

MELASTOMATACEAE

野牡丹科 *ye mu dan ke*

Chen Jie (陈介 Chen Cheih)¹; Susanne S. Renner²

Herbs, shrubs, or trees (to 20 m tall), erect, climbing, or rarely epiphytic. Stipules lacking. Leaves simple, commonly opposite and decussate with one of a pair slightly smaller than other, rarely verticillate or alternate by abortion of one of a pair, usually 1–4 (or 5) secondary veins on each side of midvein, originating at or near base and anastomosing apically, tertiary veins numerous, parallel, and connecting secondary veins and midvein but in *Memecylon* secondary veins pinnate and tertiary veins reticulate. Inflorescences cymose, umbellate, corymbose, in paniculate clusters, or a cincinnus, rarely flowers single, fascicled, or born on a spike; bracts sometimes conspicuous and persistent. Flowers bisexual, actinomorphic but androecium often slightly zygomorphic, usually (3 or) 4- or 5 (or 6)-merous, perianth biseriate, perigynous; bracteoles opposite, usually caducous. Hypanthium funnel-shaped, campanulate, cyathiform, or urceolate. Calyx lobes (3–)5 (or 6), valvate (rarely connate, but not in Chinese species). Petals (3–)5 (or 6), equal to number of sepals, distinct, imbricate. Stamens usually twice as many as petals and in 2 whorls, rarely as many as petals by loss of 1 whorl, isomorphic or dimorphic; filaments distinct, often geniculate, inflexed in bud; anthers typically 2-celled, introrse, basifixed, dehiscent by 1 or 2 apical pores or by short longitudinal slits (*Astronia*, *Memecylon*); connective often variously appendaged. Pistil and style 1; stigma minute, capitate or truncate. Ovary commonly inferior or semi-inferior, locules usually (3 or) 4 or 5 (or 6) with numerous anatropous ovules, rarely 1-loculed and ovules ca. 9 (*Memecylon*); placentation axillary, parietal (*Astronia* and, outside China, *Pternandra* Jack), or free central (*Memecylon*). Fruit a dry or fleshy capsule or a berry, loculicidally dehiscent or indehiscent. Seeds (when 3–6-loculed) usually small, curved through half a circle (cochleate) or wedge-shaped (cuneate), in *Memecylon* seeds large and ovoid; endosperm absent.

Between 156 and 166 genera (150–160 in Melastomataceae sensu stricto and six in Memecylaceae here considered part of Melastomataceae) and ca. 4500 species (ca. 4050 in Melastomataceae sensu stricto and 450 in Memecylaceae [Olisbeoideae if considered a subfamily of Melastomataceae]): primarily in tropical and subtropical regions; 21 genera (five endemic) and 114 species (72 endemic) in China.

Pternandra caerulescens Jack reported in FRPS (53(1): 282. 1984) from Hainan is a mistake. The northernmost limit of this genus is S Thailand (see Maxwell, Gard. Bull. Singapore 34: 1–90. 1981).

Driessenia sinensis H. Léveillé is a synonym of *Gonostegia hirta* (Blume ex Hasskarl) Miquel in the Urticaceae (see Fl. China 5: 178. 2003).

Chinese genera of economic value include *Osbeckia* (medicine) and *Melastoma* (wild fruit and ornamental flowers).

Chen Cheih. 1984. Melastomataceae. In: Chen Cheih, ed., Fl. Reipubl. Popularis Sin. 53(1): 135–293.

- 1a. Leaf blade with secondary veins pinnate and tertiary veins reticulate; ovary 1-celled, with free central placentation; ovary 1-celled with 6–12 ovules, placentation free central; mature seed 1, to 5 mm in diam.; embryo large 21. *Memecylon*
- 1b. Leaf blade with 1–4 (or 5) pairs of secondary veins originating at or near blade base and anastomosing apically, tertiary veins perpendicular to secondary veins and parallel to each other; ovary (2–)4- or 5 (or 6)-celled, with numerous ovules, placentation parietal or axillary; seeds numerous, ca. 1 mm in diam.; embryo small.
 - 2a. Anthers shorter than 4 mm, longitudinally dehiscent; ovules with parietal placentation near base of ovary 20. *Astronia*
 - 2b. Anthers longer than 4 mm, if shorter than 4 mm (*Sarcopyramis napalensis*, *S. bodinieri*, *Sonerila erecta*) then opening by a single terminal pore; ovules with axillary placentation.
- 3a. Seeds curved through half a circle (cochleate); leaf blade often densely appressed setose.
 - 4a. Stamen whorls equal or subequal in length and shape, connective not lengthened; fruit a dry capsule (not a fleshy capsule bursting irregularly) 1. *Osbeckia*
 - 4b. Stamen whorls unequal in length and shape, connective of longer stamen lengthened below anthers and slightly curved; fruit a fleshy capsule, bursting irregularly, rarely a berry (*M. intermedium*) 2. *Melastoma*
- 3b. Seeds oblong, obovate, triangular-lanceolate, or cuneate; leaf blade sparsely pilose or glabrous.
 - 5a. Fruit an indehiscent berry.
 - 6a. Leaves abaxially with a stellate indumentum; stamen whorls strongly dimorphic, or inner or outer whorl staminodial 18. *Diplectria*
 - 6b. Leaves abaxially glabrous; stamen whorls isomorphic or only slightly dimorphic 19. *Medinilla*
 - 5b. Fruit a capsule opening apically or loculicidally.
 - 7a. Ovary apex conic or truncate, lacking a membranous crown; hypanthium often as long as fruit, usually contracted at or near apex.
 - 8a. Stamens 4; abaxial leaf surface, petioles, and hypanthia usually with minute yellow transparent peltate glands 9. *Blastus*
 - 8b. Stamens 8; abaxial leaf surface, petioles, and hypanthia lacking glands.

¹ Kunming Institute of Botany, Chinese Academy of Sciences, 610 Longquan Road, Heilongtan, Kunming, Yunnan 650204, People's Republic of China.

² Botanische Staatssammlung, Institut für Systematische Botanik, Ludwig-Maximilians-Universität (MSB), Menzinger Straße 67, D-80638 München, Germany.

- 9a. Stamen whorls equal or subequal in size and shape.
- 10a. Flowers in sessile clusters along an unbranched elongate spike 3. *Styrophyton*
- 10b. Flowers pedicellate, in terminal cymes 4. *Allomorpha*
- 9b. Stamen whorls unequal in size and shape.
- 11a. Anthers setose at base; capsules 1–1.8 × 0.6–1 cm, with conspicuous longitudinal ribs 8. *Barthea*
- 11b. Anthers not setose at base; capsules shorter and narrower than above, not conspicuously ribbed.
- 12a. Anthers of short stamens geniculate and curved 7. *Cyphotheca*
- 12b. Anthers of short stamens straight.
- 13a. Plants 1–6 m tall shrubs; inflorescences elongate panicles 5. *Oxyspora*
- 13b. Plants usually less than 1 m tall shrublets; inflorescence an umbellate corymb, variable in size and structure, but flowers usually clustered 6. *Plagiopetalum*
- 7b. Ovary apex usually with a membranous crown, crown margin often setose and exerted from calyx; hypanthium not contracted at or near apex.
- 14a. Inflorescences axillary or at leaf scars on leafless branchlets; peduncle 0–2 cm 10. *Sporoxeia*
- 14b. Inflorescences terminal or sometimes axillary; peduncle longer than 2 cm.
- 15a. Inflorescences 2-bracteate, bracts foliaceous and anthers shorter than 1 mm 14. *Sarcopyramis*
- 15b. Inflorescences lacking persistent bracts, if bracteate, then anthers much longer than 1 mm.
- 16a. Flowers (in Chinese species) 3-merous; leaf blade less than 10 cm wide 17. *Sonerila*
- 16b. Flowers (3 or)4- or 5-merous; leaf blade usually wider than 10 cm.
- 17a. Flowers 5-merous 15. *Tigridiopalma*
- 17b. Flowers (3 or)4-merous.
- 18a. Inflorescences scorpioid cymose panicles, with numerous small flowers 16. *Scorpiothyrsus*
- 18b. Inflorescences umbellate or cymose panicles, rarely capitate, never scorpioid, usually with few relatively large flowers.
- 19a. Stamen whorls equal or only slightly unequal in length 12. *Phyllagathis*
- 19b. Stamen whorls unequal in size and shape.
- 20a. Capsule campanulate to cup-shaped, thin-walled, apex truncate, lacking an exerted crown 13. *Fordiophyton*
- 20b. Capsule turbinate, usually obtusely 4-sided, thick-walled to woody, apex truncate but with crown usually exerted from calyx 11. *Bredia*

1. OSBECKIA Linnaeus, Sp. Pl. 1: 345. 1753.

金锦香属 jin jin xiang shu

Herbs, shrublets, or shrubs, erect. Stems (3 or)4-sided, pubescent. Leaves opposite or sometimes 3-whorled, petiolate or sessile; leaf blade usually pubescent, secondary veins 1–3 on each side of midvein, tertiary veins numerous and parallel, margin entire. Inflorescences terminal, capitate or paniced. Flowers 4- or 5-merous, purple or white, usually bracteate. Hypanthium urceolate or flask-shaped, often setiform tuberculate, stellate appendaged, pectinate tuberculate or with polycyclic setiform stellate trichomes on stalks. Calyx lobes linear, lanceolate, or ovate-lanceolate, margin ciliate. Petals obovate or broadly ovate, margin ciliate or not. Stamens twice as many as perianth segments, isomorphic, equal or subequal; filaments shorter or as long as anthers; anthers oblong or oblong-ovate, beak long or short; connective decurrent, base abaxially slightly inflated or shortly spurred and sometimes with 1 or 2 setose, adaxially lengthened tubercles. Ovary half inferior, 4- or 5-celled, ± adherent to hypanthium, apex with a setose ring. Style filiform. Capsule ribbed, middle often contracted, dehiscing at truncate apex by 4 or 5 pores. Seeds numerous, curved (cochleate), small, densely granulate.

About 50 species: tropical W Africa, tropical and subtropical Asia; five species in China.

The Asian species of *Osbeckia* were revised by Hansen (Ginkgoana 4: 1–150, pl. 1–20. 1977).

- 1a. Hypanthium 0.4–0.7 cm.
- 2a. Petiole to 1 cm; flowers and fruit upright 1. *O. chinensis*
- 2b. Petiole 1.5–2 cm; flowers and fruit hanging 2. *O. nutans*
- 1b. Hypanthium 1–2.3 cm.
- 3a. Leaf blade 1.7–2.5 cm 3. *O. capitata*
- 3b. Leaf blade 4–9(–13) cm.
- 4a. Flowers 5-merous; capsule ovoid-globose, ca. 8 × 6 mm, apically with rings of strigose setae 4. *O. nepalensis*
- 4b. Flowers 4-merous; capsule long urceolate (flask-shaped), contracted at middle, 1.0–1.6(–2) × 0.5–0.8 cm, with rows of setiform stellate trichomes on stalks, ± glabrous in old specimens or basally setose, apically glabrous 5. *O. stellata*

1. *Osbeckia chinensis* Linnaeus, Sp. Pl. 1: 345. 1753.

金锦香 jin jin xiang

Herbs or shrubs, 20–100 cm tall, erect. Stems 4-sided, appressed strigose. Petiole very short or up to 1 cm, strigose; leaf blade linear, linear-lanceolate, oblong-ovate, elliptic-ovate, or sometimes ovate-lanceolate, 2–5(–9) × 0.3–1(–3.2) cm, stiffly papery, both surfaces strigose, secondary veins 1 or 2 on each side of midvein, tertiary veins inconspicuous, base obtuse, subrounded, rounded, or subcordate, margin entire, apex acute. Inflorescences terminal, capitate, 2–8-flowered, with 2–6 bracteal leaves at base; bracts sessile, ovate, pubescent or adaxially glabrous. Hypanthium usually pink, 6–6.5 mm, glabrous or 1–5 setose tuberculate. Calyx lobes 4(or 5), triangular-lanceolate, margin ciliate, setose between lobes. Petals 4 or 5, pink to pale purple, obovate, 1–1.5 × ca. 1.3 cm, margin ciliate, apex apiculate or rounded. Stamens 8 or 10, inclined to one side; filaments as long as anthers; anthers narrowly lanceolate, beaked; connective bases slightly inflated. Ovary subglobose, 4- or 5-celled, apex densely setose or strigose. Capsule purplish red, ovoid-globose, ca. 6 × 4 mm, glabrous or setiform tuberculate.

Grasslands on mountain slopes, grassy areas on open slopes, sparse forests, trailsides; near sea level to 2800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Sichuan, Taiwan, Xizang (Mêdog), Yunnan, Zhejiang [Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam; Australia].

- 1a. Plants 20–60 cm tall; leaf blade linear, linear-lanceolate, or very rarely ovate-lanceolate, 2–4(–5) × 0.3–0.8(–1.5) cm, base obtuse to subrounded; hypanthium glabrous or with 1–5 setiform tubercles 1a. var. *chinensis*
- 1b. Plants 80–100 cm tall; leaf blade oblong-ovate to elliptic-ovate, (2–)3–5(–9) × (0.3–)0.6–1(–3.2) cm, base rounded to subcordate; hypanthium with 5 to numerous setiform tubercles 1b. var. *angustifolia*

1a. *Osbeckia chinensis* var. *chinensis*

金锦香(原变种) jin jin xiang (yuan bian zhong)

Osbeckia kainantensis Masamune.

Herbs, rarely shrubs, 20–60 cm tall. Petiole 2–10 mm; leaf blade linear, linear-lanceolate, or rarely ovate-lanceolate, 2–4(–8) × 0.3–0.8(–2.1) cm, base obtuse to subrounded, apex acute. Petals 0.8–1.5 cm. Hypanthium glabrous or with 1–5 setiform tubercles. Fl. Jul–Dec, fr. Sep–Nov.

Grasslands on mountain slopes, sparse forests, trailsides; near sea level to 1500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin (Changbai Shan), Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam; Australia].

In FRPS (53(1): 151. 1984), where *Osbeckia kainantensis* was an accepted species, the specific epithet was incorrectly spelled "*hainanensis*."

1b. *Osbeckia chinensis* var. *angustifolia* (D. Don) C. Y. Wu & C. Chen, Fl. Yunnan. 2: 80. 1979.

宽叶金锦香 kuan ye jin jin xiang

Osbeckia angustifolia D. Don, Prodr. Fl. Nepal. 221. 1825.

Shrublets 80–100 cm tall. Leaves subsessile; leaf blade oblong-ovate to elliptic-ovate, (2–)3–5(–9) × (0.3–)0.6–1(–3.2) cm, base rounded to subcordate, apex acute. Petals 1.1–1.3 cm. Hypanthium with 5 to numerous setiform tubercles. Fl. Jun, fr. Aug–Nov.

Grassy areas on open slopes, trailsides; 500–2800 m. Hainan, SW Sichuan, NW and SW Yunnan [Cambodia, India, Laos, Myanmar, Nepal, Thailand, Vietnam].

2. *Osbeckia nutans* Wallich ex C. B. Clarke in Hooker, Fl. Brit. India 2: 521. 1879.

花头金锦香 hua tou jin jin xiang

Shrubs to 1.5 m tall. Branches densely covered with appressed short trichomes. Petiole 1.5–2 cm; leaf blades narrowly ovate or lanceolate, 3.6–5.5 × 0.5–1 cm, abaxially glabrous or almost so but scabrous on veins, adaxially glabrous-striolate, secondary veins 1(or 2) on each side of midvein, base acute to broadly rounded, apex narrowly acute to acute. Inflorescences terminal clusters of up to 4 flowers, with 2–4 bracteal leaves at base; bracts sessile, ovate, both surfaces glabrous or sparsely strigose only on midvein. Hypanthium 4–4.5 × 4–4.5 mm, glabrous, with pectinate scalelike trichomes between bases of calyx lobes. Calyx lobes broadly lanceolate, 6.5–7.5 mm, glabrous, margin ciliate. Capsule usually nodding, 6.5–8.5 × 5–6.5 mm, ovary exceeding hypanthium by 1.5–3 mm.

Grasslands; 2000–3000 m. Xizang (Cona, Mêdog) [Bhutan, NE India, Nepal].

3. *Osbeckia capitata* Benthham ex Walpers, Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur., Suppl. 1: 331. 1843.

头序金锦香 tou xu jin jin xiang

Herbs or shrublets, 8–25 cm tall, erect. Stems 4-sided, sparsely appressed strigose. Petiole very short, strigose; leaf blade ovate, 1.7–2.5 × 0.9–1.3 cm, stiffly papery, both surfaces strigose, secondary veins 2 on each side of midvein, tertiary veins inconspicuous, base rounded to subcordate, margin entire, apex acute. Inflorescences terminal, capitate, 2- or 3-flowered, with 2–4 bracteal leaves at base; bracts sessile, ovate, both surfaces glabrous or sparsely strigose only on midvein. Hypanthium often reddish, ca. 1.5 cm, glabrous. Calyx lobes 4, ovate, ca. 1.5 cm, setiform tuberculate among lobes, margin ciliate. Petals 4, purple to pale purple, obovate, ca. 1.5 cm, margin ciliate. Stamens 8, inclined to one side; filaments of equal lengths; anthers narrowly lanceolate, long beaked; connective abaxially with a short basal spur, adaxially slightly inflated tuberculate. Ovary ovoid, 4-celled, apex with 16–20 setae. Capsule purplish red, ovoid, ca. 7 × 7 mm, glabrous. Fl. and fr. Jun–Sep.

Grassland on mountain slopes, trailsides; 1500–2500 m. Yunnan [Bhutan, India].

4. *Osbeckia nepalensis* J. D. Hooker, Exot. Fl. 1: t. 31. 1823.

蚂蚁花 ma yi hua

Shrubs 0.6–1(–1.5) m tall, erect. Stems 4-sided, densely strigose. Petiole 1–4 mm, densely strigose; leaf blade oblong-lanceolate to ovate-lanceolate, (5–)7–13 × (1.5–)2.5–3.8 cm,

stiffly papery, both surfaces densely strigose, secondary veins 2 on each side of midvein, base cordate to obtuse, margin entire and ciliate, apex acuminate. Inflorescences terminal, a panicle of cymes, 5–8 cm or longer; bracts leaflike. Bracteoles 2, broadly ovate, ca. 1.3 cm, abaxially midvein strigose and sericeous, adaxially glabrous, margin ciliate. Hypanthium ca. 2 cm, pectinate setose-tuberculate and among calyx lobes, base clasped by bracteoles. Calyx lobes 5, long ovate, as long as hypanthium, both surfaces glabrous, margin ciliate, apex acuminate. Petals 5, pink, white, or rarely purple, obovate, 1.5–2.5 cm, oblique, margin ciliate, apex rounded but apiculate. Stamens 10, inclined to one side; filaments as long as anthers; anthers beaked; connective slightly inflated, orbiculate, shortly spurred. Ovary ovoid-globose, 5-celled, apically densely strigose, apex with a setose ring. Capsule ovoid-globose, ca. 8 × 6 mm, apically densely strigose; hypanthium urceolate, ca. 8 mm, densely pectinate setose-tuberculate. Fl. Aug–Oct, fr. Sep–Dec.

Scrub on mountain slopes, grasslands, open slopes, forest margins, open woods, streamsides, trailsides; 500–1900 m. Guangxi, Xizang, Yunnan [Bhutan, NE India, Laos, Myanmar, Nepal, Thailand, Vietnam].

- 1a. Petals pink or rarely purple 4a. var. *nepalensis*
 1b. Petals white 4b. var. *albiflora*

4a. *Osbeckia nepalensis* var. *nepalensis*

蚂蚁花(原变种) ma yi hua (yuan bian zhong)

Petals pink or rarely purple. Fl. Aug–Oct, fr. Sep–Dec.

Scrub on mountain slopes, grasslands, open woods, streamsides, trailsides; 500–1900 m. Guangxi, Xizang (Médog), Yunnan [Bhutan, NE India, Laos, Myanmar, Nepal, Thailand].

4b. *Osbeckia nepalensis* var. *albiflora* Lindley, Edwards's Bot. Reg. 17: t. 1475. 1831.

白蚂蚁花 bai ma yi hua

Petals white. Fl. Aug–Oct, fr. Sep–Nov.

Open slopes, grasslands, forest margins, trailsides; 700–1600 m. Xizang (Médog), Yunnan [Nepal].

5. *Osbeckia stellata* Buchanan-Hamilton ex Kew Gawler, Bot. Reg. 8: t. 674. 1822.

星毛金锦香 xing mao jin jin xiang

Melastoma mairei H. Léveillé; *Osbeckia crinita* Benth. ex Naudin; *O. crinita* var. *yunnanensis* Cogniaux; *O. mairei* (H. Léveillé) Craib; *O. opipara* C. Y. Wu & C. Chen; *O. paludosa* Craib; *O. pulchra* Geddes; *O. rhopalotricha* C. Y. Wu; *O. rostrata* D. Don; *O. robusta* Craib; *O. sikkimensis* Craib; *O. stellata* var. *crinita* (Benth. ex Naudin) C. Hansen; *O. yunnanensis* Franchet ex Craib.

Herbs or shrublets, 0.2–1.5(–2.5) m, erect. Stems 4(or 6)-sided, sparsely or densely patently strigose or velutinous. Leaves opposite or 3 verticillate; petiole 2–10(–15) mm, strigose or velutinous; leaf blade oblong-lanceolate, ovate-lanceolate, or elliptic, 4–9(–13) × 2–3.5(–5) cm, stiffly papery, both surfaces strigose or also velutinous, secondary veins 2 on each side of midvein, tertiary veins inconspicuous, base obtuse to subcordate, margin entire and ciliate, apex acute or acuminate. Inflorescences terminal racemose or paniced cymose, 4–22 cm; bracts 2, ovate, ca. 4 mm, abaxially glabrous or sparsely strigose, margin setiform ciliate. Pedicel short or absent. Hypanthium usually purple to dark purple, 1–2.3 cm, with several rows of up to 2.5 mm setiform stellate trichomes on stalks. Calyx lobes 4, linear-lanceolate to subulate, 0.8–1.2 cm, caducous in fruit, margin ciliate. Petals 4, pink to purple, obovate, 1.5–2 cm, margin ciliate. Stamens 8, inclined to one side; filaments ± equal to anther lengths; anthers narrowly lanceolate, long-beaked; connective slightly inflated at base, abaxially slightly inflated, adaxially spurred. Ovary ovoid, 4-celled, apex setose. Capsule long urceolate, contracted at middle, 1.0–1.6(–2) × 0.5–0.8 cm, with rows of setiform stellate trichomes on stalks, ± glabrous in old specimens or basally setose, apically glabrous. Fl. Jul–Nov, fr. Oct–Dec.

Grassland on mountain slopes, sparse thickets, dry stony pastures, trailsides; 200–2300 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Xizang (Médog), Yunnan, Zhejiang [Bhutan, Cambodia, Laos, NE India, Myanmar, Nepal, Thailand, Vietnam].

2. MELASTOMA Linnaeus, Sp. Pl. 1: 389. 1753.

野牡丹属 ye mu dan shu

Otanthera Blume.

Shrubs or small shrubs. Stems 4-sided or nearly terete, often squamose-strigose. Leaves opposite, petiolate; leaf blade pubescent on both surfaces, secondary veins 2 or 3(or 4) on each side of midvein, margin entire. Flowers terminal or on top of branches, solitary, clustered, or paniced, 5-merous, showy. Hypanthium globose-urceolate, pubescent or squamose strigose. Calyx lobes lanceolate to ovate, lobulate or not. Petals usually obovate, oblique. Stamens 10, whorls very unequal in length. Longer stamens with purple anthers; connective long extended at base, adaxially with 2 tubercles. Shorter stamens with yellow anthers; connective not extended but with 2 abaxial tubercles. Ovary half inferior, ovoid, 5-celled, apex with dense trichomes; placenta axile, sometimes fleshy in fruit. Style filiform, as long as petals. Fruit a capsule or sometimes berrylike, porose dehiscence or transverse dehiscence at middle, pubescent or squamosly strigose. Seeds numerous, small, cochleate, densely punctate.

Twenty-two species: SE Asia, N Australia, Pacific islands; five species (one endemic) in China.

The genus was revised by Meyer (Blumea 46: 351–398. 2001).

- 1a. Shrubs to 0.3 m tall, sometimes repent; leaf blade smaller than 4 × 3 cm.

- 2a. Leaf blade ovate to elliptic, 1–4 × 0.8–2(–3) cm 1. *M. dodecandrum*

- 2b. Leaf blade oblong to lanceolate-ovate, 2–4 × 1–1.5 cm 2. *M. intermedium*
 1b. Shrubs or trees, 0.5–3(–7) m tall, erect; leaf blade larger than 4 × 3 cm.
 3a. Hypanthium spreading hispid; fruit with stiff often retroflexed trichomes 3. *M. sanguineum*
 3b. Hypanthium squamose or compressed strigose; fruit densely appressed squamose strigose.
 4a. Petiole 1.8–6.5 cm; leaf blade broadly ovate to broadly elliptic, 5.5–13.5 cm wide, secondary veins
 (2 or)3 on each side of midvein 4. *M. imbricatum*
 4b. Petiole 0.5–1.9 cm; leaf blade ovate, elliptic, or elliptic-lanceolate, 1.7–3.5(–6) cm wide, secondary
 veins 2(or)3 on each side of midvein 5. *M. malabathricum*

1. *Melastoma dodecandrum* Loureiro, Fl. Cochinch. 1: 274. 1790.

地葱 di nie

Asterostoma repens (Desrousseaux) Blume; *Melastoma repens* Desrousseaux; *Osbeckia repens* (Desrousseaux) Candolle.

Shrublets 10–30 cm tall. Stems often repent; branchlets numerous, procumbent, strigose when young, later glabrous. Petiole 0.2–0.6(–1.5) cm; leaf blade ovate to elliptic, 1–4 × 0.8–2(–3) cm, stiffly papery, abaxially very remotely strigose along veins, adaxially usually strigose at margin only or sometimes sparsely strigose among veins, secondary veins 1 or 2 on each side of midvein, tertiary veins numerous and parallel, base broadly cuneate, margin densely serrulate or entire, apex acute. Inflorescences terminal, cymose, (1–)3-flowered, with 2 leaflike bracts at base. Pedicel 2–10 mm, strigose, apically 2-bracteolate; bracteoles ovate, 2–3 × ca. 1.5 mm, abaxially strigose, margin ciliate. Hypanthium ca. 5 mm, strigose, base of trichomes conically inflated. Calyx lobes lanceolate, 2–3 mm, sparsely strigose, margin bristly ciliate. Petals lavender to purple, rhomboid-obovate, 1.2–2 × 1–1.5 cm, apically oblique. Longer stamens with purple anthers; connective long extended at base, curved, apex 2-tuberculate. Shorter stamens with connective not extended, apex 2-tuberculate. Ovary inferior, apically bristly. Fruit urceolate-globular, 7–9 × ca. 7 mm, succulent, strigose. Fl. May–Jul, fr. Jul–Sep.

Open fields, thickets, grasslands, trailsides; below 1300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Zhejiang [Vietnam].

2. *Melastoma intermedium* Dunn, J. Linn. Soc., Bot. 38: 360. 1908.

细叶野牡丹 xi ye ye mu dan

Melastoma kudoi Sasaki; *M. scaberrimum* (Hayata) Y. P. Yang & H. Y. Liu; *M. suffruticosum* Merrill; *Osbeckia scaberrima* Hayata; *Otanthera scaberrima* (Hayata) Ohwi.

Shrublets 20–30 cm tall. Stems terete, appressed strigose. Petiole 2–4 mm; leaf blade oblong to lanceolate-ovate, 2–4 × 1–1.5 cm, stiffly papery, abaxially sparsely strigose but more so on veins, adaxially appressed strigose but veins glabrous, secondary veins 1 or 2 on each side of midvein, tertiary veins inconspicuous, base acute to rounded, margin entire, apex obtuse to acute. Inflorescences terminal or nearly terminal, subcapitate cymes; bracts linear-lanceolate, ca. 5 × 7.5 mm, strigose, margin ciliate. Flowers ca. 2 cm. Pedicel ca. 5 mm, densely strigose. Petals pink, obovate, 1–1.4 cm, oblique, margin minutely ciliate, apex rounded. Stamens 10 or rarely more; filaments 3.5–4 mm; anthers ovate-lanceolate, 2–2.2 mm; connective decurrent, slightly prolonged, 2-setose at base. Ovary half inferior,

globose, 4–5 mm in diam., 5-celled, apically hispidulous. Fruit a berry, subglobose, ca. 6 mm in diam.; hypanthium strigose. Fl. Jul–Oct.

• Grasslands, slopes, trailsides; 100–2700 m. Taiwan.

3. *Melastoma sanguineum* Sims, Bot. Mag. 48: t. 2241. 1821.

毛葱 mao nie

Shrubs 1.5–3 m tall. Stems, branches, petioles, pedicels, and calyces densely hirsute, trichomes basally flattened. Petiole 1–2.5(–4) cm; leaf blade ovate-lanceolate to lanceolate, (4.5–)8–15(–22) × (1.7–)2.5–5(–8) cm, stiffly papery, both surfaces strigose, secondary veins 2 on each side of midvein, base obtuse to rounded, margin entire, apex long acuminate to acuminate. Inflorescences terminal, corymbose, usually 1(or)3–5-flowered. Pedicel 2–5 mm. Hypanthium 1–2 × 1–2 cm, trichomes sometimes retroflexed. Calyx lobes 5(–7), triangular to triangular-lanceolate, 6–12 × ca. 4 mm, strigose at ridges. Petals 5(–7), pink to purple, broadly obovate, (2–)3–5 × (1.5–)2–2.2 cm, apically oblique, apex emarginate. Longer stamens with anthers ca. 1.3 cm; connective long extended at base, curved, basal-adaxially with 2 lobes. Shorter stamens with anthers ca. 9 mm; connective not extended, basal-adaxially with 2 lobes. Ovary half inferior, densely setose. Fruit urceolate-turbinate, 1.5–2.2 × 1.5–2 cm, succulent, with stiff often retroflexed trichomes. Fl. all year, fr. Aug–Oct.

Open slopes, thickets, grasslands, woodland margins on low hills, trailsides; below 400 m. Fujian, Guangdong, Guangxi, Hainan [India, Indonesia, Malaysia].

In FRPS (53(1): 159. 1984), the name *Melastoma penicillatum* Naudin was misapplied to specimens of *M. sanguineum* from Hainan.

- 1a. Branches patently hirsute, base of trichomes inflated; calyx lobes triangular to triangular-lanceolate, strigose only on ridges 3a. var. *sanguineum*
 1b. Branches squamose strigose; calyx lobes rhomboid-oblong, bristly on ridges but otherwise sparsely puberulous 3b. var. *latisepalum*

3a. *Melastoma sanguineum* var. *sanguineum*

毛葱(原变种) mao nie (yuan bian zhong)

Melastoma decemfidum Roxburgh; ?*M. dendrisetosum* C. Chen.

Branches patently hirsute. Leaf blade both surfaces strigose. Calyx lobes triangular to triangular-lanceolate, ca. 12 × 4 mm, strigose only on ridges. Fl. all year, fr. Aug–Oct.

Open slopes, thickets, grasslands, woodland margins on low hills, trailsides; below 400 m. Fujian, Guangdong, Guangxi, Hainan [India, Indonesia, Malaysia].

3b. *Melastoma sanguineum* var. *latisepalum* C. Chen, J. S. China Agric. Coll. 4(1): 36. 1983.

宽萼毛蕊 kuan e mao nie

Branches shortly squamose strigose. Leaf blade both surfaces shortly strigose. Calyx lobes rhomboid-oblong, ca. 10×5 mm, bristly on ridges but otherwise sparsely puberulous. Fl. Apr–Aug, fr. Aug–Oct.

- Open slopes, thickets, trailsides. Hainan, Hong Kong.

4. *Melastoma imbricatum* Wallich ex Triana, Trans. Linn. Soc. London 28: 60. 1871.

