Trees, shrubs, or climbers, wood and leaves often aromatic; indument of simple or less often (Uvaria, Annona) stellate hairs. Leaves alternate, normally distichous. Stipules absent. Petiole usually short; leaf blade simple, venation pinnate, margin entire. Inflorescences terminal, axillary, leaf-opposed, or extra-axillary [rarely on often underground suckerlike shoots]. Flowers usually bisexual, less often unisexual, solitary, in fascicles, glomerules, panicles, or cymes, sometimes on older wood, usually bracteolate. Sepals hypogynous, [2 or]3, imbricate or valvate, persistent or deciduous, rarely enlarging and enclosing fruit, free or basally connate. Petals hypogynous, 3–6(-12), most often in 2 whorls of 3 or 1 in 1 whorl of 3 or 4[or 6], imbricate or valvate, sometimes outer whorl valvate and inner slightly imbricate. Stamens hypogynous, usually many, rarely few, spirally imbricate, in several series; filaments very short and thick; anther locules 2, contiguous or separate, rarely transversely locular, adnate to connective, extrorse or lateral, very rarely introrse, opening by a longitudinal slit; connectives often apically enlarged, usually ± truncate, often overtopping anther locules, rarely elongated or not produced. Carpels few to many, rarely solitary, free or less often connate into a 1-locular ovary with parietal placentas; ovules 1 or 2 inserted at base of carpel or 1 to several in 1 or 2 ranks along ventral suture, often densely arranged. Carpels few to many, rarely solitary, free or less often connate into a 1-locular ovary with parietal placentas; ovules 1 or 2 inserted at base of carpel or 1 to several in 1 or 2 ranks along ventral suture, anatropous; styles short, thick, free or rarely connate; stigmas capitate to oblong, sometimes sulcate or 2-lobed. Fruit usually syncarpous, with carpels forming free, often stipitate, monocarps.


About 129 genera and over 2,300 species: tropics and subtropics, especially in Old World; 24 genera (one endemic, three introduced) and 120 species (41 endemic, 11 introduced) in China.

The flowers often open before the petals have fully expanded making it easy to underestimate floral dimensions.

One of the major studies of the Annonaceae of tropical Asia was by Suzanne Jovet-Ast (1914–2006), who published an account of the Indo-Chinese species under her maiden name, Ast (Fl. Indo-Chine, Suppl. 1: 62–121. 1938). Unfortunately, she failed to provide Latin descriptions for her many new taxa, none of the names of which was therefore validly published. Her new combinations were validly published, however, and she did subsequently validate a few species of Goniothalamus under her maiden name; but she did not validate most of her new species until after she married and took up the name “Jovet-Ast.” These later names form the major part of all her publications, so we have chosen to cite her as “Jovet-Ast ["Ast"]” for those taxa validated under her maiden name.


1a. Fruit syncarpous, with completely united carpels and seeds embedded in pulp (usually cultivated as fruit trees).
   2a. Outer petals usually free, abaxially flat ................................................................. 23. Annona
   2b. Outer petals connate at base, abaxially spurred or winged ........................................ 24. Rollinia

1b. Fruit apocarpous, with carpels forming free, often stipitate, monocarps.
   3a. Sepals or inner petals and sometimes also outer petals clearly imbricate; stellate hairs often present.
      4a. Trees or self-supporting shrubs; stellate hairs absent; sepal imbricate; petals valvate or very minutely imbricate; ovules 1 per carpel .................................................................................. 15. Trivalvaria
      4b. Climbing shrubs; stellate hairs present; sepal imbricate; inner petals and sometimes also outer petals imbricate; ovules 2 or more per carpel.
         5a. Petals spreading at anthesis; torus depressed .................................................. 2. Uvaria
         5b. Petals incurved at anthesis, not opening widely; torus flattened, margin prominent ............... 3. Cyathostemma
   3b. Sepals and inner and outer petal whors all valvate or rarely very narrowly imbricate at tip only (only 1 whorl of petals present in Desmoschalan); simple hairs usually present, less often plant glabrous.
      6a. Climbing shrubs.
         7a. Peduncles and fruiting pedicels hooklike .................................................................. 20. Artabotrys
         7b. Peduncles and fruiting pedicels not hooklike.
            8a. Monocarps ellipsoid, moniliform when more than 1-seeded; petals basally constricted to form enclosed floral chamber around stamens and carpels .................................................. 6. Desmos
            8b. Monocarps globose to cylindrical, never moniliform; petals not constricted.
9a. Monocarp stipes 5.3–7.5 cm; outer petals usually much larger than inner petals; stamen 
connectives apically truncate (flowers of *F. hainanensis* unknown) ........................................ 21. *Friesodielsia*

9b. Monocarp stipes 0.3–4 cm; outer petals only slightly larger than inner petals; stamen 
connectives apically acuminate to obtuse ................................................................. 22. *Fissistigma*

6b. Trees or erect shrubs.

10a. Petals (2 or)3, in 1 whorl ................................................................. 7. *Dasymaschalon*

10b. Petals 6, in 2 whorls.

11a. Inner petals basally clawed or stipitate, laminas vaulted and conenate into an apical cap 
at least initially.

