. Zhang et al. A10803. |

51. CERASUS Miller, Gard. Dict. Abr., ed. 4, [300]. 1754.

櫻屬 ying shu

Li Chaoluan (李朝銓 Li Chao-luang); Bruce Bartholomew

Padellus Vassilczenko.

Trees or shrubs, deciduous. Branches unarmed. Axillary winter buds 1 or 3, lateral buds flower buds, central bud a leaf bud; terminal winter buds present. Stipules soon caducous, margin serrulate, teeth often gland-tipped. Leaves simple, alternate or fascicled on short branchlets, conduplicate when young; petiole usually with 2 apical nectaries or nectaries sometimes at base of leaf blade margin; leaf blade margin singly or doubly serrate, rarely serrulate. Inflorescences axillary, fasciculate-corymbose or 1- or 2-flowered, base often with an involucre formed by floral bud scales. Flowers opening before or at same time as leaves, pedicellate, with persistent scales or conspicuous bracts. Hypanthium campanulate or tubular. Sepals 5, reflexed or erect. Petals 5, white or pink. Stamens 15–50, inserted on or near rim of hypanthium. Carpel 1. Ovary superior, 1-loculed, hairy or glabrous; ovules 2, collateral, pendulous. Style terminal, elongated, hairy or glabrous; stigma emarginate. Fruit a drupe, glabrous, not glaucous, without a longitudinal groove. Mesocarp succulent, not splitting when ripe; endocarp globose to ovoid, smooth or ± rugose.

About 150 species: temperate Asia, Europe, North America; 44 species (30 endemic, five introduced) in China.

The Himalayan species *Cerasus rufa* (J. D. Hooker) T. T. Yu & C. L. Li (*Prunus rufa* J. D. Hooker) was reported from Xizang by both T. T. Yu et al. (Fl. Xizang. 2: 693. 1985) and T. T. Yu & C. L. Chao (FRPS 38: 80. 1986). However, it is now believed that this species does not occur in Xizang.

The present authors have seen no material of the following species described from Taiwan: *Prunus matuurae* Sasaki; *P. takasagomontana* Sasaki; and *P. transarisanensis* Hayata. Their status is uncertain and they are not included in this treatment.

Many species of cherry are cultivated for their edible fruit or as garden ornamentals.

- 1a. Winter buds 3 per leaf axil with 2 lateral flower buds and 1 central leaf.
 - 2a. Pedicel to 2.5 mm or flowers sessile; hypanthium longer than wide; sepals erect or spreading; style villous basally or throughout.
 - 3a. Leaf blade ovate-elliptic to obovate-elliptic, 2–7 cm, adaxially pilose, abaxially densely tomentose 1. *C. tomentosa*
 - 3b. Leaf blade obovate-oblongate, 0.8–1.6 cm, glabrous 2. *C. tianshanica*
 - 2b. Pedicel 4–20 mm; hypanthium as long as wide; sepals reflexed; style pilose basally or glabrous throughout.
 - 4a. Leaf blade broadest basally from middle, base rounded 3. *C. japonica*
 - 4b. Leaf blade broadest at about middle or apically (basally sometimes in *C. pogonostyla* var. *obovata* and *C. glandulosa*), base cuneate or broadly so.
 - 5a. Leaf blade abaxially hirsute to pilose along veins.
 - 6a. Leaf blade abaxially pilose along veins or sometimes between veins; style basally pilose 4. *C. pogonostyla*
 - 6b. Leaf blade abaxially densely brown hirsute; style glabrous 5. *C. dictyoneura*
 - 5b. Leaf blade abaxially glabrous, sparsely pubescent, or with tufted hairs in vein axils.
 - 7a. Leaf blade secondary veins 6–8 on either side of midvein; hypanthium outside pilose; style slightly shorter than stamens; drupe 1.5–1.8 cm in diam. 6. *C. humilis*
 - 7b. Leaf blade secondary veins 4 or 5 on either side of midvein; hypanthium outside glabrous; style slightly longer than stamens; drupe 1–1.3 cm in diam. 7. *C. glandulosa*
 - 1b. Winter bud 1 per leaf axil.
 - 8a. Bracts green, persistent.
 - 9a. Teeth of leaf blade margin non-glandular, with an apical cartilaginous mucro, or with an inconspicuous apical gland.
 - 10a. Inflorescences corymbose, 5–10-flowered; endocarp markedly sculptured 8. *C. maximowiczii*
 - 10b. Inflorescences umbellate, 2–4-flowered; endocarp smooth.
 - 11a. Shrubs 0.2–1 m tall; sepals shorter than hypanthium; drupe ca. 1 cm 9. *C. fruticosa*
 - 11b. Trees 10–25 m tall; sepals nearly as long as hypanthium; drupe 1.2–2.5 cm.

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- 12a. Petiole 1–2 cm; leaf blade glabrous; inflorescence inner involucre bracts straight; mesocarp sour 10. *C. vulgaris*
 12b. Petiole 2–7 cm; leaf blade abaxially sparsely villous; inflorescence inner involucre bracts curved; mesocarp sweet 11. *C. avium*
- 9b. Teeth of leaf blade margin with a distinct apical gland.
- 13a. Glands disciform or depressed at apex of teeth along bract margins and sometimes along leaf blade margins.
- 14a. Inflorescences subcorymbose-racemose or racemose.
- 15a. Style glabrous or sparsely pilose 12. *C. szechuanica*
 15b. Style sparsely villous basal to middle 13. *C. discadenia*
- 14b. Inflorescences umbellate.
- 16a. Flowers opening at same time as leaves; hypanthium outside glabrous; petals apically rounded 14. *C. tatsienensis*
 16b. Flowers opening before leaves; hypanthium outside pilose; petals apically 2-lobed 15. *C. discoidea*
- 13b. Glands not disciform or depressed at apex of teeth along bract and leaf blade margins (sometimes depressed in *C. patentipila*).
- 17a. Inflorescences umbellate.
- 18a. Petiole glabrous; bracts 5–20 mm; sepals spreading 16. *C. setulosa*
 18b. Petiole ± hairy (sometimes glabrous in *C. clarifolia* and *C. conradinae*); bracts 2–8 mm; sepals reflexed.
- 19a. Branchlets densely villous; leaf blade abaxially densely spreading villous; hypanthium outside densely villous 18. *C. polytricha*
 19b. Branchlets glabrous or pilose; leaf blade abaxially pilose along veins or glabrous; hypanthium outside glabrous.
- 20a. Winter buds ovoid, glabrous; petiole glabrous or pilose; stamens 20–30; drupe long ellipsoid 17. *C. clarifolia*
 20b. Winter buds ellipsoid-ovoid, pilose; petiole densely spreading villous; stamens 32–54; drupe ovoid to subglobose 36. *C. conradinae*
- 17b. Inflorescences corymbose-racemose (umbellate-racemose in *C. claviculata*).
- 21a. Peduncles, rachises, pedicels, and outside of sepals glabrous.
- 22a. Young branchlets brown; bracts 0.5–2.5 cm; hypanthium ca. 5 mm in diam.; style nearly as long as stamens; endocarp ± sculptured 19. *C. conadenia*
 22b. Young branchlets tinged reddish brown to reddish green; bracts 0.2–0.5 cm; hypanthium 3–4 mm in diam.; style slightly longer than stamens; endocarp markedly sculptured 20. *C. pleiocerasus*
- 21b. Peduncles, rachises, pedicels, and outside sepals distinctly hairy.
- 23a. Leaf blade abaxially pilose or sparsely pubescent; teeth along bract margins and sometimes along leaf blade margins aristate and with a clavicate apical gland; hypanthium outside basally pilose to subglabrous; sepal margin sparsely ciliate 21. *C. dolichadenia*
 23b. Leaf blade abaxially densely horizontally spreading villous to hirsute; teeth along bract and leaf blade margins with a capitate to flattened-capitate (depressed) apical gland; hypanthium outside pilose; sepal margin glandular serrate 22. *C. patentipila*
- 8b. Bracts brown or rarely greenish brown, rarely persistent.
- 24a. Leaf blade margin coarsely incised biserrate or lobed; inflorescences 1- or 2-flowered.
- 25a. Prostrate shrubs; petiole 2–7 mm.
- 26a. Leaf blade obovate to obovate-elliptic, margin biserrate but not lobed, apex obtuse to acute 24. *C. mugus*
 26b. Leaf blade elliptic-ovate to elliptic-lanceolate, margin biserrate and lobed, apex acute to acuminate 25. *C. crataegifolia*
- 25b. Tree or shrubs; petiole 4–13 mm.
- 27a. Branchlets, pedicels, and outside of sepals hairy; style glabrous 29. *C. caudata*
 27b. Branchlets, pedicels, and outside of sepals glabrous (sometimes pilose in *C. trichostoma*); style hairy.
- 28a. Flowers opening at same time as leaves; stipules usually lanceolate to linear, 3–5 mm 30. *C. trichostoma*
 28b. Flowers opening slightly before leaves or nearly so; stipules on vegetative branches usually ovate and auriculate, 5–10 mm 31. *C. stipulacea*
- 24b. Leaf blade margin biserrate, serrate, or obtusely glandular crenate; inflorescences usually more than 2-flowered (sometimes 1-flowered in *C. serrula* and *C. schneideriana*).
- 29a. Inflorescences ± hairy or at least hairy when young.
- 30a. Style glabrous.
- 31a. Leaf blade lanceolate to ovate-lanceolate, apex acuminate to long acuminate; endocarp markedly sculptured 39. *C. serrula*
 31b. Leaf blade ovate to broadly ovate, apex usually caudate; endocarp smooth or ± sculptured.
- 32a. Petals apically emarginate; sepals nearly 1/2 or more as long as hypanthium 40. *C. pseudocerasus*
 32b. Petals apically 2-lobed; sepals nearly 2 × as long as hypanthium 41. *C. dielsiana*
- 30b. Style hairy.

- 33a. Petals abaxially hairy; pedicels 3.5–4.8 cm 44. *C. yaoana*
 33b. Petals glabrous; pedicels not more than 3 cm.
 34a. Inflorescences subcorymbose-racemose to long racemose; petals apically subundulate to emarginate; hypanthium tubular-campanulate 42. *C. yunnanensis*
 34b. Inflorescences umbellate or umbellate-racemose; petals apically emarginate or lobed; hypanthium tubular.
 35a. Sepals reflexed; hypanthium densely hirtellous outside 43. *C. schneideriana*
 35b. Sepals erect or spreading; hypanthium pilose outside.
 36a. Secondary veins 10–14 on each side of midvein, straight and nearly parallel; inflorescences umbellate, 2- or 3-flowered; pedicel 1–2 cm; sepals nearly as long as hypanthium, apically laxly serrate 27. *C. subhirtella*
 36b. Secondary veins 7–10 on each side of midvein, slightly curved; inflorescences umbellate-racemose, 3- or 4-flowered; pedicel 2–2.5 cm; sepals slightly shorter than hypanthium, apically serrate 28. *C. yedoensis*
 29b. Inflorescences glabrous.
 37a. Petals apically rounded (sometimes emarginate in *C. pusilliflora*).
 38a. Style glabrous 23. *C. mahaleb*
 38b. Style hairy.
 39a. Flowers solitary or umbellate; hypanthium densely hairy outside 26. *C. trichantha*
 39b. Flowers in a corymbose-racemose inflorescence; hypanthium glabrous outside.
 40a. Inflorescence distinctly pedunculate; pedicel 4–8 cm; hypanthium tubular-campanulate 32. *C. henryi*
 40b. Inflorescence short pedunculate; pedicel 1–1.5 cm; hypanthium campanulate 33. *C. pusilliflora*
 37b. Petals apically 2-lobed or emarginate.
 41a. Sepals reflexed 34. *C. cyclamina*
 41b. Sepals straight or spreading.
 42a. Leaf blade margin serrulate or biserrate with acuminate to aristate teeth 35. *C. serrulata*
 42b. Leaf blade sharply serrate.
 43a. Flowers opening at same time as leaves; drupe purplish black; endocarp apex obtuse 38. *C. cerasoides*
 43b. Flowers opening before leaves; drupe red; endocarp apex acute.
 44a. Leaf blade abaxially glabrous; involucre bracts 6–8 × 4–5 mm; hypanthium ca. 4 mm; petals apically 2-lobed 36. *C. conradinae*
 44b. Leaf blade abaxially with tufts of hairs in vein axils; involucre bracts ca. 5 × 3 mm; hypanthium ca. 6 mm; petals apically emarginate or rarely entire 37. *C. campanulata*

1. *Cerasus tomentosa* (Thunberg) Wallich, Numer. List no. 715. 1829.

毛櫻桃 mao ying tao

Prunus tomentosa Thunberg in Murray, Syst. Veg. ed. 14, 464. 1784; *Cerasus tomentosa* var. *pendula* B. Y. Feng & S. M. Xie; *P. batalinii* (C. K. Schneider) Koehne; *P. cinerascens* Franchet; *P. tomentosa* var. *batalinii* C. K. Schneider; *P. tomentosa* var. *breviflora* Koehne; *P. tomentosa* var. *endotricha* Koehne; *P. tomentosa* var. *heteromera* Koehne; *P. tomentosa* var. *kashkarovii* Koehne; *P. tomentosa* var. *souliei* Koehne; *P. tomentosa* var. *trichocarpa* (Bunge) Koehne; *P. tomentosa* var. *tsuluensis* Koehne; *P. trichocarpa* Bunge.

Shrubs usually 0.3–1 m tall, rarely arborescent and 2–3 m tall. Branchlets purplish to grayish brown; young branchlets densely tomentose or glabrous. Winter buds ovoid, sparsely pubescent or glabrous. Stipules linear, 3–6 mm, villous. Petiole 2–8 mm, tomentose, glabrescent; leaf blade ovate-elliptic to obovate-elliptic, 2–7 × 1–3.5 cm, abaxially grayish green and densely gray tomentose but glabrescent, adaxially dark green and pilose, base cuneate, margin coarsely and acutely serrate, apex acute to acuminate; secondary veins 4–7 on either side of midvein. Flowers solitary or 2 in a fascicle, opening before or at same time as leaves. Pedicel almost absent to 2.5 mm. Hypanthium tubular to cup-shaped, 4–5 mm, outside pubescent or gla-

brous. Sepals triangular-ovate, 2–3 mm, both surfaces pubescent or glabrous, apex obtuse to acute. Petals pink or white, obovate, apex rounded. Stamens 20–25, shorter than petals. Ovary hairy or only hairy at base or apex. Style exerted, slightly longer than stamens. Drupe red, subglobose, 5–12 mm in diam.; endocarp sides sparsely ribbed. Fl. Apr–May, fr. Jun–Sep.

• Forests on mountain slopes, forest margins, thickets, scrub, meadows, also cultivated; 100–3700 m. Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Yunnan.

This species is widely cultivated in temperate E Asia for its flowers and edible fruit.

2. *Cerasus tianshanica* Pojarkov, Bot. Zhurn. S.S.S.R. 24(3): 242. 1939.

天山櫻桃 tian shan ying tao

Cerasus prostrata (Labillardière) Seringe var. *concolor* Boissier; *Prunus prostrata* Labillardière var. *concolor* (Boissier) Lipsky.

Shrubs 1–1.5 m tall. Branchlets grayish brown; young branchlets grayish white tomentose. Winter buds ovoid, sparsely white tomentose. Stipules linear, ca. 2 mm. Petiole 1–2 mm, glabrous; leaf blade obovate-oblongate, 8–16 × 3–7 mm,

glabrous, abaxially pale green, adaxially green, base cuneate, margin acutely serrate, apex obtuse to acute; secondary veins 4 or 5 on either side of midvein. Flowers solitary, opening at same time as leaves. Pedicel ca. 1.5 mm, glabrous. Hypanthium tubular, 2–8 × ca. 2.5 mm, outside glabrous. Sepals ovate-triangular, outside glabrous, inside white tomentose, apex acute. Petals pale red, obovate. Stamens ca. 22, usually included in hypanthium. Style nearly as long as stamens, basally sparsely villous. Drupe purplish red, globose, 6–7 mm in diam., apex sparsely villous; endocarp smooth. Fl. Apr–May, fr. Jun–Jul.

Forests, meadows on mountain slopes; 700–1600 m. Xinjiang [C Asia].

3. *Cerasus japonica* (Thunberg) Loiseleur-Deslongchamps, *Traité Arbr. Arbust.* 5: 33. 1812.

郁李 *yu li*

Shrubs 1–1.5 m tall. Branchlets grayish brown; young branchlets green to greenish brown, glabrous. Winter buds ovoid, glabrous. Stipules linear or semiovalate, 4–6 mm, margin glandular serrate, lacinate or not. Petiole 2–10(–15) mm, glabrous or pilose; leaf blade ovate to ovate-lanceolate, 3–7 × 1.5–2.5 cm, abaxially pale green and glabrous or pilose along veins, adaxially dark green and glabrous, base rounded, margin acutely incised biserrate or deeply serrate, apex acuminate; secondary veins 5–8 on either side of midvein. Flowers solitary or to 3 in a fascicle, opening at same time as leaves or before. Pedicel 0.5–2 cm, glabrous or pilose. Hypanthium turbinate, 2.5–3 × 2.5–3 mm, outside glabrous. Sepals elliptic, slightly longer than hypanthium, margin serrulate, apex rounded. Petals pink or white, obovate-elliptic. Stamens ca. 32. Style nearly as long as stamens, glabrous. Drupe dark red or black, subglobose, ca. 1 cm in diam.; endocarp smooth. Fl. May, fr. Jun–Aug.

Forests on mountain slopes, thickets, grassy scrub on waste mountains, sunny mountain slopes, also cultivated; 100–1300 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Shandong, Zhejiang [Japan, Korea].

- 1a. Petiole 7–10(–15) mm; stipules semiovalate, margin lacinate; drupe black 3c. var. *zhejiangensis*
 1b. Petiole 2–5 mm; stipules linear, margin not lobed; drupe dark red.
 2a. Petiole 2–3 mm; leaf blade margin acutely incised biserrate; pedicel 0.5–1 cm 3a. var. *japonica*
 2b. Petiole 3–5 mm; leaf blade margin deeply serrate; pedicel 1–2 cm 3b. var. *nakaii*

3a. *Cerasus japonica* var. *japonica*

郁李(原变种) *yu li* (*yuan bian zhong*)

Prunus japonica Thunberg in Murray, *Syst. Veg.* ed. 14, 463. 1784; *P. japonica* var. *kerii* (Steudel) Koehne; *P. kerii* Steudel; *Microcerasus japonica* (Thunberg) M. Roemer.

Stipules linear, margin not lobed. Petiole 2–3 mm; leaf blade ovate to ovate-lanceolate, margin acutely incised biserrate. Pedicel 0.5–1 cm. Drupe dark red. Fl. May, fr. Jul–Aug.

Forests on mountain slopes, thickets, also cultivated; 100–200 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Shandong, Zhejiang [Japan, Korea].

This variety is used medicinally.

3b. *Cerasus japonica* var. *nakaii* (H. Léveillé) T. T. Yu & C. L. Li, *Fl. Reipubl. Popularis Sin.* 38: 86. 1986.

长梗郁李 *chang geng yu li*

Prunus nakaii H. Léveillé, *Repert. Spec. Nov. Regni Veg.* 7: 198. 1909; *Cerasus nakaii* (H. Léveillé) A. I. Baranov & Liou; *C. nakaii* var. *porphyrea* Takenouchi; *P. japonica* Thunberg var. *nakaii* (H. Léveillé) Rehder.

Stipules linear, margin not lobed. Petiole 3–5 mm; leaf blade ovate, margin deeply serrate. Pedicel 1–2 cm. Drupe dark red. Fl. May, fr. Jun–Jul.

Sunny mountain slopes; ca. 200 m. Heilongjiang, Jilin, Liaoning [Korea].

3c. *Cerasus japonica* var. *zhejiangensis* (Yun B. Chang) T. C. Ku ex B. Bartholomew, **comb. nov.**

浙江郁李 *zhe jiang yu li*

Basionym: *Prunus japonica* var. *zhejiangensis* Yun B. Chang, *Bull. Bot. Res.*, Harbin 12: 271. 1992.

Stipules semiovalate, margin lacinate. Petiole 7–10(–15) mm. Drupe black.

• Grassy scrub on waste mountains; ca. 1300 m. Zhejiang (Sui-chang Xian).

4. *Cerasus pogonostyla* (Maximowicz) T. T. Yu & C. L. Li, *Fl. Reipubl. Popularis Sin.* 38: 81. 1986.

毛柱郁李 *mao zhu yu li*

Shrubs or small trees, 0.5–1.5 m tall. Branchlets gray; young branchlets green, glabrous or sparsely pilose. Winter buds ovoid, glabrous or sparsely pubescent. Stipules linear, 5–6 mm, margin glandular serrate. Petiole 2–4 mm, sparsely pubescent; leaf blade obovate-elliptic to elliptic-lanceolate, 2.5–4.5 × 1–2 cm, abaxially pale green and pilose or only pilose along veins, adaxially dark green and subglabrous, base cuneate to broadly cuneate, margin obtusely rarely acutely biserrate and teeth with a minute apical gland, apex shortly acuminate, rounded, or long caudate. Flowers solitary or 2 in a fascicle, opening at same time as leaves. Pedicel 8–10 mm, sparsely pubescent. Hypanthium turbinate, 2.5–3 × 2.5–3 mm, outside subglabrous or basally pubescent. Sepals long ovate to triangular ovate, 4–5 mm, slightly longer than hypanthium, margin glandular serrate, apex acute. Petals pink, obovate to elliptic. Stamens 25–30. Style longer than stamens, basally pilose. Drupe ellipsoid to subglobose, 8–10 × 4–5 mm; endocarp smooth. Fl. Mar, fr. Apr–May.

• Forests on mountain slopes, sunny places in ravines; 200–500 m. Fujian, Guangdong, Hunan, Jiangxi, Taiwan, Zhejiang.

- 1a. Leaf blade apex shortly acuminate to rounded; drupe ca. 8 mm 4a. var. *pogonostyla*
 1b. Leaf blade apex long caudate; drupe ca. 10 mm 4b. var. *obovata*

4a. *Cerasus pogonostyla* var. *pogonostyla*

毛柱郁李(原变种) *mao zhu yu li* (*yuan bian zhong*)

Prunus pogonostyla Maximowicz, Bull. Soc. Imp. Naturalistes Moscou 54: 11. 1879; *Celtis caudata* Hance; *P. caudata* (Hance) Koidzumi (1913) not Franchet (1890); *P. caudata* (Hance) Koidzumi var. *globosa* (Koehne) F. P. Metcalf; *P. formosana* Matsumura; *P. pogonostyla* var. *globosa* Koehne.

Leaf blade obovate-elliptic, abaxially pilose or only pilose along veins, apex shortly acuminate to rounded. Drupe ca. 8 × 4–5 mm. Fl. Mar, fr. May.

• Forests on mountain slopes; 200–500 m. Fujian, Jiangxi, Taiwan, Zhejiang.

4b. *Cerasus pogonostyla* var. *obovata* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 82. 1986.

长尾毛樱桃 chang wei mao ying tao

Prunus pogonostyla Maximowicz var. *obovata* Koehne in Sargent, Pl. Wilson. 1: 265. 1912; *P. caudata* (Hance) Koidzumi var. *obovata* (Koehne) F. P. Metcalf.

Leaf blade obovate-elliptic to elliptic-lanceolate, abaxially pilose, apex long caudate. Drupe ca. 10 × 5 mm. Fl. Mar, fr. Apr–May.

• Sunny places in ravines; ca. 200 m. Fujian, Guangdong, Hunan, Taiwan.

5. *Cerasus dictyoneura* (Diels) Holub, Folia Geobot. Phytotax. 11: 82. 1976.

毛叶欧李 mao ye ou li

Prunus dictyoneura Diels, Bot. Jahrb. Syst. 36(Beibl. 82): 57. 1905; *P. humilis* Bunge var. *villosula* Bunge.

Shrubs 0.3–1(–2) m tall. Branchlets grayish brown; young branchlets densely pubescent. Winter buds ovoid, densely downy. Stipules linear, 3–4 mm, margin glandular serrate. Petiole usually 2–3 mm, densely pubescent; leaf blade obovate-elliptic, usually 2–4 × 1–2.5 cm, abaxially pale green and densely brown hirsute, adaxially dark green and glabrous or pubescent and usually crisp, base cuneate, margin serrate or biserrate, apex rounded to acute; secondary veins 5–8 on either side of midvein; reticulate veins conspicuous. Flowers solitary or to 3 in a fascicle, opening before leaves. Pedicel 4–8 mm, densely pubescent. Hypanthium campanulate, ca. 3 × 3 mm, outside pubescent. Sepals ovate, ca. 3 mm, apex acute. Petals pink or white, obovate. Stamens 30–35. Style nearly as long as stamens. Drupe red, globose, 1–1.5 cm in diam.; endocarp sides sparsely ribbed. Fl. Apr–May, fr. Jul–Sep.

• Thickets in sunny places on mountain slopes, also cultivated; 400–2300 m. Gansu, Hebei, Henan, Jiangsu, Ningxia, Shaanxi, Shanxi.

This species is used medicinally.

6. *Cerasus humilis* (Bunge) Sokolov, Trees & Shrubs URSS 3: 751. 1954.

欧李 ou li

Prunus humilis Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 2: 97. 1835; *P. glandulosa* Thunberg var. *salicifolia* (B. M. Komarov) Koehne; *P. japonica* Thunberg var. *salicifolia* B. M. Komarov.