大野牡丹 da ye mu dan

Shrubs or trees, 1–5(–7) m tall. Stems 4-sided or obtusely 4-sided; branchlets numerous, densely appressed squamose strigose. Petiole 1.8–6.5 cm; leaf blade broadly ovate to broadly elliptic, $8\text{--}21 \times 5.5\text{--}13.5$ cm, stiffly papery, abaxially puberulous and squamose strigose, adaxially strigose and puberulous only, secondary veins (2 or 3) on each side of midvein, tertiary veins numerous, parallel, and conspicuous, base rounded to cuneate, margin entire and appressed ciliate, apex acute. Inflorescences terminal, corymbose, ca. 12-flowered, with 2 leaflike bracts at base. Pedicel 3–12 mm, squamosly strigose; bracteoles very small or absent. Hypanthium 2–2.3 cm, densely squamose strigose. Calyx lobes ovate-lanceolate 1.1–1.3 cm, caducous, inside densely strigose, margin ciliate, apex acuminate. Petals pink to red, obovate, ca. 2×1.5 cm, margin densely ciliate, apically oblique, apex rounded. Longer stamens with connective long extended at base, curved, apex bifid. Shorter stamens with connective not extended, 2-tuberculate at base. Ovary half inferior, apex densely bristly. Fruit urceolate-globular, ca. 1.3×0.9 cm, succulent, densely squamose strigose. Fl. Jun–Jul, fr. Feb–Mar or Dec.

Dense broad-leaved evergreen forests, moist places; 100–1500 m. SW Guangxi, Xizang (Médog), SE Yunnan [Cambodia, India, Laos, Malaysia, Myanmar, Thailand, Vietnam].

5. *Melastoma malabathricum* Linnaeus, Sp. Pl. 2: 390. 1753.

野牡丹 ye mu dan

Melastoma affine D. Don; *M. candidum* D. Don; *M. cavaleriei* H. Léveillé & Vaniot; *M. esquirolii* H. Léveillé; *M. malabathricum* subsp. *normale* (D. Don) K. Meyer; *M. normale* D. Don; *M. polyanthum* Blume.

Shrubs 0.5–1(–5) m tall, erect. Stems 4-sided to subterete; branchlets numerous, procumbent, densely covered with appressed scales. Petiole 0.5–1.9 cm; leaf blade ovate, elliptic, or elliptic-lanceolate, $4\text{--}14 \times 1.7\text{--}3.5$ (–6) cm, stiffly papery, abaxially densely strigose and puberulous, adaxially densely strigose, secondary veins 2(or 3) on each side of midvein, tertiary veins numerous and parallel, base rounded to subcordate, margin entire, apex acuminate. Inflorescences subcapitate corymbose, terminal, 3–7-flowered, with 2 leaflike bracts at base. Pedicel 2–8(–10) mm, strigose, apically 2-bracteolate, bracteoles lanceolate to subulate, 2–5 mm, abaxially densely strigose, margin ciliate. Hypanthium 5–9 mm, densely compressed strigose, margin fimbriate. Calyx lobes lanceolate to ovate-lanceolate, apex acuminate, on both sides and along their margin squamosly strigose and pubescent. Petals reddish purple, 2–3(–4) cm, margin only ciliate, apex rounded. Longer stamens with connective long extended at base, curved, apex bifid. Shorter stamens with anthers 2-tuberculate at base; connective not extended. Ovary half inferior, densely strigose, apically with a ring of setae. Fruit urceolate-globular, $6\text{--}15 \times 6\text{--}12$ mm, succulent, densely squamose strigose. Fl. Feb–Aug, fr. Jul–Dec.

Open fields, grasslands, scrub, thickets, sparse forests, bamboo forests, trailsides; 100–2800 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Cambodia, India, Japan, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam; Pacific islands].

3. STYROPHYTON S. Y. Hu, J. Arnold Arbor. 33: 174. 1952.

长穗花属 chang sui hua shu

Shrubs. Stems terete, pubescent. Leaves petiolate; leaf blade pubescent, secondary veins 2 on each side of midvein, tertiary veins numerous and parallel, margin entire. Inflorescences terminal, spicate; bract absent. Flowers small, 4-merous, sessile, solitary or in clusters of 3–5. Hypanthium campanulate, 8-ribbed, pubescent. Calyx lobes triangular to obtusely triangular, very small, equal. Petals obovate to broadly obovate, very shortly unguiculate, base, slightly oblique, apex obtuse. Stamens equal in length, twice as many as perianth, not appendaged at base; anthers lanceolate, equal in length; connective slightly inflated, not spurred. Ovary ovoid, 4-celled. Style filiform; stigma single, Capsule ovoid-globular, conspicuously longitudinally 8-ribbed, pubescent, apex with a ring of setose trichomes. Seeds numerous, small, cuneate.

- One species: S China.

1. *Styrophyton caudatum* (Diels) S. Y. Hu, J. Arnold Arbor. 33: 176. 1952.

长穗花 chang sui hua

Anerincleistus caudatus Diels, Bot. Jahrb. Syst. 65: 101. 1932; *Allomorpha caudata* (Diels) H. L. Li; *Oxyspora spicata* J. F. Maxwell.

Shrubs 1–2(–?5) m tall, erect. Stems terete, densely villous.

Petiole 1.5–5.5 cm, densely villous; leaf blade ovate to broadly ovate, $10\text{--}21 \times 6\text{--}13$ (–16) cm, papery to stiffly papery, densely strigose when young but later scabrous, abaxially densely villous, secondary veins 2 on each side of midvein, tertiary veins inconspicuous, base rounded to subcordate, margin entire and ciliate, apex acute to shortly acuminate. Inflorescences terminal, spicate, 13–20(–26) cm, densely villous. Flowers solitary or in clusters of 3–5, small. Hypanthium campanulate, 2–2.5 mm, densely setose. Calyx lobes shortly triangular to obtusely tri-

angular, ca. 0.5 mm. Petals pink or white, obovate to broadly obovate, ca. 1.5 mm, very shortly unguiculate, oblique, furfuraceous, apex obtuse and retuse or 1- or 2-denticulate. Stamens ca. 3 mm; filaments equal in length to anthers. Ovary ovoid, apically furfuraceous. Capsule ovoid-globular, 2–2.5 × ca. 2 mm,

conspicuously longitudinally 8-ribbed, densely setose, apex with a ring of setose trichomes. Fl. May–Jun, fr. Oct–Jan.

• Dense mixed forests, moist places, stream banks, valleys, thickets; 400–1500 m. Guangxi, Yunnan.

4. ALLOMORPHIA Blume, Flora 14: 522. 1831.

异形木属 yi xing mu shu

Shrubs or perennial herbs, erect, branched. Stems 4-sided or terete, winged or not on angles, pubescent. Leaves petiolate; leaf blade stiffly papery to papery, secondary veins 2 or 3 on each side of midvein, tertiary veins parallel, margin entire or denticulate. Inflorescences terminal, narrowly panicle cymose, more than 25 × 3–4 cm; bracts often caducous. Pedicel very short. Hypanthium narrowly funnelform or funnelform-campanulate, 4-sided, 8-ribbed but 4 ribs inconspicuous, usually contracted at middle. Calyx lobes very short or inconspicuous. Petals broadly ovate or ovate, apically oblique, apex acute. Stamens twice as many as perianth, subequal in length, inclined to one side; anthers as long as filaments or longer, subulate or oblong-linear, not appendaged at base; connective slightly inflated, not spurred or shortly spurred. Ovary inferior, ovoid or ovoid-globular, 4- or 5-celled, apex 8–10-setose or -denticulate. Style filiform, exerted beyond stamens. Capsule ellipsoid, ovoid, or subglobular; hypanthium longitudinally 8-ribbed. Seeds numerous, very small, cuneate, angled, puberulous.

Number of species unclear: S China, India, Indonesia, Malaysia; four species (one endemic) in China.

The number of species in *Allomorpha* is unclear because most species have also been treated in *Oxyspora*, including the type species, *A. exigua* (Jack) Blume, and the circumscription of these two genera is currently unresolved.

Allomorpha eupteron Guillaumin var. *teretipetiolata* C. Y. Wu & C. Chen (Fl. Yunnan. 2: 93. 1979), described from Yunnan (Jinping), represents a separate species and belongs to *Oxyspora* according to Shui Yumin (pers. comm. to Renner, 2007). A paper discussing the relationships between this and related taxa, and making the new combination at species rank in *Oxyspora*, will be published in the near future (Acta Phytotax. Sin. 45. 2007).

- 1a. Branches 4-sided and conspicuously winged 1. *A. curtisii*
 1b. Branches obtusely 4-sided or terete, not winged.
 2a. Leaf blade abaxially densely patently setose or puberulous 4. *A. baviensis*
 2b. Leaf blade abaxially glabrous or ferruginous furfuraceous.
 3a. Inflorescences (9–)11–16 cm; pedicel ca. 1 mm 2. *A. urophylla*
 3b. Inflorescences 17–26 cm; pedicel ca. 2 mm 3. *A. balansae*

1. *Allomorpha curtisii* (King) Ridley, J. Straits Branch Roy. Asiat. Soc. 57: 40. 1911.

翅茎异形木 chi jing yi xing mu

Oxyspora curtisii King, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 69: 9. 1900; *Allomorpha eupteron* Guillaumin; *A. laotica* Guillaumin; *A. procursa* Craib.

Shrubs 1.7–2.5 m tall. Branchlets puberulous 4-winged, wings 1–4 mm wide. Petiole 1.5–10 cm, winged, wings 3–9 mm wide; leaf blade ovate to elliptic, 10–25 × 5–16 cm, abaxially minutely furfuraceous on veins, adaxially subglabrous when mature, secondary veins 2 on each side of midvein, abaxially prominent, and adaxially depressed, base attenuate to rounded, margin obtuse serrulate, apex shortly acuminate. Inflorescences 10–25 cm, ca. 10 cm wide at base, to 30 × 30 cm in fruit; peduncle 4-angled or 4-winged. Flowers clustered in small umbels near apex of inflorescence branchlets. Bracts and bracteoles minute, deciduous. Flowers 4-merous. Pedicel to 1.5 mm. Hypanthium cylindrical, 5–8 mm, apically barely 8-ribbed, puberulous or glabrous. Calyx rim with 4 cusps to 0.5 mm. Petals pinkish or white, ca. 3 × 3 mm. Stamens 8, subisomorphic, 5–7 mm; anthers white or sometimes pinkish, 4–5 mm, with short spurs at base. Capsule suburceolate to cylindrical, 6–8 mm, crowned by persistent 8-angled calyx rim.

Monsoon forests; 200–1200 m. Yunnan [Laos, Malaysia, Thailand, Vietnam].

2. *Allomorpha urophylla* Diels, Bot. Jahrb. Syst. 65: 102. 1932.

尾叶异形木 wei ye yi xing mu

Shrubs 1–2 m tall. Stems terete, densely furfuraceous and pubescent when young, glabrescent; bark black; branchlets numerous. Petiole 1–2 cm, densely furfuraceous and pubescent when young; leaf blade elliptic to lanceolate-elliptic, 7–14(–18) × 3–5.5(–7) cm, papery, abaxially ± furfuraceous, adaxially glabrescent or sparsely furfuraceous when young, secondary veins 1 or 2 on each side of midvein, base cuneate to broadly cuneate, margin entire or slightly sparsely serrulate, apex acuminate to caudate-acuminate. Inflorescences terminal, narrowly panicle cymose, (9–)11–16 × 2–3 cm, densely furfuraceous and pubescent or glabrescent. Pedicel ca. 1 mm. Hypanthium narrowly funnelform, ca. 5 mm, ± furfuraceous. Calyx lobes 4, narrowly triangular, to 1 mm. Petals 4, pink, red, or reddish purple, broadly ovate, ca. 3 mm, oblique. Stamens 8, inclined to one side; filaments ca. 4 mm; anthers ca. 4 mm; connective slightly inflated, not spurred. Ovary inferior, ovoid, 4-celled, apex 8-denticulate. Capsule ellipsoid to subovoid, ca. 4 × 3 mm; hypanthium ca. 5 mm, longitudinally 8-ribbed, ± furfuraceous but mostly glabrescent; calyx lobes triangular. Fl. Jul–Sep, fr. Nov–Dec.

• Dense mixed forests, moist places; 500–1700(–2000) m. Guangdong, Guangxi, Yunnan.

3. *Allomorpha balansae* Cogniaux, Monogr. Phan. 7: 1183. 1891.

异形木 *yi xing mu*

Oxy-spora balansae (Cogniaux) Maxwell.

Shrubs, 1–7 m tall. Stems 4-sided when young, densely furfuraceous, becoming terete and glabrescent; bark black; branches numerous. Petiole 2–4.5 cm, furfuraceous; leaf blade ovate, broadly ovate, elliptic, or rarely lanceolate, 6.5–19 × 2.5–9 cm, stiffly papery, abaxially furfuraceous, adaxially glabrous or sparsely furfuraceous when young, secondary veins 2 on each side of midvein, outer secondary vein inconspicuous and close to leaf margin, base rounded to broadly cuneate, margin entire or slightly sparsely serrulate, apex acuminate to caudate-acuminate. Inflorescences terminal, narrowly paniculate cymose, 17–26 × 2–4 cm, furfuraceous. Pedicel ca. 2 mm. Hypanthium narrowly funnel-shaped, 4–5 mm at anthesis, furfuraceous. Calyx lobes narrowly triangular to almost clavate, ca. 1 mm. Petals pink, broadly ovate to ovate, 3–5 mm, apex acute. Filaments ca. 2.7 mm; anthers 3.5–4 mm; connective not inflated, not spurred. Ovary ovoid, apex 4-denticulate. Capsule ovoid, 3.5–4 × 3–4 mm; hypanthium ca. 5 mm, longitudinally 8-ribbed, furfuraceous, apically contracted. Fl. Jun–Aug, fr. Oct–Dec.

Mixed forests, thickets, moist places; 400–1500 m. Guangxi, Hainan, Yunnan [Thailand, Vietnam].

4. *Allomorpha baviensis* Guillaumin, Notul. Syst. (Paris) 2: 324. 1913.

刺毛异形木 *ci mao yi xing mu*

Oxy-spora balansae (Cogniaux) J. F. Maxwell var. *baviensis* (Guillaumin) J. F. Maxwell.

Shrubs, 1–2(–4) m tall. Stems terete or obtusely 4-sided to subterete, densely setose and puberulous, glabrescent or glabrous when older; branches numerous. Petiole 1.5–3(–4.5) cm, densely setose and puberulous; leaf blade ovate, 10.5–22 × 4.5–11 cm, stiffly papery to papery, abaxially densely setose or puberulous, adaxially glabrous or very sparsely strigose, secondary veins 2 on each side of midvein, base rounded to subcordate, margin minutely denticulate, apex long acuminate. Inflorescences terminal, narrowly paniculate cymose, 9–17 × 1.5(–3) cm, densely patently setose and puberulous. Pedicel 1–2 mm. Hypanthium narrowly funnelform, 3–4 mm, furfuraceous. Calyx lobes 4, broadly triangular, ca. 1 mm. Petals 4, pink and lavender, broadly ovate to ovate, ca. 3 mm, oblique, apex acute. Stamens 8, inclined to one side; anthers as long as filaments; connective inflated at base, shortly spurred. Ovary inferior, ovoid, apex 8-setose. Capsule broadly ovoid to globular, 3–4 × ca. 3 mm; hypanthium 4–4.5 mm, longitudinally 8-ribbed, furfuraceous; calyx lobes broadly triangular. Fl. Nov–Jan, fr. Nov–Apr.

Mixed forests, woodland margins, moist places; 500–2000 m. Guangxi, Yunnan [Thailand, Vietnam].

Thai material of *Allomorpha setosa* Craib (correctly named *Oxy-spora howellii* if placed in the genus *Oxy-spora*, as was done by Renner et al., Fl. Thailand 7(3): 459. 2001) differs from Chinese material of *A. baviensis* in the longer and much stiffer pubescence of the entire plant. The Chinese gatherings identified as *A. setosa* in FRPS (53(1): 168. 1984) do not match the Thai material, but fit well with the type and more recent gatherings of *A. baviensis*.

5. OXYSPORA Candolle, Prodr. 3: 123. 1828.

尖子木属 *jian zi mu shu*

Shrubs. Stems 4-sided or obtusely 4-sided, channeled. Leaves petiolate; leaf blade stiffly papery to sometimes membranous, secondary veins 2 or 3 on each side of midvein, margin denticulate. Inflorescences terminal, a cymose panicle, with 2(or 3) leaflike bracts at base. Bractlets and bracteoles very small, caducous. Flower 4-merous. Hypanthium narrowly funnelform, 8-veined. Calyx lobes shortly and broadly triangular or shortly triangular-ovate, apex acute and apiculate. Petals pink, red, or dark red, ovate, apex apiculate and puberulous. Stamens 8, whorls unequal in length. Longer stamens purple; connective swollen and usually not extended at base into a spur. Shorter stamens yellow; connective usually extended at base into a short spur. Ovary inferior, 4-celled, glabrous. Capsule obovoid or ovoid, 4-poricidal; hypanthium narrowly funnelform, apically contracted, 8-ribbed. Seeds numerous, small, triangular-lanceolate, angular.

Number of species unclear: Bhutan, Cambodia, China, India, Laos, Myanmar, Nepal, Thailand, Vietnam; four species (one endemic) in China.

The number of species in *Oxy-spora* is unclear because of problems with the separation from *Allomorpha* (see comment under that genus above).

1a. Leaf blade abaxially glabrous.

2a. Leaf blade 6–13 × 2.5–4.2 cm; inflorescences 10–20 cm 2. *O. yunnanensis*

2b. Leaf blade 15–32 × 5–12 cm; inflorescences 20–40 cm 4. *O. cernua*

1b. Leaf blade abaxially furfuraceous stellate or furfuraceous squamose at least on veins.

3a. Inflorescences 20–30 cm, more than 10 cm wide 1. *O. paniculata*

3b. Inflorescences 12–25 × 2.6–6 cm 3. *O. vagans*

1. *Oxy-spora paniculata* (D. Don) Candolle, Prodr. 3: 123. 1828.

尖子木 *jian zi mu*

Arthrostemma paniculatum D. Don, Mem. Wern. Nat. Hist. Soc. 4: 299. 1823; *Bredia soneriloides* H. Léveillé.

Shrubs 1–2(–6) m tall. Stems 4-sided to obtusely 4-sided, furfuraceous stellate and sparsely puberulous-setose. Petiole 1–

7.5 cm, densely furfuraceous stellate; leaf blade ovate, narrowly elliptic-ovate, or suborbicular, 12–24(–32) × ca. 15.5 cm, stiffly papery, abaxially usually furfuraceous stellate on veins, adaxially furfuraceous squamose or glabrescent, secondary veins 3 on each side of midvein, base rounded to subcordate, margin denticulate, apex acuminate. Inflorescences terminal, a cymose panicle, 20–30 × ca. 10 cm or wider, furfuraceous stellate, with 2 leaflike bracts at base. Bractlets and bracteole lanceolate to subulate, 1–3 mm. Hypanthium narrowly funnellform, ca. 8 mm, longitudinally 8-ribbed, with dense stellate trichomes when young but glabrescent. Calyx lobes shortly triangular-ovate, ca. 1 mm, apex acute and apiculate. Petals pink, red, or dark red, ovate, ca. 7 mm. Longer stamens with connective swollen but not spurred. Shorter with connective shortly spurred. Capsule obovoid, ca. 8 × 6 mm; hypanthium narrowly funnellform. Fl. Jul–Sep(–Oct), fr. Jan–Mar(–May).

Mixed forests, stream banks, valleys, moist places; 500–2000 m. Guangxi, Guizhou, Xizang (Médog), Yunnan [Bhutan, Cambodia, India, Laos, Myanmar, Nepal, Vietnam].

2. *Oxyspora yunnanensis* H. L. Li, J. Arnold Arbor. 25: 12. 1944.

滇尖子木 dian jian zi mu

Oxyspora glabra H. L. Li; *O. paniculata* (D. Don) Candolle var. *yunnanensis* (H. L. Li) J. F. Maxwell.

Shrubs 1–2 m tall. Stems 4-sided, patently setose or not when young. Petiole 0.5–1.5 cm; leaf blade lanceolate-oblong to oblong-ovate, 6–13 × 2.5–4.2 cm, stiffly papery to papery, abaxially glabrous, adaxially puberulous with trichomes inflated at base, secondary veins 2 on each side of midvein, base cuneate to subrounded, margin denticulate to subentire, apex acuminate. Inflorescences terminal, a cymose panicle, 10–20 × ca. 7 cm, puberulous or glabrous, with 2 leaflike but usually caducous bracts at base. Bractlets and bracteoles lanceolate to subulate, very small. Hypanthium narrowly funnellform, ca. 5 mm, obtusely 4-sided, puberulous or glabrescent. Calyx lobes broadly triangular, 1–1.5 mm, apex acute and apiculate. Petals pink to red, ovate, ca. 1 cm, apically ciliate. Longer stamens with connective swollen and slightly extended at base. Shorter stamens with connective shortly spurred. Capsule ovoid, ca. 6 × 4 mm, 4-sided; hypanthium funnellform, longitudinally 8-ribbed, apically contracted. Fl. ca. Aug, fr. Oct–Nov.

• Dense mixed forests, stream banks, rock crevices; 1300–2800 m. Guizhou, Yunnan.

3. *Oxyspora vagans* (Roxburgh) Wallich, Pl. Asiat. Rar. 1: 78. 1830.

刚毛尖子木 gang mao jian zi mu

Melastoma vagans Roxburgh, Fl. Ind., ed. 1832, 2: 404. 1832; *Homocentria vagans* (Roxburgh) Naudin; *Oxyspora paniculata* (D. Don) Candolle var. *vagans* (Roxburgh) J. F. Maxwell.

Shrubs 1–2 m tall. Stems obtusely 4-sided or terete, with densely patently glandular trichomes when young. Petiole 1.5–5.5(–6) cm, with dense glandular trichomes; leaf blade ovate to elliptic, 11–16.5(–19) × 5–7.5(–9) cm, papery to nearly membranous, both surfaces furfuraceous squamose, secondary veins 2 or 3 on each side of midvein, base rounded to subcordate, margin denticulate with each tooth having a terminal seta, apex acuminate. Inflorescences terminal, a cymose panicle, 12–25 × 2.6–6 cm, furfuraceous stellate, with 2 leaflike bracts at base. Bractlets and bracteoles subulate, ca. 1 mm, caducous. Hypanthium narrowly urceolate, ca. 6 mm, longitudinally 8-ribbed. Calyx lobes inconspicuous, apex apiculate. Petals pink to red, ovate, ca. 6 mm. Longer and shorter stamens with connective swollen and shortly spurred at base. Ovary fusiform. Capsule elliptic, ca. 5.5 × 4 mm; hypanthium urceolate, apically contracted. Fl. Oct, fr. Mar.

Sparse or dense mixed forests, stream banks, moist places; 700–1000 m. Guangxi, Xizang (Médog), Yunnan [India, Myanmar, Thailand].

4. *Oxyspora cernua* (Roxburgh) J. D. Hooker & Thomson ex Triana, Trans. Linn. Soc. London 28: 73. 1871.

墨脱尖子木 mo tuo jian zi mu

Melastoma cernuum Roxburgh, Fl. Ind., ed. 1832, 2: 404. 1832 [“*cernua*”].

Shrubs 1–2 m tall. Stems 4-sided, furfuraceous stellate. Petiole 0.5–4 cm, densely furfuraceous; leaf blade ovate, elliptic-ovate, or subelliptic, 15–32 × 5–12 cm, stiffly papery, abaxially glabrous, furfuraceous only on veins, adaxially furfuraceous or glabrous, secondary veins 2 on each side of midvein, base rounded to subcordate, margin entire or subentire, apex acuminate. Inflorescences terminal, a cymose panicle, 20–40 cm, furfuraceous; peduncle narrowly winged, basally with 2 or 3 bracts; bracts sessile, leaflike, 2–6 × 1.5–4.5 cm, base cordate. Bractlets and bracteoles lanceolate to subulate, 1–3 mm. Hypanthium narrowly funnellform, 0.5–1 cm, longitudinally 8-ribbed, glabrous or furfuraceous. Calyx lobes broadly triangular-ovate, 1–1.2 mm, apex acute and apiculate. Petals pink to red, oblong, 1–1.2 × 0.6–0.8 cm. Longer with connective swollen but not extended at base. Shorter stamens with connective not spurred. Capsule obovoid, 9–13 × ca. 5 mm; hypanthium narrowly funnellform, furfuraceous. Fl. Sep–Nov.

Mixed forest margins, thickets, valleys, moist places; 600–1200 m. SE Xizang [Bhutan, India].

6. PLAGIOPETALUM Rehder in Sargent, Pl. Wilson. 3: 452. 1917.

偏瓣花属 pian ban hua shu

Shrubs or herbs. Stems usually 4-sided, narrowly winged when young, often subterete when older. Leaves petiolate; leaf blade membranous to papery, secondary veins 1 or 2 on each side of midvein, tertiary veins parallel, margin serrulate to subentire but sparsely setose ciliate. Inflorescences terminal or axillary, umbellate corymb, rarely umbellate; bracts often lanceolate to triangular-lanceolate. Pedicel 4-sided; bracteoles 2. Hypanthium campanulate, usually contracted at middle, 4-sided, 8-ribbed. Calyx lobes 4,

often ovate, apex apiculate. Petals 4, red, purple, or sometimes pink, ovate to obovate, oblique. Stamens 8, whorls unequal in length; anthers lanceolate to long lanceolate, not tuberculate; connective not or minutely inflated at base, shortly spurred. Ovary inferior, 4-celled, apically denticulate. Style filiform; stigma apiculate. Capsule globose to ovoid-urceolate, 4-sided; hypanthium often glabrous. Seeds numerous, long cuneate to narrowly triangular, small, ribbed on angles, densely tuberculate.

Two species: China, Myanmar, Vietnam; two species (one endemic) in China.

Plagiopetalum is often considered a synonym of *Anerincleistus* Korthals. The genus was revised by Hansen (Bull. Mus. Natl. Hist. Nat., B, Adansonia 10: 127–136. 1988), and his species concepts are followed here.

1a. Shrubs 50–70(–200) cm tall; leaf blade 2–14 × (0.7–)2.5–6.5 cm; pedicel 6–10 mm 1. *P. esquirolii*
1b. Herbs 12–22 cm tall; leaf blade 0.9–1.9 × 0.6–1.4 cm; pedicel ca. 1 mm 2. *P. tenuicaule*

1. *Plagiopetalum esquirolii* (H. Léveillé) Rehder, J. Arnold Arbor. 15: 110. 1934.

偏瓣花 pian ban hua

Sonerila esquirolii H. Léveillé, Bull. Soc. Bot. France 54: 368. 1907; *Allomorphia blinii* (H. Léveillé) Guillaumin; *A. flexuosa* Handel-Mazzetti; *Barthea blinii* H. Léveillé; *Oxyspora serrata* Diels; *Plagiopetalum blinii* (H. Léveillé) C. Y. Wu ex C. Chen; *P. esquirolii* var. *septemnerium* C. Chen; *P. esquirolii* var. *serratum* (Diels) C. Hansen; *P. henryi* (Kraenzlin) S. Y. Hu; *P. quadrangulum* Rehder; *P. serratum* (Diels) Diels; *P. serratum* var. *quadrangulum* (Rehder) C. Chen; *Sonerila henryi* Kraenzlin.

Shrublets 50–70(–200) cm tall. Stems usually 4-sided, narrowly winged when young, slightly setose and puberulous on wings otherwise glabrous, often subterete when mature. Petiole (0.4–)2–20 cm, densely squamose and patently setose or densely puberulous and shortly setose; leaf blade lanceolate, ovate-lanceolate, or rarely elliptic, 2–14 × (0.7–)2.5–6.5 cm, membranous to papery, abaxially glabrous except densely puberulous and sparsely strigose on veins, adaxially glabrescent or sparsely puberulous and very sparsely strigose, secondary veins 1–3 on each side of midvein, base obtuse to rounded, margin serrulate to subentire but sparsely setose ciliate, apex acuminate. Inflorescences terminal or axillary, remotely cymose or a compound umbellate corymb, 1.5–8.5 cm, usually squamose and glandular setose. Pedicel 6–10 mm, finely puberulous. Hypanthium campanulate, 5–7 mm, 4-sided, 8-ribbed, patently setose and sparsely puberulous. Calyx lobes ovate, apex apiculate. Petals purple or sometimes pink, obovate, 6–10 mm, oblique. Longer stamens ca. 1.1 cm; anthers ca. 6 mm. Shorter stamens 7.5–8 mm; anthers 3–4.5 mm. Connective not or mi-

nutely inflated at base. Ovary apically 4-denticulate. Capsule ovoid, 4–6 mm in diam.; hypanthium limb outside glabrous or glandular puberulous. Fl. Aug–Oct, fr. Dec–Feb.

Open broad-leaved forests, mixed forests, grasslands, valleys, moist places, moist soil, rock crevices, trailsides; 500–3500 m. Guangxi, Guizhou, Sichuan, Yunnan [NE Myanmar, Vietnam].

2. *Plagiopetalum tenuicaule* (C. Chen) C. Hansen, Bull. Mus. Natl. Hist. Nat., B, Adansonia 10: 134. 1988.

四棱偏瓣花 si leng pian ban hua

Phyllagathis tenuicaulis C. Chen, Bull. Bot. Res., Harbin 4(3): 42. 1984.

Herbs 12–22 cm tall. Stems slender, 4-sided, narrowly winged on angles, wings with sparse glandular trichomes, nodes hispid. Petiole ca. 8 mm to subsessile, with glandular trichomes; leaf blade ovate to broadly ovate, 0.9–1.9 × 0.6–1.4 cm, papery, abaxially sparsely strigose on veins, adaxially sparsely strigose, secondary veins 1(or 2) on each side of midvein, base cuneate to subcordate, margin denticulate, apex acute. Inflorescences terminal, cymes, 1.5–2.2 cm, 1–3-flowered; peduncle ca. 1 cm, with sparse glandular trichomes. Pedicel ca. 1 mm, bracteolate at base. Hypanthium bell- or funnel-shaped, 4-sided, ca. 3.5 mm, with glandular trichomes. Calyx lobes broadly triangular, apex acute with a ca. 0.5 mm aristate tip. Petals purplish red, subround, ca. 6 × 5 mm, minutely oblique, base shortly unguiculate, apex acute with 1 glandular trichome at tip. Stamens equal, ca. 5.5 mm; anthers lanceolate, ca. 2.5 mm; connective minutely inflated. Ovary broadly ovate, apex 4-dentate. Fl. Aug.

• Mountain slopes, grassy areas; ca. 1700 m. Guangxi.

7. CYPHOTHECA Diels, Bot. Jahrb. Syst. 65: 103. 1932.

药囊花属 yao nang hua shu

Shrubs. Stems obtusely 4-sided, scabrous; branchlets 4-sided. Leaves petiolate; leaf blade papery, secondary veins 2 on each side of midvein, margin remotely serrulate. Inflorescences terminal, cymose or corymbose; bracts small, with dense stellate trichomes. Pedicel with dense stellate trichomes. Hypanthium funnellform-campanulate, obtusely 4-sided, 8-ribbed. Calyx lobes orbicular, winged on ridges. Petals white to pink, broadly obovate, oblique. Stamens 8, curved, shortly beaked, whorls unequal in length; connective inflated at middle. Ovary half inferior, urceolate, 4-celled. Style exerted from corolla. Capsule urceolate, longitudinally dehiscent.

• One species: China (Yunnan).

The genus was revised by Hansen (Nord. J. Bot. 10: 21–23. 1990), but placed in the synonymy of *Oxyspora* by Maxwell (Gard. Bull. Singapore 35: 209–226. 1983 [“1982”]).

The leaves are very similar to those of *Blastus pauciflorus*, and sterile material is therefore difficult to identify.

1. *Cyphotheca montana* Diels, Bot. Jahrb. Syst. 65: 103. 1932.

药囊花 yao nang hua

Oxyspora montana (Diels) J. F. Maxwell.

Shrubs 0.8–2 m tall. Stems obtusely 4-sided, scabrous; branchlets 4-sided, densely furfuraceous puberulous and with stellate trichomes. Petiole 1–5 cm, with dense stellate trichomes; leaf blade ovate, ovate-oblong, ovate-lanceolate, or elliptic, 5–12(–17) × 2–5.5(–7) cm, papery, abaxially with stellate trichomes only on veins, adaxially with dense stellate trichomes when young, secondary veins 2 on each side of midvein, base cuneate to broadly cuneate, margin remotely serrulate with each tooth having a terminal seta, apex shortly acuminate or nearly acute. Inflorescences terminal, cymose or corymbose, ca.

5 cm, with dense stellate trichomes. Pedicel 2–6 mm, with dense stellate trichomes; bracteoles triangular, with dense stellate trichomes. Hypanthium funnelform-campanulate, ca. 8 mm, obtusely 4-sided, puberulous. Calyx lobes orbicular, winged on ridges. Petals white to pink, broadly obovate to obliquely broadly obovate, ca. 6 mm, oblique, glabrous, apex obtuse. Longer stamens ca. 1.4 cm; anthers lanceolate, ca. 9 mm, curved, shortly beaked. Shorter anthers ca. 8 mm; anthers geniculate, ca. 5 mm. Ovary urceolate, 4-celled, limb erose. Style basally sparsely puberulous. Pedicel 1.3–1.5 cm in fruit. Capsule urceolate, ca. 8 × 8 mm, 4-longitudinally dehiscent; hypanthium obtusely 4-sided, 8-veined. Fl. ca. May, fr. Oct.