12a. Outer petals 2–7 mm, usually smaller than inner petals and similar to sepals (inner 
and outer petals subequal in *Orophea hainanensis* and *O. yunnanensis*).

13a. Inner petals with a long basal claw, usually apically lozenge-shaped and cohering 
by their margins into a cap over stamens and carpels, sometimes with their tips 
conspicuously recurved; pedicel 0.2–1.2 cm ......................................................... 4. *Orophea*

13b. Inner petals with a short basal claw, shallowly saccate, at first cohering by their 
margins but soon free; pedicel usually 1.4–10 cm (0.5–0.7 cm in *M. glochidioides*) ...... 5. *Miliusa*

12b. Outer petals more than 12 mm, equaling or longer than inner petals, conspicuously 
different from sepals.

14a. Stamens linear-oblong; inner petals each with a short claw or stipe .......... 8. *Goniothalamus*

14b. Stamens cuneate; inner petals each with a long claw or stipe.

15a. Outer petals 1.6–2.5 (–3.4) cm, longer than inner petals ......................... 9. *Mitrephora*

15b. Outer petals 1–1.5 cm, shorter than inner petals ........................................ 10. *Pseuduvaria*

11b. Inner petals not basally clawed, spreading or connivent and apically 3-edged.

16a. Stamens connectives apically acuminate.

17a. Petals 5–8 cm, linear to linear-lanceolate .................................................. 19. *Cananga*

17b. Petals 0.7–1 cm, ovate-triangular to ovate-oblong, usually saccate and incurved 
at base

18a. Monocarps dehiscent, stipe clavate; ovules 2 per carpel ....................... 1. *Anaxagorea*

18b. Monocarps indehiscent, stipe not clavate; ovules 5–22 per carpel ............. 18. *Alphonsea*

16b. Stamens connectives apically truncate, rounded, or broadly 3-angular.

19a. Ovules 1 or 2(or 3) per carpel, basally or nearly basally inserted.

20a. Inner petals concave and incurved to cover stamens; fruiting carpels free 
but usually connivent ................................................................. 17. *Popowia*

20b. Inner petals spreading; fruiting carpels free and not connivent

21a. Monocarp bases extended into stipes, not articulate at base ................. 14. *Polyalthia*

21b. Monocarps on slender carpophores, articulate between apex of 
carpophore and base of monocarp .......................................................... 16. *Disepalum*

19b. Ovules many per carpel, ventrally inserted.

22a. Flower buds lanceolate, apically long beaked and 3-angled; sepals connate 
at base or beyond into a cup; petals elongated, concave at base, narrowly 
convex below middle; anther locules transversely septate ......................... 11. *Xylopia*

22b. Flower buds ovoid, apically rounded; sepals connate at base but not into a 
cup; petals flat or cucullate; anther locules not transversely septate.

23a. Petals flat; stamen connectives apically rounded; stigmas 
subcapitate, not constricted at base; monocarps almost 
sessile (Chinese species) ................................................................. 12. *Meiogyne*

23b. Petals cucullate; stamen connectives apically truncate to 
subtruncate; stigmas ovoid, constricted at base; monocarps 
long stipitate ................................................................. 13. *Chieniodendron*


蒙蒿子属 meng hao zi shu

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Shrubs or small trees. Inflorescences terminal, leaf-opposed, axillary, or extra-axillary, fasciculate or 1-flowered. Flowers 
pedicellate. Torus convex. Sepals 3, valvate, connate at base. Petals 6, in 2 whorls, with each whorl valvate, erect to spreading flat, 
subequal or outer larger than inner. Stamens many, all fertile or inner stamens sometimes reduced to staminodes; anther locules
linear-oblong; connectives apically apiculate. Carpels few to many; ovules 2 per carpel, basal; stigmas subglobose to oblong. Fruit apocarpous; monocarps long stipitate, clavate, dehiscent. Seeds 1 or 2 per monocarp, black and very shiny, without an aril.

About 27 species: tropical Asia and America; one species in China.

Both molecular (Richardson et al., Philos. Trans., Ser. B, 359: 1495–1508. 2004) and morphological studies (Scharaschkin & Doyle, Amer. J. Bot. 93: 36–54. 2006) show that Anaxagorea is the sister group to the rest of the family.


蒙蒿子 meng hao zi

Shrubs 1–2 m tall, erect, glabrous except for flowers. Petiole 0.6–2 cm; leaf blade oblong to broadly elliptic, 9–16 × 3–7 cm, membranous, yellowish when dry, secondary veins 7 or 8 on each side of midvein, base rounded, apex acute to obtuse. Inflorescences leaf-opposed, 1- or 2-flowered. Flowers ca. 1.2 cm. Pedicel ca. 6 mm. Sepals rounded to ovate, outside pubescent or tomentose. Sepals 3, valvate, usually connate at base. Petals 6, in 2 whorls, sometimes connate at very base, each whorl imbricate. Stamens many. Carpels many, rarely few, linear-oblong; ovules many per carpel or rarely 2 or 3, in 1 or 2 series; styles outside often pilose; stigmas usually apically 2-cleft, involute. Fruit apocarpous; monocarps mostly ± stipitate, oblong, ovoid, or subglobose, fleshy and berrylike. Seeds several per monocarp or 1 by abortion, subhorizontal, with or without a short aril.