Shrubs 0.4–1.5 m tall. Branchlets grayish brown, pubes-

cent. Winter buds ovoid, sparsely pubescent to subglabrous. Stipules linear, 5–6 mm, margin glandular. Petiole 2–4 mm, glabrous or sparsely pubescent; leaf blade narrowly obovate-elliptic to obovate-oblongate, 2.5–5 × 1–2 cm, abaxially pale green and glabrous or sparsely pubescent, adaxially dark green and glabrous, base cuneate, margin serrate or biserrate, apex acute to shortly acuminate; secondary veins 6–8 on either side of midvein. Flowers solitary or to 3 in a fascicle, opening at same time as leaves. Pedicel 5–10 mm, sparsely pubescent. Hypanthium campanulate, ca. 3 × 3 mm, outside pilose. Sepals triangular-ovate, apex acute to obtuse. Petals pink or white, oblong to obovate. Stamens 30–35. Style nearly as long as stamens, glabrous. Drupe red to purplish red, subglobose, 1.5–1.8 cm in diam.; endocarp sides sparsely ribbed. Fl. Apr–May, fr. Jun–Oct.

• Thickets, mountain slopes, sunny sandy slopes, also cultivated; 400–1800 m. Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Shandong, Shanxi, Sichuan.

This species is used medicinally and for its edible fruit.

7. *Cerasus glandulosa* (Thunberg) Sokolov, Trees & Shrubs URSS 3: 751. 1954.

麦李 mai li

Prunus glandulosa Thunberg in Murray, Syst. Veg. ed. 14, 463. 1784; *Cerasus japonica* (Thunberg) Loiseleur-Deslongchamps var. *glandulosa* (Thunberg) Komarov & Alissova; *P. glandulosa* f. *paokangensis* (C. K. Schneider) Koehne; *P. glandulosa* var. *purdomii* Koehne; *P. glandulosa* f. *sinensis* (Persoon) Koehne; *P. glandulosa* var. *trichostyla* Koehne; *P. japonica* Thunberg var. *paokangensis* C. K. Schneider; *P. sinensis* Persoon.

Shrubs 0.5–1.5(–2) m tall. Branchlets grayish brown to brown, glabrous or pubescent when young. Winter buds ovoid, glabrous or pubescent. Stipules linear, ca. 5 mm. Petiole 1.5–3 mm, glabrous or pilose; leaf blade oblong to elliptic-lanceolate, 2.5–6 × 1–2 cm, abaxially pale green and glabrous or pilose along midvein, adaxially green, base cuneate, margin obtusely finely biserrate, apex acuminate; secondary veins 4 or 5 on either side of midvein. Flowers solitary or 2 in a fascicle, opening at same time as leaves or nearly so. Pedicel 6–8 mm, subglabrous. Hypanthium campanulate, nearly as long as wide, outside glabrous. Sepals triangular-elliptic, as long as hypanthium, recurved, margin frequently glandular dentate, apex acute. Petals pink or white, obovate. Stamens ca. 30. Style slightly longer than stamens, glabrous or basally pilose. Drupe red to purplish, subglobose, 1–1.3 cm in diam. Fl. Mar–Apr, fr. May–Aug. $2n = 16$.

Thickets, mountain slopes, ravine sides, also cultivated; 800–2300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, N Hebei (Weichang Xian), Henan, Hubei, Hunan, Jiangsu, Shaanxi, Shandong, Sichuan, Yunnan, Zhejiang [Japan].

8. *Cerasus maximowiczii* (Ruprecht) Komarov in Komarov & Alissova, Key Pl. Far. East. Reg. URSS 2: 657. 1932.

黑樱桃 hei ying tao

Prunus maximowiczii Ruprecht, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 15: 131. 1857; *Padellus*

maximowiczii (Ruprecht) Eremin & Yushev; *Padus maximowiczii* (Ruprecht) Sokolov.

Trees to 7 m tall. Bark dark gray. Branchlets grayish brown; young branchlets tinged brown, densely villous. Winter buds long ovoid, appressed pubescent. Stipules linear, soon caducous after anthesis, margin with distant dark purple glands. Petiole 0.5–1.5 cm, densely villous; leaf blade obovate to obovate-elliptic, 3–9 × 1.5–4 cm, abaxially pale green and glabrous except appressed pilose along midvein and secondary veins, adaxially green and glabrous or appressed pilose along midvein, base cuneate to rounded, margin biserrate and non-glandular, apex cuspidate to shortly caudate; secondary veins 6–9 on either side of midvein. Inflorescences corymbose, 5–10-flowered; involucre bracts spatulate-oblong, 10–15 × 5–6 mm, soon caducous after anthesis, abaxially pilose, margin with distinct dark red tiny glands; rachis densely appressed villous; bracts green, leaflike, ovate, 5–7 × 5–4 cm, margin acutely serrate and non-glandular or inconspicuously glandular. Flowers ca. 1.5 cm in diam., opening at same time as leaves. Pedicel 0.5–1.5 cm, densely appressed villous. Hypanthium obconical, 3–4 × 2.5–3 mm, outside appressed pubescent. Sepals elliptic-triangular, ± as long as hypanthium, margin distantly serrate and teeth with an inconspicuous minute apical gland or non-glandular, apex acuminate. Petals white, elliptic, 6–7 × 5–6 mm. Stamens ca. 36. Style nearly as long as stamens; stigma capitate. Drupe black when ripe, ovoid, 7–8 × 5–6 mm; endocarp markedly sculptured. Fl. Jun, fr. Sep.

Shady mountain forests, stony places with humus-rich soil, sometimes on open mountain slopes with shrubby or herbaceous vegetation; 1000–1100 m. Heilongjiang, Jilin, Liaoning, Zhejiang [Japan, Korea, Russia (Far East)].

9. *Cerasus fruticosa* (Pallas) Woronow, Trudy Prikl. Bot. Selektiv. 14(3): 52. 1925.

草原櫻桃 cao yuan ying tao

Prunus fruticosa Pallas, Fl. Ross. 1: 19. 1784; *P. chamaecerasus* Jacquin.

Shrubs 0.2–1 m tall. Branchlets purplish brown; young branchlets green, glabrous. Winter buds ovoid, glabrous; scale margins glandular. Stipules narrowly linear, margin dentate. Petiole 0.8–1.5 cm, glabrous; leaf blade obovate, obovate-oblong, or lanceolate, 3–6 × 1.5–2.5 cm, abaxially light green and glabrous, adaxially dark green, shiny, and glabrous, base cuneate, margin obtusely to acutely dentate and teeth with an indurate cartilaginous margin and non-glandular, apex acute to obtuse; secondary veins 6–9 on either side of midvein. Inflorescences umbellate, (1–)3- or 4-flowered, sessile or shortly pedunculate. Flowers opening before or at same time as leaves. Pedicel 1.5–2.5 cm, glabrous. Hypanthium campanulate, outside glabrous. Sepals reflexed or erect. Petals white, obovate, 6–7 mm, apex usually notched. Stamens many. Style glabrous. Drupe red, ovoid, sour-sweet, ca. 1 × 0.8 cm; endocarp smooth. Fl. Apr–May, fr. Jul.

Forest-steppes and steppe zone, broad-leaved forest margins, shrubby thickets, steppes, grooves, open dry slopes, also cultivated. Xinjiang [Kazakhstan, Russia (Siberia); SW Asia, S Europe].

10. *Cerasus vulgaris* Miller, Gard. Dict., ed. 8, *Cerasus* no. 1. 1768.

欧洲酸櫻桃 ou zhou suan ying tao

Prunus cerasus Linnaeus, Sp. Pl. 1: 474. 1753; *C. hortensis* Miller; *P. vulgaris* (Miller) Schur.

Trees to 10 m tall, usually producing root suckers; crown subglobose. Bark dark brown, with lateral lined lenticels, exfoliating. Branches spreading to drooping; young branchlets green, becoming reddish brown, glabrous. Stipules linear, to 8 mm, margin glandular serrate. Petiole 1–2(–5) cm, with or without 1 or 2 nectaries; leaf blade elliptic-obovate to ovate, 5–7(–12) × 3–5(–8) cm, abaxially glabrous or pubescent when young, base cuneate and often with 2–4 nectaries, margin finely biserrulate and teeth with a very short cartilaginous apical cusp, apex acuminate to tapering to a short mucro. Inflorescences umbellate, 2–4-flowered, often with erect leaflike bracts. Flowers 2–2.5 cm in diam., opening at same time as leaves. Pedicel 1.5–3.5 cm. Hypanthium campanulate to obconical, outside glabrous. Sepals triangular, reflexed, margin glandular serrate. Petals white, 1–1.3 cm. Drupe pale red, globose to apically flattened, 1.2–1.5 cm in diam.; mesocarp yellowish and sour; endocarp brown, globose, 7–8 mm in diam., smooth, adnate to mesocarp. Fl. Apr–May, fr. Jun–Jul. $2n = 32$.

Cultivated throughout China [native to SW Asia and Europe].

This species is cultivated for its fruit and as an ornamental.

11. *Cerasus avium* (Linnaeus) Moench, Methodus 672. 1794.

欧洲甜櫻桃 ou zhou tian ying tao

Prunus cerasus Linnaeus var. *avium* Linnaeus, Sp. Pl. 1: 474. 1753; *Cerasus nigra* Miller; *P. avium* (Linnaeus) Linnaeus.

Trees to 25 m tall, producing no root suckers. Bark blackish, splitting transversely. Branchlets grayish brown; young branchlets green, glabrous. Winter buds ovoid-ellipsoid, glabrous. Stipules linear, ca. 1 cm, margin glandular serrate. Petiole 2–7 cm, glabrous, apically with 2 nectaries; leaf blade obovate-elliptic to elliptic-ovate, 3–13 × 2–6 cm, abaxially pale green and sparsely villous, adaxially green and glabrous, base cuneate to rounded, margin obtusely incised biserrate and teeth with a cartilaginous apical mucro, apex cuspidate to shortly acuminate; secondary veins 7–12 on either side of midvein. Inflorescences umbellate, 3- or 4-flowered; inner involucre bracts recurved at flowering; peduncle inconspicuous. Flowers opening at same time as leaves. Pedicel 2–6 cm, glabrous. Hypanthium cyathiform, ca. 5 × 4 mm, outside glabrous. Sepals long elliptic, ± as long as hypanthium, recurved after anthesis, margin entire, apex obtuse. Petals white, obovate, apex emarginate. Stamens ca. 34. Style nearly as long as stamens, glabrous. Drupe red to purplish black, subglobose to ovoid, 1.5–2.5 cm in diam.; endocarp smooth. Fl. Apr–May, fr. Jun–Jul. $2n = 16, 24, 32$.

Cultivated mainly in Hebei, Liaoning, and Shandong [native to SW Asia and Europe].

This species is cultivated for its fruit and as an ornamental.

12. *Cerasus szechuanica* (Batalin) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 49. 1986.

四川櫻桃 si chuan ying tao

Prunus szechuanica Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 14: 167. 1895.

Tree or shrubs, 3–7 m tall. Branchlets gray or reddish brown, glabrous or sparsely pilose. Winter buds oblong-ovoid, glabrous. Stipules green, ovate to broadly ovate, margin incised serrate, teeth with a capitate apical gland. Petiole 1–1.8 cm, glabrous or pilose, apically usually with 2 disciform to capitate nectaries; leaf blade ovate-elliptic, obovate-elliptic, or long elliptic, 5–9 × 2.5–4 cm, abaxially pale green and glabrous or pilose, adaxially green and usually glabrous or pilose along midvein, base broadly cuneate to rounded, margin biserrate or serrate and teeth with a minute disciform, capitate, or conical apical gland, apex caudate to cuspidate; secondary veins 7–9 on either side of midvein. Inflorescences subcorymbose-racemose, 4–9 cm, 2–5-flowered; involucre bracts brown, obovate-oblong, 10–15 × 5–6 mm, glabrous or nearly so, margin with capitate glands; rachis glabrous or pilose; bracts green, basally on rachis mostly sterile or only terminal 1–3 fertile, suborbicular, broadly ovate, or long ovate, 0.5–2.5 × 0.5–1.2 cm, margin with disciform glands, apex rounded. Pedicel 1–2 cm, glabrous or sparsely pilose. Hypanthium campanulate, ca. 5 × 4–5 mm, outside glabrous or pilose. Sepals triangular-lanceolate, slightly shorter than hypanthium, margin with capitate glands, apex acuminate. Petals white or pink, suborbicular, apex erose. Stamens 40–47. Style nearly as long as stamens, glabrous; stigma disciform. Drupe purplish red, ovoid, 8–10 × 7–8 mm; endocarp sculptured. Fl. Apr–Jun, fr. Jun–Aug.

• Forests, forest margins; 1500–2600 m. Henan, Hubei, Hunan, Shaanxi, Sichuan.

13. *Cerasus discadenia* (Koehne) C. L. Li & S. Y. Jiang, **comb. nov.**

盤腺櫻桃 pan xian ying tao

Basionym: *Prunus discadenia* Koehne in Sargent, Pl. Wilson. 1: 200. 1912.

Shrubs 4–6 m tall or trees 10–13 m tall. Stems 20–40 cm in diam. Branches gray to dark gray; branchlets usually dark red, darker in autumn, glabrous. Winter buds ca. 3 mm, glabrous. Stipules oblong to lanceolate, 3–4 mm, herbaceous, persistent, margin serrate, teeth gland-tipped fimbriate. Petiole sometimes dark red, 0.7–1.8 cm, glabrous, usually with 2 conspicuous nectaries at apex or at leaf blade base; leaf blade ovate, obovate, or sometimes oblong-obovate, 4–10 × 2.5–5 cm, glabrous or rarely abaxially conspicuously pilose along veins, base cordate, rounded, or rarely subacute, margin irregularly serrate and teeth with a prominently depressed-disciform apical gland, apex acuminate to caudate; secondary veins 8–10 on either side of midvein, pallid, adaxially light green, abaxially pale. Racemes 3–6 cm excluding peduncle, 3–9-flowered; involucre bracts 1–4, scalelike, usually 1–1.8 cm, inner ones sometimes persistent at anthesis; peduncles 1–2 cm, glabrous; rachis glabrous; bracts 4–9, rotund to ovate-oblong, 8–10 mm but basally to 25 mm and sterile, margin serrate, teeth with a depressed-

disciform apical gland. Flowers opening at same time as leaves. Pedicel 0.8–2.3 cm, glabrous. Hypanthium 4–5.5 or longer × 4–5.5 mm, outside glabrous. Sepals triangular, as long as or slightly longer than hypanthium, reflexed, glabrous, margin gland-tipped very shortly fimbriate, apex acute. Petals white, rotund, 6–8 mm in diam., apex erose-denticulate. Stamens 40–47, mostly 7–11 mm. Ovary ca. 1.1 cm. Style as long as or slightly shorter than stamens, sparsely villous basally to middle. Drupe red, subglobose, ca. 9 × 7 mm; endocarp ovoid, 5.5–6 × ca. 4 × 3.5 mm, obscurely few sulcate, smooth near keel. Fl. May, fr. Jul.

• Mountain slopes, thickets; 1300–2600 m. Gansu, Henan, Hubei, Ningxia, Shaanxi, Sichuan, Yunnan.

14. *Cerasus tatsienensis* (Batalin) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 52. 1986.

康定櫻桃 kang ding ying tao

Prunus tatsienensis Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 14: 322. 1895; *P. maximowiczii* Ruprecht var. *adenophora* Franchet; *P. tatsienensis* var. *adenophora* (Franchet) Koehne.

Shrubs or small trees, 2–5 m tall. Bark grayish brown. Branchlets gray, pilose or glabrous. Winter buds ovoid, glabrous. Stipules elliptic-lanceolate to ovate-lanceolate, margin serrate, teeth with a disciform apical gland. Petiole 8–10 mm, glabrous or pilose, apex with or without nectaries; leaf blade ovate to ovate-elliptic, 1–4.5 × 1–2.5 cm, abaxially pale green, glabrous or with tufted hairs in vein axils, adaxially green and subglabrous, base rounded, margin biserrate and teeth with a minute apical gland, apex acuminate; secondary veins 6–9 on either side of midvein. Inflorescences umbellate or subumbellate, 2–4-flowered; involucre bracts purplish brown, spatulate, ca. 8 × 4 mm, abaxially glabrous or sparsely villous; peduncle 5–12 mm, glabrous or pilose; bracts green, elliptic to suborbicular, 3–5 mm in diam., margin with disciform glands. Flowers ca. 1.5 cm in diam., opening at same time as leaves. Pedicel 1–2 cm, glabrous. Hypanthium campanulate, 3–4 × 2–3 mm, outside glabrous. Sepals ovate-triangular, nearly 1/2 as long as hypanthium, margin entire or distantly serrate, apex acute to obtuse. Petals white or pink, ovate. Stamens 20–35. Style nearly as long as stamens; stigma capitate. Fl. Apr–Jul, fr. Jun–Jul.

• Forests; 900–2600 m. Henan, Hubei, Shaanxi, Shanxi, Sichuan, Yunnan.

15. *Cerasus discoidea* T. T. Yu & C. L. Li, Acta Phytotax. Sin. 23: 211. 1985.

迎春櫻桃 ying chun ying tao

Trees 2–3.5 m tall. Bark dark grayish white. Branchlets purplish brown; young branchlets pilose, glabrescent. Winter buds ovoid, glabrous. Stipules narrowly lorate, 5–8 mm, margin with tiny disciform glands. Petiole 5–7 mm, sparsely pilose when young, glabrescent, apex with 1–3 nectaries; leaf blade obovate-oblong to elliptic, 4–8 × 1.5–3.5 cm, abaxially pale green and pilose, more densely so when young, adaxially dark green and appressed pilose, base cuneate to rarely subrounded, margin shallowly obtusely serrulate and teeth with a minute

conical apical gland, apex caudate, cauda acutely incised serrate; secondary veins 8–10 on either side of midvein. Inflorescences umbellate, (1 or)2(or 3)-flowered; involucre bracts brown, obovate-elliptic, 3–4 × 2–3 mm, abaxially glabrous, adaxially appressed pilose, margin with tiny capitate glands, apex serrate-lobed; peduncle 1–1.5 cm, sparsely pilose or glabrous; bracts green, suborbicular, 2–4 mm in diam., leathery, subglabrous, margin with tiny disciform to depressed glands. Flowers opening before or rarely at same time as leaves. Pedicel 1–1.5 cm, pilose. Hypanthium tubular-campanulate, 4–5 × 2–3 mm, outside sparsely pilose. Sepals oblong, 2–3 mm, apex rounded or mucronate. Petals pink, long elliptic, apically 2-lobed. Stamens 32–40. Style glabrous; stigma dilated. Drupe red, ca. 1 cm in diam.; endocarp ± sculptured. Fl. Mar, fr. May.

• Forest in ravines, thickets beside streams; 200–1100 m. Anhui, Jiangxi, Zhejiang.

16. *Cerasus setulosa* (Batalin) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 67. 1986.

刺毛櫻桃 ci mao ying tao

Prunus setulosa Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 12: 165. 1892; *P. gracilifolia* Koehne.

Shrubs or small trees, 1.5–5 m tall. Bark grayish brown. Branchlets grayish white to brown, glabrous. Winter buds ovoid, glabrous. Stipules ovate-oblong to obovate-oblongate, 4–8 × 1.5–3 mm, margin gland-tipped fimbriate. Petiole 4–8 mm, glabrous; leaf blade ovate, obovate, or ovate-elliptic, 2–5 × 1–2.5 cm, abaxially pale green, pilose along veins, and with tufted hairs in vein axils, adaxially green and appressed strigose, base rounded, margin obtusely biserrate gland-tipped fimbriate, apex caudate-acuminate to cuspidate; secondary veins 6–8 on either side of midvein. Inflorescences umbellate, 2- or 3-flowered; involucre bracts brown, spatulate, ca. 5 × 1.5 mm, soon caducous, adaxially hairy, margin glandular; peduncle 5–7 mm, glabrous; bracts 2 or 3, green, foliose, ovate, 0.5–2 cm, both surfaces sparsely strigose, margin gland-tipped serrate. Flowers 6–8 mm in diam., opening at same time as leaves. Pedicel 0.8–1.2 cm, pilose or glabrous. Hypanthium tubular, 5–6 × 3–4 mm, outside sparsely strigose. Sepals triangularly long ovate, 2–3 mm, spreading, both surfaces pilose, margin distantly serrate, apex acute. Petals pink, obovate to suborbicular. Stamens 30–40, shorter than sepals. Style slightly longer than or nearly equaling stamens, pilose basal to middle. Drupe red, ovoid-ellipsoid, ca. 8 × 6 mm; endocarp ± sculptured. Fl. Apr–Jun, fr. Jun–Aug.

• Forests or thickets in ravines, mountain slopes; 1300–2600 m. Gansu, Guizhou, Hubei, Ningxia, Qinghai, Shaanxi, Sichuan.

17. *Cerasus clarofolia* (C. K. Schneider) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 54. 1986.

微毛櫻桃 wei mao ying tao

Prunus clarofolia C. K. Schneider, Repert. Spec. Nov. Regni Veg. 1: 67. 1905; *P. litigiosa* C. K. Schneider; *P. litigiosa* var. *abbreviata* Koehne; *P. pilosiuscula* (C. K. Schneider) Koehne; *P. pilosiuscula* var. *media* Koehne; *P. pilosiuscula* var. *subvestita* Koehne; *P. rehderiana* Koehne; *P. sprengeri* Pamp. Pamp. Pamp.; *P. tatsienensis* Batalin var. *pilosiuscula* C. K. Schneider; *P. variabilis* Koehne; *P. venusta* Koehne.

Shrubs or small trees, 2.5–20 m tall. Bark grayish black. Branchlets grayish brown; young branchlets purple or green, glabrous or ± pilose. Winter buds ovoid, glabrous. Stipules lanceolate, margin gland-tipped fimbriate. Petiole 8–10 mm, glabrous or pilose; leaf blade ovate, ovate-elliptic, or obovate-elliptic, 3–6 × 2–4 cm, abaxially pale green and glabrous or pilose, adaxially green and sparsely pubescent or glabrous, base rounded, margin acuminately serrate or biserrate, teeth with a minute to inconspicuous apical gland; secondary veins 7–12 on either side of midvein. Inflorescences umbellate or subumbellate, 2–4-flowered; involucre bracts brown, spatulate, ca. 8 × 3–4 mm, abaxially glabrous, adaxially pilose; peduncle 4–10 mm, glabrous or pilose; bracts green, subovate, ovate-oblong, or suborbicular, 2–5 mm in diam., persistent in fruit, margin serrate, teeth with a conical to capitate apical gland. Flowers opening at same time as leaves. Pedicel 1–2 cm, glabrous or sparsely pilose. Hypanthium campanulate, outside glabrous or nearly so. Sepals ovate-triangular to lanceolate-triangular, margin glandular serrate or entire, apex acute to acuminate. Petals white or pink, obovate to suborbicular. Stamens 20–30. Style ± as long as stamens, basally pilose; stigma capitate. Drupe red, ellipsoid, 7–8 × 4–5 mm; endocarp ± sculptured. Fl. Apr–Jun, fr. Jun–Jul.

• Forests or thickets on mountain slopes; 600–3600 m. Anhui, S Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Ningxia, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang.

18. *Cerasus polytricha* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 56. 1986.

多毛櫻桃 duo mao ying tao

Prunus polytricha Koehne in Sargent, Pl. Wilson. 1: 204. 1912.

Trees or shrubs, 2–10 m tall. Bark black to grayish brown. Branchlets grayish reddish brown, densely villous. Winter buds ellipsoid-ovoid; scales abaxially pilose. Stipules oblong-lanceolate, sparsely villous, margin gland-tipped fimbriate. Petiole 8–10 mm, densely spreading villous, apex usually with 1–3 nectaries; leaf blade obovate to obovate-oblong, 4–8 × 2–4 cm, abaxially pale green, densely laterally spreading villous, and sparsely and appressed pubescent between veins, adaxially green and sparsely pubescent, base subrounded, margin serrate or biserrate and teeth with a minute apical gland, apex acuminate; secondary veins 7–11 on either side of midvein. Inflorescences umbellate or subumbellate, 2–4-flowered; involucre bracts obovate-elliptic, 6–8 × 4–5 mm, abaxially subglabrous, adaxially sparsely villous; peduncle 2–10 mm, spreading pilose; bracts green, ovate to suborbicular, 4–8 mm, persistent in fruit, margin serrate, teeth with a capitate apical gland. Pedicel 1–2 cm, densely villous. Hypanthium campanulate, 4–5 × 4–5 mm, outside densely villous. Sepals ovate-triangular, margin glandular serrate, apex obtuse to acute. Petals white or pink, ovate. Stamens 20–30. Style basally pilose; stigma capitate. Drupe red, globose, 7–8 mm in diam.; endocarp sculptured. Fl. Apr–May, fr. Jun–Jul.

• Forests on mountain slopes, forest margins beside streams; 900–3300 m. Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan.

19. *Cerasus conadenia* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 50. 1986.

锥腺樱桃 zhui xian ying tao

Prunus conadenia Koehne in Sargent, Pl. Wilson. 1: 197. 1912; *P. macradenia* Koehne; *P. macradenia* var. *mairei* Koehne.