• Dense broad-leaved forests, bamboo forests, mountain slopes, valleys, hillsides, stream banks; 1000–2400 m. S and SW Yunnan.

8. BARTHEA J. D. Hooker in Bentham & J. D. Hooker, Gen. Pl. 1: 731, 751. 1867.

棱果花属 leng guo hua shu

Shrubs. Branches 4-sided, glabrous or slightly furfuraceous. Leaves opposite, petiolate; leaf blade both surfaces glabrous, secondary veins 2 on each side of midvein but marginal veins inconspicuous, margin entire. Inflorescences terminal, cymes, (1–)3-flowered. Flowers 4-merous. Hypanthium campanulate, acutely 4-angled, furfuraceous. Calyx lobes 4, lanceolate to shortly triangular. Petals 4, broadly obovate. Stamens 8, whorls unequal in length. Anthers of longer stamen lanceolate, apex beaked; connective basally extended adaxially into an inconspicuous spur bearing 2 long setae. Anthers of shorter stamen oblong, apex not beaked, 2-setose at base; connective slightly inflated. Ovary half inferior, pyriform, 4-sided, 4-celled, glabrous. Capsule oblong-globose, obtusely 4-sided, often furfuraceous, dehiscent into 4 valves. Seeds numerous, cuneiform, small.

• One species: China.

The genus was revised by Hansen (Notes Roy. Bot. Gard. Edinburgh 38: 489–493. 1980), and his concept is followed here.

1. *Barthea barthei* (Hance ex Bentham) Krasser in Engler & Prantl, Nat. Pflanzenfam. 3(7): 175. 1893.

棱果花 leng guo hua

Shrubs 70–150(–300) cm tall. Stems terete; bark grayish white; branches numerous, nearly 4-sided, puberulous and glandular furfuraceous. Petiole 0.5–1.5 cm, densely furfuraceous or glabrous; leaf blade elliptic, suborbicular, ovate, or ovate-lanceolate, (3.5–)6–11(–15) × (1.8–)2.5–5.5 cm, stiffly papery to subleathery, abaxially densely furfuraceous, adaxially glabrous, secondary veins 2 on each side of midvein, base obtuse to broadly obtuse, margin entire or serrulate, apex acuminate. Inflorescences cymes, (1–)3-flowered but usually only 1 fertile; peduncle ca. 7 mm, 4-sided, furfuraceous. Hypanthium ca. 0.6 or 1.4 cm, 4-sided, very narrowly winged on ribs, densely furfuraceous. Calyx lobes shortly triangular or linear-lanceolate, ca. 3 or 1.5–1.7 mm. Petals white, pink, or purple, oblong-elliptic to obovate, 1.1–1.8 × 1–1.6 cm, apically oblique. Filaments of longer stamen ca. 8 mm; anthers ca. 1 cm, spur ca. 2 mm and curved, basal 2 setae ca. 3.5 mm. Filaments of shorter stamen ca. 6 mm; anthers ca. 3 mm, spur inconspicuous, basal setae ca. 2.5 mm. Ovary 4-sided, glabrous. Capsule oblong, ca. 1 or 1.8 × 0.6 or 1.1 cm, 4-sided, furfuraceous, wings 1–2 mm wide on ribs. Fl. Jan–May or Oct–Dec, fr. Oct–Dec or May.

• Mixed forests, forested mountain slopes, open thickets, wooded ravines, along streams; 400–2500(–2800) m. Fujian, Guangdong, Guangxi, Hunan, Taiwan.

1a. Calyx lobes shortly triangular, ca.

3 mm; hypanthium ca. 0.6 cm; capsule ca. 1 × 0.6 cm, with wings

to 1 mm wide 1a. var. *barthei*

1b. Calyx lobes linear-lanceolate, 1.5–1.7 cm;

hypanthium ca. 1.4 cm; capsule ca.

1.8 × 1.1 cm, with wings ca. 2 mm

wide 1b. var. *valdealata*

1a. *Barthea barthei* var. *barthei*

棱果花(原变种) leng guo hua (yuan bian zhong)

Dissochaeta barthei Hance ex Bentham, Fl. Hongk. 115. 1861; *Barthea chinensis* J. D. Hooker, nom. illeg. superfl.; *B. formosana* Hayata.

Petals 1.1–1.8 × 1–1.6 cm. Hypanthium ca. 6 mm. Calyx lobes shortly triangular, ca. 3 mm. Fruit ca. 1 × 0.6 cm, with wings to 1 mm wide. Fl. Jan–Apr or Oct–Dec, fr. Oct–Dec or May.

• Mixed forests, open thickets, wooded ravines, along streams; 400–1300(–2800) m. Fujian, Guangdong, Guangxi, Hunan, Taiwan.

1b. *Barthea barthei* var. *valdealata* C. Hansen, Notes Roy. Bot. Gard. Edinburgh 38: 492. 1980.

宽翅棱果花 kuan chi leng guo hua

Petals 2–2.5 × 1–2 cm. Hypanthium ca. 1.4 cm. Calyx lobes linear-lanceolate, 1.5–1.7 cm. Fruit ca. 1.8 × 1.1 cm, with wings ca. 2 mm wide. Fl. Jan–May, fr. Oct–Nov.

• Forested mountain slopes. 500–2500 m. Guangxi (Shangsi).

9. **BLASTUS** Loureiro, Fl. Cochinch. 2: 517, 526. 1790.

柏拉木属 bai la mu shu

Shrubs. Branches terete, usually glandular pubescent. Leaves opposite, petiolate to almost sessile; leaf blade oblong-lanceolate to ovate-lanceolate, secondary veins 1 or 2(or 3) on each side of midvein. Inflorescences axillary and umbellate cymes or umbellate or terminal and cymose panicles; peduncle usually short, rarely long or absent; bracts absent or caducous. Flowers (3 or)4(or 5)-merous, minute. Hypanthium funnelliform to funnelliform-campanulate, (3 or)4(or 5)-sided. Petals 4, ovate, oblong, or rarely lanceolate. Stamens 4(or 5), whorls equal in shape and length; anthers apically attenuate, curved or geniculate, divergent at base, dehiscence poricidal; connective slightly inflated, not appendaged at base. Ovary inferior, 4-celled; placentation axile, paired. Style filiform, simple. Capsule obscurely 4-furrowed, opening at apex by 4 pores, finally loculicidally dehiscent into 4-valves. Seeds very numerous, cuneate.

Twelve species: Cambodia, China, E India, Indonesia, Japan (Ryukyu Islands), Laos, Myanmar, Thailand, Vietnam; nine species (seven endemic) in China.

The genus was revised by Hansen (Bull. Mus. Natl. Hist. Nat., B, Adansonia 1: 43–77. 1982). Further study is necessary to be confident of the status of *Blastus tenuifolius* and *B. tsaii*.

- 1a. Leaves sessile; leaf blade fiddle-shaped-elliptic, base auriculate 1. *B. auriculatus*
 1b. Leaves ± petiolate; leaf blade ovate to elliptic, base not auriculate.
 2a. Inflorescences terminal.
 3a. Anthers ca. 4 mm; hypanthium in flower ca. 5 mm 2. *B. brevissimus*
 3b. Anthers (4.8–)6.2–7.4(–8) mm; hypanthium in flower 3.8–6(–8) mm 6. *B. pauciflorus*
 2b. Inflorescences axillary, subtended by a leaf or inserted at leaf scars.
 4a. Hypanthium densely lepidote with a dense cover of peltate glands 4. *B. cochinchinensis*
 4b. Hypanthium not lepidote, with only a few peltate glands.
 5a. Hypanthium with long patent trichomes in addition to a few peltate glands 5. *B. mollissimus*
 5b. Hypanthium lacking patent trichomes.
 6a. Leaf blade adaxially minutely puberulous and sparsely strigose 7. *B. setulosus*
 6b. Leaf blade adaxially glabrous or sparsely puberulous when young but then glabrescent.
 7a. Petals ca. 3 mm; anthers (0.9–)1.4–2.8 mm 3. *B. borneensis*
 7b. Petals 4–5 mm; anthers 3.5–4 mm.
 8a. Leaf blade oblong to narrowly ovate-oblong, 4–7.5 cm wide 8. *B. tenuifolius*
 8b. Leaf blade lanceolate to rarely elliptic, 2.5–4.2 cm wide 9. *B. tsaii*

1. *Blastus auriculatus* Y. C. Huang ex C. Chen, Fl. Yunnan. 2: 103. 1979.

耳基柏拉木 er ji bai la mu

Shrubs. Stems terete; branches densely yellow glandular. Leaves sessile; leaf blade fiddle-shaped-elliptic, 13–24 × 4.5–8 cm, papery, abaxially densely glandular, adaxially glandular when young but glabrescent, secondary veins 1 on each side of midvein, base auriculate, margin entire and ciliate, apex acuminate. Inflorescences axillary, cymose, 5–9-flowered, ca. 1 cm, densely glandular; bracts small, caducous. Pedicel ca. 2 mm, densely glandular. Hypanthium long funnelliform, ca. 3.5 mm, 4-sided, glandular. Calyx lobes 4, ca. 0.5 mm, margin repand, apex apiculate. Petals 4, white, ovate, ca. 2.2 mm, apex abruptly acuminate. Stamens 4; filaments ca. 2 mm; anthers ca. 3.5 mm, slightly curved; connective slightly inflated at base. Ovary inferior, urceolate, 4-celled, glandular. Capsule elliptic; hypanthium ca. 3.5 mm, obtusely 4-sided, densely glandular, 4-dentate at limb. Fl. Jun, fr. Jul.

- Mixed forests, bamboo forests. 200–300 m. Yunnan.

2. *Blastus brevissimus* C. Chen, Bull. Bot. Res., Harbin 4(3): 35. 1984.

短柄柏拉木 duan bing bai la mu

Shrubs to 50 cm tall. Stems terete, densely puberulous and

with glandular trichomes or setose when young. Petiole very short to nearly absent; leaf blade ovate to lanceolate-ovate, 15–17 × 5–6 cm, papery, abaxially puberulous on veins, sparsely patently setose, and yellow glandular, adaxially puberulous on veins otherwise glabrous, secondary veins 2 on each side of midvein, base rounded to subcordate, margin entire or inconspicuously denticulate, apex acuminate. Inflorescences terminal, paniced cymose, ca. 4 × 2 cm, puberulous. Pedicel 2–3 mm. Hypanthium funnelliform, ca. 5 mm, glandular. Calyx lobes spatulate, ca. 2.5 mm, glandular, apex rounded. Petals 4, red, oblong-ovate, ca. 4 mm, base obtuse, apex acuminate. Stamens 4; filaments ca. 4 mm; anthers linear-lanceolate, ca. 4 mm, slightly curved; connective, extended to a discoid base. Ovary half inferior, ovoid, 4-celled, ± glandular. Capsule ca. 6 × 4 mm, 4-sided, glandular, crowned by hypanthium lobes. Fl. ca. Aug, fr. Oct.

- Dense mixed forests, mountain slopes; ca. 400 m. Guangxi.

3. *Blastus borneensis* Cogniaux ex Boerlage, Handl. Fl. Ned. Ind. 1: 531. 1890.

南亚柏拉木 nan ya bai la mu

Blastus cogniauxii Stapf.

Shrubs. Stems terete; branches densely puberulous and glandular, glabrescent. Petiole 0.7–2 cm, puberulous; leaf blade lanceolate to ovate-lanceolate, 11–21 × 3–6.5 cm, papery to

submembranous, abaxially puberulous along veins when young otherwise densely yellow glandular, adaxially glabrous, secondary veins 2 on each side of midvein, base cuneate to obtuse, margin entire, apex acuminate. Inflorescences axillary, compound cymose, ca. 3.5 cm, puberulous; bracts caducous. Pedicel ca. 2 mm. Hypanthium campanulate-funnelform, 1.1–2.7(–3.5) mm, 4-sided, glandular. Calyx lobes broadly triangular, ca. 1 mm, apex acuminate. Petals white or yellow, broadly ovate, ca. 3 × 1.5 mm, sparsely glandular, margin minutely dentate, apex acuminate. Stamens 4; filaments ca. 3 mm, glandular; anthers (0.9–)1.4–2.8(–3.5) mm, curved, geniculate, adaxially at most 2-tuberculate; connective not inflated. Ovary inferior, ovoid-elliptic, 4-celled, glandular. Capsule elliptic, glandular, crowned by hypanthium lobes. Fl. ca. Apr but sometimes Dec, fr. Aug–Sep.

Dense mixed forests, valleys, mountain slopes, stream banks, moist places; below 100–1300 m. Hainan [Indonesia, Malaysia, Thailand, Vietnam].

4. *Blastus cochinchinensis* Loureiro, Fl. Cochinch. 2: 527. 1790.

柏拉木 bai la mu

Anplectrum parviflorum Benth; *Blastus marchandii* H. Léveillé; *B. parviflorus* (Benth) Triana.

Shrubs 0.6–3 m tall. Stems terete, densely yellow glandular when young, glabrescent. Petiole 1–2(–3) cm, glandular; leaf blade lanceolate, narrowly elliptic, or elliptic-lanceolate, 6–12(–18) × 2–4(–5) cm, papery to substiffly papery, abaxially densely glandular, adaxially sparsely glandular but glabrescent, secondary veins 1(or 2) on each side of midvein, base cuneate, margin entire or very inconspicuously denticulate, apex acuminate. Inflorescences axillary, umbellate cymose; peduncle ca. 2 mm to almost absent. Pedicel ca. 3 mm, densely glandular. Hypanthium campanulate-funnelform, obtusely 4-sided, ca. 4 mm, densely peltate glandular. Calyx lobes 4(or 5), broadly ovate, ca. 1 mm. Petals 4(or 5), white or pink, ovate, ca. 4 mm, apex acuminate to subacute. Stamens 4(or 5); filaments ca. 4 mm; anthers pink, lanceolate, ca. 4 mm, geniculate; connective slightly inflated, decurrent at base of anther. Ovary inferior, urceolate, 4-celled, slightly glandular. Capsule elliptic to ovoid, ca. 3 × 2–3 mm, 4-sided, glandular. Fl. Jun–Aug, fr. Oct–Dec.

Mixed forests, stony soil; 200–1300 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Taiwan, Yunnan [Cambodia, India, Laos, Myanmar, Vietnam].

5. *Blastus mollissimus* H. L. Li, J. Arnold Arbor. 25: 16. 1944.

密毛柏拉木 mi mao bai la mu

Shrubs. Stems terete, ± villous. Branches, leaf blades abaxially, petioles, pedicels, and calyces densely brown villous. Petiole 2–6.5 cm; leaf blade ovate to lanceolate-ovate, 6.5–18 × 2.5–8.5 cm, papery to membranous, adaxially sparsely puberulous when young but glabrescent, secondary veins 2 on each side of midvein, base cuneate to rounded, margin erose denticulate with each tooth having a terminal seta, apex acuminate. Inflorescences axillary, cymose, ca. 3-flowered; peduncle very short to nearly absent. Pedicel ca. 2 mm, glandular. Hypanthium funnelform, 3–4 mm. Calyx lobes linear, 3–4 mm. Petals 4, oblong, ca. 8 × 4 mm, inclined to one side, apex acuminate. Sta-

mens 4; filaments ca. 4 mm; anthers lanceolate, ca. 5 mm, slightly curved; connective not inflated, not extended. Ovary inferior, ovoid, 4-celled, ± glandular. Fl. Jul, fr. unknown.

• Dense mixed forests, valleys, stream banks, moist places. Guangxi.

6. *Blastus pauciflorus* (Benth) Guillaumin, Bull. Soc. Bot. France 60: 90. 1913.

少花柏拉木 shao hua bai la mu

Allomorpha pauciflora Benth, London J. Bot. 1: 485. 1842; *A. bodinieri* H. Léveillé; *Blastus apricus* (Handel-Mazzetti) H. L. Li; *B. apricus* var. *longiflorus* (Handel-Mazzetti) C. Chen; *B. cavaleriei* H. Léveillé & Vaniot; *B. cavaleriei* var. *tomentosus* (H. L. Li) C. Chen; *B. dunnianus* H. Léveillé; *B. dunnianus* var. *glandulosestosus* C. Chen; *B. ernae* Handel-Mazzetti; *B. hindsii* Hance, nom. illeg. superfl.; *B. lii* M. P. Nayar; *B. longiflorus* Handel-Mazzetti; *B. longiflorus* var. *apricus* (Handel-Mazzetti) Y. L. Zheng & N. H. Xia; *B. spathulicalyx* Handel-Mazzetti; *B. spathulicalyx* var. *apricus* Handel-Mazzetti; *B. squamosus* C. Y. Wu & Y. C. Huang; *B. thuyongii* C. Hansen; *B. tomentosus* H. L. Li (1944), not Bakhuizen f. (1943); *Oxyspora pauciflora* (Benth) Benth.

Shrubs 0.6–2 m tall, branched. Stems terete, puberulous and yellow glandular when young. Petiole 0.4–1.5(–2.8) cm, densely puberulous and remotely glandular; leaf blade ovate-lanceolate to ovate, (5–)10–12(–25) × (2–)3–7.3(–10) cm, papery, abaxially densely puberulous and remotely glandular on veins otherwise densely yellow glandular, adaxially only puberulous on veins, secondary veins 1 or 2 on each side of midvein, base obtuse to rounded, margin nearly entire to minutely denticulate, apex shortly acuminate. Inflorescences terminal, panicle cymose, 7.5–13 × 3–7 cm, densely puberulous and remotely glandular. Pedicels 1–3 mm. Hypanthium funnelform, 3.8–6(–8) mm, (3 or)4-sided, densely stipitate glandular. Calyx lobes shortly triangular or spatulate, 0.5–3 mm. Petals (3 or)4, pink to reddish lavender, ovate, 2.5–4(–5) mm, inclined to one side, ± glandular, apex acute. Stamens (3 or)4; filaments 5–7(–10) mm, sparsely puberulous; anthers linear, (4.8–)6.2–7.4(–8) mm, slightly curved, 2-tuberculate to sagittate at base; connective not or only minutely inflated, extended to base. Ovary half inferior, ovoid, (3 or)4-celled, ± glandular. Capsule ovoid, 3.8–4.5 × 2.5–3 mm, crowned by hypanthium lobes, yellow glandular when immature, dehiscent longitudinally. Fl. Jun–Aug, fr. Aug–Nov.

• Mixed forests, mountain slopes, low hills, valleys, stream banks, moist places, trailsides; 100–1600 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Yunnan.

7. *Blastus setulosus* Diels, Bot. Jahrb. Syst. 65: 106. 1932.

刺毛柏拉木 ci mao bai la mu

Shrubs to 1 m tall. Branches subterete, with brown glandular trichomes when young, glabrescent. Petiole 1.5–3.5 cm, densely puberulous; leaf blade oblong to lanceolate-oblong, 7–12 × 2–3.5 cm, papery, abaxially minutely puberulous especially along veins, adaxially minutely puberulous and sparsely stri-

gose, secondary veins 1 (or 2) on each side of midvein, base cuneate, margin entire or inconspicuously denticulate with each tooth having a terminal seta, apex acuminate. Inflorescences axillary a leaf scars, umbellate cymose, 3(–5)-flowered; peduncle almost absent. Flowers pedicellate to nearly sessile. Hypanthium campanulate-funnelform, ca. 3.5 mm, 4-sided, densely glandular. Calyx lobes ovate to ovate-triangular, to 1 mm. Petals 4, white, ovate, ca. 4 × 2.5 mm, inclined to one side, apex acuminate. Stamens 4; filaments 3–4 mm; anthers lanceolate, ca. 4.5 mm, not tuberculate at base; connective slightly inflated. Ovary inferior, urceolate, 4-celled, glandular. Capsule ellipsoid, small squamose. Fl. Jul, fr. Aug.

- Mixed forests, moist places; 200–900 m. Guangdong, Guangxi.

8. *Blastus tenuifolius* Diels, Bot. Jahrb. Syst. 65: 105. 1932.

薄叶柏拉木 bao ye bai la mu

Shrubs to 1 m tall. Branches densely yellow glandular pilose when young. Petiole 3–4 cm; leaf blade oblong to narrowly ovate-oblong, 10–18 × 4–7.5 cm, membranous, abaxially pilose along veins, adaxially tuberculate and sparsely puberulous when young but glabrescent, secondary veins 2 on each side of midvein, base cuneate to subcordate, margin entire and ciliate, apex long acuminate. Inflorescences axillary, cymose, 3–5-flowered; peduncle very short or absent. Pedicel ca. 4 mm, puberulous and glandular. Hypanthium campanulate-funnelform, ca. 3 mm, 4-sided, glandular. Calyx lobes shortly triangular, to 1 mm, apex apiculate. Petals 4, pink, broadly ovate to suborbicular, ca. 5 × 4 mm, inclined to one side, apex abrupt-

ly acuminate. Stamens 4; filaments ca. 4 mm; anthers ca. 3.5 mm, slightly curved; connective not inflated. Ovary inferior, subglobose, 4-celled, glandular. Fl. ca. Oct, fr. unknown.

- Mixed forests, valleys, stream banks, moist places; 600–1400 m. Guangxi.

9. *Blastus tsaii* H. L. Li, J. Arnold Arbor. 25: 309. 1944.

云南柏拉木 yun nan bai la mu

Blastus yunnanensis H. L. Li (1944), not H. Léveillé (1912).

Shrubs 1.5–2 m tall. Stems subterete but 4-sided when young, densely glandular, glabrescent. Petiole 2–6 cm, densely glandular; leaf blade lanceolate to rarely elliptic, 8–15 × 2.5–4.2 cm, papery to submembranous, abaxially glandular, adaxially sparsely puberulous when young but glabrescent, secondary veins 1 (or 2) on each side of midvein, base cuneate, margin entire or inconspicuously denticulate, apex acuminate. Inflorescences axillary, umbellate, 3–5-flowered; peduncle very short to nearly absent. Pedicel ca. 2 mm, glandular. Hypanthium campanulate-funnelform, ca. 5 mm, glandular. Petals 4, pink to reddish lavender, oblong-ovate, 4–4.5 mm, inclined to one side, both sides near margin pellucidly glandular, apex acuminate. Stamens 4; filaments ca. 2.5 mm; anthers ca. 4 mm, slightly curved; connective minutely inflated, extended from base of anthers. Ovary inferior, ovoid, 4-celled, glandular. Fl. Jun, fr. unknown.

- Dense mixed forests, valleys, stream banks, moist places; 800–1300 m. SE Yunnan.

10. SPOROXEIA W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 69. 1917.

八蕊花属 ba rui hua shu

Shrubs. Stems obtusely 4-sided, becoming subterete, densely puberulous when young. Leaves petiolate; leaf blade secondary veins 2 (or 3) on each side of midvein, tertiary veins numerous and parallel, margin usually denticulate. Inflorescences umbellate, axillary or at petiole scars on leafless branchlets; peduncle short to nearly absent; bracts small, caducous. Flowers 4-merous, pedicellate. Hypanthium campanulate-funnelform, 4-sided. Calyx lobes broadly ovate to suborbicular. Petals pink, red, or showy red, often ovate, oblique, apex acuminate. Stamen whorls equal in size; filaments as long as anthers; anthers lanceolate, oblong-linear, or rarely subulate, 2-tuberculate at base; connective slightly inflated, extended, shortly spurred at base. Ovary inferior, urceolate, 4-sided, 4-celled, apex denticulate. Capsule subglobular to ovate-globular, obtusely 4-sided; hypanthium campanulate-funnelform to subglobular, 8-ribbed, ribs conspicuous or inconspicuous. Seeds numerous, cuneate, 3-sided, densely tuberculate.

About seven species: China, Myanmar; two species (one endemic) in China.

The separation of *Sporoxeia* from related genera, especially *Anerinclaistus* Korthals, is unclear (Hansen, Bull. Mus. Natl. Hist. Nat., B, Adansonia 12: 37–41. 1990).

- 1a. Filaments to 4 mm; anthers ca. 4.5 mm; hypanthium to 4 mm; calyx lobes ca. 1 mm 1. *S. clavicalcarata*
 1b. Filaments 4–8 mm; anthers 5–7 mm; hypanthium ca. 6 mm; calyx lobes 2–3 mm 2. *S. sciadophila*

1. *Sporoxeia clavicalcarata* C. Chen, Bull. Bot. Res., Harbin 4(3): 37. 1984.

棒距八蕊花 bang ju ba rui hua

Shrubs to 1 m tall. Stems obtusely 4-sided; branches densely puberulous, glabrescent. Petiole 4–10.5 cm, densely puberulous; leaf blade ovate, 10–19 × 5.5–11 cm, papery to substiffly papery, abaxially puberulous and glandular squamose on veins, adaxially slightly and shortly strigose among veins

otherwise slightly furfuraceous, secondary veins 3 on each side of midvein, base broadly obtuse, margin serrulate, apex acuminate. Inflorescences inserted at petiole scars, umbellate, 2- or 3-flowered; bracts subulate, small, caducous. Pedicel 0.6–1.2 cm, densely puberulous. Hypanthium campanulate-funnelform, to 4 mm, obtusely 4-sided, puberulous. Calyx lobes oblanceolate, ca. 1 mm, both surfaces puberulous, apex acuminate. Petals dark red, ovate, ca. 7 × 4 mm, ± puberulous, apex acuminate. Stamens equal; filaments ca. 4 mm; anthers lanceolate, ca. 4.5

mm, 2-tuberculate at base; connective inflated, extended, forming a ca. 0.8 mm clavate spur. Ovary broadly ovate, apex denticulate. Fl. Aug, fr. unknown.

• Sparse or dense mixed forests, stream banks, moist places; 1100–1300 m. Yunnan.

2. *Sporoxeia sciadophila* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 70. 1917.

八蕊花 ba rui hua

Blastus fengii S. Y. Hu; *B. hirsutus* H. L. Li; *B. latifolius* H. L. Li; *Sporoxeia hirsuta* (H. L. Li) C. Y. Wu; *S. latifolia* (H. L. Li) C. Y. Wu & Y. C. Huang; *S. latifolia* var. *fengii* (S. Y. Hu) C. Chen.

Shrubs 1–1.2 m tall. Stems obtusely 4-sided, densely puberulous when young, glabrescent. Petiole 3.5–8 cm, when young setose or puberulous, glabrescent; leaf blade orbicular, suborbicular, or subobovate-orbicular, 9.5–15 × 7.5–12 cm, stiffly papery, both surfaces furfuraceous or abaxially setose on

veins otherwise densely glandular squamose, adaxially setose or strigose on veins otherwise puberulous, secondary veins 2(or 3) on each side of midvein, base obtuse, broadly cuneate, or subcordate, margin inconspicuous densely denticulate with short to long setose-tipped teeth, apex acute. Inflorescences in axils of leaves or at petiole scars on older branches, umbellate; bracts subulate, small, caducous. Pedicel 0.5–1 cm, ± puberulous. Hypanthium campanulate-funnelform, ca. 6 mm, obtusely 4-sided, ± puberulous. Calyx lobes broadly ovate to triangular-ovate, 2–3 mm, inside puberulous, apex acute to nearly acuminate. Petals pink, broadly ovate, 7–9 × ca. 6 mm, oblique, apex acuminate. Stamens equal; filaments 4–8 mm; anthers lanceolate, 5–7 mm, 2-tuberculate at base; connective inflated, extended, forming a spur ca. 1 mm. Ovary urceolate, ciliate, apex obtuse 4-denticulate. Capsule subglobular, ca. 5 mm in diam., obtusely 4-sided; hypanthium subglobular, 8-ribbed. Fl. Jul–Aug, fr. Oct–Dec.

Broad-leaved evergreen forests, stony mountain slopes; moist places; 1400–2800 m. Yunnan [Myanmar].

11. *BREDIA* Blume, Mus. Bot. 1: 24. 1849.

野海棠属 ye hai tang shu

Tashiroea Matsumura.

Herbs or shrublets, erect or creeping to ascending. Stems terete or 4-sided. Leaves petiolate; leaf blade secondary veins 1–3(or 4) on each side of midvein, tertiary veins parallel, margin denticulate, serrate, or almost entire. Inflorescences terminal, few-flowered cymes, cymose panicles, or rarely umbellate cymes; bract small, frequently caducous. Flowers (3 or)4-merous. Hypanthium funnel-shaped, turbinate, or nearly campanulate. Calyx lobes conspicuous. Petals pink to purplish red, ovate to broadly ovate, sometimes slightly oblique, apex acute, acuminate, or retuse. Stamens dimorphic, twice as many as petals, unequal in length; filaments filiform; anthers dimorphic, subulate, linear-subulate, or oblong-linear. Longer stamens usually without tuberculate base; connective decurrent, slightly prolonged. Ovary half inferior, turbinate, 4-celled. Style filiform; stigma apiculate. Capsule turbinate, usually obtusely 4-sided, woody, apex truncate but with crown usually exerted from calyx; calyx lobes usually persistent. Seed numerous, very minute, cuneate, densely granulate.

About 15 species: E and S Asia; 11 species (ten endemic) in China.

Bredia biglandularis cannot be reliably keyed out at this time because its flowers are unknown.

- 1a. Leaves sessile or subsessile 9. *B. sessilifolia*
 1b. Leaves petiolate.
 2a. Stems glabrous.
 3a. Petiole 5–10 cm; leaf blade with 3 secondary veins on each side of midvein 1. *B. biglandularis*
 3b. Petiole 0.6–1.2(–2.5) cm; leaf blade with 1 or 2 secondary veins on each side of midvein 8. *B. quadrangularis*
 2b. Stems pubescent or puberulous at least when young.
 4a. Leaf blade 0.8–1.7(–2) × 0.8–1.7(–2) cm, margin entire 6. *B. microphylla*
 4b. Leaf blade 2–11(–13.5) × 1.5–5.5(–10) cm, margin toothed at least to some extent.
 5a. Leaf blade adaxially glabrous.
 6a. Hypanthium not truncate at apex; persistent calyx lobes ca. 7 × 7 mm 10. *B. sinensis*
 6b. Hypanthium ± truncate at apex; persistent calyx lobes not conspicuous 7. *B. oldhamii*
 5b. Leaf blade adaxially ± densely pilose.
 7a. Inflorescences and hypanthia hirsute with whitish spreading trichomes 4. *B. hirsuta*
 7b. Inflorescences and hypanthia not hirsute.
 8a. Leaf blade base cordate; shrubs or shrublets.
 9a. Stems and hypanthia minutely glandular puberulous 2. *B. esquirolii*
 9b. Stems and hypanthia spreading pilose with glandular trichomes 3–4 mm 3. *B. fordii*
 8b. Leaf blade base obtuse or rounded; herbs or shrublets.
 10a. Calyx lobes linear-lanceolate, ca. 1 mm 5. *B. longiloba*
 10b. Calyx lobes narrowly triangular to lanceolate, ca. 3 mm 11. *B. yunnanensis*

1. *Bredia biglandularis* C. Chen, Bull. Bot. Res., Harbin 4(3): 39. 1984.

双腺野海棠 shuang xian ye hai tang

Shrubs to 60 cm tall, branched, base woody. Stems flat-terete when young but later terete, glabrous. Petiole 5–10 cm, glabrous; leaf blade ovate to suborbicular, 3–4.5 × 1.6–3.2 cm, stiffly papery, both surfaces puberulous, secondary veins 2 on each side of midvein and basally glandular between apical pair, base rounded, margin subtire to sparsely inconspicuous serrulate, apex obtuse, acute, or acuminate. Inflorescence a cymose panicle, 2- or 3-branched; peduncle 4-sided, glabrous. Flower unknown. Capsule cup-shaped, ca. 4 mm in diam., 4-sided, glabrous; persistent calyx lobes ca. 0.5 mm, apically apiculate. Fr. Oct.

• Sparse forests, foothills, stream banks, shaded places. Guangxi (Huanjiang).

2. *Bredia esquirolii* (H. Léveillé) Lauener, Notes Roy. Bot. Gard. Edinburgh 31: 398. 1927.

赤水野海棠 chi shui ye hai tang

Barthea esquirolii H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 494. 1913; *Bredia cordata* H. L. Li; *B. esquirolii* var. *cordata* (H. L. Li) C. Chen.