About 150 species: Old World tropics; eight species (one endemic) in China.

L. L. Zhou et al. (Syst. Biodivers. 7: 249–258. 2009) include Cyathostemma in Uvaria on the basis of a recent molecular study, but this is not accepted by one of us (Li). See the account of Cyathostemma for more details.

1a. Leaf blade abaxially glabrous or inconspicuously and sparsely stellate pubescent but soon glabrescent.

2a. Leaf blade oblong-obovate, abaxially glabrous; ovules 6–8 per carpel .................................................... 1. **U. boniana**

2b. Leaf blade obovate-lanceolate, abaxially inconspicuously and sparsely stellate pubescent, glabrescent; ovules 2 per carpel.

3a. Fruit ca. 1 cm in diam., smooth; leaf blade secondary veins 8–12 on each side of midvein ............................. 2. **U. tonkinensis**

3b. Fruit ca. 3.5 cm in diam., densely tuberculate; leaf blade secondary veins 12–14 on each side of midvein ................................................................................................................................................... 3. **U. kweichowensis**

1b. Leaf blade abaxially distinctly tomentose or pubescent, hairs simple or stellate.

4a. Flowers 9–10 cm in diam.; monocarps cylindric, 4–6 cm, slightly constricted between seeds ....................... 6. **U. grandiflora**

4b. Flowers 1.5–4 cm in diam.; monocarps globose to ovoid-ellipsoid, 2–3.8 cm, not constricted between seeds.

5a. Monocarps with soft and dense spines; petals yellowish and leaf blade thinly leathery to thickly papery .............................................................................................................................................. 4. **U. calamistrata**

5b. Monocarps unarmed; petals dark red to purple, or if yellow then leaf blade membranous.

6a. Leaf blade membranous; petals yellow to yellowish ....................................................................................... 5. **U. kurzii**

6b. Leaf blade thinly leathery or leathery; petals dark red to purple.

7a. Leaf blade apex acuminate, secondary veins adaxially flat; flowers ca. 1.5 cm in diam. ............................ 7. **U. rufa**

7b. Leaf blade apex acute, obtuse, or rounded, secondary veins adaxially impressed; flowers 2.5–4 cm in diam. .................................................................................................................................................. 8. **U. macrophylla**


光叶紫玉盘 guang ye zi yu pan

Shrubs to 5 m tall, climbing, glabrous except for flowers. Petiole 2–8 mm; leaf blade oblong to oblong-ovate, 4–15 × 1.8–5.5 cm, papery, secondary veins 8–10 on each side of midvein and slightly prominent on both surfaces, base cuneate to
rounded, apex acuminate to acute. Inflorescences extra-axillary, often leaf-opposed, 1- or 2-flowered. Pedicel 2.5–5.5 cm, bracteolate below middle. Sepals ovate, 2.5–3 mm, margin ciliate. Petals purple, leathery, puberulent; outer petals broadly ovate, ca. 1 × 1 cm; inner petals slightly smaller than outer petals, inside concave. Stamen connectives apically truncate, papillate. Carpels oblong, incurved, densely yellow pubescent; ovules 6–8 per carpel; stigmas horseshoe-shaped, apex 2-cleft. Monocarp stipes 4–5.5 cm; monocarp purple, globose to ellipsoid-ovoid, ca. 1.3 cm in diam. Fl. May–Oct, fr. Jun–Apr.

Moist secondary forests, thickets; 100–800 m. Guangdong, Guangxi, Guizhou, Hainan, Jiangxi [Vietnam].


东京紫玉盘 dong jing zi yu pan

Meliodorum subglabrum Bân; M. vietnamense Bân; M. vietnamense var. calcareae Bân; Uvaria tonkinensis var. subglabra Finet & Gagnepain.

Shrubs to 6 m tall, climbing. Branchlets sparsely stellate pubescent, glabrescent. Petiole 5–10 mm; leaf blade obovate, obovate-lanceolate, oblong, or elliptic, 12–21 × 4–7 cm, papery, abaxially sparsely stellate hairy but soon glabrescent, adaxially obovate-lanceolate, oblong, or elliptic, 12–21 × 4–7 cm, papery, obovate, 3–4 mm, outside densely stellate hairy but soon glabrescent, adaxially oblong, elliptic, or obovate-oblong, 9.5–21 × 4–8.5 cm, membranous, secondary veins 8–12 on each side of midvein, base rounded to slightly cordate, apex long to shortly acuminate or rarely acute. Inflorescences terminal or leaf-opposed, 1-flowered. Pedicel 1.5–4.5 cm, sparsely stellate hairy. Sepals broadly ovate, 3–4 mm, outside densely concave and glabrous. Petals purple, 1.5–1.9 × 1.5–1.9 cm; outer petals obovate, broadly ovate, or orbicular, outside densely stellate pubescent; inner petals smaller than outer petals. Stamen connectives glabrous or hairy. Carpels cylindric, stellate pubescent or with hairs only at base and apically; ovules 2 per carpel; stigmas apically entire or 2-cleft. Monocarp stipes 2.5–5 cm; monocarp purple, globose, ca. 1 cm in diam.; epicarp smooth. Fl. Feb–Sep, fr. Aug–Dec.