Trees or arborescent shrubs, 6–10 m tall. Stems ca. 30 cm in diam.; branches glabrous; older branchlets dark brown to grayish white; young branchlets brown. Winter buds ca. 3 mm, glabrous. Stipules 3–4 mm, herbaceous, caducous, margin glandular serrate. Petiole 1.2–1.8 cm, glabrous, usually with 2 to several distinct nectaries at apex or at leaf blade base; leaf blade obovate, 3–9 × 2–4.8 cm, papery, abaxially glabrous or pilose along midvein, adaxially sparsely strigulose when young, more densely strigulose along veins, and glabrescent, base cordate, rounded, or broadly cuneate, margin mostly biserrate and teeth with a conical apical gland, apex caudate-acuminate; secondary veins 8–14 on either side of midvein. Inflorescences subcorymbose-racemose, 2–3 cm excluding peduncle, 3.4–8 cm in fruit, 4–8-flowered; involucre bracts soon caducous; peduncle 5–10 mm, longer in fruit, glabrous; rachis glabrous; bracts 7–10, 1–3 basal ones usually sterile and ovate to orbicular, apical ones fertile and oblong, 0.5–2.5 × 0.4–1 cm, margin serrate, teeth with a conical apical gland. Flowers opening at same time as leaves. Pedicel 0.5–2 cm, glabrous. Hypanthium tubular, ca. 4 × 5 mm, outside glabrous. Sepals oblong triangular, ca. 3.5 mm, reflexed, glabrous, margin sparsely glandular denticulate, apex acute. Petals white, rotund-ovate, ca. 6 × 4.5 mm, apex erose. Stamens 27–30. Style nearly as long as stamens, basally sparsely villous. Drupe red, ovoid, ca. 1 × 0.8 cm; endocarp obliquely compressed ovoid, ca. 7 × 4–5 mm, markedly furrowed along keel, apex slightly pitted. Fl. Jun, fr. Jul.

• Forest, woodlands; 2300–3000 m. Gansu, Guizhou, Henan, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan.

20. *Cerasus pleiocerasus* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 51. 1986.

雕核樱桃 diao he ying tao

Prunus pleiocerasus Koehne in Sargent, Pl. Wilson. 1: 198. 1912; *P. tatsienensis* Batalin var. *stenadenia* Koehne.

Trees 3–7 m tall. Bark dark grayish brown. Branchlets grayish brown; young branchlets tinged reddish brown to reddish green, glabrous. Winter buds ellipsoid-ovoid, glabrous. Stipules ovate to ovate-elliptic, margin serrate, teeth with a conical apical gland. Petiole 0.8–2 cm, glabrous, apex with 1–3 nectaries; leaf blade usually ovate-oblong to obovate-oblong, 4–8.5 × 2–3.5 cm, abaxially pale green and glabrous or with tufted hairs in vein axils, adaxially dark green and glabrous, base cuneate to rounded, margin shallowly obtusely serrulate, teeth with a minute conical apical gland; secondary veins 9–12 on either side of midvein. Inflorescences subcorymbose-racemose, 4–6 cm, 2–9-flowered, basally usually with several sterile bracts; involucre bracts brown, obovate-elliptic, 4–8 × 4–5 mm, margin with conical glands; rachis glabrous; bracts broadly ovate, 2–5 × 2–5 mm, margin with conical glands. Pedicel 1–1.5 cm, glabrous. Hypanthium campanulate, 3–4 × 3–4 mm, outside glabrous. Sepals triangular to triangular-lanceolate, margin

with conical glands, apex acuminate. Petals white, suborbicular. Stamens 30–34. Style slightly longer than stamens; stigma slightly dilate, minutely disciform. Drupe red to black, globose, 7–8 mm in diam.; endocarp markedly sculptured. Fl. Jun–Jul, fr. Aug–Sep.

• Forests on mountain slopes; 2000–3400 m. W Sichuan, N Yunnan.

21. *Cerasus dolichadenia* (Cardot) C. L. Li & S. Y. Jiang, **comb. nov.**

长腺樱桃 chang xian ying tao

Basionym: *Prunus dolichadenia* Cardot, Notul. Syst. (Paris) 4(1): 29. 1930; *Cerasus claviculata* T. T. Yu & C. L. Li.

Small trees or arborescent shrubs, 5–13 m tall. Branchlets grayish brown, pilose and pubescent when young. Winter buds ovoid, glabrous. Stipules ca. 6 mm, margin strongly fimbriate, fimbria tipped with a clavate gland. Petiole 0.8–2 cm, pilose, apex sometimes with 2 stalked or sessile nectaries; leaf blade broadly elliptic to obovate-oblong, 4–9 × 3–5 cm, abaxially green and pilose or more sparsely hairy between veins, adaxially dark green and sparsely pubescent, base broadly cuneate, rounded, or subcordate, margin acutely biserrate and teeth aristate and with a clavate apical gland, apex abruptly caudate; secondary veins 8–12 on either side of midvein. Inflorescences umbellate-racemose, 4–9 cm, 4- or 5-flowered; involucre bracts brown, obovate-oblong, 10–12 × ca. 5 mm, abaxially glabrous, adaxially sparsely villous, margin with distant clavate glands; rachis pilose; bracts green, mostly fertile but basal 1 or 2 sterile, orbicular to ovate, 7–12 × 5–10 mm, persistent and slightly enlarged in fruit, abaxially subglabrous, adaxially sparsely pubescent, margin with distant clavate glands. Flowers opening at same time as leaves. Pedicel 1–2.5 cm, pilose. Hypanthium tubular-campanulate, ca. 7 × 6 mm, outside basally pilose to subglabrous, base slightly swollen. Sepals broadly triangular, 1.5–2 mm, margin entire and sparsely ciliate, apex acute. Petals white or pink, broadly elliptic, 7–8 mm in diam., slightly longer than wide. Stamens 36. Style nearly as long as stamens; stigma dilated. Drupe ellipsoid-ovoid, ca. 8 × 6 mm; endocarp sculptured. Fl. Jul, fr. Aug.

• Dense forests on mountain slopes, shady ravines; 1400–2300 m. Gansu, Shaanxi, Shanxi, Sichuan.

22. *Cerasus patentipila* (Handel-Mazzetti) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 46. 1986.

散毛樱桃 san mao ying tao

Prunus patentipila Handel-Mazzetti, Symb. Sin. 7: 529. 1933.

Trees or shrubs, 5–13 m tall. Branchlets gray, densely villous and pubescent when young, glabrescent. Winter buds ovoid-ellipsoid, glabrous. Stipules lanceolate, margin with long-stalked glands. Petiole 0.8–2 cm, densely spreading villous, hairs thicker and yellowish brown with age, apex with 1–3 depressed to capitate nectaries; leaf blade obovate-oblong to ovate-elliptic, 4–12 × 3–5 cm, abaxially pale green, densely horizontally spreading villous along veins, sparsely pubescent between veins, and hairs yellowish brown with age, adaxially green and pilose when young but glabrescent, base broadly cuneate,

rounded, or subcordate, margin mostly incised biserrate and teeth with a capitate to depressed apical gland, apex caudate to abruptly caudate; secondary veins 8–11 on either side of midvein. Inflorescences subcorymbose-racemose, 4–8 cm, 2–4-flowered; involucre bracts tinged brown, obovate-oblong, 7–8 × 4–5 mm, margin with stalked capitate glands; rachis densely villous, hairs thicker and yellowish brown with age; bracts mostly fertile but rarely 1 or 2 sterile basally on rachis, ovate to ovate-elliptic, 1–1.5(–1.8) × 0.5–1.2 cm, both surfaces pilose but glabrescent, margin with stalked disciform-capitate glands. Pedicel 1.5–2.5 cm, densely villous. Hypanthium subtubular, ca. 6 × 3–4 mm, outside pilose, base swollen. Sepals ovate-triangular, ca. 2 mm, markedly reflexed after anthesis. Stamens ca. 36. Ovary glabrous. Style exerted, sparsely pilose except at apex; stigma capitate. Drupe red, ovoid, ca. 10 × 8 mm; endocarp shallowly sculptured. Fl. Apr–May, fr. Jul.

- Forests on mountain slopes; 2400–3000 m. NW Yunnan.

23. *Cerasus mahaleb* (Linnaeus) Miller, Gard. Dict. ed. 8, *Cerasus* no. 4. 1768.

圆叶樱桃 yuan ye ying tao

Prunus mahaleb Linnaeus, Sp. Pl. 1: 474. 1753; *Padellus mahaleb* (Linnaeus) Vassilczenko; *Padus mahaleb* (Linnaeus) Borkhausen.

Shrubs, rarely trees, sometimes attaining 10–13 m tall. Branchlets grayish brown, densely pubescent. Winter buds ovoid, densely pubescent, glabrescent. Stipules ovate-lanceolate, caducous, margin gland-tipped fimbriate. Petiole 2–3 cm, pubescent when young, glabrescent, with 1 or 2 nectaries at apex or at leaf blade base; leaf blade ovate, suborbicular, or elliptic, 3.5–5 × 2.5–3.5 cm, abaxially pale green and pubescent, adaxially green and glabrous, base rounded, margin obtusely glandular crenate, apex obtusely cuspidate to tapering-acuminate; secondary veins 8–12 on either side of midvein. Inflorescences corymbose-racemose, 4–5 cm, 5–8-flowered, with 2 or 3 small leaves near base; rachis glabrous; bracts brown, ovate, 0.5–1 mm in diam., membranous, apex serrate. Flowers opening ± before leaves. Pedicel 1–1.5 cm, glabrous. Hypanthium obconical to campanulate, ca. 3 × 3 mm, outside glabrous. Sepals oblong-ovate, slightly shorter than hypanthium, margin entire, apex rounded. Petals white, obovate to shortly elliptic, ca. 5 × 4 mm, apex rounded. Stamens 20–25, slightly shorter than petals. Ovary glabrous; stigma capitate. Drupe black when ripe, subglobose, 7–8 mm in diam.; endocarp ovoid but laterally compressed, smooth. Fl. May, fr. Jul.

Cultivated. Hebei, Liaoning [native to SW Asia and Europe].

This species is cultivated as an ornamental and as grafting stock for other cultivated Prunoideae.

24. *Cerasus mugus* (Handel-Mazzetti) Handel-Mazzetti, Vegetationsbilder 17(Heft 7/8): [8]. 1927.

偃樱桃 yan ying tao

Prunus mugus Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 152. 1923.

Shrubs to 1 m tall, prostrate. Bark grayish brown. Branchlets brown to grayish brown; young branchlets densely appress-

ed villous. Winter buds ovoid-ellipsoid, glabrous, apex acuminate. Stipules linear, 5–8 mm, margin gland-tipped fimbriate. Petiole 2–7 mm, glabrous; leaf blade obovate to obovate-elliptic, 1–3.5 × 0.7–2 cm, abaxially pale green and glabrous, adaxially dark green and glabrous or pilose when young, base cuneate, margin acutely biserrate, apex obtuse to acute; secondary veins 5–9 on either side of midvein. Inflorescences 1-flowered or 2-flowered in a fascicle; involucre bracts obovate-oblong, 5–8 × 2–3 mm, abaxially glabrous, adaxially pilose, margin glandular hairy; peduncle absent. Flowers usually opening at same time as leaves. Pedicel 0.3–3 cm, glabrous. Hypanthium tubular, 6–8 × 2–3 mm. Sepals triangularly long ovate, 2–3 mm, margin glandular serrate, apex acuminate to acute. Petals white or pink, suborbicular, apex erose. Stamens 30–45. Style exerted after anthesis, much longer than stamens, glabrous. Drupe dark red, ca. 1 × 0.8 cm; endocarp markedly sculptured. Fl. May–Jul, fr. Jul–Aug.

- Forest margins on mountain slopes, thickets; 3200–3700 m. NW Yunnan.

25. *Cerasus crataegifolia* (Handel-Mazzetti) Handel-Mazzetti, Vegetationsbilder 17(Heft 7/8): [8]. 1927.

山楂叶樱桃 shan zha ye ying tao

Prunus crataegifolia Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 153. 1923.

Shrubs 1–2 m tall, prostrate to ascending. Bark grayish brown. Branchlets purplish brown, densely villous; young branchlets densely appressed pubescent. Winter buds long ovoid, glabrous, apex acute. Stipules brown, linear, 5–10 mm. Petiole 3–5 mm, pilose; leaf blade elliptic-ovate to elliptic-lanceolate, 1.5–4 × 1–2 cm, abaxially pale green and glabrous or appressed pubescent along midvein when young, adaxially dark green and sparsely pubescent, base cuneate to broadly so, margin acutely incised biserrate and lobed, apex acuminate to acute. Inflorescences 1-flowered or 2-flowered in a fascicle; involucre bracts soon caducous; peduncle absent. Flowers 1.2–1.5 cm in diam., opening at same time as leaves. Pedicel 1.5–2.5 cm, glabrous. Hypanthium tubular, 6–8 × 2–3 mm, outside glabrous. Sepals triangular, 2–3 mm, margin glandular serrate, apex acute to obtuse. Petals pink or white, suborbicular, apex erose. Stamens 27–31. Style exerted, much longer than stamens after anthesis, glabrous. Drupe red, ovoid, 8–10 × 6–8 mm; endocarp sculptured. Fl. Jun–Jul, fr. Aug–Sep.

- Alpine forests, thickets on rocky slopes; 3400–4200 m. SE Xizang, NW Yunnan.

26. *Cerasus trichantha* (Koehne) C. L. Li & S. Y. Jiang, **comb. nov.**

毛瓣藏樱 mao ban zang ying

Basionym: *Prunus trichantha* Koehne in Sargent, Pl. Wilson. 1: 254. 1912; *Cerasus rufa* (J. D. Hooker) T. T. Yu & C. L. Li var. *trichantha* (Koehne) T. T. Yu & C. L. Li; *P. imanishii* S. Kitamura; *P. rufa* J. D. Hooker var. *trichantha* (Koehne) H. Hara.

Trees 2–10 m tall. Young branchlets pubescent, soon glabrescent. Winter buds ovoid, glabrous or apex of bud scales

pilose. Stipules linear to lanceolate. Petiole 5–10 mm, densely hairy or pilose; leaf blade obovate-lanceolate to obovate-elliptic, (3–)5–12 × 2.5–5.5 cm, abaxially villous along veins, adaxially pilose but soon glabrescent, base cuneate, margin sharply serrulate and teeth apically with conical to capitate glands, apex acuminate to caudate-acuminate; secondary veins 9–11 on each side of midvein. Inflorescences 1- or 2-flowered or several in an umbel, 3–4.5 cm; involucre bracts brown, spatulate-oblong, 7–10 × 3–4 mm, outside glabrous, inside densely villous, margin glandular serrate; peduncle very short to subsessile, glabrous; bracts green or brown, 10–12 × 1.2–2.5 mm, margin glandular. Flowers opening at same time as leaves. Pedicel 1–2.2 cm, glabrous. Hypanthium tubular to campanulate, (8–)10–15 × 4–5 mm, outside hairy. Sepals straight or spreading, ovate-triangular, 2–3(–4) mm, ca. 1/2 as long as hypanthium to very short, margin sparsely glandular. Petals white or pink, ovate, 5–6 × 4–6 mm, margin entire or apically erose, outside pilose. Stamens ca. 45. Ovary glabrous, apex obtuse and not lobed. Style pubescent basally from middle. Drupe ellipsoid to obovoid, ca. 1.1 × 1.8 cm. Fl. May–Jun, fr. Jul.

Sparse forests, forest margins, thickets, mountain slopes; 2800–3900 m. Xizang [Nepal, Sikkim].

27. *Cerasus subhirtella* (Miquel) S. Y. Sokolov, *Trees & Shrubs URSS* 3: 734. 1954.

大叶旱樱 da ye han ying

Trees 3–10 m tall. Bark grayish brown. Young branchlets green, densely white pubescent. Winter buds ovoid; bud scale margin pilose. Stipules brown, linear, shorter than petiole, margin glandular dentate. Petiole 5–8 mm, white pubescent; leaf blade ovate to ovate-oblong, 3–6 × 1.5–3 mm, abaxially pale green and appressed white pilose or more densely so along midvein, adaxially dark green and glabrous or appressed pilose on veins, base broadly cuneate, margin sharply biserrate, apex acuminate; secondary veins 10–14 on each side of midvein, straight and parallel. Inflorescences umbellate, 2- or 3-flowered; involucre bracts obovate, ca. 4 × 3 mm, outside pilose, soon deciduous after flowering. Flowers opening at same time as leaves. Pedicels 1–2 cm, pilose. Hypanthium tubular to nearly urceolate, 4–5 × 2–3 mm, base dilated, outside appressed white pilose. Sepals oblong-ovate, nearly as long as hypanthium, margin laxly dentate, apex acuminate. Petals pale red, obovate to oblong, apex concave. Stamens ca. 10. Style base pilose. Drupe black, ovoid; endocarp sculptured. Fl. Apr, fr. Jun.

Cultivated. Mainly in Anhui, Hubei, Jiangxi, Sichuan, Taiwan, and Zhejiang [native to Japan].

- 1a. Branches erect; branchlets not pendulous; hypanthium abaxially white pubescent 27a. var. *subhirtella*
 1b. Branches spreading and curved; branchlets pendulous; hypanthium abaxially glabrous 27b. var. *pendula*

27a. *Cerasus subhirtella* var. *subhirtella*

大叶旱樱(原变种) da ye han ying (yuan bian zhong)

Prunus subhirtella Miquel, *Ann. Mus. Bot. Lugduno-Batavi* 2: 91. 1865–1866; *Cerasus herincquiana* Lavallée; *P.*

herincquiana (Lavallée) Koehne; *P. herincquiana* var. *biloba* Koehne; *P. microlepis* Koehne; *P. subhirtella* var. *ascendens* E. H. Wilson.

Branches erect; branchlets not pendulous. Hypanthium abaxially white pubescent. Fl. Apr, fr. Jun.

Cultivated. Mainly in Anhui, Hubei, Jiangxi, Sichuan, and Zhejiang [native to Japan].

27b. *Cerasus subhirtella* var. *pendula* (Yo. Tanaka) T. T. Yu & C. L. Li, *Fl. Reipubl. Popularis Sin.* 38: 74. 1986.

垂枝大叶旱樱 chui zhi da ye han ying

Prunus subhirtella var. *pendula* Yo. Tanaka, *Useful Pl. Jap.* 70, no. 620. 1891; *P. itosakura* Siebold var. *taiwaniana* (Hayata) Kudô & Masamune; *P. taiwaniana* Hayata.

Branches spreading and curved; branchlets pendulous; hypanthium abaxially glabrous.

Cultivated. Taiwan [native to Japan].

28. *Cerasus yedoensis* (Matsumura) A. V. Vassiljeva, *Trans. Sukhumi Bot. Gard. Fasc.* 10: 124. 1957.

东京樱花 dong jing ying hua

Prunus yedoensis Matsumura, *Bot. Mag. (Tokyo)* 15: 100. 1901; *P. paracerasus* Koehne; *P. yedoensis* var. *nudiflora* Koehne.

Trees 4–16 m tall. Bark gray. Branchlets pale purplish brown, glabrous; young branchlets green, pilose. Winter buds ovoid, glabrous. Stipules lanceolate, pubescent. Petiole 1.3–1.5 cm, densely pubescent, with or without 1 or 2 glands at apex; leaf blade elliptic to obovate, 5–12 × 2.5–7 cm, abaxially pale green and pilose on veins, adaxially dark green, glabrous, base rounded to rarely cuneate, margin sharply glandular serrate, apex acuminate to cuspidate; secondary veins 7–10 on each side of midvein. Inflorescences umbellate-racemose, 3- or 4-flowered; involucre bracts brown, elliptic-ovate, 6–7 × 4–5 mm, pilose on both surfaces; peduncle very short; bracts brown, spatulate-oblong, ca. 5 × 2–3 mm, margin glandular. Flowers opening before leaves, 3–3.5 cm in diam. Pedicel 2–2.5 cm, pubescent. Hypanthium tubular, 7–8 × ca. 3 mm, outside pilose, margin glandular serrate, apex emarginate or 2-lobed. Stamens ca. 32, shorter than petals. Style base pilose. Drupe black, subglobose, 0.7–1 cm in diam.; endocarp slightly sculptured. Fl. Apr, fr. May. $2n = 16$.

Cultivated mainly in Beijing, Jiangsu (Nanjing Shi), Jiangxi (Nanchang Shi), and Shandong (Qingdao Shi) [native to Japan and Korea (Cheju Island)].

29. *Cerasus caudata* (Franchet) T. T. Yu & C. L. Li, *Fl. Reipubl. Popularis Sin.* 38: 68. 1986.

尖尾樱桃 jian wei ying tao

Prunus caudata Franchet, *Pl. Delavay.* 196. 1890.

Trees. Bark gray, lenticellate. Branchlets densely hirtellous. Stipules linear to subulate, margin with stalked glands. Petiole 4–8 mm, hirtellous; leaf blade ovate, obovate, or ovate-oblong, 2–3.8 × 1–2 cm, abaxially hirtellous along midvein but

other part glabrous, adaxially strigulose, base obtuse, margin incised biserrate with teeth broadly ovate and apically subobtuse with a capitate apical gland, apex oblique and narrowly caudate; secondary veins ca. 10 on either side of midvein. Inflorescences racemose-corymbose, umbellate, or 1- or 2-flowered, densely pubescent; involucre bracts caducous; peduncle to 8 mm or absent; bracts 2–3 mm, tinged brown. Flowers opening at same time as leaves. Pedicel 4–9 mm, densely pubescent. Hypanthium broadly campanulate, 5–6 mm, outside densely pubescent. Sepals triangular, ca. 2.5 mm, suberect, both surfaces pilose, margin entire or nearly so, apex acute. Petals white, broadly elliptic, ca. 8 × 5.5 mm. Stamens 27, ca. 1 cm. Ovary and style glabrous. Fl. Apr–Jun, fr. Jul–Sep.

• Forested slopes in mountains, forest margins, grassy slopes; 3000–3200 m. Sichuan, Xizang, Yunnan.

30. *Cerasus trichostoma* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 69. 1986.

川西櫻桃 chuan xi ying tao

Prunus trichostoma Koehne in Sargent, Pl. Wilson. 1: 216. 1912; *P. droseracea* Koehne; *P. glyptocarya* Koehne; *P. latidentata* Koehne; *P. latidentata* var. *trichostoma* (Koehne) C. K. Schneider; *P. lobulata* Koehne; *P. oxydonta* Koehne; *P. pleuroptera* Koehne; *P. podadenia* Koehne; *P. zappeyana* Koehne; *P. zappeyana* var. *subsimplax* Koehne.

Trees (1.5–)2–10 m tall. Bark grayish black. Branchlets grayish brown; young branchlets glabrous or pilose. Winter buds ovoid to long ovoid, glabrous. Stipules lanceolate to linear, 3–5 mm, margin 2- or 3-serrate or lobed, teeth acute to acuminate. Petiole 6–8 mm, glabrous or pilose; leaf blade ovate, obovate, or elliptic-lanceolate, 1.5–3 × 0.5–2 cm, abaxially pale green and pilose along veins or sometimes between veins, adaxially dark green and pilose or glabrous, base cuneate, broadly cuneate, or subrounded, margin acutely incised biserrate with teeth non-glandular or with a minute apical gland, apex acute to acuminate; secondary veins 6–10 on either side of midvein. Inflorescences (1 or)2(or 3)-flowered; involucre bracts brown, obovate-elliptic, abaxially glabrous, adaxially densely appressed hairy; peduncle to 5 mm or absent; bracts brown, rarely greenish brown, usually soon caducous, rarely persistent in fruit, margin glandular serrate. Flowers opening at same time or rarely slightly before leaves. Pedicel 0.8–2 cm, 1–2.5 cm and apically thickened in fruit, glabrous or pilose. Hypanthium campanulate, 5–6 × 3–4 mm, outside glabrous or pilose. Sepals triangular to ovate, 2–3 mm, inside glabrous or appressed pilose, margin glandular serrate, apex acute to obtuse. Petals white or pale pink, obovate, apex rounded. Stamens 25–36, shorter than petals. Style ± as long as stamens, basally pilose. Drupe purplish red, ovoid, 7–8 mm in diam.; endocarp markedly sculptured. Fl. Apr–May, fr. Jun–Jul.

• Alpine forests, woods, thickets, cliffs; 1000–4000 m. Gansu, Hubei, Qinghai, Sichuan, Xizang, Yunnan.

31. *Cerasus stipulacea* (Maximowicz) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 68. 1986.

托叶櫻桃 tuo ye ying tao

Prunus stipulacea Maximowicz, Bull. Acad. Imp. Sci.

Saint-Petersbourg 29: 97. 1884.

Shrubs or trees, 1–7 m tall. Branchlets gray to grayish brown; young branchlets glabrous. Winter buds long ovoid, glabrous, apex acuminate. Stipules on vegetative branch leaflike, ovate, 5–10 × 4–8 mm; stipules on reproductive branchlets green, ovate-lanceolate, 4–6 × 2–3 mm, margin acutely serrate. Petiole 1–1.3 cm, glabrous; leaf blade ovate, ovate-elliptic, or obovate-elliptic, 3–6.5 × 2–4 cm, abaxially pale green and glabrous or with tufted hairs in vein axils, adaxially dark green and sparsely pubescent, base rounded, margin acutely incised biserrate, apex acuminate to abruptly caudate; secondary veins 6–10 on either side of midvein. Inflorescences umbellate, usually 2(or 3)-flowered; involucre bracts brown, elliptic, 5–7 × 3–4 mm, abaxially glabrous, adaxially appressed villous, margin glandular; peduncle absent or very short; bracts brown to greenish brown, elliptic, 5–6 × 3–4 mm, caducous after anthesis, margin glandular serrate. Flowers 1.2–1.3 cm in diam., opening slightly before leaves or nearly so. Pedicel 0.7–1.3 cm, 1–1.5 cm and apically thickened in fruit, glabrous. Hypanthium tubular-campanulate, 4–5 × 3–4 mm, outside glabrous. Sepals triangular, 3–4 mm, margin entire, apex acute. Petals pale red or white, broadly obovate, apex obtuse to acute. Stamens 35–40, slightly shorter than petals. Style exerted, much longer than stamens, basally pilose. Drupe red, ellipsoid, 1–1.2 × 0.8–1 cm; endocarp ± sculptured. Fl. May–Jun, fr. Jul–Aug.