Shrublets to 20(–50) cm tall, branched. Stems terete, obtusely 4-sided, densely pilose and minutely glandular puberulous. Petiole 1–3 cm, densely pilose and with glandular trichomes; leaf blade ovate to oblong-ovate, 3–10 × 1.7–5.5 cm, stiffly papery, both surfaces densely puberulous when young but glabrescent or abaxially puberulous and adaxially ± sparsely strigose, secondary veins 3 on each side of midvein, base cordate, margin serrulate with each tooth having a terminal seta, apex acuminate. Inflorescences terminal, cymose, 1–2 cm, 3–7-flowered. Pedicel ca. 1.4 cm, densely pilose and with glandular trichomes. Hypanthium bell- or funnel-shaped, ca. 5 mm, pilose and with glandular trichomes. Calyx lobes linear-lanceolate, ca. 3 mm, both surfaces puberulous, margin with glandular trichomes. Petals purplish red, ovate, 6–10 × ca. 6 mm, oblique, outside puberulous, apex acute. Longer stamens ca. 1.8 cm; anthers linear, ca. 7 mm, minutely curved. Shorter stamens ca. 1.1 cm; anthers lanceolate, ca. 5 mm, tuberculate at base. Connective decurrent, forming a short spur. Ovary half inferior, ovate, glandular punctate, apex with a membranous crown, crown margin abruptly denticulate. Fl. Jun–Aug, fr. Sep–Oct.

• Forests, forest margins, hillsides, sunny slopes, damp places; 600–800 m. NW Guizhou, Sichuan.

3. *Bredia fordii* (Hance) Diels, Bot. Jahrb. Syst. 65: 110. 1932.

叶底红 ye di hong

Otanthera fordii Hance, J. Bot. 19: 47. 1881; *Bredia omeiensis* H. L. Li; *B. sepalosa* Diels; *B. tuberculata* (Guillaumin) Diels; *Fordiophyton tuberculatum* Guillaumin; *Phyllagathis fordii* (Hance) C. Chen; *P. fordii* var. *micrantha* C. Chen.

Shrubs or shrublets, 20–50(–100) cm tall. Stems pale brown or red, 4-sided, densely spreading pilose with 3–4 mm glandu-

lar trichomes. Petiole 2.5–6.5 cm, reddish pilose; leaf blade cordate, ovate-cordate, oblong, ovate-oblong, or elliptic, 4–10(–13.5) × 2–5.5(–10) cm, stiffly papery, abaxially purplish red and only sparsely strigose and puberulous, adaxially sparsely strigose, puberulous, and sometimes white punctate, secondary veins 2–4 on each side of midvein, base cordate, margin double denticulate with each tooth having a terminal seta, apex shortly acuminate to obtusely acute. Inflorescences terminal, umbellate, cymose, or cymose paniculate; peduncle 1–5.5 cm, densely pilose and with long glandular trichomes. Pedicel 0.8–2 cm, densely pilose and with long glandular trichomes. Hypanthium 5–7 mm. Calyx lobes linear-lanceolate to narrowly triangular, 3–5 mm. Petals purple to purplish red, ovate to broadly ovate, 7–14 × 6–8 mm, slightly oblique, outside apically puberulous, margin ciliate, apex acuminate. Longer stamens 1.6–1.8 cm; anthers lanceolate, 7–11 mm, geniculate or slightly curved; connective decurrent, minutely inflated at base. Shorter stamens ca. 1.1 cm; anthers shortly lanceolate, 5–7 mm; connective decurrent, forming a short spur, abaxially tuberculate. Ovary ovoid, apex with a membranous crown, crown margin truncate. Capsule cup-shaped; hypanthium 5–10 × 7–12 mm, setose, apex truncate. Fl. Jun–Aug, fr. Aug–Oct.

• Forests, hillsides, woodland margins, shaded damp places, valleys, stream banks, trailsides; 100–1400 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang.

4. *Bredia hirsuta* Blume var. ***scandens*** Ito & Matsumura, J. Coll. Sci. Imp. Univ. Tokyo 12: 487. 1898.

野海棠 ye hai tang

Bredia hirsuta Blume var. *rotundifolia* (Y. C. Liu & C. H. Ou) S. F. Huang & T. C. Huang; *B. rotundifolia* Y. C. Liu & C. H. Ou; *B. scandens* (Ito & Matsumura) Hayata.

Shrubs or shrublets, to 1 m tall, erect or climbing. Stems 4-sided when young, later terete, closely spreading setose to hirsute, trichomes glandular. Petiole 1.3–4.5 cm, patently setose with glandular trichomes; leaf blade ovate, oblong-ovate, or elliptic, 2–11 × 2–5 cm, papery, abaxially puberulous and rarely setose on veins and otherwise glabrous, adaxially rarely strigose among veins, secondary veins 3 or 4 on each side of midvein, base rounded to cordate, margin serrulate, apex obtusely acuminate. Inflorescences terminal, cymose paniculate, 5–14 × 3–7 cm, patently setose with glandular trichomes. Pedicel 0.8–1.2 cm, glandular setose. Hypanthium turbinate, ca. 3 mm, 4-sided. Calyx lobes triangular, villous. Petals white or lavender, ovate-orbicular to oblong, 8–11 × 4–5(–6) mm, slightly oblique, outside slightly with glandular trichomes, apex shortly acute to acuminate. Longer stamens 1–1.2 cm; anthers lanceolate, 6–7 mm, tuberculate at base; connective decurrent, forming a short spur. Shorter stamens ca. 6.5 mm; anthers 2.5–3 mm, conspicuously tuberculate at base. Ovary half inferior, ovate. Capsule cup-shaped to turbinate; hypanthium 4–5 × ca. 5 mm, 4-sided, with glandular trichomes, apex truncate. Fl. Oct–Nov, fr. Nov.

• Forests, hillsides, valleys, moist shaded places, roadsides; 500–2000 m. Taiwan.

Bredia hirsuta var. *hirsuta* occurs in Japan.

5. *Bredia longiloba* (Handel-Mazzetti) Diels, Bot. Jahrb. Syst. 65: 111. 1932.

长萼野海棠 chang e ye hai tang

Fordiophyton gracile Handel-Mazzetti var. *longilobum* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 63: 10. 1926.

Shrublets 20–30 cm tall. Stems 4-sided, stoloniferous, densely pilose and with spreading glandular trichomes. Petiole 1–4.5 cm, patently setose; leaf blade ovate to elliptic-ovate, 5–8 × 2.3–4.5 cm, papery to stiffly papery, abaxially densely puberulous, adaxially puberulous and sparsely strigose or villous, secondary veins 3 on each side of midvein, base obtuse to rounded, margin serrulate with each tooth having a terminal seta, apex acute to shortly acuminate. Inflorescences terminal, umbellate cymes or umbellate, 3–7 cm, puberulous and with sparse glandular trichomes. Pedicel ca. 1 cm. Hypanthium funnel-shaped, ca. 5 mm, puberulous and with sparse glandular trichomes. Calyx lobes linear-lanceolate, ca. 1 mm. Petals purplish red, oblong-ovate, ca. 10 × 5 mm, slightly oblique, apex acuminate. Stamens subequal, 1–1.2 cm; anthers 5–6 mm. Longer stamens with connective slightly prolonged below anthers. Shorter stamens with connective decurrent, forming a short spur, abaxially setose tuberculate. Ovary ovoid, apex with a membranous crown, crown margin with glandular trichomes. Capsule cup-shaped; hypanthium ca. 5 × 4–6 mm, 4-sided, pilose and with sparse glandular trichomes. Fl. Aug–Oct, fr. Oct.

• Forests, sparse forests, hillsides, valleys, stream banks, damp places, trailsides; 600–900 m. Guangdong, Hunan, Jiangxi, Yunnan.

6. *Bredia microphylla* H. L. Li, J. Arnold Arbor. 25: 23. 1944.

小叶野海棠 xiao ye ye hai tang

Shrublets or herbs, to 20 cm tall, creeping, branched. Stems terete, densely reddish brown pubescent. Petiole 0.5–1.5 cm, densely pubescent; leaf blade ovate to ovate-orbicular, 0.8–1.7(–2) × 0.8–1.7(–2) cm, stiffly papery to nearly papery, abaxially only rarely strigose on veins, adaxially densely pubescent and rarely strigose, secondary veins 2 on each side of midvein, base broadly cuneate to nearly cordate, margin entire and ciliate, apex broadly acute. Inflorescences terminal, cymes, 1–3-flowered. Pedicel 1.3–1.5 cm, densely pubescent and with glandular trichomes. Hypanthium campanulate, ca. 3 mm, 4-sided. Calyx lobes linear, 3–4 mm. Petals lavender red, oblong, ca. 9 × 6 mm, slightly oblique, apex abruptly acute. Longer stamens ca. 7 mm; anthers narrowly lanceolate, slightly curved, ca. 4 mm; connective decurrent and slightly prolonged, shortly spurred at base. Shorter stamens ca. 5.5 mm; anthers lanceolate, ca. 3 mm, tubercular at base; connective decurrent, forming a short spur. Ovary half inferior, ovate, ciliate. Capsule cup-shaped, ca. 5 × 4 mm, 4-sided, 8-ribbed, apex truncate. Fl. Oct.

• Forests, hillsides, moist shaded places. Guangdong, Guangxi, Jiangxi.

7. *Bredia oldhamii* J. D. Hooker, Icon. Pl. 11: 68. t. 1085. 1871.

金石榴 jin shi liu

Bredia gibba Ohwi; *B. oldhamii* var. *ovata* Ohwi; *B. penduliflora* S. S. Ying.

Shrubs 1.5–2 m tall, many-branched. Stems terete, farinose, glaucous; young branches blackish brown, obtusely 4-sided, nearly glabrous to puberulous. Petiole 0.5–1.5(–2.5) cm, puberulous; leaf blade lanceolate, oblong-elliptic, or elliptic-ovate, 5–11 × 1.5–2.5(–3.5) cm, stiffly papery, abaxially very minutely puberulous on veins, often glaucous, drying pale tan or whitish, adaxially farinose-puberulous or glabrous, secondary veins 1–3 on each side of midvein and originating 1–1.5 cm from base, base cuneate to obtuse, margin nearly entire to densely serrulate, apex acuminate. Inflorescences cymose panicles, ca. 7 × 11 cm, glabrous. Pedicel ca. 1.1 cm to nearly absent, subglabrous. Hypanthium funnel-shaped, ca. 5 mm, obtusely 4-sided, puberulous or glabrous. Calyx lobes broadly triangular, less than 1 cm. Petals ovate-oblong, 7–10 mm, apex acute. Longer stamens 1.4–1.6 cm; anthers linear-lanceolate, 6–7 mm, slightly curved; connective decurrent, forming a short spur. Shorter stamens with anthers 3–3.5 mm; connective decurrent, abaxially constricted, adaxially 2 tuberculate. Ovary half inferior, ovoid. Capsule cup-shaped; hypanthium cup-shaped, 6–5 × 3.5–5 mm, obtusely 4-sided, almost glabrous, apex truncate; calyx lobes not conspicuous. Fl. Apr–May, fr. May–Jun.

• Forests, open forests, forest margins, hillsides; 100–2500 m. Taiwan.

8. *Bredia quadrangularis* Cogniaux, Monogr. Phan. 7: 473. 1891.

过路惊 guo lu jing

Bredia amoena Diels; *B. amoena* var. *eglandulata* B. Y. Ding; *B. amoena* var. *serrata* H. L. Li; *B. amoena* var. *trimera* C. Chen; *B. chinensis* Merrill; *B. pricei* F. P. Metcalf.

Shrubs or shrublets, 25–120 cm tall. Stems terete or slightly 4-sided; branchlets 4-sided, ± narrowly winged on ribs, glabrous. Petiole 0.6–1.2(–2.5) mm, puberulous or glabrous; leaf blade ovate to elliptic, (2.5–)4–10 × 1.5–2.5(–5) cm, stiffly papery, both surfaces glabrous, secondary veins 1 or 2 on each side of midvein, base rounded to cuneate, margin remotely serrulate to nearly entire, apex shortly acuminate. Inflorescences terminal at tips of branchlets, cymose, 3–10 × 2–5 cm, 3–9-flowered or sometimes with more flowers. Peduncles, pedicels, and calyces densely puberulous and with glandular trichomes or densely puberulous brownish ferruginous hirsute but sometimes calyces mostly glabrous. Pedicel 3–5 mm. Hypanthium shortly campanulate, (3 or)4-sided, 5–6 mm. Calyx lobes repand, 1–2 mm, apex small apiculate. Petals rose red to purple, ovate to oblong, 5–8 × 3–3.5 mm, slightly oblique, apex acute. Longer (3 or)4 stamens ca. 8.5 mm; anthers lanceolate, ca. 3.5 mm, geniculate; connective decurrent, slightly prolonged. Shorter (3 or)4 stamens 0.7–1.3 cm; anthers 4–6 mm, base tuberculate; connective decurrent, forming a short spur. Ovary half inferior, apex with glandular trichomes, otherwise glabrous, apex 4-lobed. Capsule cup-shaped, ca. 4 × 3.5 mm, (3 or)4-sided, apex truncate; hypanthium 3–4 × 3.5–4 mm, puberulous and glandular or densely puberulous brownish ferruginous hirsute. Fl. Jun–Oct, fr. Aug–Oct.

• Open or dense forests, valleys, slopes, stream banks, trailsides; 300–1500 m. Anhui, Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang (Taishun).

9. *Bredia sessilifolia* H. L. Li, J. Arnold Arbor. 25: 22. 1944.

短柄野海棠 duan bing ye hai tang

Shrubs 20–100 cm tall. Stems terete or slightly 4-sided; branchlets 4-sided, glabrous. Leaves sessile or subsessile; leaf blade ovate to elliptic, 5.5–14(–17) × 2.8–5(–7) cm, stiffly papery, both surfaces glabrous or very minutely puberulous with 1 line setose trichomes among veins, secondary veins 2 on each side of midvein, base rounded to subcordate, margin entire or minutely serrulate, apex acuminate to sometimes obtuse. Inflorescences terminal, cymose, 3–6.5 cm, 3–5(–15)-flowered, glabrous. Pedicel ca. 4 mm, glabrous. Calyx lobes repand. Petals pink, oblong to suborbicular, ca. 8 × 4.5–6 mm, slightly oblique, apex minutely acute. Longer stamens ca. 1.5 cm; anthers linear-lanceolate, ca. 6 mm; connective decurrent, slightly prolonged. Shorter stamens ca. 1.1 cm; anthers lanceolate, ca. 5 mm, base tuberculate; connective decurrent, forming a short spur. Ovary half inferior, ovate-globular, apex with a few glandular trichomes. Capsule subglobular; hypanthium bell- or funnel-shaped, ca. 5 × 5 mm, 4-sided, apex truncate. Fl. Jun–Jul, fr. Jul–Aug.

• Forests, valleys, slopes, shaded damp places, stream banks, rock crevices; 800–1200 m. Guangdong, Guangxi, Guizhou.

10. *Bredia sinensis* (Diels) H. L. Li, J. Arnold Arbor. 25: 22. 1944.

鸭脚茶 ya jiao cha

Tashiroea sinensis Diels, Notizbl. Bot. Gart. Berlin-Dahlem 9: 198. 1924; *Bredia glabra* Merrill.

Shrubs 60–100 cm tall. Stems terete; branchlets slightly 4-sided, with stellate trichomes when young but later glabrous or puberulous. Petiole ca. 1 cm; leaf blade lanceolate, ovate, or elliptic, 5–11(–13) × 2–6 cm, stiffly papery, mostly glabrous, base cuneate to very obtuse, margin nearly entire to remotely serrulate, apex acuminate to obtuse. Inflorescences terminal, cymes, 4–6 × 4–6 cm, (5–)20-flowered, mostly glabrous or with stellate trichomes; bracts caducous. Pedicel 5–8 mm. Calyx

lobes crenate. Petals pink to purple, oblong, ca. 10 × 6 mm, oblique, apex acute. Stamens 8, either subequal or distinctly unequal. Longer stamens ca. 1.6 cm; anthers lanceolate, ca. 1 cm; connective decurrent, slightly prolonged. Shorter stamens ca. 1 cm; anthers ca. 7 mm, tuberculate at base; connective decurrent, forming a short spur. Ovary half inferior, ovate-globular, apex puberulous. Capsule subglobular, enclosed by hypanthium; hypanthium bell- or funnel-shaped, 4-sided, apex truncate; calyx lobes ca. 7 × 7 mm, sometimes with stellate trichomes. Fl. Jun–Jul, fr. Aug–Oct.

• Mixed forests, valleys, slopes, damp places, grasslands, stream banks; 400–1400 m. Fujian, Guangdong, Hunan, Jiangxi, Zhejiang.

11. *Bredia yunnanensis* (H. Léveillé) Diels, Bot. Jahrb. Syst. 65: 111. 1932.

云南野海棠 yun nan ye hai tang

Blastus yunnanensis H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 300. 1912; *B. mairei* H. Léveillé.

Herbs or shrublets, to 30 cm tall, branched. Stems obtusely 4-sided, densely puberulous or with glandular trichomes. Petiole 2–4 cm, densely puberulous to patently villous; leaf blade ovate-lanceolate, oblong-ovate, or nearly elliptic, 6.5–11 × 2.5–4.3 cm, papery, abaxially puberulous but strigose on veins, adaxially puberulous and slightly strigose, secondary veins 2 or 3 on each side of midvein, base rounded, margin densely serrulate with each tooth having a terminal seta, apex shortly acuminate. Inflorescences terminal, umbellate, densely puberulous and slightly with glandular trichomes. Pedicel ca. 1 cm. Hypanthium purplish red, ca. 3.5 mm. Calyx lobes narrowly triangular to lanceolate, ca. 3 mm, inside densely puberulous. Petals pink, broadly ovate, 4.5–6 mm, outside only puberulous on ridge, apex acute. Longer stamens with connective minutely inflated at base. Shorter stamens with connective decurrent, inflated, forming a short triangular spur. Ovary half inferior. Fl. Sep.

• Secondary forests, valleys, stream banks, rock crevices; 600–700 m. Sichuan, Yunnan.

12. PHYLLAGATHIS Blume, Flora 14: 507. 1831.

锦香草属 jin xiang cao shu

Herbs, shrublets, or shrubs, erect or stoloniferous. Stems usually 4-sided. Leaves petiolate; leaf blade secondary veins 2–4 on each side of midvein, tertiary veins parallel, margin entire or denticulate. Inflorescences terminal, subterminal, or axillary, umbellate, cymose umbellate, cymose paniculate, or rarely capitate, usually long pedunculate; bracts caducous. Flowers (3 or)4-merous. Pedicel bracteolate. Hypanthium funnel-shaped or subcampanulate, (3 or)4-sided, longitudinal (6 or)8-ribbed. Calyx lobes (3 or)4. Petals ovate, obovate, or broadly ovate, usually oblique. Stamen whorls ± equal in shape and length or only slightly unequal in length; anthers subulate to oblong-linear, base tuberculate, expanded, or not appendaged; connective decurrent, forming a short spur. Ovary inferior, urceolate, rarely cup-shaped, (3 or)4-celled. Style filiform; stigma acute. Capsule cup-shaped or globose-urceolate; hypanthium 8-ribbed. Seeds small, cuneate, angulate, densely tuberculate or not.

About 56 species: China, Indonesia, Malaysia, Myanmar, Thailand; 24 species (19 endemic) in China.

Although the genus has recently been revised (Hansen, Bull. Mus. Natl. Hist. Nat., B, Adansonia 14: 355–428. 1993 [“1992”]), the Chinese species are poorly collected and understood.

1a. Inflorescences 2- or 3-branched.

2a. Leaf blade 3–7 × 1.5–3.5 cm; inflorescences less than 5 × 3 cm; plants less than 50 cm tall 3. *P. hainanensis*

2b. Leaf blade 8.5–16 × 4.7–10.5 cm; inflorescences 8–10 × ca. 4 cm or ca. 4 × 4 cm; plants 30–100 cm tall.

3a. Leaf blade abaxially densely white bullate, margin entire; branchlets puberulous 1. *P. erecta*

- 3b. Leaf blade abaxially puberulous and sparsely strigose, margin inconspicuously denticulate; branchlets densely puberulous and with sparse glandular trichomes 2. *P. cymigera*
- 1b. Inflorescences usually not branched.
- 4a. Peduncle 4–24 cm.
- 5a. Leaf blade adaxially usually with a line of whitish yellow spots between secondary veins 19. *P. scorpiothyrsoides*
- 5b. Leaf blade adaxially without whitish yellow spots between secondary veins.
- 6a. Fertile stamens 4 plus 4 staminodes or staminodes lacking.
- 7a. Stamens 4, staminodes absent; calyx furfuraceous puberulous; leaf blades elliptic, ovate, or rarely suborbicular, both surfaces furfuraceous puberulous 20. *P. tetrandra*
- 7b. Fertile stamens 4 plus 4 staminodes; calyx furfuraceous and with sparse glandular trichomes; leaf blades elliptic to suborbicular, rarely obovate, adaxially sparsely short setose 21. *P. elattandra*
- 6b. Fertile stamens 8, equal or subequal in length.
- 8a. Petiole hirsute or tomentose; leaf blades strigose; stamens subequal in length 22. *P. cavaleriei*
- 8b. Petiole puberulous, glabrescent; leaf blades puberulous; stamens equal in length 23. *P. asarifolia*
- 4b. Peduncle less than 4 cm.
- 9a. Leaf blade base cordate to shallowly cordate or if rounded or obtuse then branchlets puberulous.
- 10a. Hypanthium with glandular trichomes or glandular puberulous.
- 11a. Flower 3-merous; calyx only with glandular trichomes; anther connective decurrent into a short non-tuberculate spur 13. *P. ternata*
- 11b. Flower 4-merous; calyx puberulous and with glandular trichomes; anther connective decurrent into a short tuberculate spur 14. *P. velutina*
- 10b. Hypanthium setose or puberulous and villous.
- 12a. Hypanthium puberulous; calyx lobes shorter than 1 mm 15. *P. gracilis*
- 12b. Hypanthium setose or puberulous and villous; calyx lobes greater than 1 mm.
- 13a. Leaf blade 11–23 × 7–13 cm, abaxially densely furfuraceous and puberulous, adaxially densely furfuraceous and sparsely strigose 16. *P. longiradiosa*
- 13b. Leaf blade 3.5–7.5 × 1.5–4 cm, abaxially densely pustulate or only puberulous on veins, adaxially puberulous and strigose.
- 14a. Leaves with 2 secondary veins on each side of midvein 17. *P. longearistata*
- 14b. Leaves with 3 secondary veins on each side of midvein 18. *P. latisepala*
- 9b. Leaf blade base cuneate to obtuse or if rounded-subcordate then branchlets appressed setose or hirsute.
- 15a. Branchlets glabrous or puberulous and with sparse glandular trichomes.
- 16a. Peduncle 2.5–6 cm 11. *P. oligotricha*
- 16b. Peduncle less than 1 cm or nearly absent.
- 17a. Leaf blades 10–17(–20) × 3–7(–8) cm, both surfaces densely bullate 4. *P. setotheca*
- 17b. Leaf blades 5–10(–12.5) × 1–2.3(–6.5) cm, both surfaces smooth.
- 18a. Leaf blades 1–2.3 cm wide, both surfaces glabrous; secondary veins 1 on each side of midvein 5. *P. stenophylla*
- 18b. Leaf blades 3–6.5 cm wide, both surfaces puberulous; secondary veins 2 or 3 on each side of midvein 6. *P. plagiopetala*
- 15b. Branchlets densely setose, villous, or retrorse setose.
- 19a. Branchlets and hypanthium densely appressed setose or branchlets retrorse setose and hypanthium puberulous and with glandular trichomes.
- 20a. Petals ca. 1.4 cm; anther connective abaxially tuberculate; leaf blade base cuneate 7. *P. melastomatoides*
- 20b. Petals 0.8–1 cm; anther connective not tuberculate; leaf blade base rounded or slightly cordate.
- 21a. Branchlets obtusely 4-sided, appressed densely setose 8. *P. fengii*
- 21b. Branchlets terete, with stout brownish or white bristles to 1.5 cm at nodes, glabrous when old 24. *P. tentaculifera*
- 19b. Branchlets hirsute or villous, hypanthium densely stellate pilose, puberulous, and sparsely hispid or with dense glandular trichomes.
- 22a. Hypanthium with glandular trichomes; leaf blade 5–13 × 1.5–4 cm 12. *P. deltoidea*
- 22b. Hypanthium with stellate trichomes or puberulous and sparsely hirsute; leaf blade 7–18 × 3–8.5 cm.
- 23a. Hypanthium with 8–12 mm whitish trichomes 9. *P. hispidissima*
- 23b. Hypanthium puberulous and sparsely hirsute 10. *P. ovalifolia*

1. *Phyllagathis erecta* (S. Y. Hu) C. Y. Wu ex C. Chen, Bull. Bot. Res., Harbin 4(3): 41. 1984.

直立锦香草 zhi li jin xiang cao

Stapfiophyton erectum S. Y. Hu, J. Arnold Arbor. 33: 174. 1952.

Herbs or shrubs, 30–100 cm tall, erect, branched. Stems nearly 4-sided, densely puberulous, becoming glabrous. Petiole 1.5–3.5 cm, both sides slightly winged, glabrous; leaf blade elliptic, ovate-elliptic, or broadly elliptic, 8.5–16 × 4.7–6.2(–9) cm, papery to stiffly papery, both surfaces glabrous, abaxially furfuraceous or sometimes tuberculate, adaxially densely white bullate, secondary veins 2 on each side of midvein, veins conspicuous, base cuneate to obtuse, margin entire, apex shortly acuminate. Inflorescences terminal, umbellate cymose panicles, 5–8 × ca. 4 cm, furfuraceous. Flowers unknown. Capsule cup-shaped, ca. 4 × 6 mm, 4-sided. Pedicel 5–8 mm, 4-sided, narrowly winged on angles, furfuraceous. Fr. Nov–Jan.

• Dense forests, limestone hills, moist places; 1000–1500 m. Guangxi, Yunnan.

2. *Phyllagathis cymigera* C. Chen, Bull. Bot. Res., Harbin 4(3): 41. 1984.

聚伞锦香草 ju san jin xiang cao

?*Phyllagathis plurumbellata* R. H. Miao.

Shrubs to 1 m tall. Stems 4-sided, sulcate, densely puberulous and with sparse glandular trichomes. Petiole 2–7.5 cm, sulcate, densely puberulous and sparsely setose; leaf elliptic to broadly elliptic, 10–13.5 × 6–10.5 cm, oblique, blade papery, both surfaces puberulous and sparsely strigose, secondary veins 3 or 4 on each side of midvein, base obtuse to subcordate, margin inconspicuously denticulate with each tooth having a terminal seta, apex acute. Inflorescences terminal, cymose paniculate, ca. 4.5 × 4 cm, densely puberulous. Pedicel ca. 2 mm, puberulous. Hypanthium funnel-shaped, ca. 3 mm, 4-sided, puberulous. Calyx lobes ovate-triangular, margin ciliate, apex acute with a setose tip. Petals pink, broadly obovate, ca. 7 × 7 mm, minutely oblique. Stamens equal; anthers lanceolate, ca. 2.5 mm, base not tuberculate; connective decurrent, forming setose spur. Ovary ovoid. Fl. Dec.

• Forests, valleys, mountain slopes; 1300–1400 m. Yunnan.

3. *Phyllagathis hainanensis* (Merrill & Chun) C. Chen, Bull. Bot. Res., Harbin 4(3): 42. 1984.

海南锦香草 hai nan jin xiang cao

Bredia hainanensis Merrill & Chun, Sunyatsenia 6: 145. 1940; *Plagiopetalum hainanense* (Merrill & Chun) Merrill ex H. L. Li.

Shrubs 30–50 cm tall, many-branched. Stems grayish white, obtusely 4-sided; branchlets 4-sided, puberulous and with sparse glandular trichomes. Petiole 0.5–2 cm, puberulous and with sparse glandular trichomes; leaf blade oblong-elliptic, elliptic, or ovate, 3–7 × 1.5–3.5 cm, papery, abaxially puberulous and shortly setose, adaxially with a sparse line of setose trichomes between veins but otherwise glabrous, secondary veins 2 or 3(or 4) on each side of midvein, base broadly cuneate to subround, margin denticulate, apex acute to obtuse. Inflores-

cences terminal, cymose contracted to becoming subumbellate, 4–5 × ca. 3 cm; peduncle 2.5–3 cm, puberulous and with glandular trichomes. Pedicel 6–7 mm, puberulous and with glandular trichomes. Hypanthium funnel-shaped, ca. 4 mm, 4-sided, puberulous and with glandular trichomes. Calyx lobes shortly triangular, ca. 1 mm, apex acute. Petals pink to purplish red, obovate, 8–11 × 6–8 mm, oblique, apex apiculate. Stamens 8, ca. 8 mm, equal; anthers lanceolate, ca. 4 mm; connective decurrent, forming a short spur, abaxially inconspicuously tuberculate. Ovary ovoid, apical margin with glandular trichomes. Capsule cup-shaped, ca. 4 × 4 mm, 4-sided; hypanthium exceeding capsule, 8-ribbed; calyx lobes puberulous and with sparse glandular trichomes. Fl. May–Aug. fr. Aug–Dec.

• Forests, mountain slopes, limestone, hillsides, stream banks; 600–800 m. Hainan.

4. *Phyllagathis setotheca* H. L. Li, J. Arnold Arbor. 25: 32. 1944.

刺蕊锦香草 ci rui jin xiang cao

Phyllagathis setotheca var. *setotuba* C. Chen.

Shrubs to 1 m tall. Stems obtusely 4-sided, nodes slightly inflated; branchlets 4-sided, densely denticulate, glabrous. Petiole 1–7.5 cm, densely bullate; leaf blade stiffly oblong-lanceolate, elliptic, or obovate, 10–17(–20) × 3–7(–8) cm, papery, surfaces glabrous and densely bullate, secondary veins 2 on each side of midvein, base cuneate to broadly cuneate, margin entire, apex acuminate to acute. Inflorescences terminal, cymose contracted to umbellate. Pedicel 0.8–1.8 cm, densely bullate. Hypanthium funnel-shaped, ca. 6 mm, 4-sided, densely bullate, glabrous or with dense twisted setose trichomes. Calyx lobes long triangular, ca. 6.5 mm, apex acuminate to obtuse. Petals ca. 1.4 × 0.8 cm. Stamens equal; filaments filiform, ca. 7 mm; anthers lanceolate, ca. 1 cm; connective decurrent, forming a short spur, abaxially tuberculate. Ovary ovoid, apical margin with glandular trichomes. Capsule cup-shaped, ca. 7 × 6 mm, 4-sided; hypanthium exceeding capsule, 8-ribbed. Fl. May–Jul. fr. Jun.

Forests, valleys, stream banks, damp places, rock crevices, trailsides. Guangdong, Guangxi [Vietnam].

5. *Phyllagathis stenophylla* (Merrill & Chun) H. L. Li, J. Arnold Arbor. 25: 32. 1944.

窄叶锦香草 zhai ye jin xiang cao

Bredia stenophylla Merrill & Chun, Sunyatsenia 5: 146. 1940.

Shrubs 0.8–3 m tall. Stems obtusely 4-sided; branchlets glabrous. Petiole 5–10 mm, glabrous; leaf blade oblong-lanceolate to oblong-oblong-lanceolate, 5–10 × 1–2.3 cm, stiffly papery, both surfaces glabrous, secondary veins 1 on each side of midvein, base cuneate, margin basally entire but denticulate apically from middle, apex acuminate to shortly acuminate. Inflorescences, terminal, cymose contracted to umbellate, (2 or)3-flowered; peduncle ca. 4 mm. Pedicel 5–8 mm, 4-sided, glabrous. Hypanthium funnel-shaped, 5–6.5 mm, 4-sided. Calyx lobes narrowly triangular, ca. 1 mm, apex acuminate. Petals rose-colored to pale purplish red, ovate, ca. 12 × 6 mm, minutely oblique, apex acuminate. Stamens equal; filaments ca. 7 mm;

anthers subulate-lanceolate, ca. 6 mm; connective decurrent, slightly prolonged, abaxially slightly inflated. Ovary ovoid, apex 4-lobed, lobes 2-denticulate. Capsule cup-shaped, ca. 6 × 5 mm, 4-sided; hypanthium 8-ribbed. Fl. May–Aug, fr. Aug–Oct.

• Open or dense forests, valleys, stream banks, rock crevices; 500–1000 m. Hainan.

6. *Phyllagathis plagiopetala* C. Chen, Bull. Bot. Res., Harbin 4(3): 44. 1984.