Thickets, open forests; 200–600 m. Guangdong, Guangxi, Hainan, Yunnan [Vietnam].


贵州紫玉盘 gui zhou zi yu pan

Shrubs to 5 m tall, climbing. Branchlets sparsely stellate pubescent, glabrescent, lenticellate. Petiole 5–6 mm; leaf blade obovate to elliptic, 8–18 × 3.5–8 cm, papery, glossy, glabrous except for sparsely stellate pubescent veins, secondary veins 10–14 on each side of midvein and at ca. 45° to midvein, base rounded to broadly cuneate, apex acute and mucronate. Inflorescences leaf-opposed. Flowers not seen. Monocarp stipes ca. 1 cm, stout; monocarp ovoid, ca. 5.5 × 3.5 cm, densely stellate tomentose, apex rounded; epicarp tuberculate. Fl. Aug, fr. Sep–Oct.

* Secondary forests; ca. 1000 m. W Guangxi, SW Guizhou, Yunnan.

Uvaria kweichowensis is listed as Endangered (EN A2c) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 6 Oct 2010).


刺果紫玉盘 ci guo zi yu pan

Shrubs to 8 m tall, climbing. Branchlets sparsely stellate pubescent, glabrescent. Petiole 5–10 mm, stellate tomentose; leaf blade oblong, elliptic, or obovate-oblong, 5–17 × 2–7 cm, thinly leathery to thickly papery, abaxially densely stellate pubescent, adaxially sparsely stellate pubescent, secondary veins 8–10 on each side of midvein, base obtuse, apex long acuminate to acute. Inflorescences axillary or leaf-opposed, fasciculate, 1–4-flowered. Flowers ca. 1.8 cm in diam. Sepals ovate, ferruginous tomentose. Petals yellowish; outer petals oblong, ca. 8 × 5 mm, ± equal to or slightly larger than inner petals, pubescent. Stamen connectives apically rounded to obtuse, puberulent. Carpels 7–15, pubescent; ovules 6–9 per carpel. Monocarps red, ellipsoid, 2.3–3.5 × 1.5–2.5 cm; epicarp densely softly spiny. Seeds brown, compressed, 3-angular, 10–12 × 8–9 mm. Fl. May–Jul, fr. Jul–Dec.

Forests or scrub on very steep slopes; 200–800 m. Guangdong, Guangxi, Hainan [Vietnam].

The fine, strong bast fibers obtained from the inner bark of Uvaria calamistrata is used for cordage and sack manufacturing.


黄花紫玉盘 huang hua zi yu pan


Shrubs to 16 m tall, climbing, densely stellate tomentose to stellate pubescent throughout. Petiole ca. 5 mm; leaf blade oblong-obovate, oblong-elliptic, or obovate, 9.5–21 × 4–8.5 cm, membranous, secondary veins 13–18 on each side of midvein, base narrowly and shallowly cordate, apex acuminate, obtuse, or sometimes rounded. Inflorescences leaf-opposed, 1- or 2-flowered; bracts ovate, ca. 7 × 3.5 mm. Flowers ca. 3.5 cm in diam. Pedicel 2.5–4 cm, bracteolate at middle. Sepals broadly ovate, ca. 5 × 5–6 mm. Petals yellow to yellowish; outer petals ovate to obovate-oblong, ca. 1.6 × 1.1–1.2 cm, apex rounded; inner petals as large as outer petals. Anthers oblong, ca. 3 mm; connectives apically truncate, puberulent. Carpels oblong, ca. 4 mm; ovules 10 per carpel, in 2 series; stigmas horseshoe-shaped, apex 2-cleft. Monocarps ovoid to subglobose, 2–3 × ca. 2 cm; epicarp densely tawny brown pubescent, not spiny. Fl. May, fr. Jul–Aug.

Dense forests; 400–1300 m. Guangxi, Yunnan [India].

Material of this species has been misidentified as Cyathostemma yunnanense.


大花紫玉盘 da hua zi yu pan

Unona grandiflora Lessenault ex Candolle; Uvaria platypetala Champion ex Bentham; U. purpurea Blume; U. rhodantha Hance.
Shrubs to 10 m tall, climbing, densely stellate pubescent to ferruginous tomentose throughout. Petiole 5–8 mm; leaf blade oblong-obovate, 7–30 × 3.5–12.5 cm, papery to thinly leathery, secondary veins 10–17(–24) on each side of midvein and at ca. 60° to midvein, base shallowly cordate, apex acute, shortly acuminate, or sometimes caudate. Inflorescences leaf-opposed, cymose, 1(–3)-flowered; bracts 2, ovate to obovate, ca. 3 × 2.5 cm. Flowers 7–10 cm in diam. Pedicel 0.5–5 cm. Sepals broadly ovate, 2–2.5 × 2.5–3.5 cm, connate for basal third, membranous, inside glabrous, apex obtuse to acute. Petals dark red to vermilion red, turning purplish with age, obovate to oval-obovate, 4–4.5 × 2.5–3.5 cm, puberulent. Stamens oblong to linear, 6–7 mm; connectives apically truncate, glabrous. Carpels oblong to linear, ca. 8 mm; ovules 30–50 per carpel, in 2 series; stigmas apically involute and 2-cleft. Monocarp stipes 1.5–3 cm; monocarps ovoid-ellipsoid to some-truncate, glabrous. Carpels oblong; stigmas apically 2-cleft. Monocarp stipes 1–2 cm; monocarps ovoid-ellipsoid to sometimes globose, ca. 2 × 1–1.5 cm, not constricted between seeds, apex rounded. Stamens pale brown, ovoid, flattened. Fl. Mar–Nov, fr. May–Dec.