• Forests in ravines, thickets on mountain slopes, mountain slopes; 1800–3900 m. Gansu, Qinghai, Shaanxi, Sichuan.

32. *Cerasus henryi* (C. K. Schneider) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 64. 1986.

蒙自櫻桃 meng zi ying tao

Prunus yunnanensis Franchet var. *henryi* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 1: 66. 1905; *P. henryi* (C. K. Schneider) Koehne; *P. neglecta* Koehne.

Trees to 3 m tall. Branchlets purplish brown, glabrous. Winter buds ovoid, glabrous. Stipules narrowly lorate, shorter than petiole, margin gland-tipped fimbriate. Petiole 5–13 mm, glabrous, apex with 1 or 2 nectaries; leaf blade long ovate to ovate-oblong, ca. 4 × 2 cm, abaxially pale green and glabrous or with tufts of hair at axils of veins, adaxially green and glabrous, base cuneate to rounded, margin acutely serrate or biserrate and teeth with a minute capitate apical gland, apex acuminate; secondary veins 7–10 on either side of midvein. Inflorescences subcorymbose-racemose, 2.5–4 cm, 3–7-flowered; involucre bracts obovate, 4–5 × ca. 3 mm, soon caducous, abaxially glabrous, adaxially densely villous, margin glandular serrate; bracts brown to slightly greenish, obovate, 2–3 mm, glabrous or pilose, margin glandular serrate. Flowers ca. 1.5 cm in diam. Pedicel 0.6–1.5 cm, glabrous. Hypanthium tubular-campanulate, 3–4 × 2–3 mm, outside glabrous. Sepals oblong-triangular, nearly 1/2 as long as hypanthium, reflexed after anthesis, apex acute to obtuse. Petals white, ovate, ca. 1 cm, apex rounded to subundulate. Stamens 30–45, nearly as long as petals. Style nearly as long as stamens, basally sparsely villous; stigma dilated. Fl. Mar, fr. Apr–May.

• Forests on mountain slopes; ca. 1800 m. Yunnan.

33. *Cerasus pusilliflora* (Cardot) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 66. 1986.

细花樱桃 xi hua ying tao

Prunus pusilliflora Cardot, Notul. Syst. (Paris) 4(1): 27. 1920.

Trees or shrubs, 3–10 m tall. Bark grayish brown to grayish black. Branchlets gray; young branchlets green, glabrous or nearly so. Winter buds ovoid, glabrous. Stipules lorate, slightly shorter than petiole, soon caducous, margin gland-tipped fimbriate. Petiole 5–8 mm, pilose, glabrescent, with 1 or 2 purplish black nectaries at apex or leaf blade base; leaf blade obovate-oblong to ovate-elliptic, 4–6 × 2–3.5 cm, abaxially pale green and pilose along veins but glabrescent, adaxially dark green and glabrous, base rounded to rarely subcordate, margin acutely serrate and/or biserrate and teeth with a minute apical gland, apex acute to rarely acuminate. Inflorescences umbellate-racemose, 3–5-flowered; involucre bracts ovate-elliptic, 3–4 mm, abaxially glabrous, adaxially appressed pilose, margin glandular serrate; peduncle very short, slightly elongate in fruit; bracts brown, ca. 1.5 mm. Flowers 1–1.5 cm in diam. Pedicel 5–10 mm, glabrous. Hypanthium campanulate, 4–5 × 2–3 mm, outside glabrous. Sepals long ovate, 1/2 or more as long as hypanthium, margin distantly serrate, apex acute. Petals white, ovate, apex rounded to sometimes emarginate. Stamens 25–40. Style basally pilose. Drupe red, ovoid, ca. 8 × 6–7 mm; endocarp ± sculptured. Fl. Feb–Mar, fr. Apr–May.

• Forests in mountains, ravines, also cultivated; 1400–2100. Yunnan.

34. *Cerasus cyclamina* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 58. 1986.

襄阳山樱桃 xiang yang shan ying tao

Trees 5–10 m tall. Bark grayish blackish brown. Branchlets grayish to purplish brown, glabrous, rarely pilose. Winter buds ovoid, glabrous. Stipules linear, shorter than petiole, margin gland-tipped fimbriate. Petiole 0.8–1.2 cm, glabrous, rarely pilose, with 2 nectaries in apical or middle part or at leaf blade base; leaf blade obovate-oblong or broadly elliptic, 4.5–12 × 2.7–5.5 cm, abaxially pale green and glabrous or initially sparsely pilose along veins but glabrescent, adaxially dark green and glabrous, base broadly cuneate to rounded, margin serrate or acutely biserrate and teeth with a minute apical gland, apex abruptly acuminate; secondary veins 8–12 on either side of midvein. Inflorescences umbellate or subumbellate, 2–4-flowered; involucre bracts obovate, 0.8–1.3 cm in diam., abaxially subglabrous, adaxially densely villous; peduncle 0.8–2 cm, glabrous or scattered pilose; bracts orbicular, 3–5 mm in diam., margin with long-stalked glands. Flowers opening at same time as leaves. Pedicel 1.5–2.6 cm, glabrous or sparsely pilose. Hypanthium campanulate, ca. 4 mm, outside glabrous. Sepals lanceolate, 6–8 mm, reflexed, apex obtuse. Petals pink, oblong, apically 2-lobed. Stamens ca. 32, slightly shorter than petals. Style slightly longer than stamens, glabrous. Drupe red, subglobose, 7.5–8.3 mm in diam.; endocarp ± sculptured. Fl. Apr–May, fr. May–Jul.

• Woodlands, thickets; 1000–1300 m. Guangdong, Guangxi, Hubei, Hunan, Sichuan.

- 1a. Leaf blade obovate-oblong, abaxially initially sparsely pilose along veins but glabrescent, adaxially glabrous; inflorescences subumbellate, 3- or 4-flowered 34a. var. *cyclamina*
 1b. Leaf blade broadly elliptic, both surfaces glabrous; inflorescences umbellate, 2-flowered 34b. var. *biflora*

34a. *Cerasus cyclamina* var. *cyclamina*

襄阳山樱桃(原变种) xiang yang shan ying tao (yuan bian zhong)

Prunus cyclamina Koehne in Sargent, Pl. Wilson. 1: 207. 1912; *P. malifolia* Koehne; *P. malifolia* var. *rosthornii* Koehne.

Leaf blade obovate-oblong, abaxially initially sparsely pilose along veins but glabrescent, adaxially glabrous. Inflorescences subumbellate, 3- or 4-flowered. Fl. Apr, fr. May–Jun.

• Woodlands; 600–1500 m. Chongqing (Nanchuan Xian), Guangdong, Guangxi, Hubei, Hunan, Sichuan.

34b. *Cerasus cyclamina* var. *biflora* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 59. 1986.

双花襄阳山樱桃 shuang hua xiang yang shan ying tao

Prunus cyclamina Koehne var. *biflora* Koehne in Sargent, Pl. Wilson. 1: 243. 1912.

Leaf blade broadly elliptic, glabrous; secondary veins 8–12 on either side of midvein. Inflorescences umbellate, 2-flowered. Fl. May, fr. Jun–Jul.

• Thickets; ca. 1300 m. Hunan, Sichuan.

35. *Cerasus serrulata* (Lindley) Loudon, Hort. Brit. 480. 1830.

山樱花 shan ying hua

Trees 3–8 m tall. Bark grayish brown to grayish black. Branchlets grayish white or tinged brown, glabrous. Winter buds ovoid, glabrous. Stipules linear, 5–8 mm, margin gland-tipped fimbriate. Petiole 1–1.5 cm, glabrous, sparsely pilose, or pubescent, apex with 1–3 rounded nectaries; leaf blade ovate-elliptic to obovate-elliptic, 5–9 × 2.5–5 cm, abaxially pale green and glabrous, sparsely pilose, or pubescent, adaxially dark green and glabrous or sparsely pilose, base rounded, margin acuminately serrate or biserrate and teeth with a minute apical gland, apex acuminate; secondary veins 6–8 on either side of midvein. Inflorescences corymbose-racemose or subumbellate, 2- or 3-flowered; involucre bracts brownish red, obovate-oblong, ca. 8 × 4 mm, abaxially glabrous, adaxially villous; peduncle 5–10 mm, glabrous; bracts brown or tinged greenish brown, 5–8 × 2.5–4 mm, margin glandular serrate. Pedicel 1.5–2.5 cm, glabrous, sparsely pilose, or pubescent. Hypanthium tubular, 5–6 × 2–3 mm, apically enlarged. Sepals triangular-lanceolate, ca. 5 mm, margin entire, apex acuminate to acute. Petals white or rarely pink, obovate, apex emarginate. Stamens ca. 38. Style glabrous. Drupe purplish black, globose to ovoid, 8–10 mm in diam. Fl. Apr–May, fr. May–Jul.

Forests in ravines, forests on mountain slopes, also cultivated;

400–1500 m. Anhui, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Zhejiang [Japan, Korea].

- 1a. Leaf blade margin biserrate, teeth acuminate with a long awn apically 35c. var. *lannesiana*
 1b. Leaf blade margin serrate or biserrate, teeth with a minute gland apically.
 2a. Petioles, both surfaces of leaf blades, and pedicels glabrous or sparsely pilose 35a. var. *serrulata*
 2b. Petioles, abaxial surface of leaf blades, and pedicels pubescent 35b. var. *pubescens*

35a. *Cerasus serrulata* var. *serrulata*

山櫻花(原变种) shan ying hua (yuan bian zhong)

Prunus serrulata Lindley, Trans. Hort. Soc. London 7: 238. 1830; *Cerasus serrulata* var. *taishanensis* Yi Zhang & C. D. Shi; *Padus serrulata* (Lindley) Sokolov; *Prunus tenuiflora* Koehne, p.p.

Petioles, both surfaces of leaf blades, and pedicels glabrous or sparsely pilose. Leaf blade margin serrate or biserrate; teeth with a minute gland apically. Fl. Apr–May, fr. May–Jul.

Forests in ravines, also cultivated; 500–1500 m. Anhui, Guizhou, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Shandong, Zhejiang [Japan, Korea].

35b. *Cerasus serrulata* var. *pubescens* (Makino) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 75. 1986.

毛叶山櫻花 mao ye shan ying hua

Prunus pseudocerasus Lindley var. *jamasakura* (Siebold & Zuccarini) Makino subvar. *pubescens* Makino, Bot. Mag. (Tokyo) 22: 98. 1908; *P. serrulata* var. *pubescens* (Makino) E. H. Wilson; *P. tenuiflora* Koehne, p.p.; *P. veitchii* Koehne; *P. wildeniana* Koehne.

Petioles, abaxial surface of leaf blades, and pedicels pubescent. Leaf blade margin serrate or biserrate; teeth with a minute gland apically. Fl. Apr–May, fr. May–Jul.

• Forests on mountain slopes, also cultivated; 400–800 m. Anhui, Hebei, Heilongjiang, Henan, Hubei, Liaoning, Shaanxi, Shandong, Shanxi, Zhejiang.

35c. *Cerasus serrulata* var. *lannesiana* (Carrière) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 76. 1986.

日本晚櫻 ri ben wan ying

Cerasus lannesiana Carrière, Rev. Hort. 1872: 198. 1872; *Prunus lannesiana* (Carrière) E. H. Wilson; *P. serrulata* var. *lannesiana* (Carrière) Makino.

Leaf blade margin biserrate; teeth acuminate with a long awn apically.

Widely cultivated in China [native to Japan].

This variety is widely cultivated in gardens as a ornamental tree.

36. *Cerasus conradinae* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 76. 1986.

华中櫻桃 hua zhong ying tao

Prunus conradinae Koehne in Sargent, Pl. Wilson. 1: 211. 1912; *Cerasus glabra* (Pampanini) T. T. Yu & C. L. Li; *P. conradinae* var. *trichogyna* Cardot; *P. glabra* (Pampanini) Koehne; *P. helenae* Koehne; *P. hirtipes* Hemsley var. *glabra* Pampanini; *P. rufoides* C. K. Schneider var. *glabrifolia* C. K. Schneider; *P. twymaniana* Koehne.

Trees 3–10 m tall. Bark grayish brown. Branchlets grayish brown; young branchlets green, glabrous. Winter buds ovoid to elliptic-ovoid, glabrous or pilose. Stipules linear to oblong-lanceolate, ca. 6 mm, soon caducous after anthesis, margin gland-tipped fimbriate. Petiole 6–10 mm, glabrous or densely spreading villous, with 1–3 nectaries; leaf blade obovate, elliptic, or obovate-oblong, 4.5–9 × 2.5–4 cm, both surfaces glabrous, abaxially pale green, adaxially green, base rounded to broadly cuneate, margin biserrate or sharply serrulate and teeth with a punctiform apical gland, apex abruptly acuminate to caudate; secondary veins 6–9 on either side of midvein. Inflorescences umbellate, 2–5-flowered; involucre bracts brown, obovate-elliptic, 6–8 × 4–5 mm, abaxially glabrous or subglabrous, adaxially densely villous; peduncle 2–15 mm, rarely absent, glabrous or spreading pilose; bracts brown or green, ovate, sub-orbicular, or broadly fan-shaped, 1.3–8 mm, caducous or persistent in fruit, margin glandular serrate. Flowers ca. 1.5 cm in diam., opening before or nearly at same time as leaves. Pedicel 1–2.5 cm, glabrous. Hypanthium campanulate to tubular-campanulate, ca. 4 × 3 mm, outside glabrous. Sepals triangular to triangular-ovate, 2–2.5 mm, reflexed after flowering, apex obtuse to acute. Petals white or pink, oblong, ovate, or obovate, apically 2-lobed. Stamens 32–54. Style shorter to slightly longer than stamens, glabrous. Drupe red, ovoid to subglobose, 8–11 × 5–9 mm; endocarp ± sculptured, apex acute. Fl. Mar, fr. Apr–May.

• Forests in ravines, slopes; 500–2600 m. Fujian, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Shaanxi, Sichuan, Yunnan, Zhejiang.

37. *Cerasus campanulata* (Maximowicz) A. N. Vassiljeva, Trans. Sukhumi Bot. Gard., Fasc. 10, 119. 1957.

钟花櫻桃 zhong hua ying tao

Prunus campanulata Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 29: 103. 1884; *P. cerasoides* Buchanan-Hamilton ex D. Don var. *campanulata* (Maximowicz) Koidzumi.

Trees or shrubs, 3–8 m tall. Bark blackish brown. Branchlets grayish brown to purplish brown; young branchlets green, glabrous. Winter buds ovoid, glabrous. Stipules soon caducous. Petiole 0.8–1.3 cm, glabrous, apex with 2 nectaries; leaf blade ovate, ovate-elliptic, or obovate-elliptic, 4–7 × 2–3.5 cm, abaxially pale green and glabrous or with tufts of hairs in vein axils, adaxially green and glabrous, base rounded, margin acutely and usually somewhat irregularly serrate, apex acuminate; secondary veins 8–12 on either side of midvein. Inflorescences umbellate, 2–4-flowered; involucre bracts elliptic, ca. 5 × 3 mm, both surfaces appressed villous; peduncle 2–4 mm; bracts brown, rarely greenish brown, 1.5–2 mm, margin glandular ser-

rate. Flowers 1.5–2 cm in diam., opening before leaves. Pedicel 1–1.3 cm, 1.5–2.5 in fruit and apically slightly swollen, glabrous or sparsely pubescent. Hypanthium campanulate, ca. 6 × 3 mm, outside glabrous or very sparsely pilose, base slightly swollen. Sepals oblong, ca. 2.5 mm, persistent in fruit, margin entire, apex obtuse. Petals pink, obovate-oblong, apically darker and emarginate or rarely entire. Stamens 39–41. Style longer or rarely shorter than stamens, glabrous. Drupe red, ovoid, ca. 10 × 5–6 mm; endocarp ± sculptured. Fl. Jan–Mar, fr. Apr–May.

Forests in ravines, forest margins; 100–1300 m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Taiwan, Zhejiang [Japan, Vietnam].

38. *Cerasus cerasoides* (Buchanan-Hamilton ex D. Don) S. Y. Sokolov, *Trees & Shrubs URSS* 3: 736. 1954.

高盆櫻桃 gao peng ying tao

Prunus cerasoides Buchanan-Hamilton ex D. Don, *Prodr. Fl. Nepal*. 239. 1825; *Cerasus puddum* Roxburgh ex Seringe; *C. cerasoides* var. *rubea* (Ingram) T. T. Yu & C. L. Li; *Maddenia pedicellata* J. D. Hooker; *P. carmesina* H. Hara; *P. cerasoides* var. *majestica* (Koehne) Ingram; *P. cerasoides* var. *rubea* Ingram; *P. majestica* Koehne; *P. puddum* (Roxburgh ex Seringe) Brandis (1874), not Miquel (1865–1866).

Trees 3–10(–30) m tall. Branches grayish black; branchlets green, pubescent, glabrescent. Stipules linear, basally strongly gland-tipped fimbriate. Petiole 1.2–2 cm, apex with 2–4 nectaries; leaf blade ovate-lanceolate, oblong-lanceolate, oblong-ovate, or oblong-obovate, (4–)8–12 × (2.2–)3.2–5 cm, subleathery, abaxially pale green and glabrous or villous along veins, adaxially dark green, base rounded, margin acutely biserrulate, biserrate, or serrate and teeth with a minute capitate apical gland, apex acuminate to long acuminate; secondary veins 10–15 on either side of midvein; reticulate veins fine. Inflorescences umbellate, 1–4-flowered; involucre bracts 1–1.2 cm, apically divided, withered after anthesis; peduncle 1–1.5 cm, glabrous; bracts brownish to greenish brown, suborbicular, papery, persistent or caducous after anthesis, margin glandular serrate. Flowers opening at same time as or before leaves. Pedicel 1–2.3 cm, elongated to 3 cm and apically thickened in fruit. Hypanthium red to dark red, campanulate to broadly campanulate. Sepals usually reddish, triangular, 0.4–5.5 cm, erect, margin entire, apex acute to obtuse. Petals white or pink, ovate to obovate, apically entire or emarginate. Stamens 32–34, shorter than petals. Style as long as stamens, glabrous; stigma disciform. Drupe purplish black, ovoid, 1.2–1.5 × 0.8–1.2 cm; endocarp ovoid, laterally deeply furrowed and pitted, apex obtuse. Fl. Oct–Dec, Feb–Mar.

Forests in ravines; 700–3700 m. S Xizang, NW Yunnan [Bhutan, N India, Kashmir, N Laos, Myanmar, Nepal, Sikkim, N Thailand, N Vietnam].

This species is cultivated for its fruit.

39. *Cerasus serrula* (Franchet) T. T. Yu & C. L. Li, *Fl. Reipubl. Popularis Sin.* 38: 80. 1986.

细齿櫻桃 xi chi ying tao

Prunus serrula Franchet, *Pl. Delavay*. 196. 1890; *P. cerasoides* Buchanan-Hamilton ex D. Don var. *tibetica* (Batalin) C. K. Schneider; *P. odontocalyx* H. Léveillé; *P. puddum* Roxburgh

ex Wallich var. *tibetica* Batalin; *P. serrula* var. *tibetica* (Batalin) Koehne.

Trees 2–12 m tall. Bark grayish to purplish brown. Branchlets purplish brown, glabrous; young branchlets appressed pilose. Winter buds acutely ovoid, glabrous or appressed pilose. Stipules linear, shorter than petiole, caducous after anthesis. Petiole 5–8 mm, pilose, glabrescent; leaf blade lanceolate to ovate-lanceolate, 3.5–7 × 1–2 cm, abaxially pale green and glabrous or pilose on lateral sides of midvein, adaxially dark green and pilose, base rounded, margin acutely serrate or biserrate and teeth with a minute capitate apical gland, apex acuminate; secondary veins 11–16 on either side of midvein. Inflorescences 1- or 2-flowered; involucre bracts brown, narrowly elliptic, ca. 6 × 3 mm, abaxially glabrous, adaxially pilose, margin glandular serrate; peduncle short or absent; bracts brown, narrowly ovate-oblong, 2–2.5 mm, margin glandular serrate. Flowers ca. 1 cm in diam., opening at same time as leaves. Pedicel 6–12 mm, 1.5–2 cm in fruit and apically slightly enlarged, pilose. Hypanthium tubular-campanulate, 5–6 × ca. 3 mm, base outside pilose. Sepals ovate-triangular, ca. 3 mm. Petals white, obovate-elliptic, apex obtuse. Stamens 38–44. Style longer than stamens, glabrous. Drupe purplish black, ovoid, ca. 1 × 0.6–0.7 cm; endocarp markedly sculptured. Fl. May–Jun, fr. Jul–Sep.

• Mountain slopes, forest in ravines, forest margins, grassy mountain slopes; 1200–4000 m. Guizhou, Qinghai, Sichuan, Xizang, Yunnan.

40. *Cerasus pseudocerasus* (Lindley) Loudon, *Hort. Brit.* 200. 1830.

櫻桃 ying tao

Prunus pseudocerasus Lindley, *Trans. Hort. Soc. London* 6: 90. 1826; *Cerasus scopulorum* (Koehne) T. T. Yu & L. C. Li; *P. ampla* Koehne; *P. involucrata* Koehne; *P. pauciflora* Bunge; *P. saltuum* Koehne; *P. scopulorum* Koehne.

Trees 2–8 m tall. Bark grayish white to reddish brown. Branchlets grayish brown; young branchlets green, glabrous or pilose. Winter buds ovoid to long elliptic, glabrous or subglabrous. Stipules lanceolate to narrowly lanceolate, soon caducous, margin gland-tipped fimbriate. Petiole 0.5–1.5 cm, glabrous or pilose, apex with 1–3 large nectaries; leaf blade ovate, oblong-ovate, or long elliptic, 5–12 × 3–6 cm, abaxially pale green and pilose along and between veins, adaxially dark green and subglabrous, base rounded, margin acutely biserrate or incised serrate, teeth with a minute apical gland; secondary veins 9–11 on either side of midvein. Inflorescences corymbose or subumbellate, 3–7-flowered; involucre bracts brown, obovate-elliptic, ca. 5 × 3 mm, margin glandular serrate. Flowers opening before leaves. Pedicel 0.8–1.9 cm, pilose. Hypanthium campanulate, 3–6 × 2–3 mm, outside pilose. Sepals triangular-ovate to ovate-oblong, 1/2 or more as long as hypanthium, margin entire, apex acute to obtuse. Petals white, ovate to long elliptic, apically emarginate or 2-lobed. Stamens 30–35(–50 in cultivated varieties). Style nearly as long as stamens, glabrous. Drupe red, subglobose, 0.9–1.3 cm in diam.; endocarp ± sculptured. Fl. Mar–Apr, fr. May–Jun.

• Sunny mountain slopes, sides of ravines, glades, usually cultivated; 300–1300 m. Anhui, Chongqing (Nanchuan Xian), Fujian, Gan-

su, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang.

41. *Cerasus dielsiana* (C. K. Schneider) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 59. 1986.

尾叶樱桃 wei ye ying tao

Trees or shrubs, 5–10 m tall. Branchlets grayish brown, glabrous; young branchlets glabrous or densely brown villous. Winter buds ovoid, glabrous. Stipules narrowly lorate, 0.8–1.5 cm, margin glandular serrate. Petiole 0.8–1.7 cm, densely spreading villous, glabrescent, with 1–3 nectaries at apex or on apical part; leaf blade elliptic to elliptic-obovate, 6–14 × 2.5–4.5 cm, abaxially pale green, densely spreading-villous on mid and secondary veins but other part pilose, adaxially dark green and glabrous, base broadly cuneate to rounded, margin acutely serrate or biserrate and teeth with a minute apical gland, apex caudate-acuminate; secondary veins 10–13 on either side of midvein. Inflorescences umbellate or subumbellate, 2–6-flowered; involucre bracts brown, long elliptic, adaxially densely appressed villous; peduncle 0.6–2 cm or nearly absent, spreading yellow villous; bracts ovate, 3–6 mm in diam., margin strongly fimbriate, fimbria with a long-stalked gland. Flowers opening before leaves or nearly so. Pedicel 1–3.5 cm, spreading brown pilose. Hypanthium campanulate, 3.5–5 mm, outside pilose. Sepals elliptic to elliptic-lanceolate, nearly twice as long as hypanthium, reflexed, margin ciliate, apex acute to obtuse. Petals white or pink, ovate, apically 2-lobed. Stamens 32–36, nearly as long as petals. Style ± as long as stamens, glabrous. Drupe red, subglobose, 8–9 mm in diam.; endocarp smooth. Fl. Mar–Apr, fr. May–Jun.

• Forests, ravines, stream banks; 500–1400 m. Anhui, Chongqing, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan.

- 1a. Inflorescences 3–6-flowered; peduncle 0.6–2 cm 41a. var. *dielsiana*
 1b. Inflorescences 2(or 3)-flowered; peduncle very short to nearly absent 41b. var. *abbreviata*

41a. *Cerasus dielsiana* var. *dielsiana*

尾叶樱桃(原变种) wei ye ying tao (yuan bian zhong)

Prunus dielsiana C. K. Schneider, Repert. Spec. Nov. Regni Veg. 1: 68. 1905; *P. dielsiana* var. *conferta* Koehne; *P. dielsiana* var. *laxa* Koehne; *P. rufoides* C. K. Schneider.