偏斜锦香草 pian xie jin xiang cao

Shrublets 30–40 cm tall, base woody. Stems 4-sided, sulcate, puberulous, glabrescent. Petiole 0.8–4(–5.2) cm, puberulous; leaf blade broadly elliptic to ovate, 5–12.5 × 3–6.5 cm, papery to stiffly papery, both surfaces puberulous, secondary veins 2 or 3 on each side of midvein, base cuneate, obtuse, or rarely shallowly cordate, margin subentire, ciliate, and sometimes denticulate with each tooth having a terminal seta, apex acuminate to acute. Inflorescences terminal or sometimes axillary, cymose umbellate; peduncle 0.5–3 cm, puberulous. Pedicel ca. 1 cm, puberulous. Hypanthium funnel-shaped, 4-sided, 8-ribbed, ca. 6 mm, puberulous. Calyx lobes lanceolate, ca. 5 mm, both surfaces puberulous, apex acuminate. Petals pink, red, or purple, broadly obovate, ca. 7 × 5 mm, very oblique, apex acute. Stamens equal or subequal in length, 1.1–1.3 cm; anthers ca. 7 mm, base tuberculate; connective decurrent, forming a short spur. Ovary ovoid, furfuraceous ciliate, apex 4-lobed. Capsule cup-shaped, exserted ca. 1.5 mm beyond hypanthium; hypanthium, ca. 4 × 4 mm. Fl. Jun, fr. Oct.

• Open or dense forests, valleys, hillsides, stream banks; 800–1200 m. Guangxi, Hunan.

7. *Phyllagathis melastomatoides* (Merrill & Chun) W. C. Ko, Acta Phytotax. Sin. 8: 267. 1963.

毛锦香草 mao jin xiang cao

Shrubs to 1 m tall, many-branched. Stems terete, nodes usually inflated; branchlets densely appressed setose, glabrescent. Petiole 1–5(–10) cm, densely appressed setose; leaf blade oblong-elliptic to oblong-ovate, 6–14 × 2–6 cm, stiffly papery to papery, abaxially appressed sparsely setose on veins, adaxially densely bullate with a sparse setose line between veins, secondary veins 2 or 3 on each side of midvein, base cuneate, margin denticulate with each tooth having a terminal seta, apex shortly acuminate to acuminate. Inflorescences axillary, cymose, usually 1(–3)-flowered; peduncle ca. 2 mm. Pedicel in fruit less than 0.8 or 1.2–1.8 cm, appressed setose. Petals rose-colored, obovate, ca. 1.4 × 0.9 cm, oblique, glandular ciliate up middle, apex rounded. Stamens equal; filaments ca. 7 mm; anthers lanceolate, ca. 7 mm; connective decurrent, forming a short spur, abaxially tuberculate. Ovary half inferior, ovate, apex with glandular trichomes. Capsule cup-shaped, ca. 7 × 5 mm, 4-sided; hypanthium 8-ribbed. Fl. Oct–Dec, fr. Dec–Feb.

• Valleys, stream banks. Hainan (Ding'an, Lingshui).

1a. Pedicel 1.2–1.8 cm in fruit 7a. var. *melastomatoides*
1b. Pedicel less than 0.8 cm in fruit 7b. var. *brevipes*

7a. *Phyllagathis melastomatoides* var. *melastomatoides*

毛锦香草(原变种) mao jin xiang cao (yuan bian zhong)

Osbeckia melastomatoides Merrill & Chun, Sunyatsenia 2: 293. 1935.

Pedicel 1.2–1.8 cm in fruit.

• Valleys, stream banks. Hainan (Ding'an).

7b. *Phyllagathis melastomatoides* var. *brevipes* W. C. Ko, Acta Phytotax. Sin. 8: 268. 1963.

短柄锦香草 duan bing jin xiang cao

Pedicel less than 0.8 cm in fruit.

• Valleys, stream banks. Hainan (Lingshui).

8. *Phyllagathis fengii* C. Hansen, Nordic J. Bot. 10: 23. 1990.

刚毛锦香草 gang mao jin xiang cao

Cyphotheca hispida S. Y. Hu; *Phyllagathis hispida* (S. Y. Hu) C. Y. Wu ex C. Chen (1979), not King (1900).

Shrubs to 1 m tall, branched. Stems obtusely 4-sided, appressed densely setose, glabrescent. Petiole 0.8–5 cm, densely setose; leaf blade ovate to oblong-ovate, 5–10 × 2.5–5 cm, papery to submembranous, both surfaces densely setose but almost glabrescent, abaxially only appressed setose on veins, secondary veins 2 on each side of midvein, base rounded to subcordate, margin entire and setose ciliate or denticulate with each tooth having a terminal seta, apex acuminate. Inflorescences, terminal, cymose umbellate, 1–4-flowered; peduncle 0.7–2(–3) cm, setose. Pedicel ca. 8 mm, densely appressed setose. Hypanthium subcampanulate, ca. 5 mm, nearly 4-sided, densely appressed setose. Calyx lobes ovate, ca. 1.5 mm, setose and setose ciliate. Petals pink, obovate, ca. 8 mm, apex emarginate. Stamens subequal; anthers of longer stamens ca. 5 mm; anthers or shorter stamens ca. 3.5 mm; connective decurrent, forming a very short spur. Ovary urceolate, ca. 6 × 6 mm; hypanthium obtusely 4-sided. Fl. Jun, fr. Nov.

• Mixed forests, woodland margins; 1000–1600 m. Yunnan.

9. *Phyllagathis hispidissima* (C. Chen) C. Chen, Bull. Bot. Res., Harbin 4(3): 46. 1984.

密毛锦香草 mi mao jin xiang cao

Bredia hispidissima C. Chen, Fl. Yunnan. 2: 105. 1979; *Phyllagathis xinyiensis* Z. J. Feng.

Shrubs 25–150 cm tall. Stems terete, densely hirsute, with long, whitish, spiny trichomes. Petiole 2–5 cm, densely hirsute; leaf blade elliptic to ovate, 6–14 × 4.5–7.5 cm, papery, both surfaces densely strigose, secondary veins 3 on each side of midvein, base broadly obtuse, rounded, or subcordate, margin entire and ciliate, apex acuminate. Inflorescences terminal or axillary, cymes, 3–6-flowered; peduncle ca. 1 cm or shorter. Pedicel ca. 1 cm or shorter, densely hirsute. Hypanthium cup-shaped or subcampanulate, 6–8 mm, densely stellate pilose. Calyx lobes ovate to triangular-ovate, ca. 2 mm, hirsute, ciliate. Petals purplish or rose-colored, obovate, 0.6–1.1 cm, oblique, apex acuminate and with a 1–3-setose tip. Stamens equal; anthers lan-

ceolate; connective decurrent, forming a spur ca. 1 mm. Ovary urceolate, margin setose ciliate, apex with a membranous crown. Capsule cup-shaped, ca. 5 × 5 mm, 4-lobed; hypanthium 8-ribbed. Fl. May–Jun, fr. Dec.

Dense forests, valleys, damp places, rock crevices; 100–1900 m. Guangdong, Yunnan [Vietnam].

10. *Phyllagathis ovalifolia* H. L. Li, J. Arnold Arbor. 25: 31. 1944.

卵叶锦香草 luan ye jin xiang cao

Phyllagathis calisaurea C. Chen; *P. ovalifolia* var. *pauciflora* R. H. Miao.

Herbs or shrubs, 0.3–1(–2) m tall, branched. Stems 4-sided, densely retrorse hirsute, glabrescent. Petiole (1.5–)2.5–6.5 cm, densely hirsute to setose; leaf blade ovate, oblong-ovate, or broadly elliptic, 7–18 × (2–)3–8.5 cm, papery to submembranous, both surfaces sparsely strigose or abaxially sometimes puberulous, adaxially puberulous and sparsely setose, secondary veins 2 or 3 on each side of midvein, base obtuse to subcordate, margin entire or sometimes inconspicuously denticulate and ciliate, apex acuminate to acute. Inflorescences terminal, umbellate, (3–)5–30-flowered; peduncle 1–1.5(–3) cm, densely hirsute or retrorsely setose. Pedicel 5–10 mm, sparsely hirsute and glandular puberulous. Hypanthium funnel-shaped, 5–9 mm, puberulous and sparsely glandular hirsute. Calyx lobes triangular-ovate, 2–3 mm, densely (glandular) villous. Petals purplish, broadly ovate, 6–9 mm, apex acute. Stamens equal to unequal, longer stamens with filaments 4–5.5 mm; anthers lanceolate, ca. 6 mm; connective decurrent, forming a short spur. Shorter stamens aborted; filaments 3–4 mm; anthers ca. 3 mm. Ovary urceolate, apex with a crown, crown margin puberulous ciliate. Capsule cup-shaped, ca. 7 × 7 mm, 4-lobed; hypanthium 8-ribbed. Fl. Jun–Aug, fr. Dec.

Dense forests, hillsides, valleys, damp places; 800–1200 m. W Guangxi (Jingxi), Yunnan [Vietnam].

11. *Phyllagathis oligotricha* Merrill, Sunyatsenia 1: 74. 1930.

毛柄锦香草 mao bing jin xiang cao

Phyllagathis anisophylla Diels; *Phyllagathis nudipes* C. Chen.

Shrublets 10–20 cm tall, stoloniferous, branched or not. Stems terete, densely lenticellate; branchlets nearly 4-sided, puberulous, with sparse glandular trichomes, or glabrous. Petiole 0.6–2 cm, puberulous, both sides barbate setose or glabrous; leaf blade broadly ovate to broadly elliptic, sometimes lanceolate-ovate basally on stem, (4.5–)5–11(–14) × (2.5–)4–8(–9) cm, stiffly papery to subleathery, abaxially sparsely setose but glabrescent, adaxially puberulous and sparsely setose but later puberulous then glabrescent, secondary veins 2 on each side of midvein, base obtuse to rounded, margin entire or inconspicuously denticulate with each tooth having a terminal seta, apex acute to obtuse. Inflorescences terminal and axillary, cymose or contracted to subumbellate, (2.5–)3.5–6 cm, densely puberulous or glabrous. Pedicel ca. 6 mm, puberulous. Hypanthium funnel-shaped, 2–3 mm, 4-sided, with sparse glandular trichomes or glabrous. Calyx lobes broadly triangular, apex acute. Petals purple or pink, oblong to elliptic-oblong, 6–7 × ca. 4.5 mm, slight-

ly oblique, apex acute. Stamens subequal; connective decurrent, forming a short adaxial spur, abaxially not tuberculate. Longer stamens 0.8–1.2 cm. Shorter stamens 0.6–1 cm. Ovary subglobose, 4-lobed, apex truncate. Capsule cup-shaped, 4-sided, apex truncate; hypanthium 4–6 × ca. 4.5 mm, exceeding capsule, sparsely setose. Fl. May–Jun, fr. Aug–Nov.

• Sparse to dense forests, valleys, hillsides, shaded moist places, stream banks, rock crevices, trailsides; 500–2300 m. Guangdong, Guangxi, Hunan, Jiangxi.

12. *Phyllagathis deltoidea* C. Chen, Bull. Bot. Res., Harbin 4(3): 48. 1984 [“*deltoda*”].

三角齿锦香草 san jiao chi jin xiang cao

Shrubs to 1 m tall. Stems 4-sided, with dense glandular trichomes, later subterete and glabrous. Petiole 0.7–5 cm, densely villous; leaf blade elliptic to long elliptic, 5–13 × 1.5–4 cm, stiffly papery, abaxially sparsely setose on veins otherwise sparsely puberulous, adaxially puberulous and sparsely setose, secondary veins 2 on each side of midvein, base cuneate, margin entire or inconspicuously sparsely denticulate with each tooth having a terminal seta, apex long acuminate. Inflorescences terminal, umbellate; peduncle 1–2 cm, with dense glandular trichomes. Pedicel ca. 8 mm, with dense glandular trichomes. Hypanthium funnel-shaped, ca. 3.5 mm. Calyx lobes broadly triangular, ca. 2 mm, margin setose ciliate, apex abruptly acuminate. Petals purple to pink, broadly ovate, ca. 5 mm, apex acute. Stamens ca. 7 mm; connective decurrent, forming a short spur, not tuberculate. Ovary ovoid, 4-lobed, apex with a membranous crown. Fl. Nov–Dec.

• Forests, hillsides, in rock crevices; ca. 1300 m. Guangxi (Ningming).

13. *Phyllagathis ternata* C. Chen, Bull. Bot. Res., Harbin 4(3): 49. 1984.

三瓣锦香草 san ban jin xiang cao

Shrublets or herbs, to 25 cm tall, basally branched, base woody. Stems 4-sided, densely patently setose. Petiole 1.5–3.5 cm; leaf blade ovate, 5–8 × 2.5–4 cm, papery to stiffly papery, abaxially patently long setose on veins, adaxially setose strigose, secondary veins 3 or 4 on each side of midvein, base subcordate to cordate, margin double serrulate with each tooth having a terminal seta, apex acuminate. Inflorescences terminal, umbellate, 3–7-flowered; peduncle short; bracts 2, foliaceous. Flowers 3-merous. Pedicel 5–10 mm, with patent glandular trichomes. Hypanthium funnel-shaped, 3-sided, ca. 3.5 mm. Calyx lobes 3, broadly triangular, ca. 2.5 mm, with glandular trichomes, margin ciliate, apex abruptly acuminate. Petals purplish, obovate, ca. 7 × 4 mm, glabrous, apex abruptly acuminate with a setose tip. Stamens 6, ca. 1.2 cm, equal; connective decurrent, forming a short spur, not tuberculate. Ovary ovoid, 3-lobed, apex with a membranous crown; persistent calyx lobes triangular, margin entire. Fr. Aug.

• Forests, hillsides, stream banks. Guangdong (Xinyi).

14. *Phyllagathis velutina* (Diels) C. Chen, Bull. Bot. Res., Harbin 4(3): 51. 1984.

腺毛锦香草 xian mao jin xiang cao

Bredia velutina Diels, Bot. Jahrb. Syst. 65: 109. 1932.

Herbs or shrubs, 0.3–1 m tall, branched. Stems terete, densely ferruginous with glandular trichomes and tomentose. Petiole 3–6(–11.5) cm, densely puberulous and with glandular trichomes; leaf blade ovate to elliptic-ovate, 6–11 × 4.5–7 cm, papery to substiffly papery, abaxially purplish red and densely pilose on veins otherwise sparsely pubescent, adaxially green and densely pubescent, secondary veins 3 or 4(or 5) on each side of midvein, base cordate, margin ciliate and densely serrulate to subentire with each tooth having a terminal seta, apex acuminate. Inflorescence terminal, an umbellate or cymose panicle, 3(–7)-flowered, ferruginous puberulous and with glandular trichomes. Pedicel 5–8 mm but to 1.2 cm in fruit. Hypanthium sometimes purplish red, ca. 6 mm. Calyx lobes narrowly triangular, less than 1 mm, both surfaces puberulous. Petals pink, ovate, ca. 8 mm, oblique, puberulous, margin ciliate, apex acute. Stamens subequal; anthers slightly curved; connective forming a short triangular spur, abaxially tuberculate. Ovary ovoid, apex with a membranous crown. Capsule ovoid, exserted, apex with a membranous crown; hypanthium ca. 6 mm, puberulous and with sparse glandular trichomes; calyx lobes ca. 2 mm. Fl. May–Jun, fr. Oct.

• Dense forests, hillsides, damp places; 1000–2300 m. Fujian, Yunnan.

15. *Phyllagathis gracilis* (Handel-Mazzetti) C. Chen, Bull. Bot. Res., Harbin 4(3): 51. 1984.

细梗锦香草 xi geng jin xiang cao

Fordiophyton gracile Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 63: 10. 1926; *Bredia gracilis* (Handel-Mazzetti) Diels.

Shrublets 20–40 cm tall. Stems 4-sided, puberulous, later nearly glabrous. Petiole 1.5–6 cm, puberulous; leaf blade long elliptic to ovate, 8–16 × 4–6 cm, papery to stiffly papery, both surfaces puberulous, secondary veins 3 on each side of midvein, base obtuse to subcordate, margin sparsely serrulate and inconspicuous ciliate, apex acuminate. Inflorescences terminal or axillary, cymose, 3–12-flowered; peduncle 1–3(–11) cm. Peduncles, pedicel, calyces puberulous. Pedicel 5–10 mm. Hypanthium funnel-shaped, ca. 3 mm. Calyx lobes less than 1 mm, apex shortly acute. Petals purplish red to purple, broadly ovate, ca. 7 × 5 mm, oblique, apex acuminate. Longer stamens 1–1.2 cm; shorter stamens 8.5–9.5 mm; anthers erect, base tuberculate; connective decurrent, forming a short spur. Ovary half inferior, ovate, with glandular trichomes, apex with a membranous crown. Fl. Aug–Sep.

• Dense forests, hillsides, valleys, trailsides, thickets, in well-drained soil; 1100–1300 m. Hunan.

16. *Phyllagathis longiradiosa* C. Chen, Bull. Bot. Res., Harbin 4(3): 51. 1984.

大叶熊巴掌 da ye xiong ba zhang

Herbs or shrubs, 30–100 cm tall. Stems terete, glabrescent or sparsely villous. Petiole 3–8.5 cm, sulcate, lateral sides villous or not, glabrescent; leaf blade broadly ovate to subelliptic, 11–23 × 7–13 cm, papery to submembranous, abaxially usually

purplish red, densely furfuraceous, and puberulous, adaxially green, densely furfuraceous, and sparsely strigose, secondary veins 3 on each side of midvein, base cordate, margin denticulate to subentire and ciliate or sparsely ciliate, apex acuminate. Inflorescences terminal, umbellate; peduncle 2–4 cm but to 6 cm in fruit, puberulous and sparsely villous. Pedicel ca. 1 cm, puberulous. Hypanthium ca. 1 cm, setose with inflated bases or puberulous. Calyx lobes semiorbicular, ca. 2 mm, outside sparsely setose or puberulous, inside puberulous, apex retuse. Petals rose-colored, broadly ovate, ca. 4 × 5 mm, margin ciliate, apex retuse. Stamens subequal; anther bases tuberculate; connective base inflated forming a short spur. Ovary ovoid, apex with a membranous ciliate crown. Capsule crown minutely exserted from calyx; hypanthium ca. 6 × 8 mm, setose with inflated bases. Fl. May–Jul or Nov, fr. Dec–Jan.

• Broad-leaved evergreen forests; 300–2200 m. Guangxi, Guizhou, Yunnan.

- 1a. Leaf margin ciliate; petiole lateral sides villous; hypanthium setose with inflated bases, calyx lobes sparsely setose and inside puberulous 16a. var. *longiradiosa*
- 1b. Leaf margin sparsely ciliate; petiole lateral sides not villous; hypanthium and calyx lobes puberulous on both surfaces 16b. var. *pulchella*

16a. *Phyllagathis longiradiosa* var. *longiradiosa*

大叶熊巴掌(原变种) da ye xiong ba zhang (yuan bian zhong)

Barthea cavaleriei H. Léveillé, Repert. Spec. Nov. Regni Veg. 8: 61. 1910; *Bredia cavaleriei* (H. Léveillé) Diels (1933), not H. Léveillé & Vaniot (1906); *B. longiradiosa* C. Chen ex Govaerts; *Fordiophyton cavaleriei* (H. Léveillé) Guillaumin.

Petiole lateral sides villous; leaf blade margin ciliate. Hypanthium setose with inflated bases. Calyx lobes sparsely setose and inside puberulous. Fl. Jun–Jul.

• Broad-leaved evergreen forests; 300–2200 m. Guangxi, Guizhou, Yunnan.

16b. *Phyllagathis longiradiosa* var. *pulchella* C. Chen, Bull. Bot. Res., Harbin 4(3): 52. 1984.

丽萼熊巴掌 li e xiong ba zhang

Petiole not villous on lateral sides; leaf blade margin sparsely ciliate. Hypanthium and sepals puberulous on both surfaces. Fl. May or Nov.

• SW Guangxi (Daxin).

17. *Phyllagathis longearistata* C. Chen, Bull. Bot. Res., Harbin 4(3): 52. 1984.

长芒锦香草 chang mang jin xiang cao

Shrubs, creeping or ascending, ca. 40 cm. Stems 4-sided, villous and puberulous. Petiole 1.5–3 cm, villous and puberulous; leaf ovate to oblong-ovate, 4–7.5 × 1.5–3.5 cm, papery, abaxially puberulous on veins otherwise glabrous, adaxially puberulous and sparsely strigose between teeth, secondary veins 2 on each side of midvein, base subcordate to obtuse, margin

inconspicuously serrulate with each tooth having a terminal seta, apex obtusely acute. Inflorescences terminal, umbellate; peduncle ca. 5 mm. Pedicel ca. 1.5 mm, puberulous. Hypanthium campanulate, ca. 5 mm, villous and puberulous. Calyx lobes broadly ovate, ca. 2 mm, sparsely puberulous, margin villous ciliate, apex acute. Petals white, ovate, ca. 3 × 4.5 mm, with glandular trichomes, margin ciliate, apex acute with and with an aristate tip. Stamens equal, ca. 5.5 mm; anthers lanceolate, ca. 3.5 mm; connective decurrent, discoid. Ovary ovoid, apex with a membranous crown, crown margin abruptly denticulate. Capsule cup-shaped; hypanthium cup-shaped, ca. 7 × 6 mm, setose, apex truncate. Fl. Jun.

- Stream banks. Guangxi (Hechi).

18. *Phyllagathis latispala* C. Chen, Bull. Bot. Res., Harbin 4(3): 53. 1984.

宽萼锦香草 kuan e jin xiang cao

Herbs or shrublets, to 20 cm tall. Stems stoloniferous, 4-sided, puberulous. Petiole 1.5–3.5 cm, densely puberulous, laterally with sparsely long setose trichomes; leaf blade elliptic, oblong-elliptic, or sometimes ovate-elliptic, 3.5–7 × 2.2–4 cm, papery, abaxially densely bullate and puberulous on veins, adaxially puberulous and strigose, secondary veins 3 on each side of midvein, base rounded to obtuse, margin ciliate and subtire to inconspicuous sparsely serrulate, apex acute to obtuse. Inflorescences terminal, cymose umbellate, 1- or 2-flowered; peduncle 0.5–2 cm, puberulous. Pedicel ca. 1.2 mm, ca. 1.5 cm in fruit. Hypanthium cup-shaped, ca. 4 × 3 mm, puberulous and sparsely setose. Calyx lobes broadly ovate, ca. 2 × 2 mm, both surfaces glabrous, margin setose ciliate, apex acute. Petals white. Stamens equal, ca. 1.2 cm; anthers lanceolate, ca. 6 mm, base setose; connective decurrent and tuberculate. Ovary ovoid, apex with a membranous crown, crown margin ciliate with glandular trichomes. Capsule cup-shaped; hypanthium ca. 5 × 4 mm, puberulous and sparsely setose. Fl. Sep, fr. Sep.

- Mountain slopes, rock crevices, shaded areas; 300–400 m. Hubei.

19. *Phyllagathis scorpiothyrsoides* C. Chen, Bull. Bot. Res., Harbin 4(3): 55. 1984.

斑叶锦香草 ban ye jin xiang cao

Herbs to 20 cm tall. Stems stoloniferous, 4-sided or 6-angled, furfuraceous. Petiole 3.5–6.5 cm, furfuraceous; leaf blade broadly elliptic to ovate, 7–10 × 5.2–8.8 cm, stiffly papery, both surfaces furfuraceous, adaxially with (or sometimes without) a line of whitish yellow spots between secondary veins, base cordate to subcordate, margin inconspicuous denticulate, apex acute. Inflorescences terminal, umbellate; peduncle ca. 6.5 cm; bracts leaflike, lanceolate, ca. 6 × 1.7 mm, with or without whitish yellow spots. Pedicel ca. 8 mm in fruit, 4-sided. Capsule cup-shaped; hypanthium cup-shaped, 4-sided, sparsely triangular setose, furfuraceous. Fr. Jun.

Forests, valleys, hillsides, shaded damp places. Guangxi [Vietnam].

20. *Phyllagathis tetrandra* Diels, Bot. Jahrb. Syst. 65: 116. 1932.

四蕊熊巴掌 si rui xiong ba zhang

Stapfiophyton tetrandrum (Diels) H. L. Li.

Herbs, repent, stoloniferous, rooting at nodes, nodes inflated. Stems 4-sided, densely ferruginous setose. Petiole 5–9(–14) cm, furfuraceous puberulous and sparsely setose; leaf blade elliptic, ovate, or rarely suborbicular, 6.5–12.5 × 5.5–9.5(–10.5) cm, papery to substiffly papery, both surfaces furfuraceous puberulous, abaxially sometimes sparsely setose on veins, secondary veins 3 on each side of midvein, base cordate, margin entire, apex acute, obtuse, or retuse. Inflorescences terminal, umbellate or cymose, (5–)9–26 cm, 3–12-flowered; peduncle (4–)8–24 cm. Pedicel 5–12 mm to subsessile, furfuraceous puberulous and sparsely setose. Hypanthium funnel-shaped, ca. 5 mm, 4-sided, furfuraceous puberulous, sparsely setose. Calyx lobes broadly triangular-ovate, furfuraceous puberulous. Petals pink, rose-colored, or rarely red, ovate to subelliptic, ca. 6 mm. Stamens 4, pink, ca. 1.3 cm; anthers ca. 7 mm; connective decurrent, forming a short spur. Ovary ovoid, apex with a membranous crown. Capsule funnel-shaped, ca. 4 mm in diam., 4-sided; hypanthium exceeding capsule, furfuraceous puberulous. Fl. Dec or Mar–May, fr. May–Jun.

Dense forests, mountain slopes, valleys, shaded damp places; 1000–1700(–2000) m. Hainan, Yunnan [Vietnam].

21. *Phyllagathis elattandra* Diels, Bot. Jahrb. Syst. 65: 116. 1932.

红敷地发 hong fu di fa

Stapfiophyton elattandrum (Diels) H. L. Li.

Herbs, repent. Stolons ca. 1 cm thick, with conspicuous leaf scar. Stems very short, with 2 or 3 pairs of leaves. Petiole 4–8 cm, sometimes winged; leaf blade elliptic or rarely obovate to suborbicular, 10–22 × 7–15(–18) cm, papery, abaxially furfuraceous and sometimes very sparsely setose on veins, adaxially sparsely setose, secondary veins 3 or 4 on each side of midvein, base cordate to obtuse, margin entire or sometimes inconspicuously sparsely denticulate, apex obtuse to retuse. Inflorescences terminal, umbellate or umbellate panicles; peduncle 8–10 cm, furfuraceous and sometimes with sparse glandular trichomes. Pedicel ca. 1 cm, 4-sided, furfuraceous and with sparse glandular trichomes. Hypanthium funnel-shaped, ca. 5 mm, 4-sided. Calyx lobes inconspicuous. Petals pink, red, or purplish red, oblong-ovate, ca. 10 × 5 mm, oblique, apex acuminate. Stamens 8, whorls unequal, outer stamens fertile, inner ones staminodial. Fertile stamens ca. 1.3 cm; anthers ca. 7 mm, base not tuberculate; connective decurrent, forming a short spur. Ovary ovoid, apex with a membranous ciliate crown. Capsule cup-shaped, apex truncate; hypanthium ca. 6 × 4 mm, 4-sided, 8-ribbed, furfuraceous, wings with glandular trichomes on angles. Fl. Sep–Nov, fr. Jan–Mar.

- Sparse forests, hillsides, valleys, in stone damp soil; 200–1000(–2000) m. Guangdong, Guangxi, Yunnan.

22. *Phyllagathis cavaleriei* (H. Léveillé & Vaniot) Guillaumin, Notul. Syst. (Paris) 2: 325. 1913.

锦香草 jin xiang cao

Allomorpha cavaleriei H. Léveillé & Vaniot, Mém. Soc.

Sci. Nat. Cherbourg 35: 394. 1906; *Phyllagathis cavalieriei* var. *tankahkeei* (Merrill) C. Y. Wu; *P. cavalieriei* var. *wilsoniana* Guillaumin; *P. longipes* H. L. Li; *P. tankahkeei* Merrill; *P. wenshanensis* S. Y. Hu.

Herbs 10–20 cm tall. Stems 4-sided, erect or creeping, densely hirsute or tomentose, glabrescent. Petiole 1.5–9 cm or longer, densely hirsute or tomentose; leaf blade ovate, broadly ovate, broadly elliptic, or orbicular, 6–12.5(–16) × 4.5–11(–14) cm, papery to substiffly papery, both surfaces green or abaxially purplish red, abaxially puberulous, sometimes strigose, or veins spreading-hirsute, sometimes shortly setose, or sometimes glabrescent, adaxially sparsely strigose-hirsute or puberulous and strigose, secondary veins 3 or 4 on each side of midvein, base cordate, margin inconspicuous minutely repand and ciliate, apex broadly acute, acuminate, subround, or sometimes retuse. Inflorescences terminal, umbellate; peduncle 4–17 cm, hirsute, rarely glabrescent or glabrous. Pedicel 3–8 mm, furfuraceous. Hypanthium funnel-shaped, 5–6 mm, 4-sided, furfuraceous, sometimes long setose. Calyx lobes broadly ovate, ca. 1 mm, apex acute. Petals pink to purple, broadly obovate, 5–6 mm, slightly oblique, apex acute. Stamens subequal, longer stamens ca. 1.5 cm, shorter stamens ca. 1.1 cm; anther base 2-tuberculate or not; connective decurrent, forming a short spur. Ovary cup-shaped, apex with a membranous crown, crown margin 8-dentate. Capsule cup-shaped, 4–5 × 6–7 mm, crown 4-lobed and exerted from calyx; hypanthium 8-ribbed, furfuraceous. Fl. May–Aug, fr. Jul–Oct.

• Sparse to dense forests, valleys, mountain slopes, stream banks, shaded damp places; 300–3100 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang.

23. *Phyllagathis asarifolia* C. Chen, Bull. Bot. Res., Harbin 4(3): 56. 1984.

细辛锦香草 xi xin jin xiang cao

Herbs. Stems ca. 3 cm, erect or creeping, with conspicuous leaf scar. Leaves ± in a basal rosette; petiole 13–16 cm, puberulous, glabrescent; leaf blade orbicular to ovate-orbicular, ca. 11

× 11 cm, papery, adaxially sparsely strigose but glabrescent, both surfaces puberulous, secondary veins 4 or 5 on each side of midvein, base cordate, margin very small denticulate, apex rounded, retuse, or sometimes abruptly acute. Inflorescences terminal, umbellate, ca. 9-flowered; peduncle 12–15 cm, puberulous. Pedicel 5–8 mm, puberulous. Hypanthium campanulate, ca. 5 mm, glabrous. Calyx lobes ovate, ca. 2 mm, apex acuminate. Petals purple, broadly ovate, ca. 7 × 6 mm, oblique, apex acuminate. Stamens ca. 1.1 cm, equal; anthers lanceolate, ca. 6 mm, base 2-setiform tuberculate; connective inflated, decurrent forming a ca. 1 mm clavate spur. Ovary ovoid, apex with a membranous crown, crown margin abruptly denticulate. Capsule cup-shaped, crown slightly exerting calyx; hypanthium cup-shaped, ca. 8 × 7 mm, apex truncate. Fl. May.

• Dense forests. Guangxi (Pingnan).

24. *Phyllagathis tentaculifera* C. Hansen, Bull. Mus. Natl. Hist. Nat., B, Adansonia 12: 40. 1990.

须花锦香草 xu hua jin xiang cao

Shrubs 30–60 cm tall, branched. Branchlets terete, with an irregular small purple swelling between bristles at each side of leaf base, with dense appressed stout brownish or white bristles to 1.5 cm at nodes but glabrescent. Petiole 0.5–2 cm, pubescent as branchlets; leaf blade ovate to elliptic, 3.5–9 × 1.3–3.5 cm, abaxially with patent bristles, adaxially with sparse ascending bristles, secondary veins 1 or 2 on each side of midvein, base rounded, margin entire, apex long acuminate. Inflorescences a cluster of 2–4 flowers, ca. 2.5 cm; peduncle ca. 0.4 cm. Hypanthium cup-shaped, 3–4 mm, with minute brown glands and ascending bristles. Calyx lobes ca. 8 mm, with an apical keel. Petals pink, suborbicular, ca. 11 × 9 mm, apex apiculate. Stamens 6.4–7.4 cm, unequal in size; anthers narrowly ovate, ca. 3.6 × 2.7 mm, base not tuberculate; connective thickened toward base, with a short stout abaxial spur. Ovary apex deeply depressed, crown large, with flat gland-tipped trichomes. Capsule immature ca. 5 × 5.5 mm, 4-sided, valves with accrescent trichomes on edge. Fl. Jan.

• Old forests. Yunnan (Mengzi).

13. FORDIOPHYTON Stapf, Ann. Bot. (Oxford) 6: 314. 1892.

异药花属 yi yao hua shu

Gymnagathis Stapf (1892), not Schauer (1843); *Stapfiophyton* H. L. Li.