Open forests, thickets; 400–1000 m. S Guangdong, SE Guangxi, Hainan [India, Indonesia, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].


小花紫玉盘

Shrubs to 5 m tall, climbing. Branches stellate tomentose, hairs rust-colored when dry. Petiole 5–10 mm; leaf blade elliptic to ovate-oblong, 5–15 × 2.5–6 cm, thinly leathery, abaxially stellate tomentose, secondary veins ca. 12 on each side of midvein, base cordate, apex acuminate. Inflorescences leaf-opposed or extra-axillary, cymose, 1–4-flowered. Flowers ca. 1.5 cm in diam., stellate pubescent. Petals purple to dark red, ovate, 8–12 × 6–7 mm, apex rounded. Stamens oblong; connectives apically truncate, glabrous. Carpels oblong; stigmas apically 2-cleft. Monocarp stipes 1–2 cm; monocarps ovoid-ellipsoid to sometimes globose, ca. 2 × 1–1.5 cm, not constricted between seeds, apex rounded; epicarp not spiny. Fl. Mar–Jun, fr. Jun–Oct.

Sparsely forested slopes; 400–1700 m. Hainan, Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Philippines, Thailand, Vietnam].

8. Uvaria macrophylla Roxburgh, Fl. Ind. 2: 663. 1824.

紫玉盘

Guatteria cordata Dunal; Uvaria badiiflora Hance; U. cordata (Dunal) Alston (1931), not Schumacher & Thonnin (1827); U. dolichocladia Hayata; U. nucelare Diels; U. macrophylla var. microcarpa (Champion ex Bentham) Finet & Gagnepain; U. microparpa Champion ex Bentham; U. obovata-folia Hayata; U. synsepala Miquel.

Shrubs to 18 m tall, climbing, stellate pubescent throughout or stellate tomentose when young and glabrescent, hairs ferruginous in dried specimens. Petiole 5–10 mm; leaf blade obovate, oblong-ovabate, elliptic, or broadly oblong, 9–30 × 3–15 cm, leathery, secondary veins 9–14(–22) on each side of midvein, abaxially elevated, and usually adaxially impressed when dry, base shallowly cordate, truncate, rounded, or rarely cuneate, apex acute, obtuse, or rounded and mostly apiculate. Inflorescences leaf-opposed or rarely extra-axillary, sometimes cymose, 1- or 2(or more)-flowered; bracts ovate to broadly elliptic, 4–7 mm. Flowers 2–3.8 cm in diam. Pedicel 0.5–4 cm. Sepals ovate to broadly oblong, 4–5 × 4–5 mm. Petals dark red, purple, or purplish, subovate to oblong-elliptic, 1.2–2 × 0.6–1.3 cm, spreading, apex rounded to obtuse. Stamens oblong, ca. 9 mm; connectives ovoid, apex puberulent or glabrous; outer stamens sterile, oblongate, ca. 7 mm. Carpels oblong, ca. 5 mm; stigmas horseshoe-shaped, apex 2-cleft and involute. Monocarps orange, ovoid to subterete, 1–3 × 1–1.5 cm, not constricted between seeds; epicarp not spiny, hairy or glabrous. Seeds globose, 6.5–7.5 mm in diam. Fl. Mar–Sep, fr. Jul–Mar. 2n = 22.

Open forests, scrub; 400–1400 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, SE Yunnan [Bangladesh, Indonesia, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam].

The fine strong bast fiber obtained from the bark of Uvaria macrophylla is used for making sacks. The roots are used as a sedative, to stop vomiting, and for rheumatism. The leaves are used to relieve pain and to reduce swellings.

3. CYATHOSTEMMA


杯冠木属

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Shrubs, climbing. Inflorescences terminal, extra-axillary, or often leaf-opposed; flowers solitary or in pendulous and few-flowered cymes from branches or trunk. Flowers bisexual or unisexual, subglobose. Pedicel bracteate. Torus flattened, margins prominent. Sepals 3, valvate, connate at base, usually hirsute. Petals 6, biseriate, short, subequal or inner smaller, imbricate at apex, valvate at base remaining incurved. Stamens numerous, oblong; anthers subinflorose; connectives oblique, incurved. Carpels numerous; ovules few to numerous per carpel, in 2 series; styles cylindric, glabrous; stigma conical, 2-cleft at apex. Fruit apocarpous, pedicellate; monocarps stipitate, oblong or ovoid. Seeds several per monocarp, in 2 series.

About ten species: China, Indonesia, Malaysia, Thailand, Vietnam; one species in China.

