

## 18. SORBUS Linnaeus, Sp. Pl. 1: 477. 1753.<sup>1</sup>

花楸属 hua qiu shu

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*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 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*

<sup>1</sup> Extensive 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.

- 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. helenae*
- 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*
- 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. monbeigi*
- 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.
- 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*
- 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. astatéria*
- 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 imparipinnate, 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 tomen-

tose. 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 helena** 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 pu-

bescent; 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, subentire 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 tomentose 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. *obtusata* 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 tomentose 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.

侏江花楸 *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***

侏江花楸(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.

无毛侏江花楸 *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 per-

sistent. 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 poterifolia* 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, puberulous 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, ± 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 × 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 ± 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 × 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 × (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 × 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 × 6–10 mm; branchlets, leaflet blades, and inflorescences rust-red hairy ..... 33a. var. *rufopilosa*
- 1b. Leaflet blades lanceolate, 0.8–1.2 cm × 3–5 mm, branchlets, leaflet blades, and inflorescences ± 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 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 tibetica* (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 glabrous, 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 (Médog 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 margin, prominent on both surfaces, both surfaces glabrous, base narrowly cuneate, margin entire basally, crenulate apically, apex shortly acuminate. Flowers not seen. Inflorescences 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.

圆果花楸 yuan guo hua qiu

*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.

滇缅花楸 dian mian hua qiu

*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, Sikim].

**58. *Sorbus aronioides*** Rehder in Sargent, Pl. Wilson. 2: 268. 1915.

毛背花楸 mao bei hua qiu

*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 mao xu hua qiu

*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 ± acute or ± 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 × 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 × 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 × 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 × 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 ± acute teeth.

• Valleys, slopes, stream sides in mixed forests; 800–2000 m. Anhui, 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 × 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 × 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) × 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 epidendron* (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, Adansonia, 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 & Iketani.

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; peti-

ole 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.

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