Herbs, erect or creeping, sometimes stoloniferous. Stems 4-sided, sometimes succulent or base subwoody. Leaves petiolate to almost sessile; leaf blade with secondary veins (1 or)2 or 3(–5) on each side of midvein, tertiary veins parallel, quaternary veins reticulate but usually inconspicuous, margin usually denticulate or serrulate. Inflorescences terminal, umbellate or cymose panicles; peduncle long; bracts subulate, small, caducous. Flowers 4-merous. Pedicel usually 4-sided, 2-bracteolate. Hypanthium campanulate to funnel-shaped, membranous, 4-sided or 8-ribbed. Calyx lobes usually triangular, membranous, apex apiculate. Petals pink, red, purple, or rarely white, oblong to obovate, base oblique. Stamens 8, whorls unequal in shape and length. Longer stamens usually pink to purplish red; anthers oblong to oblong-linear, longer than filaments, opening by 1 apical pore, base lengthened and forked or unappendaged. Shorter stamens pale yellow or white; anthers oblong, 1/3 or 1/2 longer than filaments, base usually not forked. Connective base sometimes minutely inflated. Ovary inferior, campanulate, narrowly ovate, or oblong, apex with a membranous 4-lobed crown, margin ciliate. Capsule campanulate to cup-shaped, apex truncate, 4-lobed, longitudinally dehiscent; hypanthium exceeding capsule, 8-ribbed. Seeds cuneate, small (ca. 1 mm), angular, testa tuberculate.

Nine species: China, Vietnam; nine species (eight endemic) in China.

1a. Leaves in a basal or sub-basal rosette; leaf blade adaxially with white spots and tuberculate.

- 2a. Stems densely brown hirsute 3. *F. peperomiifolium*
 2b. Stems glabrous except for reddish spiny trichomes at nodes 8. *F. brevicaulis*
 1b. Leaves not as above.
 3a. Leaves of a pair highly unequal and asymmetric, blade membranous 4. *F. strictum*
 3b. Leaves of a pair not unequal or only slightly unequal but then blade not membranous.
 4a. Leaf blade secondary veins 3–5 on each side of midvein.
 5a. Leaf blade glabrous 6. *F. cordifolium*
 5b. Leaf blade puberulous, strigose, villous, or densely pilose.
 6a. Stems terete, densely puberulous 2. *F. degeneratum*
 6b. Stems 4-angular, villous 9. *F. repens*
 4b. Leaf blade secondary veins 1 or 2 on each side of midvein, or if 3 then blade elongate oblong or lanceolate, not cordate-ovate.
 7a. Inflorescences cymose, paniculate, or umbellate, 13–20 cm 5. *F. faberi*
 7b. Inflorescences cymes or umbels, 3–7.5 cm.
 8a. Peduncle 1.5–3 cm; herbs 13–21 cm tall 1. *F. breviscapum*
 8b. Peduncle (2.5–)4–7.5 cm; herbs 50–100 cm tall 7. *F. longipes*

1. *Fordiophyton breviscapum* (C. Chen) Y. F. Deng & T. L. Wu, *Novon* 14: 429. 2004.

短葶无距花 duan ting wu ju hua

Stapfiophyton breviscapum C. Chen, *Bull. Bot. Res.*, Harbin 4(3): 57. 1984.

Herbs 13–21 cm. Stems 4-sided, narrowly winged on angles, margin of wings with sparse glandular trichomes or setose, otherwise glabrous. Petiole 0.5–2 cm, laterally narrowly winged, margin of wings sometimes with sparse glandular trichomes; leaf blade ovate to sublanceolate, (2.5–)5–8.5 × (1–)2–3.5 cm, papery, abaxially sparsely strigose on veins, sometimes bullate, adaxially strigose, secondary veins 1 on each side of midvein, margin serrate with each tooth having a terminal seta. Inflorescences terminal cymes, 3–5 cm; peduncle 1.5–3 cm. Pedicel 3–5 mm, 4-sided, narrowly winged on angles, margin of wings sometimes with sparse glandular trichomes. Hypanthium narrowly funnel-shaped, ca. 5 mm, 4-sided, winged on angles, margin of wings with sparse glandular trichomes. Calyx lobes broadly triangular, apex acuminate with an aristate tip. Petals pink, oblong, ca. 7.5 × 3 mm, apex acute. Longer stamens ca. 1.6 cm; anthers oblong-linear, ca. 7 mm. Shorter stamens ca. 6 mm; anthers oblong, ca. 2 mm. Ovary narrowly ovate, apex truncate and with a 4-lobed membranous crown; hypanthium 3–4 × 2–2.5 mm, 4-sided, 8-veined, with sparse glandular trichomes. Fl. Aug, fr. Sep–Oct.

• Sparse to dense forests, trailsides, valleys, mountain slopes, streamsides, soil rich in humus; 800–1500 m. Guangdong, Hunan.

2. *Fordiophyton degeneratum* (C. Chen) Y. F. Deng & T. L. Wu, *Novon* 14: 429. 2004.

败蕊无距花 bai rui wu ju hua

Stapfiophyton degeneratum C. Chen, *Bull. Bot. Res.*, Harbin 4(3): 58. 1984.

Herbs 7–20 cm tall, stoloniferous, erect or repent. Stems succulent, terete, usually slightly red, densely puberulous. Petiole 2–2.5 cm; leaf blade ovate to broadly ovate, 5–8(–9) × 3–4(–6) cm, membranous to subpapery, abaxially puberulous and sparsely strigose, adaxially strigose and densely pilose with base sometimes having white spots, secondary veins 3 or 4 on each side of midvein, base truncate to cordate, margin shallowly ser-

ulate with each tooth having a terminal seta, apex acuminate to obtuse. Pedicel ca. 1 mm but 2–3 mm in fruit, puberulous and with sparse glandular trichomes. Calyx lobes broadly triangular, apex acute with a setose tip. Petals pink, red, or purplish red, obovate-elliptic to oblong, 6–8 × 2–3.5 mm, slightly oblique, with sparse glandular trichomes, apex acute to long acute. Stamens 8, outer whorl fertile, inner whorl sterile. Fertile stamens ca. 1.3 cm; anthers lanceolate-oblong, ca. 6 mm. Sterile stamens filiform, 6–10 mm. Ovary ovoid, apex truncate and with a membranous 4-lobed crown, crown margin abruptly denticulate. Capsule broadly ovate, 4-sided, 4-lobed; hypanthium ca. 4 × 4 mm, with glandular trichomes. Fl. Apr–May, fr. Jun.

• Sparse forests, valleys, damp and shaded places, streamsides, open places, rock crevices; 200–300 m. Guangdong, Guangxi.

3. *Fordiophyton peperomiifolium* (Oliver) Hansen, *Bull. Mus. Natl. Hist. Nat.*, B, *Adansonia* 14: 425. 1993 [“1992”].

无距花 wu ju hua

Sonerila peperomiifolia Oliver, *Icon. Pl.* 19: t. 1814. 1889; *Gymnagathis peperomiifolia* (Oliver) Stapf; *Stapfiophyton peperomiifolium* (Oliver) H. L. Li.

Herbs, succulent. Root stock ca. 1 cm thick, with densely fibrous roots. Stems very short, densely brown hirsute. Leaves in a basal or sub-basal rosette of 3 or 4; petiole 4–14(–20) cm, densely hispid, with glandular trichomes, or rarely glabrescent; leaf blade ovate, ovate-elliptic, or broadly ovate, 5.5–11 × 3–7.5 cm, papery to submembranous, abaxially usually purple and setose on veins, adaxially with white spots and tuberculate after shedding of dense trichomes, secondary veins 3 or 4 on each side of midvein, base subcordate, cordate, or rarely rounded, margin denticulate with each tooth having a terminal seta, apex broadly acute. Inflorescences compound cymes, hirsute on nodes otherwise glabrous; peduncle 14–35 cm. Pedicel to 1.2 cm but to 1.9 cm in fruit, with sparse glandular trichomes and puberulous. Calyx lobes triangular, ca. 1.7 × 0.8 cm, oblique, apex acute to shortly acuminate with a setose tip. Longer stamens ca. 2.5 cm; anthers oblong-linear, ca. 1.2 cm. Shorter stamens ca. 1.2 cm; anthers oblong, ca. 4.5 mm. Ovary oblong, apex truncate and with a membranous ciliate crown. Capsule funnel-shaped, 4-sided, 8-ribbed, ± hispid, apex truncate. Fl. Mar–Apr, fr. Apr.

- Low hills, damp places, moist soil on stones. Guangdong.

4. *Fordiophyton strictum* Diels, Bot. Jahrb. Syst. 65: 113. 1932.

劲枝异药花 jin zhi yi yao hua

Fordiophyton longipetiolatum S. Y. Hu; *F. polystegium* Handel-Mazzetti.

Herbs or sometimes shrublets, 0.6–2 m tall, much-branched. Stems 4-sided, sulcate, glabrous, usually pilose or setose at nodes. Petiole 8(–25) mm or less, sometimes white small maculate, glabrous; leaves of a pair highly unequal and asymmetric, leaf blade broadly lanceolate, 6.5–11.5(–15) × 2–4(–5) cm, oblique, membranous, both surfaces sparsely puberulous, abaxially sometimes white small maculate, secondary veins (1 or) 2 on each side of midvein, base shallowly cordate to oblique, margin serrulate with each tooth having a terminal seta, apex acuminate. Inflorescences terminal cymes, ca. 8.5 cm, with glandular trichomes; bracts cordate, ca. 4 mm, membranous, caducous, glabrous. Pedicel short. Hypanthium ca. 4 mm, 8-ribbed, with white small macula, with sparse glandular trichomes or glabrescent. Calyx lobes triangularly broadly ovate, with sparse glandular trichomes or not, base auriculate, margin entire, apex with 1 glandular trichome at tip. Petals reddish or purple, oblong, ca. 1 cm, appressed sparsely strigose, apex oblique with 1 glandular trichome at tip. Longer stamens purplish red; filaments ca. 1 cm, glabrous; anthers linear, ca. 1.5 cm, curved, base lengthened and forming a forked spur ca. 3.5 cm. Shorter stamens yellow; filament ca. 7 mm; anthers oblong, ca. 4 mm, base spurred. Ovary inferior, 4-celled, apex with a membranous ciliate crown. Capsule campanulate, 6(–5) mm in diam., 4-lobed, membranous crown exerting calyx by ca. 2 mm; hypanthium glabrous or with sparse glandular trichomes. Fl. (Aug–)Sep, fr. Dec.

Dense forests, hillsides, valleys, damp and shaded places, grassy areas; 900–2200 m. Guangxi, Yunnan [Vietnam].

5. *Fordiophyton faberi* Stapf, Ann. Bot. (Oxford) 6: 314. 1892.

异药花 yi yao hua

Blastus lyi H. Léveillé; *Bredia cavalieriei* H. Léveillé & Vaniot (1906), not (H. Léveillé) Diels (1933); *B. mairei* H. Léveillé; *Fordiophyton cantonense* Stapf; *F. fordii* (Oliver) Krasser; *F. fordii* var. *pilosum* C. Chen; *F. fordii* var. *verniginum* Handel-Mazzetti; *F. maculatum* C. Y. Wu ex Z. Wei & Y. B. Chang; *F. multiflorum* C. Chen; *Oxyspora cavalieriei* H. Léveillé; *Sonerila fordii* Oliver.

Herbs or shrublets, 30–150 cm tall. Stems 4-sided, narrowly winged on angles or lacking wings, with small white spots, glabrous. Petiole 1.5–7 cm, often white-maculate, glabrous or shortly setose; leaf blade broadly lanceolate, oblong, ovate, or rarely lanceolate, (5–)10–22 × 2–8 cm, membranous, abaxially glabrescent or minutely puberulous and with white spots, adaxially glabrous, appressed puberulous, sometimes sparsely strigose between veins, sparsely pilose, or sometimes with glandular trichomes and white spots, secondary veins 2 or 3 on each side of midvein, base subcordate to rarely subcuneate, margin inconspicuously serrulate with each tooth having a terminal seta, apex acuminate. Inflorescences terminal, cymose

paniculate or umbellate, 13–20 × ca. 8 cm, to 50-flowered; peduncle 2–10(–15) cm, glabrous; bracts usually purplish red, imbricate at base of pedicel, broadly ovate to suborbicular, 1–1.8 × 1.2–2 cm, caducous. Pedicel 5–15 cm, 4-sided, with dense glandular trichomes or glabrous; bracteoles obovate to elliptic. Hypanthium funnel-shaped, 1–1.5 cm, 4-sided, 8-ribbed, with glandular trichomes, sometimes with white spots. Calyx lobes long triangular to ovate-triangular, 4.5–5 mm, with sparse glandular trichomes, margin glandular ciliate, apex obtuse. Petals pink to reddish purple, apex oblique with 1 glandular trichome at tip. Longer stamens with filament ca. 1.1 cm; anthers linear, ca. 1.5 cm, curved, base lengthened and forming a forked spur. Shorter stamens with filament ca. 7 mm; anthers oblong, ca. 3 mm, base obtuse. Ovary apex with membranous ciliate crown. Capsule campanulate, 6–10 mm, apex 4-lobed; hypanthium exceeding capsule, with glandular trichomes or glabrous. Fl. Jun–Oct, fr. Aug–Nov.

- Sparse to dense forests, mountain slopes, valleys, hillsides, side of ravines, shaded damp places, streamsides, grassy areas, soil rich in humus; 500–1800 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang.

6. *Fordiophyton cordifolium* C. Y. Wu ex C. Chen, Bull. Bot. Res., Harbin 4(3): 61. 1984.

心叶异药花 xin ye yi yao hua

Herbs to 70 cm tall. Stems 4-sided, narrowly winged on angles, glabrous. Petiole (3–)6–15 cm, both sides winged, apex ± setose; leaf blade cordate to ovate-cordate, 5–13 × 4–9.5 cm, papery to submembranous, often with small white spots, glabrous, secondary veins 4 or 5 on each side of midvein, base cordate, margin sparsely serrulate, apex broadly acuminate to acute. Inflorescences terminal, umbellate panicles, densely many-flowered; peduncle 10–17 cm, glabrous; bracts caducous. Pedicel 4-sided, 5–10 mm. Hypanthium funnel-shaped, ca. 8 mm, 4-sided, glabrous. Calyx lobes oblong to ovate, 6–8 × 3–4 mm, apex obtuse to acute. Petals lavender, ovate, ca. 11 × 7 mm, oblique, apex acute. Longer stamens ca. 2.1 cm; anthers linear, ca. 1 cm, base shortly spurred; connective decurrent, forming a spur. Shorter stamens ca. 1 cm; anthers ovate, ca. 4 mm. Ovary half inferior, obovate, apex with a membranous crown. Fl. Mar–Apr.

- Forests, valleys, damp places. Guangdong (Xinyi).

7. *Fordiophyton longipes* Y. C. Huang ex C. Chen, Fl. Yunnan. 2: 116. 1979.

长柄异药花 chang bing yi yao hua

Herbs 50–100 cm tall. Stems 4-sided, winged on angles, with small white spots, glabrous. Petiole 2.5–5.5 cm, white-spotted; leaf blade oblong-lanceolate to elliptic, 13–21 × 5–6.7 cm, abaxially furfuraceous squamose, adaxially glabrous and often with white spots near base, secondary veins 2 on each side of midvein, base cuneate, margin ciliate and entire or sparsely serrulate, apex acuminate. Inflorescences terminal, umbellate, many-flowered; peduncle (2.5–)4–7.5 cm, winged; bracts broadly obovate, ca. 1.6 × 1 cm, caducous, densely furfuraceous squamose. Pedicel ca. 5 mm but to 9 mm in fruit, glabrous. Hypanthium funnel-shaped, ca. 1.2 cm, 8-ribbed, glabrous. Calyx lobes triangular-ovate, ca. 4 mm, base subauriculate, apex

obtuse. Petals white, elliptic (in bud), ca. 8 mm, oblique. Longer stamens (in bud) with filament ca. 5 mm; anthers linear, ca. 8 mm, base lengthened and forming a forked spur; connective minutely bulged. Shorter stamens ca. 5 mm; anthers oblong, ca. 2 mm. Ovary inferior, 4 lobed, apex with a membranous crown. Capsule campanulate, ca. 6 mm in diam., apex 4-lobed, crown exerted ca. 1.5 mm beyond calyx; hypanthium 8-ribbed, glabrous. Fl. May, fr. Jul.

• Dense forests, valleys, shaded damp places; 500–1200 m. Yunnan (Pingbian).

8. *Fordiophyton brevicaule* C. Chen, Acta Phytotax. Sin. 18: 62. 1980.

短茎异药花 duan jing yi yao hua

Herbs to 15 cm tall (including inflorescence), stoloniferous. Stems 2–3 cm, 4-sided, glabrous except for reddish spiny trichomes at nodes. Leaves in a basal or sub-basal rosette; petiole 1–3 cm, both sides sparsely spreading setose, abaxially ± with glandular trichomes; leaf blade elliptic to ovate-elliptic, 3.5–8 × 2–5 cm, papery to subpapery, abaxially sparsely setose on veins otherwise glabrous, adaxially glabrous and minutely tuberculate, secondary veins 3 on each side of midvein, base cordate, margin sparsely denticulate with each tooth having a terminal seta, apex acute. Inflorescences terminal, cymose paniculate, 9–11-flowered; peduncle 4.5–11 cm, glabrous; bracts 2, lanceolate, ca. 6 mm. Pedicel ca. 5 mm but to 1.3 cm in fruit, glabrous. Hypanthium narrowly funnel-shaped, 4–6 mm, 4-sided, glabrous. Calyx lobes lanceolate, ca. 7 × 2 mm, apex acuminate. Petals purple, ovate, ca. 9 × 5 mm, apex with 1 glandular trichome at tip. Longer stamens ca. 1.4 cm; anthers linear, ca. 8 mm, base an obtuse forked spur; connective minutely bulged. Shorter stamens ca. 6.2 mm; anthers ovate, ca. 1.2 mm.

Ovary half inferior, obovate, apex truncate and with a membranous crown. Capsule broadly campanulate to almost cup-shaped, ca. 6 mm in diam.; hypanthium exceeding capsule, 4-sided. Fl. Jun.

• Near coast, below hills, grassy areas, shaded damp places; near sea level. Hong Kong.

9. *Fordiophyton repens* Y. C. Huang ex C. Chen, Fl. Yunnan. 2: 117. 1979.

匍匐异药花 pu fu yi yao hua

Herbs 7–12 cm tall (including inflorescence). Stems creeping, repent, 4-angular, villous. Petiole (2–)4–11 cm, white maculate, densely villous; leaf blade orbicular to ovate-orbicular, 4–7.5 × 4–6.5 cm, papery, abaxially villous on veins otherwise furfureaceous squamose, adaxially furfureaceous squamose and sparsely strigose, secondary veins 3 or 4 on each side of midvein, base cordate, margin densely denticulate with each tooth having a terminal seta, apex shortly acute to retuse. Inflorescences terminal, umbellate, 3–6-flowered; peduncle 7–12 cm, glabrous or sparsely villous. Pedicel ca. 5 mm, glabrous. Hypanthium funnel-shaped, ca. 1.4 cm, 4-sided, glabrous. Calyx lobes long triangular-ovate, ca. 5 mm, margin entire, apex obtuse. Petals pink, obovate, ca. 1.7 cm, oblique. Longer stamens pink; filaments linear, ca. 1.4 cm, base lengthened forming a forked spur; connective base slightly bulging. Shorter stamens white or whitish yellow; filaments ca. 6 mm; anthers oblong, ca. 3 mm. Ovary obovate, apex with a membranous ciliate crown. Capsule campanulate, ca. 5 mm in diam., apex 4-lobed, crown slightly exerted from calyx or not; hypanthium exceeding capsule, 8-ribbed, glabrous. Fl. and fr. May–Jun.

• Dense forests, valleys, shaded damp places; 1000–1600. Yunnan (Pingbian).

14. *SARCOPYRAMIS* Wallich, Tent. Fl. Nepal. 32. 1824.

肉穗草属 rou sui cao shu

Herbs. Stems erect or creeping, 4-sided. Leaves petiolate; leaf blade papery to membranous, secondary veins 1 or 2 on each side of midvein, tertiary veins parallel, margin usually serrulate. Inflorescences terminal cymes, nearly capitate, 3–5-flowered, base 2-bracteate; bracts foliaceous. Pedicel short, 4-sided, usually narrowly winged. Hypanthium cupular to cupular-funnelform, 4-sided, usually winged on angles. Calyx lobes 4, apex usually truncate but tip armed pubescent or a fimbriate membranous disk. Petals 4, pink to purplish red, usually oblique, apex apiculate. Stamens 8, equal in size; anthers obcordate or obcordate-elliptic, dehiscence poricidal; connective base usually decurrent forming a curved spur or bulge. Ovary inferior, 4-celled, apex with a membranous crown. Capsule cup-shaped, 4-sided, 4-poricidal, crown usually exerted from hypanthium. Seeds small, numerous, long obovate, densely papillose tuberculate.

About two species: Bhutan, China, NE India, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Thailand; two species (one endemic) in China.

The genus was revised by Hansen (Bot. Tidsskr. 73: 177–184. 1979), who recognized a single species, *Sarcopyramis napalensis*, without subordinate taxa. In China, however, tiny plants from several collection sites have traditionally been accepted as a separate species (*S. bodinieri*), and this practice is followed here. Field studies are required to resolve the status of *S. napalensis* and *S. bodinieri*.

1a. Leaf blade ovate to elliptic, 1–5 × 0.7–5 cm 1. *S. bodinieri*
1b. Leaf blade broadly ovate, ovate, or rarely sublanceolate, (2–)5–10 × (1–)2.5–4.5 cm 2. *S. napalensis*

1. *Sarcopyramis bodinieri* H. Léveillé & Vaniot, Mém. Soc. Sci. Nat. Cherbourg 35: 397. 1906.

肉穗草 rou sui cao

Sarcopyramis bodinieri var. *delicata* (C. B. Robinson) C. Chen; *S. crenata* H. L. Li; *S. delicata* C. B. Robinson; *S.*

napalensis Wallich var. *bodinieri* (H. Léveillé & Vaniot) H. Léveillé; *S. napalensis* var. *delicata* (C. B. Robinson) S. F. Huang & T. C. Huang; *S. parvifolia* Merrill ex H. L. Li.

Herbs to 5 cm tall, slender, sometimes creeping, stoloniferous, glabrous. Petiole 3–11 mm, narrowly winged, glabrous; leaf blade ovate to elliptic, 1–5 × 0.7–5 cm, papery, abaxially

usually purplish red or rarely green and usually glabrous but sometimes sparsely strigose along tertiary veins, adaxially green or purplish green and sparsely strigose, secondary veins 1 or 2 on each side of midvein, base obtuse, rounded, or subcuneate, margin subrepand and armed with teeth, apex obtuse to acute. Inflorescences terminal cymes, 1–5-flowered, with 2–6 bracts at base; peduncle 0.5–3(–4) cm; bracts, foliaceous, obovate, pubescent. Pedicel 1–3 mm, 4-sided, narrowly winged on angles. Hypanthium 3–5 mm, 4-sided, narrowly winged on angles. Calyx lobes rectangular or triangular, forming a right angle with hypanthium or not, abaxially setose or with triangular wings, sometimes their margin setose. Petals purplish red to pink, broadly ovate, oblique, 3–4 mm, apex acute with an apiculate tip. Stamens 1–1.5 mm; anthers yellow, ca. 0.5 mm; connective decurrent, forming a short spur ca. 1/2 length of anther. Ovary urceolate, apex with a membranous crown, crown margin undulate. Capsule whitish green, cup-shaped, 4-sided, membranous crown exserted from hypanthium.

• Dense forests, *Tsuga* forests (in SE Xizang), grassy areas, trail-sides, valleys, shaded damp places, rock crevices; 300–2800 m. Fujian, Guangxi, Guizhou, Sichuan, Taiwan, SE Xizang, Yunnan.

2. *Sarcopyramis napalensis* Wallich, Tent. Fl. Nepal. 32. 1824.

赭头红 zhu tou hong

Phyllagathis chinensis Dunn; *Sarcopyramis dielsii* Hu; *S. lanceolata* Wallich ex Bennett; *S. napalensis* var. *maculata* C. Y. Wu.

Herbs, erect, 10–30 cm tall, branched. Stems 4-sided, succulent, glabrous. Petiole (0.8–)1.2–2.8 cm, narrowly winged; leaf blade broadly ovate, ovate, or rarely sublanceolate, (2–)5–10 × (1–)2.5–4.5 cm, membranous, abaxially puberulous or glabrescent, adaxially sparsely strigose and with or without white spots, secondary veins 1 or 2 on each side of midvein, base cuneate to subround and slightly decurrent, margin serrulate, apex acuminate. Inflorescences terminal, cymes, 1–3-flowered, with 2 bracts at base; bracts sessile, foliaceous, ovate. Pedicel 2–6 mm, 4-sided, narrowly winged on angles. Hypanthium ca. 5 mm, 4-sided, narrowly winged on angles; apex of calyx lobes truncate and with a membranous disk, disk margin fimbriate. Petals pink, obovate, ca. 7 mm, oblique, apex truncate. Stamens equal; connective decurrent, forming a short spur or minute bulge. Ovary with a membranous crown, crown margin repand. Capsule cup-shaped, 4-sided, membranous crown exserted from hypanthium. Fl. Aug–Oct, fr. Sep–Jan.

Forests, streamsides, shaded damp places; 1000–3200 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, SE Xizang, Yunnan, Zhejiang [Bhutan, NE India, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Thailand].

15. TIGRIDIOPALMA C. Chen, Acta Bot. Yunnan. 1(2): 106. 1979.

虎颜花属 hu yan hua shu

Herbs, base subwoody. Stems stoloniferous, erect stems short. Leaves petiolate; leaf blade usually membranous, secondary veins 4 on each side of midvein, tertiary veins parallel, margin dentate. Inflorescences axillary, scorpioid cymes, long pedunculate. Flowers 5-merous. Hypanthium funnel-shaped, 5-sided, usually narrowly winged on angles, apex truncate. Calyx lobes short. Petals usually obovate, oblique, apex apiculate. Stamens 10, whorls unequal in shape and length; filaments filiform; anthers linear; connective minutely inflated. Longer stamens with connective decurrent, slightly prolonged, abaxially slightly spurred, adaxially 2-tuberculate at base. Shorter stamens 2-tuberculate at base of anther; connective decurrent, forming a short spur. Ovary superior, ovate, 5-celled, apex with a 5-lobed membranous crown; ovules numerous, with free central placentation, longitudinal 5-fascicled. Capsule funnellform cup-shaped, apex truncate and with a woody 5-lobed crown exserted from calyx; hypanthium usually winged on angles. Seeds cuneate, small, minutely tuberculate.

• One species: China (Guangdong).

Tigridiopalma is close to *Phyllagathis* (from which it differs only in the 5-merous flowers), and this was recognized by Diels, who annotated the type as "*Phyllagathis*, flowers wanted."

1. *Tigridiopalma magnifica* C. Chen, Acta Bot. Yunnan. 1(2): 107. 1979.

虎颜花 hu yan hua

Herbs. Rhizomes ca. 6 cm, thick, slightly woody. Stems very short, reddish hispid. Leaves basal; petiole terete, 10–17 cm or more, succulent, sulcate, reddish hispid; leaf blade cordate, 20–30 × 20–30 cm or larger, membranous, abaxially densely furfuraceous, reddish villous, and puberulous on veins, adaxially glabrous, secondary veins 4 on each side of midvein, base cordate, margin ciliate and irregular abruptly denticulate, apex subround. Inflorescences axillary, scorpioid cymes; peduncle 24–30 cm, obtusely 4-sided, glabrous; bracts very small, caducous. Pedicel 8–10 mm, angular, narrowly winged on angles, sometimes nodose, ± furfuraceous. Hypanthium funnellform to cup-shaped, 5-sided, narrowly crisply

winged, glabrous, apex truncate. Calyx lobes triangular-semi-orbicular, very short, inserted on tip of wing, apex apiculate. Petals dark red, broadly obovate, ca. 10 × 6 mm, oblique, almost rhomboid, apex truncate, oblique, and apiculate. Longer stamens ca. 1.8 cm; anthers ca. 1.1 cm; connective decurrent, basally with an abaxial small, triangular spur and 2 adaxial tubercles. Shorter stamens 1.2–1.4 cm; anthers 7–8 mm, base 2-tuberculate; connective decurrent, forming a short spur. Ovary ovoid, apex with membranous crown; crown 5-lobed, lobe margins ciliate. Capsule funnellform cup-shaped, apex truncate, dehiscence poricidal; crown woody, 5-lobed, exserted ca. 2 mm beyond calyx, margin irregularly denticulate; hypanthium funnel-shaped, ca. 1 cm, 5-sided, narrowly winged on angles, glabrous. Fl. Nov, fr. Mar–May.

• Dense forests, valleys, streamsides, rock crevices; 400–400 m. Guangdong (Xinyi, Yangchun).

16. SCORPIOTHYRSUS H. L. Li, J. Arnold Arbor. 25: 33. 1944.

卷花丹属 juan hua dan shu

Shrublets, erect, branched or not. Stems 4-sided but basally subterete, sulcate, pubescent or glabrous. Leaves petiolate; leaf blade usually papery, secondary veins 2–4 on each side of midvein, tertiary veins parallel. Inflorescences terminal, scorpioid, cymose panicles, usually pedunculate; bract small, caducous. Flowers small, 4-merous. Pedicel short, usually 4-sided. Hypanthium funnel-form-campanulate, 4-sided, usually pubescent. Calyx lobes lanceolate, ovate, or orbicular, margin dentate, apex acute or apiculate. Petals obovate, orbicular, or subovate. Stamens 8, equal; filaments short; anthers oblong, base setose or not, apex obtuse; connective decurrent, sometimes forming a spur. Ovary half inferior, ovoid, 4-celled. Style filiform; stigma apiculate. Capsule subglobose; hypanthium turbinate to half globose, obtusely 4-sided, 8-ribbed. Seeds cuneate, small, minutely tuberculate.

- Three species: China (Guangxi, Hainan).

Scorpiothyrsus is highly distinct within the family in its scorpioid, cymose inflorescence panicles that bear numerous, very small, white or pink flowers.

- 1a. Shrublets 50–100 cm tall; hypanthium at anthesis ca. 2.5 mm 1. *S. shangszeensis*
 1b. Shrublets 10–40 cm tall; hypanthium at anthesis 1.5–2.5 mm.
 2a. Leaf blade pubescent on both surfaces; secondary veins 4 on each side of midvein 2. *S. erythrotrichus*
 2b. Leaf blade glabrous or deciduously furfuraceous; secondary veins (2 or)3 on each side of midvein 3. *S. xanthostictus*

1. *Scorpiothyrsus shangszeensis* C. Chen, Bull. Bot. Res., Harbin 4(3): 63. 1984.

上思卷花丹 shang si juan hua dan

Shrublets, erect, 50–100 m tall. Branches spreading, woody, basally terete but apically 4-sided, with dense glandular trichomes and pilose but glabrescent. Petiole 4–10.5 cm, with dense glandular trichomes and pilose; leaf blade ovate to broadly ovate, 7–14 cm × 4.5–9 mm, papery or stiffly papery, both surfaces sparsely strigose and puberulous, secondary veins 4 on each side of midvein, base cordate, margin ciliate and denticulate to subentire with each tooth having a terminal seta, apex acuminate. Inflorescences terminal, scorpioid cymose panicles, ca. 8.5 × 6 cm, spreading. Pedicel ca. 1.5 mm, with glandular trichomes and pilose. Hypanthium campanulate, 4-sided, ca. 2.5 mm, with glandular trichomes and pilose. Calyx lobes narrowly lanceolate, ca. 1.5 mm. Petals white or pink, oblong to broadly ovate, 4.5–7 × ca. 5 mm, apex rounded to shortly acute. Stamens 4.5–5.5 mm; anther 2–2.5 mm, base 2-setose; connective minutely inflated. Ovary half inferior, ovoid, not crowned, glabrous. Capsule ovoid; hypanthium ca. 2 × 2.5 mm, 4-sided, 8-ribbed, with glandular trichomes and pilose, apex truncate. Fl. May–Jun, fr. Jun–Jul.

- Sparse or dense forests, mountain slopes, valleys, streamsides, shaded damp places; 600–900 m. Guangxi (Shangsi).

2. *Scorpiothyrsus erythrotrichus* (Merrill & Chun) H. L. Li, J. Arnold Arbor. 25: 35. 1944.