Cyathostemma was included in Uvaria on the basis of a recent molecular study by L. L. Zhou et al. (Syst. Biodivers. 7: 249–258. 2009). This study included 25 species of Uvaria and seven species of Cyathostemma (but not C. yunnanense) and showed the Cyathostemma spp. to form two separate groups nested within Uvaria and separated by four species of Uvaria. One of us (Gilbert) believes that this shows Zhou et al. were right to transfer all species of Cyathostemma to Uvaria.

毛澄广花  mao cheng guang hua


Shrubs to 5 m tall, climbing, brownish pubescent throughout, often glabrescent. Petiole 5–8 mm; leaf blade obovate, 13–20 × 4.5–9 cm, membranous to papery, secondary veins 13–15 on each side of midvein, abaxially distinctly elevated, and adaxially slightly elevated and sparsely stellate pubescent or glabrous, base rounded to shallowly cordate, apex acute to obtuse. Inflorescences axillary, cymose, several flowered. Flowers small. Pedicel 1–1.5 cm, densely stellate pubescent; bracteoles 1 or 2, oblong to obovate, 4–13 mm. Calyx cupular; petals broadly ovate, 3.5–5 cm. Stamens ca. 3.5 mm; connectives broadly conic, puberulent. Carpels ca. 3.5 mm, densely pubescent; ovules 4–14 per carpel, in 2 series; stigmas conic, glabrous. Fruiting pedicel 0.7–4 cm; monocarps ellipsoid, 4–7 × 3–4 cm; epicarp tubercular and densely tomentose to glabrous. Fl. Jun–Jul, fr. Aug–Oct.

Scrub on slopes; ca. 1000 m. S Yunnan [Vietnam].

**Cyathostemma yunnanense** is known in China only from the type collection. Other Chinese records are based on misidentifications of material of **Uvaria kurzii**. **Uvaria yunnanensis** (Hu) L. L. Zhou, Y. C. F. Su & R. M. K. Saunders (Syst. Biodivers. 7: 255. 2009) appears to be a later homonym of **U. yunnanensis** Li (Pl. Fossils China: Tertiary 3: 19, pl. 24, t. 7, f. 4, 1978, not seen), based on fossil material. A new epithet would be required if **Cyathostemma** was included within **Uvaria** because of the blocking name **U. vietnamensis** Meade (2005).

4. **OROPHEA** Blume, Bijdr. 18. 1825.

澄广花属  cheng guang hua shu

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

**Mezzettiopsis** Ridley.

Trees or erect shrubs. Leaf blade often with pellucid dots. Inflorescences axillary or superaxillary, cymose, pedunculate or sessile, 1- or several flowered. Flowers bisexual. Sepals 3, smaller than outer petals. Petals 6, in 2 whorls, free, each whorl valvate; outer petals ovate or obovate, usually smaller than inner petals (± equal in **O. multiflora** and **O. hainanensis**); inner petals ± as long as outer petals, thinner and more narrowly clawed.

About 37 species: S and SE Asia; six species (three endemic) in China.

All the Chinese species of **Orophea** belong to **O. subg. Sphaerocarpus** Kessler, distinguished by carpels with 2 (or 3) ovules per carpel producing globose monocarps with hemispherical seeds. **Mezzettiopsis** is included here following Leonardia and Kessler (Blumea 46: 141–163. 2001).

1a. Leaf blade base oblique; petals reddish or reddish yellow.

2a. Shrubs to 4 m tall; leaf blade base shallowly cordate, abaxially hirsute; carpels 3–6; monocarps villous ............... 1. **O. hirsuta**

2b. Trees to 10 m tall; leaf blade base rounded, abaxially glabrous or glabrescent; carpels 12; monocarps glabrous .............................................. 2. **O. polycarpa**

1b. Leaf blade base equilateral; petals white, yellowish green, or greenish.

3a. Leaf blade leathery; stamens 9–14; carpels hairy.

4a. Secondary veins of leaves 10–15 on each side of midvein; carpels 3; inner petals ± as long as outer petals ................................................................. 3. **O. yunnanensis**

4b. Secondary veins of leaves 7–11 on each side of midvein; carpels 9–18; inner petals much longer than outer petals, tips conspicuously recurved and thickened .................................................. 6. **O. laui**

3b. Leaf blade papery; stamens 6–9; carpels glabrous.

5a. Shrubs 2–4 m tall; petioles, leaf blades abaxially, sepals, and petals outside pubescent; inner petals clearly longer than outer petals; carpels 3 .......................................................... 4. **O. multiflora**

5b. Trees 6–8 m tall; petioles, leaf blades, sepals, and petals glabrous; inner and outer petals subequal; carpels 6 ................................................................. 5. **O. hainanensis**


毛澄广花  mao cheng guang hua

Shrubs to 4 m tall. Branchlets, petioles, leaf blades abaxially, and peduncles persistently ferruginous hispid. Petiole 1–2 mm; leaf blade elliptic to oblong, 3.5–12 × 1.5–5 cm, papery, secondary veins 7–11 on each side of midvein, base obliquely shallowly cordate, apex acuminate to acute. Inflorescences superaxillary, cymose, 1–3-flowered; peduncle 1–1.5 cm. Pedicel ca. 4.5 mm, with 1 or 2 bracteoles at base. Sepals broadly ovate, puberulent. Petals reddish; outer petals broadly ovate, 3–4 mm, outside puberulent; inner petals ca. 8 mm, inside sparsely puberulent, basally long clawed, apically lozenge-shaped. Stamens 6. Carpels 3–6, glabrous; ovules 2 or 3 per carpel. Monocarp stipes 1–2 mm; monocarps globose, 0.8–1.3 cm in diam., sparsely villous. Fl. Apr–Jul, fr. Jul–Dec.