Inflorescences 3–6-flowered; peduncle 0.6–2 cm. Fl. Mar–Apr, fr. May–Jun.

• Forests, ravines, stream banks; 500–900 m. Anhui, Guangdong, Guangxi, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan.

41b. *Cerasus dielsiana* var. *abbreviata* (Cardot) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 60. 1986.

短梗尾叶樱桃 duan geng wei ye ying tao

Prunus dielsiana var. *abbreviata* Cardot, Notul. Syst. (Paris) 4(1): 29. 1920.

Inflorescences 2(or 3)-flowered, rarely more; involucre bracts persistent; peduncle very short to nearly absent. Fl. Mar, fr. May–Jun.

• Forests; 1200–1300 m. Chongqing (Nanchuan Xian), Guizhou.

42. *Cerasus yunnanensis* (Franchet) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 64. 1986.

云南樱桃 yun nan ying tao

Trees 4–8 m tall. Bark gray. Branchlets grayish brown, glabrous; young branchlets green, hirtellous, soon glabrescent. Winter buds ovoid to long ovoid, glabrous. Stipules narrowly lorate, slightly shorter than petiole, soon caducous, margin glandular serrate. Petiole 6–12 mm, hirtellous to glabrous, glabrescent, apex with 2 orbicular nectaries; leaf blade elliptic, oblong, obovate-oblong, or ovate-oblong, 3.5–6 × 2–3.5 cm, abaxially green, hirtellous when young, and more densely so along veins, adaxially dark green and pilose, both surfaces glabrescent, base rounded to cuneate, margin acutely serrate and sometimes biserrate and teeth with a capitate apical gland, apex abruptly acute to acuminate; secondary veins 7–14 on either side of midvein. Inflorescences subcorymbose-racemose or long racemose, 3.5–7 cm, 3–9-flowered; involucre bracts brown, elliptic, spatulate-oblong, or obovate-oblong, 3.5–12 mm, abaxially glabrous or pilose, adaxially pilose, both surfaces glabrescent, margin glandular serrate, apex rounded; bracts brown to greenish, ovate to obovate, 2–3 mm in diam., membranous to leathery, margin glandular serrate. Flowers ca. 1.5 cm in diam., opening at same time as leaves or slightly before. Pedicel 0.3–2 cm, hirtellous. Hypanthium tubular-campanulate, 3–5 × 3–4 mm, outside densely hirtellous. Sepals ovate, nearly 1/2 or less as long as hypanthium, apex obtuse. Petals white, ovate to sub-orbicular, apex subundulate to emarginate. Stamens 33–45, nearly as long as petals. Style basally pilose. Drupe purplish red, ellipsoid to ovoid, 7–10 × 5–8 mm; endocarp ± sculptured. Fl. Mar–May, fr. May–Jun.

• Forests in ravines, mountain slopes, also cultivated; 1900–2600 m. Guangxi, W Hubei, Sichuan, Yunnan.

- 1a. Inflorescences subcorymbose-racemose, 3–5(–7)-flowered; bracts deciduous after anthesis 42a. var. *yunnanensis*
 1b. Inflorescences long racemose, 5–9-flowered; bracts persistent after anthesis 42b. var. *polybotrys*

42a. *Cerasus yunnanensis* var. *yunnanensis*

云南樱桃(原变种) yun nan ying tao (yuan bian zhong)

Prunus yunnanensis Franchet, Pl. Delavay. 195. 1890; *Cerasus duclouxii* (Koehne) T. T. Yu & C. L. Li; *P. duclouxii* Koehne; *P. duclouxii* var. *hirtissima* Koehne; *P. hirtifolia* Koehne; *P. macgregoriana* Koehne.

Inflorescences subcorymbose-racemose, 3–5(–7)-flowered; involucre bracts deciduous after anthesis. Fl. Mar–May, fr. May–Jun.

• Forests in ravines, mountain slopes, also cultivated; 1900–2600 m. Guangxi, W Hubei (Badong Xian), Sichuan, Yunnan.

42b. *Cerasus yunnanensis* var. *polybotrys* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 64. 1986.

多花云南樱桃 duo hua yun nan ying tao

Prunus yunnanensis Franchet var. *polybotrys* Koehne, Repert. Spec. Nov. Regni Veg. 11: 525. 1913.

Inflorescences long racemes, 5–9-flowered; involucre bracts persistent after anthesis. Fl. Apr–May, fr. May–Jun.

- Mountain slopes; 2300–2500 m. Yunnan.

43. *Cerasus schneideriana* (Koehne) T. T. Yu & C. L. Li, Fl. Reipubl. Popularis Sin. 38: 60. 1986.

浙闽樱桃 zhe min ying tao

Prunus schneideriana Koehne in Sargent, Pl. Wilson. 1: 242. 1912.

Trees 2.5–6 m tall. Branchlets purplish brown; young branchlets grayish green, densely grayish brown hirtellous. Winter buds ovoid, glabrous. Stipules brown, 4–7 mm, soon caducous, margin with distant long-stalked glands. Petiole 5–8 mm, densely brown hirtellous, apex with 2(or 3) black nectaries; leaf blade elliptic, ovate-oblong, or obovate-oblong, 4–8 × 1.5–4.5 cm, abaxially grayish green, grayish yellow hirtellous, and more densely hirtellous along veins, adaxially dark brown and subglabrous, base rounded to broadly cuneate, margin acuminately serrate and biserrate and teeth with a capitate apical gland; secondary veins 8–11 on either side of midvein. Inflorescences umbellate, (1 or)2(or 3)-flowered; involucre bracts oblong, apex rounded; peduncle 1.8–3.8 mm, hairy; bracts greenish brown, margin serrate, teeth with a stalked conical apical gland. Flowers opening before leaves. Pedicel 1–1.4 cm, densely brown hirtellous. Hypanthium tubular, 3–4 ×

2–3 mm, outside appressed brown pubescent. Sepals lorate-lanceolate, nearly as long as hypanthium, reflexed, apex obtuse. Petals ovate, apically 2-lobed. Stamens ca. 40, shorter than petals. Ovary and basal part of style sparsely hirtellous. Drupe purplish red, ellipsoid, ca. 8 × 5 mm; endocarp sculptured. Fl. Mar, fr. May.

- Forests; 600–1300 m. Fujian, Guangxi, Zhejiang.

44. *Cerasus yaoana* W. L. Zheng, Acta Phytotax. Sin. 38: 195. 2000.

西藏樱桃 xi zang ying tao

Trees to 8 m tall. Branchlets brown, hispid. Stipules long subulate, 4–10 × ca. 0.5 mm, margin glandular serrate. Petiole 0.7–1.2 cm, sparsely hispid or subglabrous; leaf blade rhomboid-elliptic or ovate-elliptic, 2.2–9 × 1.6–5 cm, abaxially strigose on veins, adaxially sparsely strigose; secondary veins 6–12 on either side of midvein. Inflorescences umbellate, (1 or)2- or 3-flowered; involucre bracts green, leaflike, narrowly elliptic, margin glandular serrate; peduncle 0.7–2.8 cm, hairy; bracts ovate-lanceolate. Flowers opening at same time as leaves, ca. 8 mm in diam.; pedicel 3.5–4.8 cm, hairy. Hypanthium cylindrical, ca. 6 × 3 mm. Sepals spreading, ovate, both surfaces sparsely long strigose, apex obtuse. Petals broadly ovate, abaxially hairy, apex subrounded. Style much longer than stamens, base villous. Drupe ellipsoid, ca. 8 × 5 mm, apex sparsely villous. Fl. May, fr. Jun–Jul.

- Forests; ca. 3000 m. E Xizang (Nyingchi Xian).

The following taxa have been described from China, but we have seen no specimens and are therefore unable to treat them in this account. Further revision is necessary.

Prunus bonatii Koehne (Repert. Spec. Nov. Regni Veg. 11: 265. 1912), described from Yunnan: *Maire* 3719.

Prunus canescens M. Vilmorin & Bois (Frutic. Vilmor. 66. 1904), described from Hubei: *E. H. Wilson* 65.

Prunus carcharias Koehne (in Sargent, Pl. Wilson. 1: 267. 1912), described from Chongqing: *A. von Rosthorn s.n.*

Prunus concinna Koehne (in Sargent, Pl. Wilson. 1: 210. 1912), described from Hubei: *E. H. Wilson* 2825.

Prunus giraldiana C. K. Schneider (Repert. Spec. Nov. Regni Veg. 1:

65. 1905), described from Shaanxi: *G. Girdaldi* 3789.

Prunus phyllopoda Koehne (in Sargent, Pl. Wilson. 1: 257. 1912), described from Shaanxi: *G. Girdaldi s.n.*

Prunus plurinervis Koehne (in Sargent, Pl. Wilson. 1: 208. 1912), described from Sichuan: *E. H. Wilson* 907.

Prunus pulchella Koehne (in Sargent, Pl. Wilson. 1: 197. 1912), described from Hubei: *E. H. Wilson* 2827.

Prunus rossiana Koehne (in Sargent, Pl. Wilson. 1: 223. 1912), described from Hubei: *E. H. Wilson* 182.

52. PADUS Miller, Gard. Dict. Abr, ed. 4, [999]. 1754.

稠李属 chou li shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Bruce Bartholomew

Trees or shrubs, deciduous, many branched. Branches unarmed. Axillary winter buds ovoid; terminal bud present. Stipules membranous, soon caducous. Leaves simple, alternate, conduplicate when young; petiole usually with 2 nectaries at apex or at base of leaf blade margin; leaf blade margin serrate, rarely entire. Inflorescences terminal on current year's branchlets, racemose, many flowered, base with a soon caducous involucre formed by floral bud scales; peduncle usually with leaves. Hypanthium campanulate to cup-shaped. Sepals 5. Petals 5, white. Stamens 10 or more, inserted on rim of hypanthium. Ovary superior, 1-loculed; ovules 2, collateral, pendulous. Style terminal, elongated; stigma flat. Fruit a drupe, glabrous, not glaucous, without a longitudinal groove; mesocarp succulent, not splitting when ripe; endocarp bony.

About 20 species: mostly in N temperate regions; 16 species (nine endemic) in China.

1a. Racemes basally leafless; sepals persistent in fruit.

2a. Branchlets and abaxial surface of leaf blades glabrous; peduncle subglabrous to sparsely pubescent 1. *P. buergeriana*

2b. Branchlets pubescent and leaf blades pubescent at least on veins; peduncle densely pubescent.

3a. Leaf blade margin acutely serrate; inflorescence base without squamose involucre bracts 2. *P. stellipila*

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- 3b. Leaf blade margin serrulate; inflorescence base with persistent squamose involucre bracts 3. *P. perulata*
- 1b. Racemes basally leafy (usually leafless in *P. maackii* and *P. laxiflora*); sepals soon caducous in fruit.
- 4a. Inflorescence base leafless or sometimes with 1 or 2 small bracts near base; leaves abaxially glandular or eglandular.
- 5a. Leaf blade abaxially glandular, midvein pubescent 4. *P. maackii*
- 5b. Leaf blade not glandular, midvein sericeous-villous 5. *P. laxiflora*
- 4b. Inflorescence base leafy; leaf blade abaxially non-glandular.
- 6a. Peduncles and pedicels thickened, conspicuously pale lenticellate in fruit.
- 7a. Branchlets and abaxial surface of leaf blades glabrous or very rarely sparsely pubescent when young 15. *P. napaulensis*
- 7b. Branchlets and abaxial surface of leaf blades pubescent 16. *P. wilsonii*
- 6b. Peduncles and pedicels not thickened and not lenticellate in fruit.
- 8a. Style exerted 6. *P. grayana*
- 8b. Style not exerted (not seen in *P. brunnescens* or *P. integrifolia*).
- 9a. Style 1/2 as long as stamens; pedicel 1–1.5(–2.4) cm 7. *P. avium*
- 9b. Style nearly as long as stamens (not seen in *P. brunnescens* or *P. integrifolia*); pedicel shorter than 1 cm.
- 10a. Leaf blade margin serrulate 14. *P. cornuta*
- 10b. Leaf blade margin entire, crenulate, or serrate.
- 11a. Leaf blade margin aristate serrate; inflorescences 16–30 cm.
- 12a. Leaf blade elliptic to ovate-oblong, abaxially brown pubescent; peduncles and pedicels brown pubescent 8. *P. brunnescens*
- 12b. Leaf blade oblong to rarely elliptic or lanceolate, glabrous; peduncles and pedicels not brown pubescent.
- 13a. Petiole 1.5–4.2 cm; peduncle with very small leaves at base; pedicels glabrous 10. *P. ssiiori*
- 13b. Petiole 1.5–2.3 cm; peduncle with larger leaves at base; pedicels pubescent 9. *P. brachypoda*
- 11b. Leaf blade margin not aristate serrate; inflorescences 8–15 cm.
- 14a. Leaf blade margin entire or very rarely apically sparsely serrate 13. *P. integrifolia*
- 14b. Leaf blade margin crenulate or appressed serrate.
- 15a. Leaf blade abaxially glabrous; branchlets glabrous or pubescent; peduncles and pedicels pubescent 11. *P. obtusata*
- 15b. Leaf blade abaxially velutinous; branchlets velutinous; peduncles and pedicels velutinous 12. *P. velutina*

1. *Padus buergeriana* (Miquel) T. T. Yu & T. C. Ku, Fl. Reipubl. Popularis Sin. 38: 91. 1986.

榲桲木 lin mu

Prunus buergeriana Miquel, Ann. Mus. Bot. Lugduno-Batavi 2: 92. 1865–1866; *Laurocerasus buergeriana* (Miquel) C. K. Schneider; *P. adenodonta* Merrill; *P. buergeriana* var. *nudiuscula* Koehne; *P. venosa* Koehne.

Trees 6–12(–25) m tall. Branches brown; branchlets purplish brown, usually glabrous, with pale lenticels. Winter buds ovoid to conical, usually glabrous; scale margins rarely ciliate. Stipules linear, margin glandular serrate, apex acuminate. Petiole 1–1.5 cm, usually glabrous; leaf blade elliptic, oblong-elliptic, or rarely obovate-elliptic, 4–10 × 2.5–5 cm, both surfaces glabrous, abaxially pale green, adaxially dark green, base rounded, broadly cuneate, or occasionally cuneate, margin acutely appressed serrate, apex caudate-acuminate to shortly acuminate. Racemes 6–9 cm, usually 20–30-flowered, base leafless; peduncle subglabrous to sparsely pubescent. Flowers 5–7 mm in diam. Pedicel ca. 2 mm, to 3 mm in fruit, subglabrous to sparsely pubescent, glabrescent. Hypanthium campanulate, outside glabrous. Sepals triangular-ovate, persistent in fruit, out-

side glabrous or sparsely pubescent, margin irregularly serrulate, apex acute. Petals white, broadly ovate, base cuneate to shortly clawed, margin apically erose. Stamens 10. Ovary glabrous. Style ca. 1/2 as long as stamens; stigma discoid to semi-rounded. Drupe blackish brown, subglobose to ovoid, ca. 5 mm in diam., glabrous. Fl. Apr–May, fr. May–Oct.

Dense forests on slopes, along trails, sunny places on slopes; 1000–3400 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, Japan, Korea, Sikkim].

2. *Padus stellipila* (Koehne) T. T. Yu & T. C. Ku, Fl. Reipubl. Popularis Sin. 38: 92. 1986.

星毛稠李 xing mao chou li

Prunus stellipila Koehne in Sargent, Pl. Wilson. 1: 61. 1911.

Trees 6–9 m tall. Branches blackish brown, glabrous, with pale lenticels; branchlets grayish brown, densely velutinous. Winter buds conical; scale margin glabrous or pubescent. Stipules linear-lanceolate, margin glandular serrate, apex acuminate. Petiole 5–8 mm, pubescent, without nectaries; leaf blade

elliptic, narrowly oblong, or rarely obovate-oblong, 1–10(–13) × 2.5–4 cm, abaxially brown stellate hairy on veins or in vein axils, adaxially glabrous or pubescent only on midvein and secondary veins, base rounded to broadly cuneate, margin irregularly spreading and acutely serrate, apex caudate, long acuminate, or rarely acute. Racemes 5–8 cm, many flowered, base leafless; peduncle velutinous. Flowers 3–7 mm in diam. Pedicel 2–4 cm, velutinous, glabrescent. Hypanthium campanulate. Sepals triangular, persistent in fruit, outside glabrous, margin glandular serrulate, apex obtuse. Petals white, broadly obovate, base cuneate and shortly clawed, margin apically erose. Stamens 10. Ovary glabrous. Style slightly shorter than stamens. Drupe black, subglobose, 5–6 mm in diam., glabrous. Fl. Apr–May, fr. May–Oct.

• Slopes, along trails, scrub; 1000–1800 m. Gansu, Guizhou, Hubei, Jiangxi, Shaanxi, Sichuan, Zhejiang.

3. *Padus perulata* (Koehne) T. T. Yu & T. C. Ku, Fl. Reipubl. Popularis Sin. 38: 92. 1986.

宿鳞稠李 *su lin chou li*

Prunus perulata Koehne in Sargent, Pl. Wilson. 1: 61. 1911.

Trees 6–12 m tall. Branches blackish brown to reddish brown, glabrous, with pale lenticels; branchlets reddish brown to purplish brown, velutinous when young. Winter buds ovoid, glabrous or sometimes pubescent at scale margins. Stipules linear-lanceolate, margin glandular serrate, apex acuminate. Petiole 1.2–2.5 cm, velutinous when young, non-glandular; leaf blade oblong-obovate, to obovate-oblong, rarely elliptic, 5–11 × 3–5.5 cm, abaxially pale green, hairy on midvein, and barbate in vein axils, adaxially dark green and glabrous, base rounded to broadly cuneate, margin appressed serrulate, apex acute to shortly acuminate. Racemes 5–10 cm, many flowered, base leafless; involucre bracts persistent; peduncle velutinous, glabrescent. Flowers 5–7 mm in diam. Pedicel ca. 2 mm, to 8 mm in fruit, velutinous, glabrescent. Hypanthium campanulate, outside glabrous. Sepals triangular-ovate, persistent in fruit, outside glabrous, margin glandular, apex acute. Petals white, nearly suborbicular to ovate, apically undulate. Stamens 10. Ovary glabrous. Style slightly shorter than stamens; stigma disk-shaped. Drupe black, subglobose, 7–8 mm in diam., glabrous. Fl. Apr–May, fr. May–Oct.

• Mixed forests, sparse forests beside streams, river sides, valleys; 1800–3200 m. W Sichuan, NW Yunnan.

4. *Padus maackii* (Ruprecht) Komarov in Komarov & Alisova, Key Pl. Far. East URSS 2: 657. 1932.

斑叶稠李 *ban ye chou li*

Prunus maackii Ruprecht, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 15: 361. 1857; *Cerasus maackii* (Ruprecht) G. V. Eremin & V. S. Simagin; *Laurocerasus maackii* (Ruprecht) C. K. Schneider; *Padus maackii* f. *lanceolata* T. T. Yu & T. C. Ku.

Trees 4–10 m tall. Branches blackish to yellowish brown, glabrous, with pale lenticels; branchlets reddish, pubescent

when young. Winter buds ovoid, glabrous or with scale margins ciliate. Stipules linear, margin glandular, apex acuminate. Petiole 1–1.5 cm, pubescent, rarely subglabrous, apically or sometimes at leaf blade base with 2 nectaries; leaf blade elliptic, rhombic-ovate, or rarely oblong-obovate, 4–8 × 2.8–5 cm, abaxially pale green, purplish brown glandular, and pubescent on midvein, adaxially dark green and pubescent to subglabrous on veins, base rounded to broadly cuneate, margin irregularly and acutely glandular serrate, apex caudate-acuminate to shortly acuminate. Racemes 5–7 cm, many flowered, base leafless; peduncle sparsely pubescent. Flowers 8–10 mm in diam. Pedicel 4–6 mm, to 7 mm in fruit, sparsely pubescent, glabrescent. Hypanthium campanulate, outside pubescent. Sepals triangular to ovate-lanceolate, soon caducous, outside pubescent, margin irregularly glandular serrate, apex long acuminate. Petals white, oblong-obovate, base cuneate and shortly clawed, margin apically erose. Stamens 25–30. Ovary glabrous. Style slightly shorter than stamens; stigma disk-shaped. Drupe purple, subglobose, 5–7 mm in diam., glabrous. Fl. Apr–May, fr. Jun–Oct.

Sparse forests on sunny slopes, forest margins, under pine woods, stream sides; 800–2000 m. Heilongjiang, Jilin, Liaoning [Korea, Russia (Far East)].

5. *Padus laxiflora* (Koehne) T. C. Ku, **comb. nov.**

疏花稠李 *shu hua chou li*

Basionym: *Prunus laxiflora* Koehne in Sargent, Pl. Wilson. 1: 70. 1911; *Cerasus laxiflora* (Koehne) C. L. Li & S. Y. Jiang.

Trees to 10 m tall. Trunk to 40 cm d.b.h. Branches dark brown or tinged black, glabrescent, lenticels few and small; young branchlets puberulent. Stipules narrowly linear, 5–10 mm, pubescent. Petiole 7–12 mm, densely pubescent; leaf blade obovate-oblong to broadly so, 3.5–6 × 1.6–2.7 cm, abaxially glabrous except sericeous-villous along veins, more densely so along midvein, and not papillose, adaxially light green and glabrous except pubescent-villous along midvein, base broadly cuneate and with 2 flattened nectaries, margin incised subduplicate-serrulate, apex acuminate. Inflorescences laxly racemose, 4.5–7 cm, 6–12-flowered, rachis appressed pubescent; peduncle 0.7–1.7 cm, sometimes with 1 or 2 brown sterile bracts, appressed pubescent; bracts basally on rachis 4–10 mm, gradually shortened to 1 mm apically, persistent. Pedicel ca. 1.8 cm for basalmost flowers, ca. 2 mm for apical flowers, laxly villous. Hypanthium semiglobose-campanulate, ca. 3 × 3 mm, outside basally pilose. Sepals triangular, as long as hypanthium, margin with horizontally spreading somewhat long glandular fimbriations, apex acute. Petals white or pink, apex rounded, emarginate, or parted. Stamens 15–50. Ovary and style hairy or glabrous. Endocarp globose to ovoid, smooth or ± rugose. Fl. May.

• Woods; ca. 1700 m. W Hubei.

6. *Padus grayana* (Maximowicz) C. K. Schneider, Ill. Handb. Laubholz. 1: 640. 1906.

灰叶稠李 *hui ye chou li*

Prunus grayana Maximowicz, Bull. Acad. Imp. Sci. Saint-

Pétersbourg 29: 107. 1884; *Padus acrophylla* C. K. Schneider; *Prunus padus* Linnaeus var. *japonica* Miquel.

Trees 8–10(–16) m tall. Branches blackish brown, glabrous, with pale lenticels; branchlets reddish brown to grayish green, velutinous when young. Winter buds ovoid, glabrous or sometimes sparsely pubescent at scale margins. Stipules linear, margin glandular, apex acuminate. Petiole 5–10 mm, usually glabrous; leaf blade grayish green, ovate-oblong to oblong, 4–10 × 1.8–4 cm, glabrous or abaxially pubescent on midvein, base rounded to subcordate, margin acutely serrate or incised, apex long acuminate to long caudate. Racemes 5–8 cm, dense, many flowered, basally with 2–4(or 5) leaves; peduncle glabrous. Flowers 7–8 mm in diam. Pedicel 2–4 mm, 6–9 mm in fruit, glabrous. Hypanthium campanulate, outside glabrous. Sepals triangular-ovate, soon caducous, outside glabrous, margin serrulate, apex acute. Petals white, oblong-obovate, base cuneate and shortly clawed, margin apically erose; stamens 20–30. Ovary glabrous. Style long and exerted; stigma discoid. Drupe blackish brown, ovoid-globose, 5–6 mm in diam., glabrous. Fl. Apr–May, fr. Jun–Sep.

Mixed forests in valleys, shady places on slopes, along trails; 1000–3800 m. Anhui, Fujian, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang [Japan].

7. *Padus avium* Miller, Gard. Dict ed. 8. *Padus* no. 1, 1778.

稠李 *chou li*

Trees to 15 m tall. Branches purple to brownish gray, with pale lenticels; branchlets reddish brown, glabrous, pubescent, or densely brown villous. Winter buds ovoid, glabrous or with ciliate scale margins. Stipules linear, margin glandular serrate, apex acuminate. Petiole 1–1.5 cm, glabrous, pubescent, or densely brown villous, apically with 2 nectaries; leaf blade abaxially pale green, adaxially dark green, elliptic, oblong, or oblong-obovate, 4–10 × 2–4.5 cm, glabrous, pubescent, or densely brown villous, base rounded to broadly cuneate, margin irregularly and acutely serrate or sometimes biserrate, apex caudate. Racemes 7–10 cm, 7- or 8-flowered, glabrous, pubescent, or densely brown villous, basally with 1 or 2 leaves. Flowers 1–1.6 cm in diam. Pedicel 1–1.5(–2.4) cm. Hypanthium campanulate, outside glabrous. Sepals triangular-ovate, soon caducous, outside glabrous, margin glandular, apex acute to obtuse. Petals white, oblong, base shortly clawed. Stamens many. Ovary glabrous. Style 1/2 as long as stamens; stigma disk-shaped. Drupe reddish brown to black, ovoid-globose, 8–10 cm in diam., smooth. Fl. Apr–Jun, fr. May–Oct.