红毛卷花丹 hong mao juan hua dan

Phyllagathis erythrotricha Merrill & Chun, Sunyatsenia 5: 147. 1940; *P. xanthotricha* Merrill & Chun; *Scorpiothyrsus oligotrichus* H. L. Li; *S. xanthotrichus* (Merrill & Chun) H. L. Li.

Shrublets, erect, to 20 cm tall. Stems 3–5 cm, 4-sided, sparsely hispid, basally ligneous. Petiole 4–8.5 cm, sparsely villous to long-hispid; leaf blades broadly ovate, elliptic, or rarely suborbicular, 8–20 × 3.5–14 cm, papery to submembranous, both surfaces sparsely strigose and furfuraceous, secondary veins 4 on each side of midvein, base cordate to subround, margin

denticulate to serrulate, apex acute to subround. Inflorescences terminal, scorpioid cymose panicles, 7–19 cm, villous on nodes others sparsely villous and furfuraceous; peduncle 6–8 cm, 4-sided. Pedicel 1–2 mm, furfuraceous. Hypanthium campanulate, obtusely 4-sided, 2–2.5 mm, furfuraceous. Calyx lobes broadly triangular, ca. 0.5 mm, apex acute. Petals white or pink, suborbicular, 1.8–2 × 1.8–2 mm. Stamens 2–3 mm; anthers oblong, 1–1.5 mm, base minutely tuberculate; connective decurrent and abaxially minutely spurred. Ovary ovate, apex retuse. Capsule ovoid; hypanthium 2–3 × 2–4 mm, 4-sided, inconspicuously 8-ribbed, furfuraceous, apex truncate; calyx lobes usually persistent. Fl. and fr. Apr–May.

- Sparse to dense forests, mountain slopes, shaded places; 600–1400 m. Hainan (Baoting, Ledong).

3. *Scorpiothyrsus xanthostictus* (Merrill & Chun) H. L. Li, J. Arnold Arbor. 25: 34. 1944.

卷花丹 juan hua dan

Phyllagathis xanthosticta Merrill & Chun, Sunyatsenia 5: 148. 1940; *Scorpiothyrsus glabrifolius* H. L. Li.

Shrublets, erect, 10–40 cm tall, with subterranean stems. Stems 4-sided, sulcate, with sparse glandular trichomes, hispid or puberulous when young, later basally subterete and glabrous. Petiole 3–7 cm, sparsely long glandular hispid, gradually glabrescent; leaf blade broadly ovate to suborbicular, 8–17 × 4.5–9.3 cm, papery to substiffly papery, both surfaces glabrous or deciduously furfuraceous, adaxially with yellow, orbicular or elliptic spots, secondary veins (2 or)3 on each side of midvein, base rounded to subcordate, margin serrulate and each tooth with a terminal seta, apex acute to broadly acute. Inflorescences terminal, scorpioid cymose panicles, 4–12 cm, furfuraceous, sparsely setose but often with long glandular trichomes at nodes. Pedicel ca. 1 mm, furfuraceous. Hypanthium tubular-campanulate, 1.5–2 mm, 4-sided. Calyx lobes broadly ovate-triangular, 0.5–2 mm, apex acute to obtuse. Petals white or pink, broadly ovate, slightly oblique, furfuraceous. Stamens 2.5–3 mm; anthers narrowly oblong, ca. 1.5 mm; connective decurrent, forming a spur. Ovary ovoid, margin furfuraceous, apex truncate. Capsule

ovoid; hypanthium ca. 1.8 × 2 mm, 4-sided, 8-ribbed, apex truncate. Fl. and fr. Sep–Nov.

• Sparse to dense forests, shaded areas; ca. 500 m. Hainan (Baoting).

17. SONERILA Roxburgh, Fl. Ind. 1: 180. 1820, nom. cons.

蜂斗草属 feng dou cao shu

Herbs, shrublets, or shrubs, branched. Stems usually 4-sided, winged or not, usually pubescent with simple or glandular trichomes. Petiole winged or not, usually pubescent; leaf blade thin, secondary veins 2–4(or 5) on each side of midvein, base usually cordate and often oblique, margin serrulate with each tooth having a terminal seta, apex acute or acuminate. Inflorescences terminal or sometimes axillary, scorpioid cymes or subumbellate, pedunculate; bracts small, caducous. Flowers small, 3[or 6]-merous. Hypanthium tubular-campanulate, 3-sided, 6-ribbed, pubescent. Calyx lobes broadly triangular, small, very short. Petals pink, red, or purplish red, oblong-elliptic. Stamens 3[or 6], equal or unequal; filaments filiform; anthers subulate to broadly ovate, dehiscence poricidal; connective not inflated. Ovary inferior, urceolate, apex with a membranous 3-lobed crown. Style filiform; stigma apiculate. Capsule campanulate to tubular-campanulate, crown woody and exerted from calyx; hypanthium 3[or 6]-sided, 6-ribbed, usually with sparse glandular trichomes. Seeds numerous, cuneate, small, glabrous or small tuberculate.

About 150 species: tropical Asia; six species (three endemic) in China.

Some 240 names have been published in this genus, and there may be as many as 150 species.

Sonerila khasiana C. B. Clarke (in J. D. Hooker, Fl. Brit. India 2: 539. 1879) probably occurs in SE Xizang (Médog), although it is not treated here.

- 1a. Flower hypanthium and capsule tubular, hypanthium 4–5 × to 1.7 mm and capsule 4–7 × ca. 2 mm 4. *S. erecta*
 1b. Flower hypanthium and capsule ± campanulate, broader in diam. than above relative to length.
 2a. Herbs to 7 cm tall, with a basal leaf rosette; leaf blade cordate, as long as wide 5. *S. primuloides*
 2b. Herbs 10–50 cm tall, with leaves distributed along stems; leaf blades elliptic, ovate, or lanceolate, distinctly longer than wide (except sometimes in *S. hainanensis*).
 3a. Leaf blade 1.5–3 × 1–2.3 cm 6. *S. hainanensis*
 3b. Leaf blade usually much longer and wider than above.
 4a. Leaf blade base oblique or symmetrically deeply cordate, secondary veins usually (2–)4(or 5) on each side of midvein 1. *S. plagiocardia*
 4b. Leaf blade base cuneate to obtuse, sometimes slightly oblique, but never deeply cordate, secondary veins 1 or 2(or 3) on each side of midvein.
 5a. Leaf blade abaxially scattered setose on veins, adaxially remotely setose between veins and sometimes with white, orbicular patches 2. *S. maculata*
 5b. Leaf blade abaxially hispid on veins, adaxially sparsely appressed setose or strigose 3. *S. cantonensis*

1. *Sonerila plagiocardia* Diels, Bot. Jahrb. Syst. 65: 117. 1932.

海棠叶蜂斗草 hai tang ye feng dou cao

Fordiophyton begoniifolium H. L. Li; *Sonerila alata* Chun & F. C. How ex C. Chen; *S. alata* var. *triangula* C. Chen.

Herbs, erect or sometimes creeping, 30–40 cm tall, base woody. Stems 4-sided, succulent, winged, with sparse glandular trichomes, glabrescent. Petiole 2–10 cm, winged, puberulous and sparsely setose; leaf blade ovate, (2.5–)5–18 × 3.5–5.5(–10) cm, papery to membranous, adaxially puberulous and sometimes purple on veins, secondary veins (2–)4(or 5) on each side of midvein, base oblique or symmetrically deeply cordate, margin serrulate, abaxially puberulous and sparsely setose on veins, apex acuminate. Inflorescences terminal and axillary, scorpioid cymes, 3–6 cm, to 8-flowered, inconspicuously winged, sometimes branched, with sparse glandular trichomes; peduncle 2–4 cm. Pedicel 2–5 mm but to 1.8 cm in fruit, with sparse glandular trichomes or puberulous. Hypanthium tubular-campanulate, middle slightly contracted, 6–8 mm, 3-sided, 6-ribbed, puberulous and with sparse glandular trichomes. Calyx lobes 3, broadly triangular, 1–3 mm, slightly with glandular trichomes. Petals pink to red, oblong-obovate, 1–1.1 cm, middle vein with a few glandular trichomes, apex shortly acuminate. Stamens 3,

usually 2 shorter and 1 longer, rarely equal. Longer stamens with filament ca. 8 mm; anthers oblong, 5–7 mm on longer stamen, ca. 9 mm on shorter stamens, base forked, apex rounded and shortly beaked. Ovary flask-shaped, apex truncate and with a membranous 3-lobed crown. Capsule campanulate, 7–8 × ca. 5 mm, 3-sided, 3-lobed; hypanthium 6-ribbed, slightly with glandular trichomes or glandular. Fl. Aug–Sep, fr. Oct–Nov.

Dense forests, hillsides, valleys, shaded damp places, stony soil rich in humus; 600–2500 m. Guangdong, Guangxi, Jiangxi, SE Yunnan [Cambodia, Laos, Malaysia, Thailand, Vietnam].

2. *Sonerila maculata* Roxburgh, Fl. Ind. 1: 180. 1820.

溪边桑勒草 xi bian sang le cao

Sonerila laeta Stapf; *S. rivularis* Cogniaux.

Herbs or shrublets, 20–30 cm tall, sometimes stoloniferous. Stems obtusely 4-sided, glandular puberulous or glabrescent. Petiole (0.5–)1.2(–3) cm, puberulous; leaf blade obovate to elliptic, (2.5–)6(–14) × 2.5–4.5 cm, papery to submembranous, abaxially scattered setose on veins, adaxially remotely setose between veins and sometimes with white, orbicular patches (maculae), secondary veins 1 or 2 on each side of midvein, base cuneate to obtuse and sometimes slightly oblique, margin serrulate with each tooth having a terminal seta, apex

acuminate to acute. Inflorescences terminal, scorpioid cymes, 1.5–3.5 cm, furfureaceous, glabrescent; peduncle 0.7–2 cm, 4-angled. Pedicel 1–3 mm, sparsely furfureaceous and with glandular trichomes. Hypanthium funnel-shaped, 5–6 mm, 3-sided, 6-ribbed. Calyx lobes broadly triangular, less than 1 mm, apex acute. Petals purple, oblong, 5.5–10 × 2.5–6 mm, apex acute with 1 glandular trichome at tip. Stamens 3, equal, 5.5–12 mm; anthers 3–7 mm. Ovary flask-shaped to cup-shaped, apex with a membranous 3-lobed crown. Capsule campanulate, 3-sided; hypanthium 6–8 × 4–6 mm, furfureaceous or glabrescent. Fl. Jun–Sep, fr. Aug–Dec.

Thickets, hillsides, valleys, trailsides, streamsides, shaded damp places; 100–1300 m. Fujian, Guangdong, Guangxi, Xizang (Cona), Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Thailand, Vietnam].

3. *Sonerila cantonensis* Stapf, Ann. Bot. (Oxford) 6: 302. 1892.

蜂斗草 feng dou cao

Sonerila cantonensis var. *strigosa* C. Chen; *S. yunnanensis* Jeffrey.

Herbs or shrublets, (15–)20–50 cm tall, sometimes stoloniferous. Stems obtusely 4-sided, spreading-hirsute and puberulous, glabrescent, usually lenticellate. Petiole 0.5–3(–6) cm, densely hirsute or villous; leaf blade ovate, elliptic-ovate, narrowly lanceolate-oblong, or subelliptic, 3–5.5(–13) × 1.8–6 cm, papery to submembranous, abaxially hispid on veins and sometimes trichomes brownish purplish, adaxially sparsely appressed setose or strigose, secondary veins 1 or 2(or 3) on each side of midvein, base cuneate to obtuse and sometimes slightly oblique, margin serrulate with each tooth having a terminal seta, apex shortly acuminate to acute. Inflorescences terminal, scorpioid cymes or dichasial cymes, 3–7-flowered, densely puberulous and with sparse glandular trichomes or densely villous; peduncle. 1.5–3 cm, puberulous and with sparse trichomes; bracts caducous. Pedicel 1–3 mm, slightly 3-sided. Hypanthium tubular-campanulate, 5–7 mm, 3-sided, 6-ribbed, puberulous or with sparse glandular trichomes. Calyx lobes broadly triangular, ca. 1 mm, pilose, apex acute. Petals pink to pale rose-colored, oblong, 5–10 mm, with sparse glandular trichomes or pilose on ridge, apex acute. Stamens 3, equal; filament ca. 7 mm; anthers ca. 8 mm, base slightly forked. Ovary flask-shaped, apex with a membranous crown. Capsule campanulate, 5–7 × 4–5 mm, 3-sided; hypanthium 6-ribbed, glabrous. Fl. Jun–Oct, fr. Dec–Feb.

• Dense forests, hillsides, valleys, shaded damp places, dry or damp places, grassy areas; 500–1500 m. Guangdong, Yunnan [Vietnam].

This species has also been treated as a synonym of *Sonerila maculata* (Renner et al., Fl. Thailand 7(3): 488. 2001), but study of Chinese material shows that it is probably a distinct species.

4. *Sonerila erecta* Jack, Malayan Misc. 1(5): 7. 1820.

直立蜂斗草 zhi li feng dou cao

Sonerila cheliensis H. L. Li; *S. epilobioides* Stapf & King; *S. shanlinensis* C. Chen; *S. tenera* Royle.

Herbs 5–18 cm tall. Stems slender, almost 4-sided, alate, with sparse spreading glandular trichomes. Petiole 4–15 mm, glandular pilose, faintly narrowly alate; leaf blade narrowly elliptic to ovate, (0.5–)1–2.5(–3) × (0.3–)0.4–1.6(–2) cm, membranous, abaxially scattered hirsute, glabrous, or furfureaceous, adaxially sparsely hirsute, secondary veins 2–3 on each side of midvein, base cuneate, margin serrulate with each tooth having a terminal seta, apex shortly acuminate. Inflorescences terminal, scorpioid cymes, 1–5(–11)-flowered, 1–4.5 cm, with spreading glandular trichomes; peduncle 0.8–2 cm. Pedicel 2–7 mm, sub 3 sided, with scattered glandular trichomes. Hypanthium tubular, 4–5 mm, to 1.7 mm in diam., almost 3-sided, 6-ribbed, usually with sparse glandular trichomes on ribs. Calyx lobes broadly ovate-triangular, ca. 0.5 mm, apex apiculate. Petals pink to purple, oblong-elliptic, 3–3.5 mm, oblique, with sparse glandular trichomes on ridge, apex acute. Stamens 3, subequal; filaments as long as anthers; anthers broadly ovate, 1.8–2 mm, base forked. Ovary flask-shaped, membranous crown 3-lobed. Capsule tubular, 4–7 × ca. 2 mm, 3-sided; hypanthium sparsely glandular pilose, 6-ribbed. Fl. Jul–Oct, fr. Oct–Dec.

Pinus woodlands, forest margins, limestone hillsides, bamboo thickets, grassy areas, grasslands, trailsides; 500–1800 m. Guangdong, Guangxi, Hunan, Jiangxi, Yunnan [N India, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

In Chinese herbaria the name *Sonerila epilobioides* has often been misapplied to specimens of *S. maculata*.

5. *Sonerila primuloides* C. Y. Wu, Fl. Yunnan. 2: 126. 1979.

报春蜂斗草 bao chun feng dou cao

Herbs, ca. 7 cm. Stems ca. 1 cm, densely villous. Leaves in a basal rosette; petiole 1–3 cm, winged, sparsely villous; leaf blade cordate, 1.5–3 × 1.5–3 cm, membranous, abaxially furfureaceous and sparsely puberulous along veins, adaxially sparsely villous and furfureaceous, secondary veins 3 on each side of midvein, base cordate, margin serrate with each tooth having a terminal seta, apex acute. Inflorescences terminal, scorpioid cymes or subumbellate; peduncle (2–)5.5 cm, winged, glabrous. Pedicel 1.1–1.6 cm in fruit, winged, glabrous. Capsule tubular-campanulate; hypanthium tubular-campanulate, ca. 5 × 2 mm, 3-sided, 6-ribbed, glabrous; calyx lobes triangular, sparsely puberulous. Fr. Oct.

• River banks, rock crevices; 1400–1500 m. Yunnan (Jingdong).

6. *Sonerila hainanensis* Merrill, Philipp. J. Sci. 23: 256. 1923.

海南桑叶草 hai nan sang ye cao

Herbs or shrublets, 10–20 cm tall, stoloniferous, many-branched, base woody. Stems with sparse glandular trichomes, glabrescent. Petiole 5–10 mm, both sides with sparse glandular trichomes; leaf blade ovate-elliptic to elliptic, 1.5–3 × 1–2.3 cm, membranous, abaxially scattered furfureaceous, adaxially sparsely strigose, secondary veins 1 or 2 on each side of midvein, base rounded, margin scattered serrate with each tooth tipped by 1 glandular trichome, apex acute to obtuse. Inflorescence terminal, compact scorpioid cymes or subumbellate, 2–5-flowered; peduncle 5–8 mm, with a few glandular trichomes; bracts subulate, ca. 1.5 mm. Pedicel 2–4.5 mm. Hypanthium

tubular-funnelform, ca. 5 mm, 3-sided, \pm furfuraceous. Calyx lobes shortly triangular-semiorbicular, ca. 1 mm, adaxially glandular furfuraceous, apex apiculate. Petals pink, oblong to oblong-elliptic, with 1 or 2 glandular trichomes at base of ridge, apex acute. Stamens 3, ca. 8.5 mm; anthers ca. 3.5 mm. Ovary

flask-shaped, apex with a membranous crown, crown margin abruptly denticulate. Capsule campanulate, 3-sided, apex truncate; hypanthium ca. 6×4 mm, glabrous. Fl. Apr, fr. May.

- Forests, mountain slopes, soil among stones. Hainan.

18. DIPLECTRIA (Blume) Reichenbach, Deut. Bot. Herb.-Buch 174. 1841.

藤牡丹属 teng mu dan shu

Dissochaeta sect. *Diplectria* Blume, Flora 14: 501. 1831.

Climbers or scandent shrubs. Stems squamose, glabrous or pubescent. Leaves shortly petiolate; secondary veins 1 or 2 on each side of midvein, margin entire. Inflorescences terminal or axillary, cymose paniculate, sometimes bracteate. Flowers small, 4-merous. Hypanthium tubular-campanulate to campanulate, squamose, glabrous or pubescent, apex truncate or inconspicuous. Petals white, ovate to oblong, glabrous. Stamens 8, whorls unequal in shape and length. Longer stamens with anthers oblong to linear-oblong, base abaxially 2-tuberculate and abaxially spurred or not, apex usually beaked. Shorter stamens abortive; anthers rhomboid-ovate, usually papery, abaxially long caudate-spurred, adaxially 2-setose at base. Ovary inferior, ovate, apex truncate. Style filiform; stigma apiculate. Fruit a berry, subglobular to ovate, apex often with persistent calyx lobes. Seeds numerous, cuneate, small, angular.

Between eight and eleven species: China, India, Indonesia, Malaysia, Myanmar, New Guinea, Philippines, Vietnam; one species in China.

Diplectria is often considered as a synonym of *Dissochaeta* Blume (see Renner et al., Fl. Thailand 7(3): 419–420. 2001). *Dissochaeta* when including *Diplectria* has ca. 40 species and a similar geographic distribution.

1. *Diplectria barbata* (Wallich ex C. B. Clarke) Franken & M. C. Roos, Blumea 24: 415. 1978.

藤牡丹 teng mu dan

Anplectrum barbatum Wallich ex C. B. Clarke in J. D. Hooker, Fl. Brit. India 2: 546. 1879; *Backeria barbata* (Wallich ex C. B. Clarke) Raizada.

Climbers or scandent shrubs, 3–4 m tall. Stems obtusely 4-sided, sparsely stellate pilose, later subterete and glabrescent. Petiole ca. 5 mm, densely stellate pilose, both sides setose; leaf blade oblong, broadly lanceolate, or oblong-ovate, 8–12 \times 2.8–4 cm, stiffly papery to subpapery, both surfaces with stellate trichomes but glabrescent, secondary veins 2 on each side of midvein, base slightly cordate to subcordate, margin entire, apex acuminate. Inflorescences terminal, cymose paniculate,

ca. 22 \times 12 cm, many-flowered, with dense stellate trichomes. Pedicel 2–5 mm, with stellate trichomes. Hypanthium tubular-campanulate, 5–7 mm, with stellate trichomes. Calyx lobes inconspicuous. Petals white, broadly ovate, ca. 7 \times 6 mm, apex acute. Longer stamens ca. 1.2 cm; anthers ca. 8 mm, U-curved, abaxially spurred, adaxially 2-tuberculate at base. Shorter stamens abortive, ca. 2.5 mm; anthers papery, rhomboid-ovate, ca. 1 mm, margin denticulate, abaxially with a spur ca. 2 mm, adaxially at base with 2 setae ca. 1 mm. Ovary ovoid, apex truncate. Fl. Jun or Nov, fr. Jun–Jul.

Dense forests, climbing up trees; ca. 400 m. Hainan [India, Malaysia, Vietnam].

This species has also been treated as a synonym of *Dissochaeta divaricata* (Willdenow) G. Don (Renner et al., Fl. Thailand 7(3): 423–424. 2001). In addition to Hainan, *D. divaricata* sensu lato occurs in India, Indonesia, Laos, Malaysia, Myanmar, Thailand, and Vietnam.

19. MEDINILLA Gaudichaud-Beaupré ex Candolle, Prodr. 3: 167. 1828.

酸脚杆属 suan jiao gan shu

Pseudodissochaeta M. P. Nayar.

Small trees, or erect or scandent shrubs, terrestrial, epiphytic, or rarely climbing. Stems 4-sided or terete, sometimes succulent or corky. Leaves opposite or verticillate, petiolate or sessile; leaf blade usually glabrous, margin entire or dentate. Inflorescences terminal or axillary inserted on leafless stems or at nodes of root stock, cymose or cymose paniculate; bracts small, caducous. Flowers 4(–6)-merous, pedicellate and sometimes bracteolate. Hypanthium cup-shaped, funnel-shaped, campanulate, or tubular. Calyx lobes conspicuous or inconspicuous, apex apiculate. Petals obovate, ovate, or suborbicular, sometimes oblique. Stamens 2 \times as many as petals, whorls equal or slightly unequal in shape and length; anthers linear, lanceolate, or oblong, base tuberculate or appendaged, apex beaked, dehiscent by a single pore; connective slightly decurrent forming a spur. Ovary inferior, ovate, apex truncate or with a membranous crown, sometimes septate. Berry globular, ovate, or often urceolate, apex indehiscent. Seeds numerous, obovate to shortly cuneate, small, glabrous or tuberculate.

Between 300 and 400 species: tropical Africa, Asia, and Pacific islands; 11 species (five endemic) in China.

In China *Pseudodissochaeta* has been treated as a synonym of *Medinilla* (the species concerned are *M. assamica*, *M. lanceata*, and *M. septentrionalis*), whereas *Pseudodissochaeta* has also been treated as a separate genus (Fl. Thailand 7(3): 475. 2001). Unpublished molecular data indicate

that at least *M. septentrionalis* (*P. septentrionalis*) is not close to *Medinilla*. The fact that the Melastomataceae specialists W. W. Smith, H. L. Li, Kraenzlin, Guillaumin, Nayar, and Chen Cheih allocated the three Chinese species of *Pseudodissochaeta* to six different genera (*Allomorpha*, *Anplectrum* A. Gray, *Diplectria*, *Medinilla*, *Oritrephes* Ridley, *Pseudodissochaeta*) indicates the difficulty of determining their true affinities from morphological data. Additional molecular data are needed to resolve the problem.

- 1a. Leaves 4–8-verticillate, leaf blade oblong, 9–12 × 2.5–3 cm 7. *M. hayatana*
 1b. Leaves opposite, leaf blade lanceolate, elliptic, or obovate, but not oblong.
 2a. Branchlets conspicuously long setose at leaf nodes, seta to 8 mm 6. *M. formosana*
 2b. Branchlets not setose at leaf nodes.
 3a. Leaf blade elliptic, (2–)6–8.5 × 1–2.8 cm.
 4a. Leaves and branchlets not succulent, leaves drying thin-papery; branchlets terete, with thin not corky bark 1. *M. septentrionalis*
 4b. Leaves and branchlets succulent, drying subleathery; branchlets angular, with thickly corky bark 4. *M. nana*
 3b. Leaf blade larger than above.
 5a. Inflorescences 15–30 cm, many-flowered; leaf blade abaxially puberulous, furfuraceous, or finely strigose.
 6a. Leaves sessile or subsessile; leaf blade 3.8–11 cm wide 2. *M. assamica*
 6b. Leaves with a 0.8–1 cm petiole; leaf blade 3–3.5 cm wide 3. *M. lanceata*
 5b. Inflorescences shorter than above, usually few-flowered; leaf blade abaxially glabrous.
 7a. Bark of branchlets dark brown with conspicuous white lenticels 5. *M. fengii*
 7b. Bark of branchlets usually pale tan (not dark brown), rarely conspicuously lenticellate.
 8a. Leaves 3–5-verticillate, leaf blade obovate, 2–3.5(–5) × 1.1–1.5(–2.8) cm 8. *M. arboricola*
 8b. Leaves opposite, leaf blade elliptic, 6–23 × 2–11 cm.
 9a. Inflorescences terminal or lateral cymes, peduncle 2–3 cm 9. *M. himalayana*
 9b. Inflorescences lateral cymes only, usually on leafless branchlets, peduncle 0.5–1 cm.
 10a. Leaf blade base subrounded, not decurrent 10. *M. rubicunda*
 10b. Leaf blade base cuneate and slightly decurrent 11. *M. petelotii*

1. *Medinilla septentrionalis* (W. W. Smith) H. L. Li, J. Arnold
 Arbor. 25: 38. 1944.

北酸角杆 bei suan jiao gan

Oritrephes septentrionalis W. W. Smith, J. Proc. Asiat. Soc. Bengal 7: 69. 1911; *Anplectrum yunnanense* Kraenzlin; *Medinilla caerulescens* Guillaumin; *M. caerulescens* var. *nuda* Craib; *Pseudodissochaeta septentrionalis* (W. W. Smith) M. P. Nayar.

Shrubs 1–5(–7) m tall, many branched, erect or sometimes scrambling. Branches terete, glabrous with thin brown bark. Petiole 0.4–0.9 mm; leaf blade lanceolate, ovate-lanceolate, or broadly ovate, 7–8.5 × 2–2.5 cm, papery, abaxially ± furfuraceous, adaxially glabrous, secondary veins 2 on each side of midvein, base obtuse to subrounded, margin sparsely serrulate apically from middle, apex caudate-acuminate. Inflorescences axillary, cymose, 3.5–5.5 cm, (1 or)3(or 5)-flowered, glabrous; peduncle 1–2.5 cm. Hypanthium campanulate, 4–4.5 mm, densely tuberculate, with very scattered glandular trichomes or glabrous. Calyx lobes inconspicuous, apiculate. Petals pink, lavender, or purplish red, triangular-ovate, 8–10 mm, base slightly oblique, apex acute. Stamens 8, subequal. Longer (outer) stamens with filaments 4.5–5.5 mm; anthers ca. 7 mm. Shorter stamens with filaments 3–4 mm; anthers ca. 6 mm, base tuberculate. Connective slightly decurrent and forming a short spur. Ovary ovoid, apex 4-undulate. Berry urceolate, ca. 7 × 6 mm. Seeds cuneate, densely tuberculate. Fl. Jun–Sep, fr. Feb–May.

Dense forests, forest margins, damp shady areas; 200–1800 m. Guangdong, Guangxi, Yunnan [Myanmar, N Thailand, Vietnam].

2. *Medinilla assamica* (C. B. Clarke) C. Chen, Acta Phytotax. Sin. 21: 419. 1983.

顶花酸角杆 ding hua suan jiao gan

Anplectrum assamicum C. B. Clarke in J. D. Hooker, Fl. Brit. India 2: 546. 1879; *Allomorpha subsessilis* Craib; *Diplectria assamica* (C. B. Clarke) Kuntze; *Medinilla spirei* Guillaumin; *Pseudodissochaeta assamica* (C. B. Clarke) M. P. Nayar; *P. subsessilis* (Craib) M. P. Nayar.

Shrubs or scandent (scrambling) shrubs, 1–4 m tall. Branches 4-angled when young, later terete, glabrous. Leaves very shortly petiolate or sessile; leaf blade ovate, lanceolate-ovate, or elliptic, 10–21 × 3.8–11 cm, leathery, both surfaces minutely tuberculate or adaxially glabrous, abaxially sparsely strigose and furfuraceous, secondary veins 1 or 2 on each side of midvein, base oblique and cordate or rarely obtuse, margin entire or shallowly serrulate, apex acuminate. Inflorescences terminal, cymose paniculate, 15–30 cm. Pedicel 0.5–2 mm. Hypanthium cup-shaped, 3–4 mm, minutely tuberculate, margin slightly undulate. Calyx lobes inconspicuous. Petals 4, pink, broadly ovate, 3–4.5 × ca. 3.5 mm, basally slightly oblique, apex obtuse to subacute. Stamens 8, subequal; filaments ca. 3 mm; anthers lanceolate, ca. 4 mm; connective decurrent, inflated around base of anther and abaxially minutely spurred. Ovary ovoid, 4-celled, apex truncate and entire. Berry globular, 4.5–6 × 4–5 mm, apex truncate. Seeds shortly cuneate, small tuberculate. Fl. Apr–Jun, fr. Oct.

Sparse to dense forests, valleys, hillsides, streamsides, damp places, trailsides; 200–1300 m. Guangdong, Guangxi, Hainan, Xizang (Cona, Mêdog), Yunnan [India, Laos, Myanmar, N Thailand, Vietnam].

3. *Medinilla lanceata* (M. P. Nayar) C. Chen, Acta Phytotax. Sin. 21: 421. 1983.

酸脚杆 suan jiao gan

Pseudodissochaeta lanceata M. P. Nayar, J. Bombay Nat. Hist. Soc. 65: 563. 1968; *Medinilla radiciflora* C. Y. Wu.

Shrubs or trees, 2–5 m tall. Branches obtusely 4-sided but later terete; bark corky, longitudinally shedding. Petiole 8–10 mm, slightly pilose; leaf blade lanceolate to ovate-lanceolate, 15–24 × 3–5.5 cm, papery, both surfaces glabrous or abaxially puberulous and slight furfuraceous, secondary veins 1 or 2 on each side of midvein, base rounded to obtuse, margin sparsely shallow serrulate to subentire, apex caudate-acuminate. Inflorescences inserted on leafless stems or on root stock, cymose paniculate, 15–25 cm, puberulous. Pedicel ca. 4 mm, puberulous. Hypanthium campanulate, 5–6 mm, minutely tuberculate. Calyx lobes inconspicuous, apiculate. Petals broadly ovate, ca. 4.5 × 6 mm, apex obtuse to rounded. Stamens 8, subequal; filaments ca. 7 mm, base tuberculate; connective decurrent, forming a spur. Ovary ovoid, 4-celled, apex 4-dentate. Berry urceolate, ca. 8 × 7 mm, minutely tuberculate, puberulous. Seeds shortly cuneate, scattered small tuberculate. Fl. Aug, fr. Apr or Oct.

• Sparse to dense forests, shaded damp places, valleys, hillsides; 400–1000 m. Hainan, Yunnan.

4. *Medinilla nana* S. Y. Hu, J. Arnold Arbor. 33: 168. 1952.

矮酸脚杆 ai suan jiao gan

Shrubs 15–100 cm tall, often epiphyte, stoloniferous, many-branched. Stems curved ascending, angled to winged, glabrous, later bark corky and wrinkled. Petiole 1–4 mm, glabrous; leaf blade obovate to elliptic, 2–3.5(–5) × 1.1–1.5(–2.8) cm, succulent to subleathery, both surfaces glabrous, secondary veins 1 on each side of midvein, base cuneate, margin basally entire and apically from middle sparsely serrulate, apex obtuse, sub-round, or retuse. Inflorescences terminal cymes, 1–3-flowered; peduncle ca. 5 mm, 4-sided. Pedicel ca. 1 mm. Hypanthium long funnel-shaped, ca. 6 mm, bulging. Calyx lobes ca. 2 mm, margin repand, apex obtuse to acute. Petals 4, pink, obovate, ca. 1.1 cm, slightly oblique, apex truncate. Stamens 8, equal; filaments filiform, ca. 5 mm; anthers ca. 4 mm, base subulate bulging; connective slightly inflated, base decurrent and forming a subulate spur. Ovary inferior, turbinate, 4-celled. Berry urceolate, ca. 10 × 7 mm, small tuberculate. Fl. Jun, fr. Nov.

Dense forests; 1100–2000 m. SE Xizang, Yunnan [Vietnam].