Forest ed slopes; 300–600 m. Hainan, S Yunnan [Cambodia, India, Laos, Malaysia, Vietnam].

广西澄广花 guang xi cheng guang hua


Trees to 10 m tall. Branchlets grayish brown, pubescent when young, glabrescent. Petiole 1.5–3 mm, glabrous or glabrescent; leaf blade elliptic to oblong-elliptic, 4–10 × 1.5–4.5 cm, thickly papery, glabrous or abaxially glabrescent, secondary veins 8–10 on each side of midvein, base obliquely rounded, apex shortly acuminate to obtuse. Inflorescences axillary, 1-flowered. Flowers small. Petiole 5–10 mm, bracteolate near base. Sepals triangular, ca. 2 × 1.5 mm, outside puberulent, inside glabrous. Petals reddish; outer petals elliptic to orbicular, 4–5 × 3–4 mm, outside puberulent, inside glabrous; inner petals rhombic, 8–9 × ca. 5 mm, glabrous, base long clawed, margin apically ciliate and revolute toward apex. Stamens 6; connectives apically conic. Carpels 12, glabrous; ovules 2 per carpel. Monocarp stipes 5–7 mm; monocarps globose, 0.5–1.9 cm in diam. Fl. Jul–Sep. fr. Aug–Nov.

Open forests; ca. 600 m. Guangxi, Hainan, SE Yunnan [Bangladesh, Cambodia, Laos, Malaysia, Myanmar, Sri Lanka, Thailand, Vietnam].


云南澄广花 yun nan cheng guang hua

Shrubs ca. 2 m tall. Bark grayish black. Branchlets glabrous. Petiole ca. 3 mm; leaf blade oblong-elliptic to oblong-ovate, 2.5–7.5 × 1–2.3 cm, leathery, glabrous except abaxially puberulent on midvein, midvein adaxially flat, secondary veins 10–15 on each side of midvein and slightly elevated on both surfaces, base attenuate to broadly cuneate, apex acuminate. Inflorescences axillary, 1- or 2-flowered. Flowers ca. 3 mm in diam. Pedicel 2–5 mm, bracteolate at base or near middle. Sepals triangular, outside puberulent, inside glabrous. Petals greenish yellow; outer petals ovate-triangular, 2.5–3 × 1.5–2 mm, outside puberulent, inside glabrous; inner petals ± as long as outer petals. Stamens ca. 12, ovoid; connectives apically acute. Carpels 3, densely villous; ovules 3 per carpel; stigmas capitulate. Fruit not seen. Fl. Apr, fr. May–Jul.

● Forested slopes; ca. 600 m. Yunnan (Jiangchuan).

Orophea yunnanensis is listed as Critically Endangered (CR B1ab(i,ii,iii,v)) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 6 Oct 2010).


多花澄广花 duo hua cheng guang hua

Orophea chinensis S. Z. Huang.

Shrubs to 4 m tall, erect. Bark grayish brown. Branchlets hispid when young, glabrescent. Petiole ca. 2 mm, hispid; leaf blade elliptic to oblong-elliptic, 5–9 × 2–3.5 mm, thickly papery, abaxially sparsely hispid or glabrous, adaxially glabrous, secondary veins 6–9 on each side of midvein, base rounded, apex acuminate. Inflorescences axillary, cymose, 1–3-flowered. Flowers ca. 5 mm in diam. Pedicel ca. 2 mm, hispid. Sepals ovate-triangular, 1–2 × ca. 1 mm, outside pubescent, inside glabrous. Petals greenish yellow; outer petals orbicular, ca. 3 × 2–3 mm, outside pubescent, inside glabrous; inner petals ovate-triangular, 5–8 × 2–4 mm, outside densely pubescent, inside glabrous. Stamens 9; filaments very short. Carpels 3, glabrous; ovules 2 or 3 per carpel; stigmas capitulate. Monocarps globose, ca. 1 cm in diam. Fl. Mar, fr. Apr–Jun.

Forests on limestone; ca. 500 m. SW Guangxi [Vietnam].

The name Orophea multiflora was first published in 1938 (Fl. Indo-Chine, Suppl. 1: 121) but not validly so.


澄广花 cheng guang hua

Shrubs or small trees, 2.5–15 m tall. Branchlets slender, sparsely pubescent or glabrous. Petiole 2–3 mm, glabrous or glabrescent; leaf blade elliptic to ovate, 4–9.5 × 2–4 cm, thickly papery, glabrous, secondary veins 4–7 on each side of midvein, base broadly cuneate, apex shortly acuminate to acute. Inflorescences axillary or superaxillary, usually 1–3-flowered, sparsely pubescent; peduncle 4–20 cm; bracts ciliate. Flowers 3–5 mm in diam. Pedicel 4–10 mm. Sepals ovate-triangular, 1.5–2 × 1–1.5 mm, golden pubescent, apex acute. Petals greenish white; outer petals broadly ovate to orbicular, ca. 4 × 4 mm, margin ciliate, apex acute; inner petals 7–8 mm, basal half ± long and incurved claw, apex rhombic to ovate-triangular. Stamens 6; connectives apically incurved and mucronulate. Carpels 6–10, glabrous; ovules 2 per carpel; stigmas subcapitate, puberulent. Monocarp stipes 2–5 mm; monocarps globose, 7–8 mm in diam. Fl. Apr–Jul, fr. Jun–Dec.