Forests, forest margins, thickets, slopes, valleys, stream sides; 800–2700 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Xinjiang [Japan, Korea, Mongolia, Russia].

- 1a. Branchlets, petioles, abaxial surface of leaf blades, and inflorescences glabrous 7a. var. *avium*
- 1b. Branchlets, petioles, abaxial surface of leaf blades, and inflorescences densely villous or pubescent.
 - 2a. Branchlets, petioles, abaxial surface of leaf blades, and inflorescences densely brown villous 7b. var. *pubescens*

- 2b. Branchlets, petioles, abaxial surface of leaf blades, and inflorescences pubescent 7c. var. *asiatica*

7a. *Padus avium* var. *avium*

稠李(原变种) *chou li* (yuan bian zhong)

Cerasus padus (Linnaeus) Delarbre; *Padus germanica* Borkhausen; *P. vulgaris* Borkhausen; *P. racemosa* (Lamarck) Gilibert; *Prunus padus* Linnaeus; *P. racemosa* Lamarck.

Branchlets, abaxial surface of leaf blades, petioles, and inflorescences glabrous. Fl. Apr–Jun, fr. May–Oct.

Slopes, valleys, thickets; 800–2600 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Qinghai, Shandong, Shanxi [Japan, Korea, Russia].

7b. *Padus avium* var. *pubescens* (Regel & Tiling) T. C. Ku & B. Bartholomew, **comb. nov.**

毛叶稠李 *mao ye chou li*

Basionym: *Prunus padus* Linnaeus var. *pubescens* Regel & Tiling, Nouv. Mém. Soc. Imp. Naturalistes Moscou 11: 79. 1858; *Padus racemosa* var. *pubescens* (Regel & Tiling) C. K. Schneider; *P. beijingensis* Y. L. Han & C. Y. Yang.

Branchlets, abaxial surface of leaf blades, petioles, and inflorescences densely brown villous. Fl. Apr–Jun, fr. Jun–Oct.

• Forest on slopes, thickets in valleys, moist slopes; 1200–2000 m. Hebei, Henan, Liaoning, Nei Mongol, Shanxi.

7c. *Padus avium* var. *asiatica* (Komarov) T. C. Ku & B. Bartholomew, **comb. nov.**

北亚稠李 *bei ya chou li*

Basionym: *Padus asiatica* Komarov, Fl. URSS 10: 578. 1941; *P. racemosa* var. *asiatica* (Komarov) T. T. Yu & T. C. Ku.

Branchlets, petioles, abaxial surface of leaf blades, and inflorescences pubescent. Fl. Apr–Jun, fr. Jun–Oct.

Broad-leaved evergreen forests, forest margins, slopes, stream sides; 800–2700 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xinjiang [Mongolia, Russia (Siberia)].

8. *Padus brunnescens* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 23: 211. 1985.

褐毛稠李 *he mao chou li*

Trees 7–12 m tall. Branches blackish brown, glabrous, with pale lenticels; branchlets reddish brown to purplish brown, brown velutinous, glabrescent. Winter buds ovoid, usually glabrous. Stipules linear, margin entire, apex obtuse. Petiole 1.5–2.3 cm, glabrous or brown pubescent; leaf blade elliptic to ovate-oblong, 8–14 × 4–8 cm, abaxially brownish and densely brown pubescent at least on veins or tufted in vein axils, adaxially dark green and glabrous, base cordate to rarely rounded, margin acutely appressed serrate with teeth apically aristate, apex acute to caudate. Racemes 17–22 cm, many flowered, basally with 1–3 leaves; peduncle brown pubescent. Flowers not seen. Fruiting pedicel ca. 4 mm, brown pubescent. Drupe reddish brown to purplish brown, globose to ovoid, ca. 5 mm in diam., glabrous; sepals soon caducous. Fl. May, fr. Jun–Jul.

• Margins of dense forests, slopes, stream sides; 2000–3000 m. SW Sichuan, Yunnan.

9. *Padus brachypoda* (Batalin) C. K. Schneider, Repert. Spec. Nov. Regni Veg. 1: 69. 1905.

短梗稠李 *duan geng chou li*

Trees 8–10 m tall. Branches blackish, glabrous; branchlets blackish brown, glabrous, with sparse lenticels; young branchlets reddish brown, velutinous to subglabrous. Winter buds ovoid, usually glabrous. Stipules linear, margin glandular serrate, apex acuminate. Petiole 1.5–2.3 cm, glabrous, apically with 2 nectaries; leaf blade oblong to rarely elliptic or lanceolate, 6–16 × 3–7 cm, abaxially pale green and glabrous or with tufted hairs in vein axils, adaxially dark green and glabrous, base rounded, subcordate, or rarely truncate, margin appressed to spreading serrate or curved serrate with teeth apically shortly aristate, apex acute, acuminate, or shortly caudate. Racemes 16–30 cm, many flowered, basally with 1–3 leaves; peduncle pubescent. Flowers 5–7 mm in diam. Pedicel 5–7 mm, pubescent. Hypanthium campanulate, base persistent in fruit, outside sparsely pubescent. Sepals triangular-ovate, caducous in fruit, outside sparsely pubescent, margin glandular serrate, apex acute. Petals white, obovate, base cuneate and shortly clawed, margin apically erose or undulate. Stamens 25–27. Ovary glabrous. Style slightly shorter than stamens; stigma disk-shaped. Drupe purplish red but blackish brown with age, globose, 5–7 mm in diam. Fl. Apr–May, fr. May–Oct.

• Mixed forests, thickets on slopes, valleys; 1000–2500 m. Anhui, Gansu, Guizhou, Hebei, Henan, W Hubei, Hunan, Ningxia, Shaanxi, Sichuan, Yunnan, Zhejiang.

- 1a. Leaf blade margin appressed to spreading serrate, apex acute, acuminate, or rarely shortly caudate 9a. var. *brachypoda*
 1b. Leaf blade margin curved serrate, apex shortly caudate 9b. var. *microdonta*

9a. *Padus brachypoda* var. *brachypoda*

短梗稠李(原变种) *duan geng chou li* (*yuan bian zhong*)

Prunus brachypoda Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 12: 166. 1892; *Padus brachypoda* var. *eglandulosa* (Cheng) H. J. Wang; *Prunus brachypoda* var. *eglandulosa* Cheng; *P. brachypoda* var. *pseudossiori* Koehne.

Leaf blade oblong to rarely elliptic, margin appressed to spreading serrate, apex acute, acuminate, or rarely shortly caudate.

• Thickets on slopes, valleys; 1000–2500 m. Anhui, Gansu, Guizhou, Hebei, Henan, Hunan, Ningxia, Shaanxi, Sichuan, Yunnan, Zhejiang.

9b. *Padus brachypoda* var. *microdonta* (Koehne) T. T. Yu & T. C. Ku, Fl. Reipubl. Popularis Sin. 38: 99. 1986.

细齿短梗稠李 *xi chi duan geng chou li*

Prunus brachypoda Batalin var. *microdonta* Koehne in Sargent, Pl. Wilson. 1: 66. 1911.

Leaf blade oblong to lanceolate, margin curved serrate, apex shortly caudate.

• Mixed forests. W Hubei (Zigui Xian).

10. *Padus ssiori* (F. Schmidt) C. K. Schneider, Ill. Handb. Laubholz. 1: 641. 1906.

库页稠李 *ku ye chou li*

Prunus ssiori F. Schmidt, Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, 12(2): 124. 1868.

Trees to 7 m tall. Branchlets glabrous. Petiole 1.5–4.2 cm, glabrous, with nectaries near apex; leaf blade oblong to ovate, 7–15 × 3–7 cm, abaxially glabrous or hairy in vein axils, adaxially glabrous, base usually cordate or deeply so, margin simply or doubly sharply serrate, apex acuminate. Racemes 15–20 cm, densely many flowered, glabrous, base with very small leaves. Flowers ca. 10 mm in diam. Pedicel 7–8 mm, glabrous. Hypanthium cup-shaped. Sepals semiorbicular, short, margin glandular dentate. Petals spreading, white, oblong, 4–5 mm, nearly as long as stamens, margin sparsely serrate. Drupe black, globose. Fl. May–Jun, fr. Aug–Sep.

Probably cultivated. NE China [native to N Japan and Russia (S Sakhalin)].

The present authors have seen no specimens of this species; the above description is based mainly on the protologue.

11. *Padus obtusata* (Koehne) T. T. Yu & T. C. Ku, Fl. Reipubl. Popularis Sin. 38: 101. 1986.

细齿稠李 *xi chi chou li*

Prunus obtusata Koehne in Sargent, Pl. Wilson. 1: 66. 1911; *Padus brachypoda* (Batalin) C. K. Schneider var. *pubigera* C. K. Schneider; *Prunus bicolor* Koehne; *P. ohwii* Kanehira & Hatusima; *P. pubigera* (C. K. Schneider) Koehne; *P. pubigera* var. *longifolia* Cardot; *P. pubigera* var. *obovata* Koehne; *P. pubigera* var. *ohwii* (Kanehira & Hatusima ex Kanehira) S. S. Ying; *P. pubigera* var. *potaninii* Koehne; *P. pubigera* var. *prattii* Koehne; *P. vaniotii* H. Léveillé; *P. vaniotii* var. *obovata* (Koehne) Rehder; *P. vaniotii* var. *potaninii* (Koehne) Rehder.

Trees 6–20 m tall. Branches purplish brown to dark brown, glabrous, with sparse lenticels; branchlets reddish brown when young, pubescent or glabrous. Winter buds ovoid, glabrous. Stipules linear, margin glandular serrate, apex acuminate. Petiole 1–2.2 cm, pubescent or glabrous, apex usually with a nectary on either side; leaf blade narrowly oblong, elliptic, or obovate, 4.5–11 × 2–4.5 cm, both surfaces glabrous, abaxially pale green, adaxially dark green, base subrounded, broadly cuneate, or rarely subcordate, margin crenulate, apex acute, acuminate, or rarely obtuse; midvein and secondary veins abaxially prominent. Racemes 10–15 cm, many flowered, basally with 2 leaves; peduncle pubescent. Flowers 8–10 mm in diam. Pedicel 3–7 mm, pubescent. Hypanthium campanulate, outside pubescent. Sepals triangular-ovate, soon caducous, outside subglabrous, margin crenulate, apex acute. Petals white, suborbicular to oblong, base cuneate and shortly clawed, margin apically erose or undulate. Stamens many. Ovary glabrous. Style slightly shorter than stamens; stigma discoid. Drupe black, ovoid-globose, 6–8 mm in diam., glabrous. Fl. May–Jun, fr. Jul–Sep.

• Mixed forests on slopes, valleys, stream sides; 800–3600 m. Anhui, S Gansu, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang.

12. *Padus velutina* (Batalin) C. K. Schneider, *Repert. Spec. Nov. Regni Veg.* 1: 69. 1905.

毡毛稠李 zhan mao chou li

Prunus velutina Batalin, *Trudy Imp. S.-Peterburgsk. Bot. Sada* 14: 168. 1895.

Trees 7–20 m tall. Branches blackish brown, glabrous, sparsely lenticellate; branchlets reddish brown, velutinous to subglabrous. Winter buds ovoid; scale margins velutinous when young. Stipules linear, margin glandular serrate, apex acuminate. Petiole 1.5–2.5 cm, densely brown velutinous, apex with a nectary on either side; leaf blade ovate, elliptic, or occasionally obovate, 6–10 × 3–5.5 cm, abaxially pale green to brownish green, velutinous, and densely velutinous along midvein and veins, adaxially dark green and glabrous, base rounded, margin appressed serrate, apex acute to shortly acuminate. Racemes 10–15 cm, many flowered, basally with 2–4 leaves; peduncle densely velutinous. Flowers 8–10 mm in diam. Pedicel ca. 5 mm, to 6 mm in fruit, densely velutinous, nearly glabrescent in fruit. Hypanthium cup-shaped, outside glabrous. Sepals triangular to semiorbicular, soon caducous, outside glabrous, margin glandular serrate, apex obtuse to acute. Petals white, oblong, base cuneate and shortly clawed, apex obtuse. Stamens 22–28. Ovary glabrous. Style slightly shorter than stamens; stigma oblique. Drupe reddish brown, globose, 5–7 mm in diam., glabrous. Fl. Apr–May, fr. Jun–Oct.

• Scrub in valleys, stream sides; 1000–1600 m. Hebei, Henan, Hubei, Shaanxi, Sichuan.

13. *Padus integrifolia* T. T. Yu & T. C. Ku, *Acta Phytotax. Sin.* 23: 212. 1985.

全缘叶稠李 quan yuan ye chou li

Trees 2–7 m tall. Branches purplish brown to blackish brown, glabrous, with sparse pale lenticels; branchlets reddish brown, velutinous, glabrescent. Winter buds ovoid; scale margins velutinous when young. Stipules not seen. Petiole 1.5–2.2 cm, densely velutinous, apex with 1 nectary; leaf blade elliptic, ovate-elliptic, or rarely oblong, 7–10(–12) × 3–4.5 cm, abaxially pale green and glabrous, adaxially dark green and velutinous on midvein or basally on secondary veins, base subrounded, subcordate, or broadly cuneate, margin entire or very rarely apically sparsely serrate, apex shortly acuminate. Racemes 8–13 cm, many flowered, basally with 1–3 leaves; peduncle densely velutinous. Flowers not seen. Fruiting pedicel 4–6 mm, densely velutinous. Drupe black, ovoid, flat on both sides, 6–7 mm in diam., glabrous; sepals soon caducous. Fr. Jun–Oct.

• Forests, stream sides, valleys, along trails; 2900–3200 m. S Xizang.

14. *Padus cornuta* (Wallich ex Royle) Carrière, *Rev. Hort.* 1869: 275. 1869.

光萼稠李 guang e chou li

Cerasus cornuta Wallich ex Royle, *Ill. Bot. Himal. Mts.* 207. 1835; *Padus cornuta* var. *glabra* Fritsch ex C. K. Schneider; *Prunus cornuta* (Wallich ex Royle) Steudel.

Trees 3–15 m tall. Branches blackish brown, glabrous, with sparse oblong lenticels; branchlets purplish brown, glabrous or sometimes velutinous. Winter buds ovoid, usually glabrous. Stipules linear, margin glandular serrate, apex acuminate. Petiole 1–2.3 cm, glabrous or subglabrous, apex with 2 nectaries; leaf blade narrowly elliptic to oblong, rarely oblong-lanceolate or obovate, 6–11 × 3–5 cm, abaxially pale green and glabrous or with tufts of hair at veins axils, adaxially dark green and glabrous, base subcordate to broadly cuneate, margin sparsely serrulate, apex shortly acuminate to shortly caudate. Racemes 8–16 cm, many flowered, basally with 1–3 leaves; peduncle velutinous. Flowers 6–8 mm in diam. Pedicel 5–7 mm, velutinous. Hypanthium campanulate, outside basally velutinous, inside glabrous. Sepals triangular-ovate, soon caducous, outside glabrous, margin glandular serrulate, apex obtuse. Petals white, obovate, base cuneate and shortly clawed, margin apically erose. Stamens 20–25. Ovary glabrous. Style slightly shorter than stamens; stigma disk-shaped. Drupe black-brown, ovoid-globose, ca. 8 mm in diam., glabrous. Fl. Apr–May, fr. May–Oct.

Secondary forests, slopes, along trails; 2700–3300 m. S Xizang (Cona Xian, Yadong Xian) [Afghanistan, Bhutan, N India, Nepal, Sikkim].

15. *Padus napaulensis* (Seringe) C. K. Schneider, *Repert. Spec. Nov. Regni Veg.* 1: 68. 1905.

粗梗稠李 cu geng chou li

Cerasus napaulensis Seringe in Candolle, *Prodr.* 2: 540. 1825; *Prunus napaulensis* (Seringe) Steudel.

Trees to 27 m tall. Branches blackish brown, glabrous, with conspicuous pale lenticels; branchlets reddish brown, glabrous. Winter buds ovoid, glabrous. Stipules linear, margin glandular serrate, apex acuminate. Petiole 0.8–1.5 cm, glabrous, without nectaries; leaf blade narrowly elliptic, ovate-elliptic, or elliptic-lanceolate, 6–14 × 2–6 cm, abaxially pale green and glabrous or very rarely sparsely pubescent when young, adaxially dark green and glabrous, base cuneate, margin coarsely serrate or sometimes undulate, apex acute to shortly acuminate. Racemes 7–14 cm, many flowered, basally with 2 or 3 leaves; peduncle glabrous or subglabrous, later thickened and with pale lenticels. Flowers ca. 1 cm in diam. Pedicel 4–6 mm, conspicuously thickened in fruit, velutinous, glabrescent or nearly so, with conspicuous pale lenticels in fruit. Hypanthium cup-shaped, outside pubescent to subglabrous. Sepals triangular-ovate, soon caducous, outside pubescent, margin serrulate, apex acuminate. Petals white, obovate-oblong, base cuneate and shortly clawed, margin apically erose. Stamens 22–27. Ovary glabrous. Style longer than stamens; stigma disk-shaped. Drupe dark purple to black, ovoid, 1–3 cm in diam., glabrous. Fl. Apr, fr. Jul.

Broad-leaved evergreen or deciduous mixed forests, open places beside streams; 1200–2500 m. Anhui, Guizhou, Hunan, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, N India, N Myanmar, Nepal, Sikkim].

16. *Padus wilsonii* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 1: 69. 1905.

绢毛稠李 *juan mao chou li*

Padus napaulensis (Seringe) C. K. Schneider var. *sericea* (Batalin) C. K. Schneider; *Prunus dunniana* H. Léveillé; *P. napaulensis* (Seringe) Steudel var. *sericea* Batalin; *P. rufomicans* Koehne; *P. sericea* (Batalin) Koehne; *P. sericea* var. *batalinii* Koehne; *P. sericea* var. *brevifolia* Koehne; *P. sericea* var. *septentrionalis* Koehne; *P. wilsonii* (C. K. Schneider) Koehne; *P. wilsonii* var. *leiobotrys* Koehne.

Trees 10–30 m tall. Branches purplish brown to blackish brown, robust, pubescent to subglabrous, with conspicuous pale lenticels; branchlets reddish brown, pubescent. Winter buds ovoid, glabrous or pubescent at scale margins. Stipules linear, margin hairy when young, apex long acuminate. Petiole 7–8 mm, glabrous or pubescent, apex with 2 nectaries; leaf blade elliptic, oblong, or oblong-obovate, 6–14(–17) × 3–6 cm, abaxially pale green, densely white silky pubescent when young,

and later brownish silky pubescent but conspicuously more so on midvein and veins, adaxially dark green to purplish green, base rounded, cuneate, or broadly cuneate, margin rounded to sometimes acutely serrate, apex shortly acuminate to shortly caudate. Racemes 7–14 cm, many flowered, basally with 3–5 leaves; peduncle thickened in age, brown silky pubescent. Flowers 6–8 mm in diam. Pedicel 5–8 mm, to 1 cm in fruit, thickened and densely covered with pale lenticels with age, brown silky pubescent. Hypanthium campanulate to cup-shaped, outside silky pubescent. Sepals triangular-ovate, soon caducous, outside silky pubescent, inside sparsely pubescent but margin densely so, margin serrulate, apex acute. Petals white, obovate-oblong, base cuneate and shortly clawed, margin apically erose. Stamens ca. 20. Ovary glabrous. Style slightly longer than stamens; stigma disk-shaped. Drupe reddish brown at first, becoming blackish purple, globose to ovoid, 8–10 mm in diam., glabrous. Fl. Apr–May, fr. Jun–Oct.

• Slopes, valleys; 900–2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang.

53. LAUROCERASUS Duhamel, Traité Arbr. Arbust. 1: 345. 1755.

桂樱属 *gui ying shu*

Lu Lingdi (陆玲娣 *Lu Ling-ti*); Bruce Bartholomew

Trees or shrubs, evergreen or very rarely deciduous. Branches unarmed. Stipules small, free or sometimes connate, soon caducous. Leaves simple, alternate, conduplicate when young, usually with 2 to rarely several nectaries on petiole, at base on leaf blade abaxial surface, or along leaf blade margin; leaf blade margin entire or serrate. Inflorescences axillary, usually racemose, rarely in a fascicle, very rarely panicle, usually with more than 10 flowers; bracts small, soon caducous, basal ones usually sterile and with a tripartite or tridentate apex; bracteoles often absent. Flowers usually bisexual, sometimes male with ovary ± reduced. Hypanthium cup-shaped to campanulate. Sepals 5. Petals 5, white, longer than sepals. Stamens 10–50, in 2 whorls, inner ones shorter. Ovary superior, 1-loculed, glabrous or sometimes pubescent; ovules 2, collateral. Style terminal; stigma disk-shaped. Fruit a drupe; mesocarp succulent, not splitting when ripe; endocarp bony or woody, surface smooth or rugose.

About 80 species: Asia, Europe, New Guinea, North and South America; 13 species (six endemic) in China.

- 1a. Leaf blade abaxially scatteredly purplish black or black punctate.
 - 2a. Leaf blade herbaceous to subleathery, apex long caudate, tertiary veins conspicuous on both surfaces; drupe subglobose to transversely ellipsoid, 8–10 mm in diam., wider than long; endocarp smooth 1. *L. phaeosticta*
 - 2b. Leaf blade thickly leathery, apex acute to shortly acuminate, tertiary veins very inconspicuous to nearly invisible on both surfaces; drupe elongated ovoid-globose to ellipsoid, 6–8 mm in diam., longer than wide; endocarp slightly reticulately rugose 2. *L. fordiana*
- 1b. Leaf blade abaxially not scatteredly purplish black or black punctate.
 - 3a. Leaf blade abaxially densely pubescent.
 - 4a. Petioles 6–10 mm, often with a pair of basal nectaries; leaf blade elliptic to elliptic-oblong, densely gray pubescent abaxially, margin ± densely coarsely serrate; drupe ovoid-oblong, 1–1.2 cm in diam., apex acute 3. *L. hypotricha*
 - 4b. Petioles 10–15 mm, without nectaries; leaf blade ovate-oblong to oblong, densely yellowish pubescent abaxially, margin indistinctly shallowly obtusely serrate apically from middle; drupe broadly oblong, 1.4–1.7 cm in diam., apex obtuse 4. *L. menghaiensis*
 - 3b. Leaf blade abaxially glabrous.
 - 5a. Rachises and pedicels glabrous.
 - 6a. Leaf blade elliptic to oblong-lanceolate, margin entire or rarely with a few teeth apically from middle; racemes 5–10 cm; ovary pubescent; drupe ovoid-globose to ellipsoid, 1–1.6 cm 5. *L. undulata*
 - 6b. Leaf blade oblong to ovate-oblong, margin sparsely and shallowly serrulate with minute teeth; racemes 2–5 cm; ovary glabrous; drupe globose to compressed globose, 0.7–1 cm 6. *L. andersonii*
 - 5b. Rachises and pedicels pubescent.
 - 7a. Drupe 1.4–1.6 cm in diam.; endocarp thick and hard, surface prominently coarsely reticulately rugose 7. *L. jenkinsii*

- 7b. Drupe 0.6–1.1 cm in diam.; endocarp thin and fragile, surface smooth or slightly reticulately rugose.
 8a. Drupe 1.8–2.4 cm; petiole 1–2 cm 8. *L. zippeliana*
 8b. Drupe 0.8–1.4 cm; petiole 0.1–1 cm (rarely 1.5 cm in *L. spinulosa*).
 9a. Leaf blade margin entire or sparsely acutely serrate, secondary veins indistinct.
 10a. Leaf blade oblong to obovate-oblong, 5–7(–9) cm, base narrowly cuneate, apex
 acuminate; drupe ovoid-globose; endocarp thinly reticulately rugose 12. *L. marginata*
 10b. Leaf blade elliptic to ovate-orbicular, 2–5(–6) cm, base broadly cuneate to
 rounded, apex obtuse; drupe subglobose; endocarp smooth 13. *L. aquifolioides*
 9b. Leaf blade margin undulate to serrate, secondary veins distinct.
 11a. Leaf blade elliptic; secondary veins 5–7 on either side of midvein 11. *L. australis*
 11b. Leaf blade oblong to obovate-oblong; secondary veins 8–14 on either side of midvein.
 12a. Leaf blade herbaceous to thinly leathery, margin usually undulate with few
 acicular teeth apically from middle or near apex, apex acuminate to caudate;
 drupe ellipsoid 9. *L. spinulosa*
 12b. Leaf blade thickly leathery, margin not undulate but coarsely acutely
 serrate with teeth incurved, apex acute to shortly acuminate; drupe
 ovoid-globose 10. *L. dolichophylla*

1. *Laurocerasus phaeosticta* (Hance) C. K. Schneider, Ill.
 Handb. Laubholz. 1: 649. 1906.

腺叶桂樱 xian ye gui ying

Pygeum phaeostictum Hance, J. Bot. 8: 72. 1870; *Laurocerasus phaeosticta* f. *ciliospinosa* Chun ex T. T. Yu & L. T. Lu; *L. phaeosticta* f. *dentigera* (Rehder) T. T. Yu & L. T. Lu; *L. phaeosticta* f. *lasioclada* (Rehder) T. T. Yu & L. T. Lu; *L. phaeosticta* f. *puberula* T. T. Yu & L. T. Lu; *L. phaeosticta* f. *pubipedunculata* T. T. Yu & L. T. Lu; *Prunus edentata* Handel-Mazzetti; *P. phaeosticta* (Hance) Maximowicz; *P. phaeosticta* f. *dentigera* Rehder; *P. phaeosticta* f. *lasioclada* Rehder; *P. punctata* J. D. Hooker & Thomson; *P. xerocarpa* Hemsley.