5. *Medinilla fengii* (S. Y. Hu) C. Y. Wu & C. Chen, Fl. Yunnan. 2: 129. 1979.

西畴酸角杆 xi chou suan jiao gan

Pachycentria fengii S. Y. Hu, J. Arnold Arbor. 33: 170. 1952; *Medinilla taiwaniana* Yuen P. Yang & H. Y. Liu; *P. formosana* Hayata.

Shrubs 50–120 cm tall, usually epiphytic, many-branched. Stems subterete or obtusely 4-sided, conspicuous white lenticels, puberulous or glabrous; bark brown. Petiole 5–12 mm;

leaf blade obovate to elliptic, 4–10 × 2–3.5 cm, leathery, abaxially densely furfuraceous tuberculate but glabrescent, adaxially densely reticulate scrobiculate but glabrescent, secondary veins 1 on each side of midvein, base cuneate, margin entire or sparsely serrulate, apex acuminate to caudate-acuminate. Inflorescences terminal, corymb-panicles, 2–3 × 3–5 cm, 3–6(–16)-flowered. Pedicel 5–10 mm. Hypanthium funnel-shaped, 4–5 mm, minutely tuberculate, glabrous. Calyx lobes 4, ovate, ca. 2 mm, apex rounded and apiculate. Petals 4, pink, broadly obovate, 6–7.5 mm, small tuberculate, apex retuse, truncate, or acute. Stamens 8, subequal, ca. 9 mm; anthers ca. 3.5 mm, bases abaxially slightly decurrent forming a short spur and adaxially subulate bulging. Ovary glabrous, apex dentate. Berry urceolate to subglobular, 6–7 × 4–5 mm. Seeds obovate, glabrous. Fl. May–Jun, fr. Oct–Jan.

• Broad-leaved evergreen forests, shaded damp places, rock crevices; 600–1800 m. Taiwan (Xinzhu), Yunnan.

6. *Medinilla formosana* Hayata, Icon. Pl. Formosan. 2: 110. 1912.

台湾酸角杆 tai wan suan jiao gan

Shrubs, scandent. Branches obtusely 4-sided, scattered lenticellate, glabrous but with a ringed long setose trichomes on nodes. Leaves opposite or verticillate; petiole 5–10 mm, glabrous; leaf blade oblong-obovate to obovate-lanceolate, 10–20 × 7–14 cm, papery, both surfaces glabrous, secondary veins 1 on each side of midvein, base broadly cuneate, margin entire, apex abruptly acuminate with an obtuse tip. Inflorescences terminal or nearly terminal, cymose paniculate, ca. 25 cm, glabrous; bracts linear, ca. 3 mm. Pedicel ca. 6 mm, glabrous. Hypanthium nearly globular, ca. 3 × 2.5 mm, 4-sided, glabrous, apex entire or inconspicuously 4-dentate. Petals 4, obovate, ca. 7 mm, oblique. Stamens 8, equal; filaments ca. 4 mm; anthers narrowly lanceolate, 3–4 mm, base tuberculate; connective decurrent, forming a short spur. Ovary inferior. Berry nearly globular, ca. 7 mm in diam., glabrous. Fl. Dec–Jan.

• Forests, mountain slopes; below 100–1000 m. Taiwan (Hengchun Peninsula).

7. *Medinilla hayatana* H. Keng, Quart. J. Taiwan Mus. 8: 26. 1955 [*“hayataiana”*].

糠秕酸脚杆 kang bi suan jiao gan

Medinilla formosana Hayata var. *hayatana* (H. Keng) S. S. Ying.

Shrubs, scandent. Branches 4-sided, with a setose ring at nodes, scattered lenticellate. Leaves 4-verticillate; petiole ca. 1 cm, brownish furfuraceous; leaf blade oblong, 9–12 × 2.5–3 cm, abaxially minutely brownish furfuraceous, adaxially glabrous, secondary veins 2 on each side of midvein, base obtuse to cuneate, margin entire, apex caudate-acuminate. Inflorescences inserted on leafless branches, cymose paniculate, 15–20 cm; peduncle 3–4 cm, bracteate. Pedicel ca. 5 mm, minutely brownish furfuraceous, bracteolate. Hypanthium urceolate, ca. 6 mm. Calyx lobes 4, inconspicuous. Petals pink, ovate, ca. 9 mm, apex obtuse. Stamens equal; filaments 6–7 mm; anthers linear-lanceolate, 7–8 mm, base tuberculate; connective decurrent, forming a short spur. Ovary globular, glabrous. Berry 3–4 × 3–5 mm. Fl. Jul–Aug.

• Tropical broad-leaved evergreen forests; 400–500 m. Taiwan (Lan Yu).

8. *Medinilla arboricola* F. C. How, Acta Phytotax. Sin. 8: 345. 1963.

附生美丁花 fu sheng mei ding hua

Shrubs scandent or trees, epiphytic. Stems canescent yellow, 4-sided, glabrous, lenticellate; bark corky and wrinkled. Leaves 3–5-verticillate; petiole 0.8–1.5 cm, glabrous; petiole 0.8–1.5 cm, glabrous; leaf blade elliptic to obovate-elliptic, 6–8 × 3–4.5 cm, stiffly papery to subleathery, both surfaces glabrous, secondary veins 1 on each side of midvein, base broadly cuneate, margin entire, apex broadly acute. Inflorescences inserted on leafless stems or branches, cymose, 2–3 cm, 3–5-flowered; peduncle 4–8 mm, glabrous. Flowers 4- or 5-merous. Hypanthium tubular, 0.8–1.2 cm, apex truncate. Calyx lobes inconspicuous, glabrous. Petals greenish, yellowish green, or white, long elliptic, ca. 2 × 0.8–1 cm, oblique, glabrous, base gradually narrowed, apex rounded. Stamens 8–10, equal; filaments 1.2–1.5 cm; anthers linear-lanceolate, curved, unequal, ca. 1.5 or 0.7 cm, base tuberculate; connective decurrent, forming a short spur. Ovary subglobose. Berry subglobose-flask-shaped; hypanthium ca. 1.4 cm, tubular. Fl. Jun–Jul, fr. Aug–Sep.

• Forests, streamsides, on stones, epiphytic on trees, shaded places. Hainan (Baoting).

9. *Medinilla himalayana* J. D. Hooker ex Triana, Trans. Linn. Soc. London 28: 88. 1871.

锥序酸角杆 zhui xu suan jiao gan

Medinilla luchenensis C. Y. Wu & C. Chen.

Shrubs, epiphytic, many-branched. Branchlets 4-sided, later terete, glabrous; bark corky and wrinkled. Petiole ca. 3 mm, glabrous; leaf blade lanceolate-ovate to elliptic-ovate, 6–16 × 2.2–7 cm, stiffly papery, both surfaces glabrous, adaxially densely scrobiculate, secondary veins 1–2 on each side of midvein, base cuneate, margin entire, apex acute to acuminate. Inflorescences terminal, compound cymes; peduncle 2–3 cm. Pedicel 8–11 mm, glabrous. Hypanthium campanulate, 4-sided, ca. 3 mm, densely tuberculate, glabrous, margin inconspicuously repand. Calyx lobes ca. 5 mm. Petals rhombic-ovate, ca. 1.4 × 0.6 cm, oblique, apex with 1 glandular trichome at tip. Stamens 8, subequal, 4 longer and 4 slightly shorter; anthers linear-lanceolate, base tuberculate; connective base inconspicuously spurred. Longer stamens ca. 1.4 cm; anthers ca. 6.5 mm. Shorter stamens ca. 1.2 cm; anthers ca. 5.5 mm. Ovary 8-ribbed, glabrous, apex truncate and dentate. Berry urceolate, 7–10 × 5–9 mm, persistent sepals semiorbicular, glabrous, margin repand. Seeds obovate. Fl. and fr. Sep.

Dense forests, valleys; 1900–2100 m. Xizang (Médog), Yunnan [Bhutan, N India].

10. *Medinilla rubicunda* (Jack) Blume, Flora 14: 512. 1831.

红花酸脚杆 hong hua suan jiao gan

Medistoma rubicundum Jack, Trans. Linn. Soc. London 14: 18. 1823; *Medinilla emarginata* Craib; *M. erythrophylla* Wallich ex Lindley; *M. fuligineoglandulifera* C. Chen; *M. hainanensis* Merrill & Chun; *M. rubicunda* var. *tibetica* C. Chen; *M. yunnanensis* H. L. Li.

Shrubs 0.5–5 m tall, sometimes epiphytic, many-branched. Stems light brown or tan, slightly succulent, obtusely 4-angled, later terete, scattered lenticellate, glabrous; bark corky, wrinkled. Petiole 0.5–2.5 cm, glabrous; leaf blade elliptic to lanceolate, 5–14 × 2.5–6.5 cm, stiffly papery to subleathery, both surfaces glabrous, abaxially sometimes tuberculate, adaxially scrobiculate, secondary veins 1 or 2 on each side of midvein, if secondary veins 2-paired then apical pair originating ca. 5 mm for leaf blade base, base broadly cuneate to subround, margin entire, apex abruptly acuminate. Inflorescences axillary in axils of leaves or at leaf scars on older branches, cymose, (1–)3–5-flowered; peduncle 4–5 mm, puberulous. Pedicel 2–5 mm, puberulous; bracts 2 at base of each pedicel, acutely triangular, ca. 1 mm. Hypanthium funnel-shaped, 5–6.5 mm, puberulous. Calyx lobes inconspicuous, forming an undulate ring. Petals pink, rhomboid-obovate, 1–1.5 × 0.6–0.8 cm, oblique, glabrous, apex rounded to truncate. Stamens equal, 1–1.4 cm; anthers lanceolate, curved; connective decurrent, forming a short spur, adaxially 2-tuberculate. Ovary ovoid, glabrous, margin membranous, apex truncate. Berry ovoid to urceolate because of persistent, short, free calyx margin, 9–11 × 7–8 mm. Seeds obovate, glabrous. Fl. Aug–Sep, fr. Oct–Mar.

Mixed forests, woodlands, river banks, mountain slopes; 800–1800 m. Guangxi, Hainan, Xizang (Médog), Yunnan [Bhutan, NE India, Malaysia, N Myanmar, Nepal, Thailand].

11. *Medinilla petelotii* Merrill, Univ. Calif. Publ. Bot. 13: 137. 1926.

沙巴酸脚杆 sha ba suan jiao gan

Medinilla tsaii H. L. Li.

Shrubs 40–150 m tall, stoloniferous, epiphytic. Stems creeping, ascending, or erect, 4-sided, winged, lenticellate, later subterete, densely lenticellate, and scabrous, many-branched. Petiole ca. 5 mm, slightly winged; leaf blade obovate to elliptic, (6.5–)11–16(–23) × (2.2–)4.5–8(–11) cm, stiffly papery to subleathery, abaxially furfuraceous and tuberculate, adaxially minutely scrobiculate and glabrous, secondary veins 1 on each side of midvein, base cuneate and slightly decurrent, margin entire, apex acuminate. Inflorescences inserted on leafless stems or stolons, cymose, 3–7-flowered; peduncle ca. 1 cm, glabrous. Pedicel 3–7 mm. Hypanthium funnel-shaped, 6–7 mm, obtusely 4-sided, furfuraceous and small tuberculate. Calyx lobes inconspicuous, undulate, apex apiculate. Petals pink, suborbicular, 8–9 × ca. 8 mm, apex rounded. Stamens equal; filaments as long as anthers; anthers ca. 4 mm, base linear bulged ca. 1/2 length of anther; connective inflated, base decurrent forming a short spur. Ovary obovate, glabrous. Berry urceolate, ca. 1.8 × 1.2 cm. Seeds obovate, glabrous. Fl. Aug–Oct, fr. May–Jun.

Dense forests, near lake or river margins; 800–1400 m. Yunnan [Vietnam].

20. ASTRONIA Blume, Bijdr. 1080. 1826–1827.

褐鳞木属 he lin mu shu

Shrubs or small trees. Branches terete or obtusely 4-sided, glabrous or pubescent. Leaves petiolate; leaf blade ovate to oblong, secondary veins 1 on each side of midvein, margin entire. Flowers 4- or 5-merous. Inflorescences terminal, cymose paniculate; bracts small, caducous. Hypanthium campanulate, pubescent or glabrous. Calyx lobes 3–8 or inconspicuous. Petals 4 or 5, white or purple. Stamens 8 or 10 (or 12), equal; filaments short; anthers oblong or 3-sided, small, longitudinally dehiscent; connective decurrent and inflated, usually conic, 2–3 × as large as anthers or not appendaged. Ovary inferior, 2–5-celled, apex often truncate but without a crown; ovules with parietal placentation near base of ovary. Style short; stigma capitate. Capsule subglobular, enclosed by hypanthium; hypanthium subglobular, apical margin irregular. Seeds linear to linear-oblancoolate, small.

About 60 species: China, Malaysia, Philippines; Pacific islands; one species (endemic) in China.

1. *Astronia ferruginea* Elmer, Leaf. Philipp. Bot. 4: 1205. 1911.

褐鳞木 he lin mu

Astronia formosana Kanehira.

Shrubs or small trees. Branches 4-sided, ± puberulous or furfuraceous; bark dark brown, glabrous. Petiole 2–3 cm, slightly furfuraceous; leaf blade elliptic to obovate, 8.5–14(–18) × 4–7(–8.5) cm, stiffly papery to leathery, abaxially ferruginous puberulous along main veins when young but later becoming ferruginous tomentose or lepidote, adaxially glabrous, secondary veins 1 on each side of midvein, base cuneate to obtuse,

margin entire, apex acute to subacuminate. Inflorescences terminal, cymose paniculate, ca. 10 × 12 cm, many-flowered, densely furfuraceous and lepidote; peduncle ca. 3 cm. Pedicel 1–3 mm, furfuraceous and lepidote. Hypanthium campanulate, 1.5–2 mm, furfuraceous and lepidote. Calyx lobes 5, broadly triangular, ca. 0.5 mm. Petals 5, broadly ovate, ca. 1 × 1 mm, apex acute. Stamens 8; filaments ca. 2 mm; anthers oblong, 0.5–1 mm; connective inflated, 2–3 × as large as anthers, spur absent. Ovary subglobular. Style ca. 1 mm. Capsule subglobular, apex truncate; hypanthium 2–3 × 3–5 mm, margin irregular, apex truncate. Seeds linear-lanceolate, ca. 2 mm.

• Forests, forest margins, mountain slopes, valleys; 200–400(–500) m. Taiwan (Huoshao Dao, Lan Yu).

21. MEMECYLON Linnaeus, Sp. Pl. 1: 349. 1753.

谷木属 gu mu shu

Shrubs or small trees, often glabrous; branches terete or 4-sided, many-branched. Leaves petiolate or sessile; leaf blade usually leathery, pinnately veined, margin entire. Inflorescences axillary or inserted on leafless stems, cymose or umbellate. Flowers 4-merous. Hypanthium cup-shaped, campanulate, subfunnel-shaped, or semiorbicular, apex repand or shallowly 4-lobed. Petals orbicular, oblong, or ovate, often oblique. Stamens 8, equal, isomorphic; filaments as long as anthers; anthers elliptic, small, longitudinally dehiscent; connective conic, inflated, lengthened, 2–3 × as large as anthers, sometimes abaxially with a circular concave gland. Ovary inferior, subglobose, 1-celled, apex truncate, 8-sulcate, radiated; ovule 6–12, with free central placentation. Fruit a baccate drupe, often globular, apex with hypanthium forming a ring; exocarp usually succulent, 1-seeded. Seed globular, glabrous; seed coat bony; cotyledon crumpled; embryo curved.

About 300 species: tropical Africa, Asia, Australia, Madagascar, and Pacific islands; 11 species (six endemic) in China.

Material usually cannot be reliably identified unless flowers and fruits are both available.

- 1a. Trees to 25 m tall, d.b.h. to 60 cm 11. *M. celastrinum*
 1b. Shrubs or small trees.
 2a. Leaf blade 6–11(–15) × 2–3.8(–7.5) cm.
 3a. Leaves sessile or with petiole 2–3 mm; peduncle 2–3 mm 1. *M. lanceolatum*
 3b. Leaves with petiole 5–7(–10) mm; peduncle 5–20 mm.
 4a. Fruit yellowish green, less than 1 cm in diam. 2. *M. hainanense*
 4b. Fruit pink to dark red and maturing purple to black, to 1.5 cm in diam. 3. *M. caeruleum*
 2b. Leaf blade 3.5–8 × 0.6–3.5 cm.
 5a. Leaf blade 4.2–5 × as long as broad, base decurrent on petiole 6. *M. luchuenense*
 5b. Leaf blade 1.4–3.2 × as long as broad, base not decurrent on petiole.
 6a. Anther connective abaxially without a circular concave gland.
 7a. Leaf blade scabrous on both surfaces 4. *M. ligustrifolium*
 7b. Leaf blade glabrous and glossy on both surfaces 10. *M. nigrescens*
 6b. Anther connective abaxially with a circular concave gland.
 8a. Fruit with 8 raised ribs 7. *M. octocostatum*
 8b. Fruit not ribbed.
 9a. Inflorescences umbellate, forming a very dense spheroid clump of flowers 5. *M. polyanthum*

9b. Inflorescences cymose.

- 10a. Leaf blade on both surfaces glabrous and glossy 8. *M. pauciflorum*
 10b. Leaf blade on both surfaces densely covered with small tubercles and scabrous 9. *M. scutellatum*

1. Memecylon lanceolatum Blanco, Fl. Filip. 301. 1837.

狭叶谷木 xia ye gu mu

Shrubs or small trees. Branches terete, glabrous. Leaves sessile or with a petiole to 3 mm; leaf blade elliptic, elliptic-ovate, or ovate-oblong, 6–8(–12) × 2–3.5(–5) cm, leathery, both surfaces glabrous, secondary veins ca. 6 on each side of midvein and inconspicuous, base obtuse to cuneate, margin entire, apex acuminate with an obtuse tip. Inflorescences axillary, densely cymose. Flowers 1–2 mm in diam. Fruit globular, 7–8 × ca. 8 mm.

Dense forest margins by streamsides; 300–500 m. Taiwan (Lan Yu) [Indonesia, Philippines].

2. Memecylon hainanense Merrill & Chun, Sunyatsenia 2: 44. 1934.

海南谷木 hai nan gu mu

Shrubs or trees, 3–15 m tall, many-branched. Branches terete, glabrous. Petiole ca. 5 mm; leaf blade elliptic to oblong-elliptic, 6–8(–15) × 3–3.8(–6.5) cm, leathery to subleathery, both surfaces glabrous, secondary veins 9 on each side of midvein, base cuneate, margin entire, apex shortly acuminate. Inflorescences in axils of leaves or at leaf scars on older branches, cymose, 2–3 cm, glabrous; peduncle 1–2 cm; bracts lanceolate, ca. 1.5 mm, caducous. Pedicel to 2 mm. Hypanthium broadly cup-shaped, 2–3.5 mm, glabrous, 4-lobed, apex repand. Petals white, ovate, ca. 3.5 mm, oblique, base unguiculate, apex acute. Stamens blue, ca. 3.5 mm; anthers ovate; connective conic, ca. 1.5 mm, inflated, with a small concave abaxial gland. Ovary cup-shaped. Fruit a baccate drupe, globular, 7–9 mm in diam., minutely tuberculate, apex ringed. Fl. May, fr. Feb.

- Thickets, hillsides; ca. 1000 m. Hainan, Yunnan.

3. Memecylon caeruleum Jack, Malayan Misc. 1(5): 26. 1820.

天蓝谷木 tian lan gu mu

Memecylon cyanocarpum C. Y. Wu (1979), not Gilg (1901); *M. floribundum* Blume.

Shrubs or trees, 3–6(–12) m tall, few- to many-branched. Stems terete, glabrous. Petiole 5–10 mm; leaf blade oblong to elliptic, 8–11(–16) × 3.8–6(–7.5) cm, leathery, both surfaces glabrous, base cuneate, obtuse, or subround, margin entire, apex acute, obtuse, or retuse. Inflorescences axillary, clustered or shortly cymose, 1.5–3 cm; peduncle 5–12 mm; bracts ca. 0.5 mm, caducous. Pedicel 2–5 mm, glabrous. Hypanthium shallowly cup-shaped, 1.5–3 mm, glabrous. Calyx lobes 4, repand. Petals white or yellowish green but base pale blue, broadly ovate, ca. 2 mm, apex acute. Stamens blue, ca. 2.5 mm; anthers and conic connective 1–1.5 mm, with a small concave abaxial gland. Ovary cup-shaped to ovoid. Fruit pink to dark red and maturing purple to black, obovoid, 1–1.5 cm in diam., smooth and glabrous; exocarp succulent, juicy. Fl. Apr–Aug, fr. Dec–Jan.

Sparse to dense forests; 900–1200 m. Hainan, SE Xizang, Yunnan [Cambodia, Indonesia, Vietnam].

4. Memecylon ligustrifolium Champion ex Bentham, Hooker's J. Bot. Kew Gard. Misc. 4: 117. 1852.

谷木 gu mu

Shrubs or trees, 1.5–5(–7) m tall, many-branched. Branches terete or sometimes 4-sided. Petiole 3–5 mm; leaf blade elliptic, ovate, or ovate-lanceolate, 5.5–8 × 2.5–3.5 cm, leathery, both surfaces scabrous, base cuneate, margin entire, apex acuminate with an obtuse tip. Inflorescences in axils of leaves or at leaf scars on older branches, cymose, ca. 1 cm; peduncle 1–3 mm; bracts ovate, ca. 1 mm. Pedicel 1–4 mm, both sides pubescent. Hypanthium semiglobose, 1.5–3 mm. Calyx lobes 4, repand. Petals white or tinged yellowish green or purple, semi-orbicular, ca. 3 × 4 mm, apex rounded. Stamens blue, ca. 4.5 mm; anthers and conic connective 1–2 mm, lacking an abaxial gland. Ovary ovoid, apex truncate. Fruit a baccate drupe, globular, ca. 1 cm in diam., minutely tuberculate, apex with a ring. Fl. May–Aug, fr. Dec–Feb.

- Dense forests, mountain slopes, valleys, damp places; 100–1600 m. Fujian, Guangdong, Guangxi, Hainan, Yunnan.

- 1a. Leaf axil 1- or 2-fruited; fruiting peduncle ca. 3 mm; pedicel 1–2 mm 5a. var. *ligustrifolium*
 1b. Leaf axil only 1-fruited; fruiting peduncle 1–2 mm; pedicel ca. 4 mm 5b. var. *monocarpum*

4a. Memecylon ligustrifolium var. *ligustrifolium*

谷木(原变种) gu mu (yuan bian zhong)

Leaf axil 1- or 2-fruited. Pedicel 1–2 mm. Fruiting peduncle ca. 3 mm.

- Dense forests; 100–1600 m. Fujian, Guangdong, Guangxi, Hainan, Yunnan.

4b. Memecylon ligustrifolium var. *monocarpum* C. Chen, Bull. Bot. Res., Harbin 4(3): 67. 1984.

单果谷木 dan guo gu mu

Leaf axil only 1-fruited. Pedicel ca. 4 mm. Fruiting peduncle 1–2 mm.

- Dense forests, mountain slopes, valleys, damp places; 800–900 m. Yunnan (Pingbian).

5. Memecylon polyanthum H. L. Li, J. Arnold Arbor. 25: 42. 1944.

滇谷木 dian gu mu

Shrubs or trees, 1–8 m tall, many-branched. Branches terete or sometimes 4-sided, glabrous. Petiole 3–5 mm, glabrous; leaf blade ovate, ovate-lanceolate, or elliptic, 5.5–8 × 2–2.5 cm, leathery, both surfaces scabrous, base cuneate, margin entire,

apex acuminate to caudate-acuminate. Inflorescences axillary or inserted on leaf axil of leafless branches, umbellate, forming a very dense spheroid clump of flowers, ca. 1 cm; peduncle very short; bracts lanceolate, ca. 0.5 mm. Pedicel ca. 1.5 mm, glabrous. Hypanthium subfunnel-shaped, ca. 2 mm, glabrous. Calyx lobes 4, repand. Petals purplish red or white, tinged yellowish green, broadly ovate, ca. 2×2 mm, apex acute. Stamens ca. 3 mm; filaments ca. 2.5 mm; anthers and conic connectives ca. 1 mm, with a small concave abaxial gland. Ovary cup-shaped, glabrous. Fruit a baccate drupe, globular, ca. 6×5 –6 mm, glabrous, apex with a ring. Fl. Aug–Oct, fr. Mar–May.

• Dense forests, mountain slopes, valleys, trailsides, streamsides, shaded damp places; 600–1000 m. Yunnan (Jinghong).

6. *Memecylon luchuense* C. Chen, Bull. Bot. Res., Harbin 4(3): 67. 1984.

禄春谷木 *lu chun gu mu*

Shrubs, to 30 cm tall, many-branched. Branches brown, 4-sided, winged, later terete and glabrescent. Petiole 1–3 mm, slightly winged; leaf blade narrowly elliptic to linear-elliptic, 3.5 – 5.5×0.6 – 1.3 cm, leathery, both surfaces glabrous, base cuneate and decurrent, margin entire, apex obtuse to acuminate. Flowers unknown. Inflorescences axillary, 1 or 2 per leaf axil, cymose, ca. 1 cm, 2- or 3-fruited; peduncle 2–4 mm, 4-sided, glabrous. Fruit globular, ca. 7 mm in diam., glabrous, apex 4-dentate with broadly triangular ca. 0.5 mm teeth; fruiting pedicel ca. 2 mm, terete. Fr. Oct.

• Thickets, among stones, river banks; 400–500 m. Yunnan.

7. *Memecylon octocostatum* Merrill & Chun, Sunyatsenia 2: 294. 1935.

棱果谷木 *leng guo gu mu*

Shrubs 1–3 m tall, many-branched. Branches 4-sided, narrowly winged, later almost unwinged; bark canescent brown. Petiole 1–2 mm; leaf blade elliptic to broadly elliptic, 1.5 – 3.5×0.7 – 1.8 cm, stiffly papery to subleathery, both surfaces glabrous, abaxially pale brown, adaxially dark brownish green and glossy when dry, base broadly cuneate, margin entire, apex obtuse to acute. Inflorescences axillary, cymose, 6–8 mm, few-flowered, glabrous; peduncle 2–4 mm; bracts subulate, ca. 1 mm. Pedicel 1–2 mm, glabrous. Hypanthium cup-shaped, 2–2.8 mm, 4-sided, glabrous. Calyx lobes triangular to ovate-triangular, ca. 0.8 mm. Petals lavender, ovate, ca. 3×1.5 mm, margin basally irregularly denticulate, apex acuminate. Stamens 2.5–3 mm; filament ca. 2.5 mm; anthers ovate, small; connective conic, ca. 1.2 mm, inflated, with a small concave abaxial gland. Fruit a baccate drupe, subglobose, ca. 7 mm in diam., with 8 conspicuously raised ribs, apex with a ring. Fl. May–Jun or Nov, fr. Nov–Jan.

• Sparse to dense forests, hillsides, valleys, damp places. Guangdong, Hainan.

8. *Memecylon pauciflorum* Blume, Mus. Bot. 1: 356. 1851.

少花谷木 *shao hua gu mu*

Shrubs or trees, 1–6 m tall, many-branched. Branches 4-sided, glabrous. Petiole 1–2(–3) mm; leaf blade brownish

yellow-green when dry, elliptic, broadly elliptic, or rhomboid-oblong, 2.5 – 3 (– 5) $\times 1$ – 1.5 (– 3) cm, stiffly papery to subleathery, both surfaces glabrous and glossy, base cuneate, margin entire, apex obtuse to acute and with an apiculate or retuse tip. Inflorescences axillary, cymose, to 1 cm; peduncle very short, glabrous; bracts lanceolate, 2–2.5 mm. Pedicel 1–2 mm, glabrous. Hypanthium lobes lanceolate to triangular-lanceolate, ca. 1.5 mm, apex acuminate. Petals triangular-ovate, 2.5 – $3 \times$ ca. 2 mm, apex acuminate. Stamens ca. 3 mm; filaments ca. 2 mm; anthers and conic connective ca. 1 mm, with a small concave abaxial gland. Fruit a baccate drupe, globular, 5–6 mm in diam., minutely angular when young but later inconspicuously angular, apex with persistent calyx lobes. Fl. Apr–May, fr. Nov.

Forests, mountain slopes. Guangdong, Hainan [India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam; N Australia].

9. *Memecylon scutellatum* (Loureiro) Hooker & Arnott, Bot. Beechey Voy. 186. 1833.

细叶谷木 *xi ye gu mu*

Scutula scutellata Loureiro, Fl. Cochinch. 1: 235. 1790;
Memecylon edule Roxburgh var. *scutellatum* (Loureiro) Triana.

Shrubs or rarely trees, 1.5–4 m tall, many-branched. Branches 4-sided, later terete; bark glaucous. Petiole 3–5 mm; leaf blade elliptic to ovate-lanceolate, 2 – 5×1 – 3 cm, leathery, both surfaces densely small tuberculate and scabrous, base broadly cuneate, margin entire, apex obtuse, rounded, or retuse. Inflorescences axillary, cymose, up to 8 mm; peduncle base often setose. Pedicel 1–2 mm, glabrous. Hypanthium shallowly cup-shaped, ca. 2×3 mm, glabrous, apically truncate, repand, and 4-apiculate. Petals purple to blue, broadly ovate, ca. 2.5 mm. Stamens ca. 3 mm; filaments ca. 2 mm; anthers and conic connective ca. 1 mm, with a small concave abaxial gland. Fruit a baccate drupe, globular, 6–7 mm in diam., densely tuberculate. Fl. (Mar–)Jun–Aug, fr. (Nov–)Jan–Mar.

Sparse to dense forests, thickets, grassy areas, open slopes, streamsides; ca. 300 m. Guangdong, Guangxi, Hainan [Cambodia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

10. *Memecylon nigrescens* Hooker & Arnott, Bot. Beechey Voy. 186. 1833.

黑叶谷木 *hei ye gu mu*

Shrubs or trees, 2–8 m tall, many-branched. Branches terete, glabrous; bark canescent brown. Petiole 2–3 mm; leaf blade brownish yellow-green when dry, elliptic, rarely ovate-oblong, 3 – 6.5×1.5 – 3 cm, stiffly papery, both surfaces glabrous and glossy, base cuneate, margin entire, apex obtuse to acute and sometimes with a retuse tip. Inflorescences axillary, cymose, nearly capitate, less than 1 cm, 2- or 3-branched, many-flowered; peduncle very short; bracts very small, caducous. Pedicel ca. 0.5 mm. Hypanthium shallowly cup-shaped, ca. 1.5×2 mm, glabrous, apex truncate and shallowly 4-lobed. Petals blue or white, broadly lanceolate, ca. 2×1 mm, base unguiculate, margin irregularly 1- or 2-dentate, apex acuminate. Stamens ca. 2 mm; filaments 1.2–1.5 mm; anthers and conic connective ca. 0.8 mm, lacking abaxial gland. Fruit black when dry, a baccate drupe, globular, 6–7 mm in diam. Fl. May–Jun, fr. Dec–Feb.

• Sparse to dense forests, thickets, hillsides; 400–1700 m. Guangdong, Hainan.

11. *Memecylon celastrinum* Kurz, Prelim. Rep. Forest Veg. Pegu, App. A, lxvii, App. B, 53 [in key]. 1875.

蛇藤谷木 she teng gu mu

Trees to 25 m tall, d.b.h. to 60 cm, bole straight but buttressed in larger individuals. Bark finely fissured and flaking, thin, reddish brown to tan or blackish, inner bark pink to red, cambium whitish purple, wood orange-yellow or cream. Branchlets somewhat flattened or quadrangular, becoming cylindrical with age. Petiole 3–6 mm; leaf blade lanceolate to broadly ovate, 5–10 × 2–5.5 cm, leathery, abaxially usually drying green

to straw-colored, adaxially brown to black, veins invisible, base cuneate, apex acuminate. Inflorescences in leaf axils, cymes, 0.7–1.7 cm, many-flowered. Hypanthium funnel-shaped to urceolate, 1–2 mm, papillose. Calyx lobes minute. Petals pink, broadly ovate to suborbiculate, 2–2.5 mm, apically rounded or acute. Anthers crescent-shaped; connective with a small concave abaxial gland. Fruit green when immature, drying yellowish, globose, 7–10 mm in diam., surface pustulate, basally and apically flattened, apex with a ring 1–2 mm in diam.

Primary forests; ?500–1800 m. SE Xizang (Mêdog) [Myanmar, Singapore, Thailand].

This is perhaps a synonym of *Memecylon minutiflorum* Miquel (Fl. Ned. Ind., Eerste Bijv. 323. 1861).