Shrubs or trees, 4–12 m tall. Branchlets dark purplish brown, ± pubescent when young, glabrous and purplish black with age, with sparse orbicular lenticels. Winter buds purplish brown, ovoid, 2–4 mm, glabrous, apex acute to obtuse. Petiole 4–8 mm, glabrous, without nectaries; leaf blade narrowly elliptic, oblong, oblong-lanceolate, or rarely obovate-oblong, 6–12 × 2–4 cm, herbaceous to subleathery, both surfaces glabrous, abaxially scattered black punctate, base cuneate and with 2 large flat nectaries near margin, margin entire or on sterile branchlets acutely serrate, apex long caudate; secondary veins 6–10 on either side of midvein; tertiary veins abaxially somewhat elevated, adaxially slightly prominent. Racemes in axils of normal leaves on basal part of lateral branchlets or in axils of cataphylls on apical part of branchlets, solitary, 4–6 cm, several to 10-flowered or more; cataphylls small, soon caducous, apex tridentate; rachis often glabrous, rarely pubescent; bracts linear to lanceolate, 2–4 mm, soon caducous, glabrous, margin glandular serrate. Flowers 4–6 mm in diam. Pedicel 3–6 mm often glabrous, rarely pubescent. Hypanthium cup-shaped, 1.5–2.5 mm, outside glabrous. Sepals ovate-triangular, 1–2 mm, outside glabrous, margin ciliate or minutely serrate, apex obtuse. Petals white, suborbicular, 2–3.5 mm, glabrous. Stamens 20–35, 5–6 mm. Ovary glabrous. Style 5–6 mm. Drupe purplish black, subglobose to transversely ellipsoid, 8–10 mm in diam., glabrous; endocarp thin, smooth. Fl. Apr–May, fr. Jul–Oct.

Mixed forests, mountain valleys, mountain meadows, stream sides, along trails; 300–2500 m. Anhui, Fujian, Guangdong, Guangxi,

Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, India, N Myanmar, N Thailand, N Vietnam].

2. *Laurocerasus fordiana* (Dunn) Browicz, Arbor. Kórnickie
 15: 6. 1970.

华南桂樱 hua nan gui ying

Prunus fordiana Dunn, J. Bot. 45: 402. 1907; *P. balansae* Koehne; *P. fordiana* Dunn var. *balansae* (Koehne) J. E. Vidal; *P. multipunctata* Cardot; *P. phaeosticta* (Hance) Maximowicz var. *ancylocarpa* J. E. Vidal; *P. phaeosticta* var. *dimorphophylla* J. E. Vidal; *P. phaeosticta* var. *promeccocarpa* Cardot.

Shrubs or trees, 5–15 m tall. Branchlets purplish red but purplish black with age, puberulous when young, glabrescent, with prominent suborbicular to rarely shortly ellipsoid lenticels. Winter buds brown, ovoid, 2–5 mm, apex acute; scale margins ciliate. Petiole 2–8 mm, glabrous, without nectaries; leaf blade elliptic to oblong, 5–12 × 2–4 cm, thickly leathery, both surfaces glabrous, abaxially scattered purplish black minutely punctate and with or sometimes without 2–4 larger flat nectaries near basal margin, adaxially lustrous, base cuneate, margin entire or rarely with a few teeth, apex acute to shortly acuminate; secondary veins 7–11 on either side of midvein; tertiary veins very indistinct on both surfaces or abaxially nearly invisible. Racemes in leaf axils, solitary, 3–9 cm, more than 10-flowered; rachis glabrous; bracts 2–4 mm, soon caducous, margin ciliate, basal ones sterile, hard and dark, and longer persistent. Flower 5–6 mm in diam. Pedicel 3–8 mm, glabrous. Hypanthium campanulate, 1–2 mm, outside glabrous. Sepals ovate-triangular, 1–2 mm, outside glabrous, apex obtuse to acute. Petals white, suborbicular, glabrous. Stamens 25–40, 3–4 mm. Ovary glabrous. Style to 4 mm, glabrous. Drupe blackish brown, elongately ovoid-globose to ellipsoid, 9–14 × 6–8 mm, glabrous; endocarp thin, slightly reticulately rugose. Fl. Mar–Apr, fr. May–Aug.

Forests, slopes, foothills, river banks; 600–1800 m. Guangdong, Guangxi [Cambodia, Vietnam].

3. *Laurocerasus hypotracha* (Rehder) T. T. Yu & L. T. Lu,
 Bull. Bot. Res., Harbin 4(4): 44. 1984.

毛背桂樱 mao bei gui ying

Prunus hypotricha Rehder in Sargent, Pl. Wilson. 3: 425. 1917; *P. macrophylla* Siebold & Zuccarini var. *puberifolia* Koehne.

Trees 5–15 m tall. Branchlets brownish to grayish brown, yellowish gray pubescent, with inconspicuous small lenticels. Petiole 6–10 mm, pubescent, glabrescent, with a pair of large flat nectaries apically from middle; leaf blade elliptic to elliptic-oblong, 10–18 × (4–)5–7 cm, leathery, abaxially densely gray pubescent, adaxially lustrous and glabrous, base rounded to broadly cuneate, margin ± densely coarsely serrate and teeth with a dark brown apical gland, apex shortly acuminate; secondary veins 10–12 on either side of midvein, prominent, abaxially raised. Racemes usually solitary, sometimes 2 or 3 in a fascicle, 2–5 cm; rachis pubescent; bracts ovate-lanceolate, 5–6 mm, soon caducous, pubescent. Flowers 5–6 mm in diam. Pedicel 4–10 mm, pubescent. Hypanthium campanulate to cup-shaped, outside pubescent. Sepals ovate-triangular, outside pubescent, apex obtuse. Petals suborbicular to broadly obovate, 4–5 mm in diam. Stamens 20–30, longer than petals. Ovary pubescent. Style slightly longer than stamens. Drupe dark brown, ovoid-oblong, 2–2.5 × 1–1.2 cm, glabrous, apex acute; endocarp slightly compressed, ± thin, fragile. Fl. Sep–Oct, fr. Nov–Dec.

• Sparse forests, slopes, mountain valleys, stream sides; 200–2600 m. Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, Sichuan, Yunnan.

4. *Laurocerasus menghaiensis* T. T. Yu & L. T. Lu, Bull. Bot. Res., Harbin 4(4): 45. 1984.

勐海桂櫻 meng hai gui ying

Trees to 14 m tall. Branchlets purplish brown, robust, yellowish pubescent when young, glabrescent, with many small lenticels. Petiole stout, 1–1.5 cm, yellowish pubescent, without nectaries; leaf blade ovate-oblong to oblong, 8–13 × 3–5 cm, thick, leathery, abaxially densely yellowish pubescent, adaxially shining and glabrous, base broadly cuneate, margin indistinctly shallowly obtusely serrate apically from middle, apex acute; secondary veins 7–11 on either side of midvein, distinct. Flowers unknown. Drupe blackish brown, broadly oblong, 2.2–2.5 × 1.4–1.7 cm, glabrous, apex obtuse; endocarp ± thin, not rugose; cotyledons large and fat. Fr. winter.

• Mixed forests; ca. 1800 m. SW Yunnan (Menghai Xian).

5. *Laurocerasus undulata* (Buchanan-Hamilton ex D. Don) M. Roemer, Fam. Nat. Syn. Monogr. 3: 92. 1847.

尖叶桂櫻 jian ye gui ying

Prunus undulata Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 239. 1825; *Cerasus acuminata* Wallich; *C. undulata* (Buchanan-Hamilton ex D. Don) Seringe; *C. wallichii* (Stuedel) M. Roemer; *Laurocerasus acuminata* (Wallich) M. Roemer; *L. undulata* (Buchanan-Hamilton ex D. Don) f. *elongata* (Koehne) T. T. Yu & L. T. Lu; *L. undulata* f. *microbotrys* (Koehne) T. T. Yu & L. T. Lu; *L. undulata* f. *pubigera* T. T. Yu & L. T. Lu; *P. acuminata* (Wallich) D. Dietrich; *P. acuminata* f. *elongata* Koehne; *P. acuminata* f. *microbotrys* (Koehne) Koehne; *P. microbotrys* Koehne; *P. microbotrys* var. *obovata* S. Y. Hu; *P. wallichii* Stuedel; *P. wallichii* var. *crenulata* F. P. Metcalf.

Shrubs or trees, 5–16 m tall. Branchlets grayish brown to purplish brown, glabrous, with indistinct small lenticels. Petiole 5–10(–12) mm, glabrous, without nectaries; leaf blade elliptic to oblong-lanceolate, 6–15 × 3–5 cm, herbaceous to thinly leathery, both surfaces glabrous, abaxially usually with a pair of small flat nectaries near base and sometimes additional small nectaries in many rows ± parallel to midvein especially in basal part of leaf, adaxially shiny, base broadly cuneate to sub-rounded, margin entire or rarely with a few teeth apically from middle, apex acuminate; secondary veins 6–9 on either side of midvein, spreading and arched, abaxially slightly raised. Racemes solitary or 2–4 in a fascicle, 5–10 cm, 10–30-flowered or more; rachis glabrous, rarely slightly pubescent; bracts 1–2 mm, soon caducous, basal ones sometimes with a tridentate apex. Pedicel 2–5 mm, glabrous, rarely slightly pubescent. Hypanthium broadly campanulate, outside glabrous. Sepals ovate-triangular, outside glabrous, apex obtuse. Petals yellowish white, elliptic to obovate, 2–4 mm. Stamens 10–30, 3–4 mm. Ovary pubescent. Style shorter than stamens. Drupe purplish black, ovoid-globose to ellipsoid, 1–1.6 × 0.7–1.1 cm, glabrous, apex acute to ± obtuse; endocarp ± thin, ± smooth. Fl. Aug–Oct, fr. winter–spring.

Slopes in broad-leaved evergreen and mixed coniferous forests, stream sides; 500–3600 m. Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan [Bangladesh, Bhutan, E India, Indonesia, N Laos, N Myanmar, Nepal, Sikkim, N Thailand, Vietnam].

6. *Laurocerasus andersonii* (J. D. Hooker) T. T. Yu & L. T. Lu, Bull. Bot. Res., Harbin 4(4): 48. 1984.

云南桂櫻 yun nan gui ying

Pygeum andersonii J. D. Hooker, Fl. Brit. India 2: 320. 1878; *Prunus pygeoides* Koehne; *P. semiarmillata* Koehne.

Trees, rarely shrubs, to 6 m tall. Branchlets brown to grayish brown, glabrous. Petiole 0.7–1.5 cm, glabrous; leaf blade oblong to ovate-oblong, 6–16 × 2–4 cm, thinly leathery, both surfaces glabrous, base broadly cuneate to subrounded and with 1 to several small nectaries per side, margin sparsely and shallowly serrulate and teeth with a black apical gland, apex acute to shortly acuminate; secondary veins 8–12 on either side of midvein, slightly prominent. Racemes axillary, solitary, 2–5 cm, several to 10-flowered or more; rachis glabrous; bracts to 2 mm, soon caducous, basal ones often sterile and with a tridentate apex. Flowers 3–5 mm in diam. Pedicel 3–6 mm, glabrous; bracteoles present at base of pedicel. Hypanthium campanulate, outside glabrous. Sepals triangular, 1–2 mm, outside glabrous, apex obtuse. Petals white, elliptic, slightly longer than sepals, puberulous. Stamens 25–30, 2–3 mm. Ovary glabrous, slightly shorter than stamens. Drupe globose to compressed globose, 7–10 × 8–10 mm, glabrous; endocarp glabrous, inconspicuously reticulately rugose. Fl. Jul–Aug, fr. winter.

Rocky forested slopes, ravines; 900–1500 m. SE Yunnan [India].

7. *Laurocerasus jenkinsii* (J. D. Hooker) Browicz, Arbor. Kórnickie 15: 5. 1970.

坚核桂櫻 jian he gui ying

Prunus jenkinsii J. D. Hooker & Thomson ex J. D. Hooker, Fl. Brit. India 2: 317. 1878.

Trees to 20 m tall. Branchlets reddish brown to blackish brown, glabrous, with sparse suborbicular small lenticels. Winter buds reddish brown, ovoid, 2–4 mm, glabrous. Petiole 5–10 mm, glabrous; leaf blade oblong to rarely obovate-oblong, (6–)8–16 × 2.5–5 cm, herbaceous to thinly leathery, both surfaces glabrous, abaxially paler and usually with a pair of purplish black basal nectaries near margin, adaxially shining, base broadly cuneate, margin sparsely and shallowly aciculary serrate or sometimes entire near base or basally from middle, apex shortly acuminate to caudate; secondary veins 10–14 on either side of midvein, abaxially raised, adaxially slightly prominent to somewhat impressed. Racemes axillary, solitary, 5–9 cm; rachis sparsely pubescent; bracts 2–2.5 mm, soon caducous, slightly pubescent, basal ones usually sterile, dark, hard, and tridentate at apex. Pedicel 2–3 mm, sparsely pubescent. Hypanthium shortly campanulate, 1.5–2 mm, outside slightly pubescent. Sepals ovate-triangular, 1–2 mm, outside slightly pubescent, margin ciliate. Petals white, suborbicular, 2–3 mm in diam., glabrous. Stamens 20–30, 4–5 mm, glabrous. Ovary glabrous. Style slightly longer than or nearly as long as stamens. Drupe dark brown, broadly ellipsoid to obovoid-globose, 1.7–2 × 1.4–1.6 cm, glabrous, narrowed towards base and apex but apex more obtuse; endocarp thick and hard, prominently coarsely reticulately rugose. Fl. autumn, fr. winter-spring.

Forests, mountain regions, ravines; 1000–1800 m. SW Yunnan [Bangladesh, Bhutan, N India, N Myanmar].

8. *Laurocerasus zippeliana* (Miquel) Browicz, *Arbor. Kórnickie* 15: 6. 1970.

大叶桂樱 da ye gui ying

Prunus zippeliana Miquel, *Fl. Ned. Ind.* 1: 367. 1855; *Laurocerasus macrophylla* C. K. Schneider; *L. zippeliana* var. *crassistyla* (Cardot) T. T. Yu & L. T. Lu; *P. kanehirae* Hayata ex Hisauchi; *P. macrophylla* Siebold & Zuccarini (1845) not Poiret (1816); *P. macrophylla* Siebold & Zuccarini var. *crassistyla* Cardot; *P. oxycarpa* (Hance) Maximowicz; *P. zippeliana* f. *angustifolia* T. T. Yu & L. T. Lu; *P. zippeliana* var. *crassistyla* (Cardot) J. E. Vidal; *Pygeum oxycarpum* Hance.

Trees 10–25(–30) m tall. Branchlets brown, grayish brown, or blackish brown, glabrous, with distinct suborbicular small lenticels. Petiole 1–2 cm, stout, glabrous, with a pair of flat basal nectaries; leaf blade narrowly elliptic-lanceolate, oblong-lanceolate, broadly ovate, elliptic-oblong, or broadly oblong, (5–)6–19 × (1.5–)2–8 cm, leathery, both surfaces glabrous, abaxially greenish, adaxially dark green, base broadly cuneate to subrounded, margin with sparse to dense coarse black glandular serration, apex acute to shortly acuminate; secondary veins 7–13 on either side of midvein, abaxially prominent, adaxially flat to slightly impressed. Racemes solitary or to 4 in a fascicle, 2–6 cm, pubescent; bracts 2–3 mm, puberulous, proximal fertile ones often apically tridentate, basal ones often sterile, stout, glabrous, and conspicuously tripartite at apex. Flowers 5–9 mm in diam. Pedicel 1–3 mm, pubescent. Hypanthium campanulate, ca. 2 mm. Sepal ovate-triangular, 1–2 mm, outside sparsely pubescent, apex obtuse to rarely acute. Petals white, suborbicular, 2–4 mm, margin usually ciliate.

Stamens 20–25, 4–6 mm. Ovary glabrous. Style to 4 mm, glabrous. Drupe blackish brown, oblong to ovoid-oblong, 1.8–2.4 × 0.8–1.1 cm, glabrous, apex acute and mucronate; endocarp glabrous, slightly reticulately rugose. Fl. Jul–Oct, fr. winter.

Mixed forests, thickets, calcareous mountain regions; 400–2400 m. Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, N Vietnam].

9. *Laurocerasus spinulosa* (Siebold & Zuccarini) C. K. Schneider, *Ill. Handb. Laubholz*. 1: 649. 1906.

刺叶桂樱 ci ye gui ying

Prunus spinulosa Siebold & Zuccarini, *Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss.* 4(2): 122. 1845; *P. balfourii* Cardot; *P. limbata* Cardot; *P. spinulosa* Siebold & Zuccarini var. *pubiflora* Koehne; *P. sundaica* Miquel.

Trees to 20 m tall, rarely shrubs. Branchlets purplish brown to blackish brown, glabrous or puberulous when young, glabrescent. Winter buds dark brown, ovoid; scales hard, margin ciliate, apex tridentate. Petiole 5–10(–15) mm, glabrous; leaf blade oblong to obovate-oblong, 5–10 × 2–4.5 cm, herbaceous to thinly leathery, abaxially pale green and with 1 or 2 pairs of basal nectaries or on border of blade and petiole, both surfaces glabrous, adaxially bright green, base broadly cuneate to subrounded and often unequal, margin undulate and with a few acicular teeth apically from middle to near apex, apex acuminate to caudate; secondary veins 8–14 on either side of midvein, slightly prominent. Racemes axillary, solitary, 5–10 cm, 10–20-flowered or more; rachis thinly pubescent; bracts 2–3 mm, soon caducous, basal ones usually sterile, hard, dark, and more persistent. Flowers 3–5 mm in diam. Pedicel 1–4 mm, thinly pubescent. Hypanthium campanulate to cup-shaped, outside glabrous or puberulous. Sepals ovate-triangular, 1–2 mm, outside glabrous or puberulous, apex obtuse. Petals white, orbicular, 2–3 mm in diam., glabrous. Stamens 25–35, 4–5 mm; filaments glabrous. Ovary glabrous. Style slightly shorter than stamens. Drupe brown to blackish brown, ellipsoid, 8–11 × 6–8 mm, glabrous; endocarp thin, smooth. Fl. Sep–Oct, fr. Nov–Mar.

Sunny forested slopes, broad-leaved evergreen forests along rivers, mountain valleys; 400–1500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Japan].

10. *Laurocerasus dolichophylla* T. T. Yu & L. T. Lu, *Bull. Bot. Res.*, Harbin 4(4): 50. 1984.

长叶桂樱 chang ye gui ying

Trees to 20 m tall. Branchlets grayish brown to purplish brown, glabrescent, with sparse small lenticels. Petiole 6–8 mm, glabrous, without nectaries; leaf blade narrowly oblong to obovate-oblong, 9–14 × 2.5–4.5 cm, thickly leathery, both surfaces glabrous, abaxially paler and usually without basal nectaries, adaxially shining, base cuneate and asymmetric, margin coarsely acutely serrate with teeth incurved, apex acute to shortly acuminate; secondary veins 10–14 on either side of midvein, abaxially raised, adaxially impressed. Racemes axillary, solitary, 7–9 cm, 10–20-flowered or more; rachis yellowish brown

pubescent; bracts small, soon caducous. Flowers 5–7 mm in diam. Pedicel 5–8 mm, yellowish brown pubescent. Hypanthium campanulate, 2–3 mm, outside yellowish brown pubescent. Sepals ovate-triangular, ca. 2 mm, outside yellowish brown pubescent, apex obtuse. Petals white, suborbicular to obovate, 2–3 mm, glabrous. Stamens 20–30, 4–5 mm. Ovary glabrous. Style slightly longer than or nearly as long as stamens. Drupe blackish brown, ovoid-globose, 1.2–1.4 × 0.9–1.1 cm, glabrous; endocarp thin, smooth. Fl. Aug–Sep, fr. Dec–Jan.

• Stony forested slopes; 1300–1500 m. SE Yunnan (Malipo Xian, Xichou Xian).

11. *Laurocerasus australis* T. T. Yu & L. T. Lu, Bull. Bot. Res., Harbin 4(4): 51. 1984.

南方桂櫻 nan fang gui ying

Shrubs or trees, 3–4 m tall. Branchlets grayish brown to purplish brown, glabrous, with small lenticels. Petiole slender, 5–7 mm, glabrous, usually without nectaries, rarely with a pair of minute nectaries apical from middle; leaf blade elliptic, 4.5–9 × 2–3.5 cm, leathery, both surfaces glabrous, base cuneate, margin densely and minutely obtusely serrate and teeth with a small purplish black apical gland, apex acute to shortly acuminate; secondary veins 5–7 on either side of midvein, slightly prominent. Racemes axillary, solitary, 4–5 cm, 10-flowered or more; rachis pubescent; bracts small, soon caducous. Flowers 5–6 mm in diam. Pedicel 4–6 mm, pubescent. Hypanthium campanulate, outside puberulous. Sepals ovate-triangular, outside puberulous. Petals white, obovate to suborbicular, longer than sepals. Stamens 15–20, longer than petals. Ovary glabrous. Style nearly as long as to slightly longer than stamens. Drupe blackish brown, ellipsoid to ovoid-ellipsoid, ca. 1 cm, glabrous, apex acute; endocarp very thin. Fl. summer–autumn, fr. winter–spring.

• Sparse slope forests, dense mountain top forests; ca. 800 m; W Guangxi (Debao Xian), SW Guizhou (Wangmo Xian).

12. *Laurocerasus marginata* (Dunn) T. T. Yu & L. T. Lu, Bull. Bot. Res., Harbin 4(4): 52. 1984.

全缘桂櫻 quan yuan gui ying

Prunus marginata Dunn, J. Bot. 45: 402. 1907.

Trees or shrubs, 4–6 m tall. Branchlets grayish brown to

blackish brown, densely yellowish brown pubescent when young, glabrescent or hairs persistent, sparsely covered with inconspicuous suborbicular lenticels. Winter buds dark brown, ovoid, 2–4 mm, apex obtuse to acute; scale margins ciliate. Petiole 1–5 mm, glabrous; leaf blade oblong to obovate-oblong, 5–7(–9) × 1.5–3(–4) cm, thickly leathery, both surfaces glabrous, abaxially greenish and with or without 2 basal nectaries, adaxially lustrous green, base narrowly cuneate and asymmetric, margin flat, entire, and hard, apex acuminate and obtusely mucronate; secondary veins indistinct. Racemes axillary, solitary, 2–3(–4) cm, several-flowered; rachis densely pubescent; bracts small, soon caducous. Flowers 2–3 mm in diam. Pedicel 1–3 mm, densely pubescent. Hypanthium campanulate to cup-shaped, ca. 2 mm, outside glabrous or puberulous. Sepals ovate to ovate-lanceolate, slightly shorter than hypanthium, outside glabrous or puberulous, apex obtuse to acute. Petals white, suborbicular to obovate, 2–3 mm. Stamens 25–30, longer than petals. Ovary glabrous. Style nearly as long as stamens. Drupe dark brown blackish brown, ovoid-globose, 10–12 × 7–9 mm, glabrous; endocarp very thin, thinly reticulately rugose when mature. Fl. spring, fr. autumn–winter.

• Mountain top forests, thickets, sunny slopes, along trails, ravines; 500–700 m. Guangdong.

13. *Laurocerasus aquifolioides* Chun ex T. T. Yu & L. T. Lu, Bull. Bot. Res., Harbin 4(4): 52. 1984.

冬青叶桂櫻 dong qing ye gui ying

Shrubs to 4 m tall. Branchlets grayish brown to grayish black, yellowish brown pubescent when young, glabrescent, with inconspicuous small lenticels. Petiole 1–4 mm, glabrous; leaf blade elliptic to ovate-orbicular, 2–5(–6) × 1.5–3 cm, thickly leathery, both surfaces glabrous, abaxially paler and with or rarely without 2 basal nectaries on margin, adaxially dark and shining, base broadly cuneate to rounded, margin sparsely acutely serrate to nearly entire, apex obtuse to obtusely mucronate; secondary veins inconspicuous. Flowers not seen. Fruiting racemes axillary, solitary, 1–3 cm, with several fruit. Pedicels 2–3 mm, pubescent. Drupe brownish black, subglobose, ca. 1 cm and nearly as broad, glabrous; endocarp ± thin, smooth. Fr. Sep–Oct.

• Mixed or dense forests, mountain valleys; 500–700 m. C and N Guangdong (Qingyuan Xian, Ruyuan Xian).

54. **PYGEUM** Gaertner, Fruct. Sem. Pl. 1: 218. 1788.

臀果木属 tun guo mu shu

Lu Lingdi (陆玲娣 Lu Ling-ti); Bruce Bartholomew

Trees or shrubs, evergreen. Branches unarmed. Stipules small, free, soon caducous, rarely persistent. Leaves simple, alternate, petiolate; leaf blade abaxially with a pair of flat to depressed nectaries near base and additional nectaries sometimes near margin, margin entire or very rarely minutely serrulate. Racemes axillary, solitary or sometimes several in a fascicle, unbranched or branched; bracts small, soon caducous, very rarely persistent after anthesis. Flowers bisexual or unisexual by want of ovary, sometimes polygamo-dioecious. Hypanthium obconic, campanulate, or cyathiform, caducous at fruiting time, only annular base remained. Perianth segments 5–10(–14), small. Sepals and petals often similar but sometimes distinct in shape and texture. Petals white, as many as sepals, very rarely absent, usually 1.5–2 × as long as sepals. Stamens 10–30(–85), in 1 to many series; filaments filiform. Ovary superior, 1-loculed, glabrous or hairy; ovules 2, collateral, pendulous. Style terminal; stigma capitate. Fruit a drupe, dry, usually transversely oblong to ellipsoid, obscurely didymous, sometimes subglobose to oblong and distinctly longer than wide; endocarp cartilaginous.

About 40 species; tropical Africa, S and SE Asia, NE Australia, New Guinea, Pacific Islands; six species (all endemic) in China.

Pygeum griseum Blume ex Müller Stuttgart (*Prunus grisea* (Blume ex Müller Stuttgart) Kalkman) was reported from Lan Yu off the coast of SE Taiwan by Ohashi (Fl. Taiwan, ed. 2, 3: 98–100. 1993, as *Prunus grisea*). The species is not included in this treatment because the present authors have seen no Chinese specimens.

- 1a. Leaf blade secondary veins 9–14 on either side of midvein.
 2a. Bracts ovate to triangular-ovate, persistent at anthesis; ovary densely pubescent; drupe ovoid-globose 1. *P. henryi*
 2b. Bracts lanceolate to linear-lanceolate, caducous at anthesis; ovary often glabrous; drupe compressed globose to transversely shortly oblong 3. *P. wilsonii*
- 1b. Leaf blade secondary veins 5–8(or 9) on either side of midvein.
 3a. Drupe wider than long.
 4a. Leaf blade ovate-elliptic to elliptic, apex shortly acuminate and with an apical obtuse tip; racemes 4–7 cm; drupe reniform, apically depressed, 0.8–1 cm 2. *P. topengii*
 4b. Leaf blade ovate-lanceolate to lanceolate, apex acuminate to caudate-acuminate; racemes 1.5–4 cm; drupe compressed ovoid-globose to transversely shortly oblong, 1.6–2 cm 5. *P. laxiflorum*
- 3b. Drupe as long as or longer than wide.
 5a. Leaf blade lanceolate, base cuneate, apex acuminate to caudate; drupe oblong 4. *P. oblongum*
 5b. Leaf blade elliptic to oblong-elliptic, base rounded, apex abruptly pointed; drupe compressed ovoid-globose 6. *P. macrocarpum*

1. *Pygeum henryi* Dunn, J. Linn. Soc., Bot. 35: 493. 1903.

云南臀果木 yun nan tun guo mu

Trees 6–15 m tall. Branchlets grayish brown to grayish black, reddish brown pubescent when young, glabrescent, with distinct orbicular lenticels. Winter buds brown, small, ovoid, pubescent. Petiole ca. 1 cm, reddish brown pubescent; leaf blade oblong-lanceolate to rarely elliptic, 9–17 × 4–7 cm, leathery, both surfaces reddish brown appressed pubescent when young, abaxially with distinct hollowed nectaries near base, adaxially glabrescent, base broadly cuneate to rounded, margin entire, apex shortly acuminate to acute; secondary veins 9–12 on either side of midvein, abaxially raised. Racemes solitary to several in a fascicle, 3–6 cm; rachis, bracts, pedicels, hypanthia, and sepals densely reddish brown pubescent; bracts small, ovate to triangular-ovate, persistent at anthesis. Flowers 2–4 mm in diam. Pedicel 1–2 mm. Hypanthium cyathiform, 1.5–2.5 mm. Sepals 5 or 6, narrowly triangular, slightly shorter than hypanthium. Petals as many as sepals, narrowly oblong, often indistinguishable from sepals although petals slightly longer. Stamens 20–30, longer than petals. Ovary densely pubescent. Style slightly shorter than stamens. Drupe dark brown, ovoid-globose, 7–10 mm and ± as broad, pubescent when young, glabrescent. Fl. Aug–Sep, fr. winter–spring.

• Foothill mixed forests, thickets, mountain valleys; 600–2000 m. Yunnan.

2. *Pygeum topengii* Merrill, Philipp. J. Sci. 15: 237. 1919.

臀果木 tun guo mu

Pygeum tokangpengii Merrill.

Trees to 25 m tall. Bark dark gray to grayish brown. Branchlets dark brown, brown pubescent when young, glabrescent, with orbicular small lenticels. Winter buds ovoid, 2.5–5 mm, brown pubescent, apex acute. Petiole 5–8 mm, brown pubescent; leaf blade ovate-elliptic to elliptic, 6–12 × 3–5.5 cm, leathery, abaxially brown appressed pubescent and more densely so along midvein and secondary veins but glabrescent or only very sparsely pubescent and with 2 black nectaries near base, adaxially lustrous and glabrous, base broadly cuneate and

asymmetric, margin entire, apex shortly acuminate and with an apical obtuse tip; secondary veins 5–8 on either side of midvein, abaxially raised. Racemes solitary or to several in a fascicle, 4–7 cm, many flowered; rachises, pedicels, bracts, hypanthia, and sepals densely brown pubescent; bracts small, ovate-lanceolate to lanceolate, soon caducous. Flowers 2–3 mm in diam. Pedicel 1–3 mm. Hypanthium obconic, 2–2.5 mm. Sepals 5 or 6, triangular-ovate, 1–2 mm; apex acute. Petals as many as sepals, oblong, slightly longer than sepals or indistinguishable from sepals, outside brown pubescent, apex ± obtuse. Ovary glabrous. Drupe dark brown, reniform, 0.8–1 × 1–1.6 cm, glabrous, apically depressed. Fl. Jun–Sep, fr. winter.

• Forests, forest margins, abandoned fields, mountain valleys, along trails, stream sides; 100–1600 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Yunnan.

3. *Pygeum wilsonii* Koehne, Bot. Jahrb. Syst. 52: 334. 1915.

西南臀果木 xi nan tun guo mu

Trees 8–24 m tall. Branchlets grayish brown, brown pubescent, glabrescent, lenticellate. Petiole 7–10 mm, densely brown pubescent; leaf blade oblong to ovate-oblong, 10–39 × 4–15 cm, papery to subleathery, abaxially persistent brown appressed pubescent and usually with 2 nectaries near base, adaxially initially brown pubescent along veins but glabrescent, base rounded to broadly cuneate, margin entire, apex acuminate; secondary veins 10–14 on either side of midvein, abaxially elevated. Racemes axillary, solitary to several in a fascicle, more than 10-flowered; rachises, pedicels, bracts, hypanthia, and sepals densely brown pubescent; bracts lanceolate to linear-lanceolate, soon caducous. Flowers 2–3 mm in diam. Pedicel 1–3 mm, 5–12 mm in fruit and sparsely brown pubescent. Hypanthium campanulate. Sepals 5, oblong, 1–2 mm. Petals 5, spatulate-oblong, slightly longer than sepals or resembling sepals. Stamens 24–30. Ovary often glabrous. Drupe black when dry, compressed globose to transversely shortly oblong, 0.9–1 × 1–1.5 cm, glabrous, apex usually slightly abruptly pointed. Fl. Aug–Sep, fr. Nov–Dec.

• Foothill mixed forests, forested slopes, thickets on slopes; 900–1700 m. Sichuan, Xizang, Yunnan.

- 1a. Leaf blade \pm thin, 10–18 \times 4–7 cm; fruiting pedicel 5–7 mm 3a. var. *wilsonii*
 1b. Leaf blade \pm thick, 19–39 \times 8–15 cm; fruiting pedicel 7–12 mm 3b. var. *macrophyllum*

3a. *Pygeum wilsonii* var. *wilsonii*

西南臀果木(原变种) xi nan tun guo mu (yuan bian zhong)

Leaf blade \pm thin, 10–18 \times 4–7 cm. Fruiting pedicel 5–7 mm.

• Foothill mixed forests, thickets on slopes; 900–1200 m. Sichuan, Xizang, Yunnan.

3b. *Pygeum wilsonii* var. *macrophyllum* L. T. Lu, Acta Bot. Yunnan. 10: 363. 1988.

大叶臀果木 da ye tun guo mu

Leaf blade \pm thick, 19–39 \times 8–15 cm. Fruiting pedicel 7–12 mm.

• Forested slopes; ca. 1700 m. SE Xizang (Mêdog Xian).

4. *Pygeum oblongum* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 23: 213. 1985.

长圆臀果木 chang yuan tun guo mu

Trees to 4 m tall. Branchlets grayish brown to dark purplish brown, reddish brown pubescent when young, glabrescent, with few inconspicuous small lenticels. Petiole 8–10 mm, densely reddish brown pubescent; leaf blade lanceolate, 8–13 \times 2–3.5 cm, subleathery to leathery, abaxially densely reddish brown pubescent, not glabrescent, and without or rarely with 2 flat nectaries near base, adaxially glabrous, base cuneate, margin entire, apex acuminate to caudate; secondary veins 6–8 on either side of midvein, abaxially raised. Racemes axillary, solitary or to 3 in a fascicle, 1.5–3 cm; rachises, pedicels, hypanthia, and sepals reddish brown pubescent; bracts ovate-lanceolate to lanceolate, 1–2 mm, undivided, soon caducous. Flowers 2–3 mm in diam. Pedicel 1–2 mm. Hypanthium cup-shaped. Sepals 5, triangular-lanceolate, 1–1.5 mm, apex acuminate. Petals 5, oblong, nearly as long as sepals, sometimes almost indistinguishable from sepals, apex obtuse. Stamens more than 10. Ovary glabrous. Drupe dark purplish brown, oblong, 1.6–2 \times 1–1.2 cm, glabrous. Fl. Sep–Oct, fr. winter–spring.

• Evergreen broad-leaved forests, dense mountain forests; 2000–2100 m. SE Yunnan (Jinping Xian, Pingbian Xian).

5. *Pygeum laxiflorum* Merrill ex H. L. Li, J. Arnold Arbor. 26: 64. 1945.

疏花臀果木 shu hua tun guo mu

Trees 7–20 m tall. Bark dark gray. Branchlets blackish brown to dark purplish brown, pubescent when young, glabrescent, with prominent small lenticels. Winter buds ovoid, 2–4 mm, brown pubescent, apex obtuse to acute. Petiole 6–10 mm, glabrous or sparsely pubescent; leaf blade ovate-lanceolate to lanceolate, 7–10 \times 2–3.5 cm, papery to subleathery, abaxially paler, glabrous or slightly pubescent when young, glabrescent, and with or without 2 flat nectaries near base, adaxially greenish brown and glabrous, base cuneate, margin entire, apex acuminate to caudate-acuminate; secondary veins 5–8 on either side of midvein, slender, abaxially slightly raised. Racemes axillary, solitary or to 3 in a fascicle, 1.5–4 cm, with loose flowers; rachis and pedicels brown pubescent, glabrescent or with persistent hairs; bracts small, soon caducous. Flowers 1–3 mm in diam. Pedicel 1–3 mm. Hypanthium campanulate to obconic, ca. 2 \times 3 mm, outside brown pubescent. Sepals 5, triangular-ovate, 0.5–1 mm, outside brown pubescent, apex acute to shortly acuminate. Petals 5, oblong, slightly longer than sepals but sometimes resembling them, apex obtuse. Stamens 15–25, 4–6 mm, glabrous. Ovary glabrous. Style ca. 3 mm. Drupe dark purplish brown, compressed ovoid-globose to transversely shortly oblong, 7–10 \times 9–12 mm, glabrous. Fl. Aug–Oct, fr. Nov–Dec.

• Forests on stream banks, foothills; 100–700 m. Guangdong, Guangxi.

6. *Pygeum macrocarpum* T. T. Yu & L. T. Lu, Acta Phytotax. Sin. 23: 213. 1985.

大果臀果木 da guo tun guo mu

Pygeum latifolium Miquel var. *macrocarpum* (T. T. Yu & L. T. Lu) C. Y. Wu & H. Chu.

Trees 8–10 m tall. Branchlets purplish brown to dark grayish brown, brown pubescent when young, glabrescent, with many distinct lenticels. Petiole 1–1.2 cm, pubescent when young, glabrescent; leaf blade elliptic to oblong-elliptic, 10–18 \times 5–9 cm, papery to subleathery, abaxially paler, sparsely brown pubescent along veins, glabrescent, and with or without 2 flat nectaries near base, adaxially greenish brown and glabrescent, base rounded, margin entire, apex abruptly short pointed; secondary veins 6–8 on either side of midvein, abaxially conspicuously raised. Racemes solitary or to 3 in a fascicle; rachises, pedicels, hypanthia, and sepals brown pubescent. Drupe purplish brown, compressed ovoid-globose, 1.5–1.8 cm and \pm as broad as to slightly broader than long, glabrous, apex acute; mesocarp sometimes splitting when ripe. Seed fragrant. Fl. Aug–Oct, fr. winter–spring.

• Forests, forest margins, deep ravines, stream sides; 500–1000 m. SE Yunnan (Jinping Xian, Malipo Xian).

55. MADDENIA J. D. Hooker & Thomson, Hooker's J. Bot. Kew Gard. Misc. 6: 381. 1854.

臭櫻属 chou ying shu

Gu Cuizhi (谷粹芝 Ku Tsue-chih); Bruce Bartholomew

Trees or shrubs, deciduous, polygamous dioecious. Branches unarmed. Winter buds large, oblong to ovoid, with several scales. Stipules large, persistent, margin glandular. Leaves alternate, simple; leaf blade margin with gland-tipped simple, double, or incised teeth. Inflorescences inserted apically on branchlets, racemose, many flowered; bracts soon caducous. Pedicel short. Hypanthium campanulate. Sepals and petals essentially identical. Perianth segments 10–12, to 3 mm. Stamens 20–40, in 2 whorls, irregularly inserted on rim of hypanthium. Bisexual flowers: ovary superior, (1 or)2-loculed, glabrous; ovules 2 per locule, parallel, pendulous;

style terminal, slender, \pm as long as stamens; stigma disk-shaped. Female flowers: stamens reduced to staminodes; carpels 2; ovary glabrous; style much shorter than staminodes; stigma capitate. Fruit a 1- or 2-seeded drupe, oblong, \pm flat; mesocarp thin, fleshy, not splitting when ripe; endocarp bony, ovoid, 3-angled, apex acute.

About seven species: Bhutan, China, Nepal, Sikkim; six species (five endemic) in China.

- 1a. Leaf blade abaxially glabrous; branchlets glabrous or pubescent.
 2a. Leaf blade abaxially whitish, glaucous, margin irregularly simply serrate or doubly serrate; secondary veins 14–18 on each side of midvein 1. *M. hypoleuca*
 2b. Leaf blade abaxially green, not glaucous, margin doubly serrate or incised doubly serrate; secondary veins 9–15 on each side of midvein.
 3a. Branchlets densely pubescent; leaf blade 5–10(–15) \times 3–5(–8) cm, margin incised doubly serrate 2. *M. incisoserrata*
 3b. Branchlets sparsely pubescent; leaf blade 4–5 \times 2–2.5 cm, margin not incised doubly serrate 3. *M. fujianensis*
 1b. Leaf blade abaxially densely pubescent at least on veins; branchlets densely pubescent.
 4a. Branchlets of first year's growth villous; winter buds purplish red; hypanthium villous; style \pm as long as stamens 6. *M. himalaica*
 4b. Branchlets of first year's growth pubescent or tomentose-pubescent; winter buds purplish brown; hypanthium pubescent; style longer than stamens.
 5a. Winter bud scales to 2 \times 1 cm; stipules linear to lanceolate, herbaceous; inflorescence bracts lanceolate to ovate-lanceolate 4. *M. hypoxantha*
 5b. Winter bud scales to 1.5 \times 0.8 cm; stipules lorate-lanceolate, membranous; inflorescence bracts oblong 5. *M. wilsonii*

1. *Maddenia hypoleuca* Koehne in Sargent, Pl. Wilson. 1: 56. 1911.

臭樱 chou ying

Trees 2–7 m tall. Branches purple, glabrous, lustrous; branchlets of first year's growth purplish red or greenish, pubescent, glabrescent. Winter buds purple, ovoid; scales to 10 \times 8 mm, outside glabrous. Stipules lanceolate, ca. 1.5 cm, herbaceous, margin basally glandular serrate and apically entire, apex long acuminate. Petiole 2–4 mm, glabrous or apically pubescent when young; leaf blade ovate-oblong, oblong, or elliptic, 4–9(–15) \times 2–4(–8) cm, both surfaces glabrous, abaxially whitish and glaucous, adaxially dark green, base subcordate, rounded, or rarely broadly cuneate, margin irregularly simply serrate or biserrate, apex acuminate to caudate; midvein and secondary veins prominent; secondary veins 14–18 on either side of midvein. Racemes 1.7–5 cm; peduncle glabrous; bracts triangular-lanceolate, margin basally glandular serrate and apically entire, apex acuminate. Bisexual flowers 2–4 mm in diam. Pedicel 2–4 mm, glabrous but densely brown villous in fruit. Perianth segments oblong, ca. 3 mm, persistent in fruit, margin entire, apex acute. Stamens 30–35. Ovary glabrous. Style slender, longer than stamens, persistent in fruit; stigma oblique. Drupe purplish black, ovoid, ca. 8 mm in diam., apex acute. Fl. Apr, fr. Jun.

• Sparse forests on slopes; 1000–1800 m. Chongqing (Wushan Xian), Gansu, Henan, W Hubei, Hunan, Ningxia, Shaanxi.

2. *Maddenia incisoserrata* T. T. Yu & T. C. Ku, Acta Phytotax. Sin. 23: 214. 1985.

锐齿臭樱 rui chi chou ying

Shrubs 2–5 m tall. Branches blackish to purplish black, glabrous; branchlets of first year's growth reddish brown, densely brown pubescent, glabrescent. Winter buds reddish brown, oblong to ovoid; scales to 1.5 \times 0.8 cm, outside pubescent. Stipules lanceolate to linear, ca. 1.5 cm, membranous, margin glandular serrate or basally glandular serrate and apically entire, apex acuminate. Petiole 2–3 mm, brown villous; leaf blade ovate-oblong to rarely elliptic, 5–10(–15) \times 3–5(–8)

cm, abaxially pale green, glabrous, and not glaucous, adaxially dark green and glabrous or occasionally sparsely appressed pubescent, base subrounded to broadly cuneate, margin incised and biserrate, apex acute to caudate; midvein and secondary veins yellowish, conspicuously prominent; secondary veins 10–15 on either side of midvein. Racemes 3–5 cm, dense; peduncle densely brown pubescent; bracts lanceolate to linear, membranous, margin glandular serrate or non-glandular. Bisexual flowers 2–4 mm in diam. Pedicel ca. 2 mm, densely brown pubescent, glabrescent. Perianth segments oblong, ca. 3 mm, soon caducous or base persistent in fruit, outside pubescent, inside subglabrous, margin entire, apex acute. Stamens 23–30. Ovary glabrous. Style slender, nearly as long as stamens; stigma oblique. Drupe black, ovoid, ca. 8 mm in diam., glabrous, apex acute. Fl. Apr–May, fr. Jun.

• Forests in valleys, slopes, scrub; 1100–2900 m. Anhui, Gansu, Guizhou, S Henan, Qinghai, Shaanxi, Shanxi, Sichuan, Zhejiang.

3. *Maddenia fujianensis* Y. T. Chang, Guihaia 5: 25. 1985.

福建假稠李 fu jian jia chou li

Shrubs 2–4 m tall, erect. Branches grayish green, glabrous; branchlets of first year's growth slightly pulverulently puberulous, glabrescent. Winter buds ovoid; scales several, imbricate, margin densely ciliate. Stipules linear, 1–1.5 cm, margin apically ciliate. Petiole 2–4 mm; leaf blade ovate, 4–5 \times 3–2.5 cm, abaxially pale green, glabrous or sometimes pubescent in vein axils, adaxially glabrous; secondary veins 9–12 on each side of midvein. Racemes lax; peduncle 3–5 cm. Pedicel pulverulently puberulous, glabrescent. Hypanthium campanulate, 2–2.5 \times 2.5–3 mm, glabrous. Sepals 10, slightly unequal, triangular, glabrous. Stamens 20–28. Ovary glabrous. Style shorter than stamens. Fruit unknown. Fl. Apr.

• Sparse forests; ca. 1700 m. N Fujian (Chong'an Xian).

4. *Maddenia hypoxantha* Koehne in Sargent, Pl. Wilson. 1: 57. 1911.

四川臭樱 si chuan chou ying

Shrubs 3–6 m tall. Branches purplish brown, glabrous, lustrous; branchlets of first year's growth yellowish brown, brown pubescent, glabrescent. Winter buds purplish brown, ovoid; scales to 2×1 cm, outside brown pubescent but glabrescent, margin basally glandular serrate. Stipules linear to lanceolate, 1–1.3 cm, herbaceous, margin basally glandular serrate and apically entire, apex acuminate. Petiole 2–7 mm, densely brown villous; leaf blade oblong to elliptic, $5-11 \times 2.5-5$ cm, abaxially yellowish green and densely brown pubescent on midvein and secondary veins, adaxially dull green and glabrous, base subrotund to broadly cuneate, margin biserrate or sometimes incised serrate, apex acute, acuminate, or shortly caudate; secondary veins 12–20 on either side of midvein. Racemes 3–5 cm; peduncle densely brown pubescent; bracts lanceolate to ovate-lanceolate, membranous, margin entire or indistinctly shallowly serrate. Bisexual flowers 2–4 mm in diam. Pedicel ca. 2 mm, to 3 mm in fruit, densely brown pubescent. Hypanthium outside pubescent. Perianth segments ovate, soon caducous, outside and inside pubescent, margin entire, apex acute. Stamens many. Ovary glabrous. Style slender, longer than stamens; stigma oblique. Drupe purple, ovoid, ca. 8 mm in diam., glabrous. Fl. Apr–May, fr. Jun. $2n = 32^*$.

• Shady valleys, scrub; 2100–3200 m. Qinghai, W Sichuan, Yunnan.

5. *Maddenia wilsonii* Koehne in Sargent, Pl. Wilson. 1: 58. 1911.

华西臭樱 hua xi chou ying

Trees or shrubs, 3–5 m tall. Branches purplish brown to brown, glabrous, lustrous; branchlets of first year's growth yellowish brown, densely yellowish brown tomentose-pubescent, glabrescent. Winter buds purplish brown, ovoid; scales to 1.5×0.8 cm, tomentose or outside subglabrous. Stipules lorately lanceolate, membranous, sparsely pubescent, margin glandular, apex acuminate. Petiole 2–7 mm, yellowish brown villous; leaf blade oblong to oblong-obovate, $3.5-12 \times 1.8-6$ cm, abaxially pale green to brown, densely yellowish brown villous or white pubescent, and more densely hairy on veins, adaxially brownish green and glabrous or sometimes sparsely appressed pubescent, base subcordate, margin irregularly incised and biserrate or sometimes singly serrate, apex acute; midvein and secondary veins prominent; secondary veins 15–20 on either side of midvein. Racemes 3–4 cm; peduncle sometimes brownish, densely tomentose-pubescent; bracts oblong, submembranous, subglabrous, margin entire. Bisexual flowers 2–4 mm in

diam. Pedicel sometimes brown, ca. 2 mm, thickened in fruit, densely tomentose-pubescent. Hypanthium outside pubescent. Perianth segments triangular-ovate, ca. 3 mm, soon caducous, outside pubescent, inside glabrous, margin entire, apex acute. Stamens 30–40. Ovary glabrous; style slender, longer than stamens, base persistent in fruit; stigma oblong. Drupe black, ovoid, ca. 8 mm in diam., smooth, apex acute. Fl. Apr–Jun, fr. Jun.

• Slopes, scrub, sunny places by rivers; 1500–3600 m. S Gansu, Guizhou, W Hubei, Shaanxi, Sichuan.

6. *Maddenia himalaica* J. D. Hooker & Thomson, Hooker's J. Bot. Kew Gard. Misc. 6: 381. 1854.

喜马拉雅臭樱 xi ma la ya chou ying

Maddenia himalaica var. *glabrifolia* H. Hara.

Trees 3–8(–10) m tall. Branchlets more than two years old purplish brown to reddish brown, pubescent, lustrous; branchlets of first year's growth reddish brown, densely brown villous, glabrescent. Winter buds purplish red, ovoid; scales outside brown villous to subglabrous. Stipules lorately lanceolate, abaxially pubescent, margin glandular serrate, apex acuminate. Petiole 2–5 mm, densely brown villous; leaf blade abaxially pale green and densely brown villous especially on veins but occasionally glabrous except on veins, adaxially dark green and glabrous, margin teeth with an apical gland when young; midvein and secondary veins abaxially conspicuously prominent, adaxially impressed; secondary veins 15–20 on either side of midvein. Sterile shoots with leaf blade narrowly elliptic, oblong, or rarely ovate, $5-15 \times 1.8-5$ cm, base subrounded to cordate, margin aristate biserrate, apex long acuminate to caudate. Flowering shoots with leaf blade ovate to ovate-lanceolate, $5-9.5 \times 2-5$ cm, base cordate, margin incised and simply serrate or biserrate, apex long acuminate to caudate. Racemes 3.5–6 cm, dense; peduncle densely brown villous; bracts oblong lanceolate, membranous, outside sparsely pubescent, margin glandular serrate. Bisexual flowers 2–4 mm in diam. Pedicel ca. 2 mm, to 5 mm in fruit, densely brown villous. Hypanthium outside brown villous. Perianth segments ovate, ca. 3 mm, soon caducous, outside brown villous, inside subglabrous, margin entire, apex acute. Stamens 20–30. Ovary glabrous. Style slender, \pm as long as stamens, base persistent in fruit; stigma disk-shaped. Drupe purple, ovoid, ca. 9 mm in diam., apex acute. Fl. May, fr. Jun.

Forests; 2800–4200 m. E and S Xizang (Bomi Xian, Yadong Xian) [Bhutan, Nepal, Sikkim].

ROSACEAE