● Dense woodlands; 400–700 m. Hainan, Guangxi.


蚁花 yi hua

Shrubs or small trees, 2.5–15 m tall. Branchlets slender, sparsely pubescent or glabrous. Petiole 3–7 mm; leaf blade oblong, narrowly oblong, or lanceolate, 5.5–19 × 2.2–7.5 cm, ± thickly papery to thinly leathery, sparsely pubescent or glabrous, midvein adaxially sometimes hispid and adaxially flat to slightly sunken, secondary veins 7–11 on each side of midvein, base cuneate, apex acute to shortly acuminate. Inflorescences axillary, cymose, 6-flowered or more, densely pubescent; peduncle 4–15 mm. Pedicel 0.9–1.2 cm, bracteolate near base. Sepals triangular to broadly ovate, 2–2.5 × ca. 2 mm, outside densely puberulent. Outer petals sepal-like, ovate, 3.4 × 3–4 mm, outside greenish white, slightly warty, and pubescent; inner petals 13–16 × 2–4 mm, slightly warty, sparsely hairy, basally clawed, limb strongly recurved and thickened. Stamens 9 in a single whorl or 12(or 14) in 2 whorls; connectives apically rounded. Carpels 9–18, sparsely hairy, glabrescent; ovules 2–6 per carpel; stigmas capitulate. Fruit pedicel 4–9 mm, 1.5–2 mm thick; monocarp stipes 6–10 × ca. 1 mm; monocarps ca. 10, globose, 1–1.3(–2) cm in diam., glabrous. Seeds 1 or 2 per monocarp.

Miliusa tenuistipitata


Miliusa bannaensis X. L. Hou.

Trees to 6 m tall. Branchlets grayish brown, reticulate striate brown tomentose or glabrous. Petiole 3.4–(8) mm; leaf blade oblong to broadly oblong, 4.18–(26) × 1.5–8(–10) cm, papery, more densely pubescent on veins but sometimes glabrous, secondary veins 12–15 on each side of midvein, base cuneate to rounded, apex obtuse to bluntly acuminate. Inflorescences axillary at leafless nodes, 2–6–flowered; peduncle 1–2 mm; bracts 1 or 2, broadly ovate, 1.5–2 × 1.5–2 mm. Pedicel (1–)2–3 cm; pendulous; bracteoles 1–2 or 2 at base of pedicel and 1 below middle, similar to bracts, persistent. Sepals triangular to broadly lanceolate, 2 mm, outside pubescent. Petals pale purple; outer petals similar to sepals, 3.5 × 0.7–1 mm, pubescent; inner petals broadly lanceolate to oblong, 2 × 1.3 cm, outside pubescent, inside puberulent and basally cuneate.

Meliaceae

Trees to 12 m tall, d.h. to 30 cm, most parts pubescent. Petiole 1–4 mm; leaf blade obovate-elliptic to obovate-oblong, 7.5–19 × 2.8–7 cm, membranous, secondary veins 7–9 on each side of midvein and inconspicuous on both surfaces, base rounded to broadly cuneate and sometimes slightly oblique, apex acuminate to shortly acuminate. Inflorescences axillary, 1-flowered; bracts lanceolate, ca. 3 mm. Flowers ca. 1 cm. Pedicel 1–1.4 cm. Sepals ovate-oblong, ca. 4 × 1.5 mm. Outer petals 2.5–5 × ca. 2 mm; inner petals ovate, ca. 9 × 5 mm, puberulent. Stamen connectives slightly elevated. Carpels 4–8, oblong, puberulent; ovule 1 per carpel; stigmas globose, glabrous. Fruiting pedicel 1.7–3.5 cm; monocarp stipules 0.9–2.1 cm; monocarps globose, ca. 7 mm in di., glabrous, tuberculate. Seeds 1 per monocarp. Fl. May, fr. Jun.

Meliaceae

Trees; leaf blade secondary veins 13–20 on each side of midvein; pedicel 0.5–0.7 cm, superaxillary; inner petals ca. 0.3 cm ................................................................. 3. M. glochidioides

3b. Trees; leaf blade abaxially pubescent or tomentose; sepal petals and petals pubescent or tomentose.

3b. Trees; leaf blade glabrous or with larger veins only sparsely puberulent and glabrescent; sepals and petals sparsely pubescent.

3a. Shrubs; leaf blade glabrous or with larger leaves only sparsely puberulent and glabrescent; sepals and petals sparsely pubescent.

1b. Leaf blade broadest at or below middle; ovules 2–8 per carpel.

1a. Leaf blade broadest above middle; ovules 1 per carpel.

Trees or erect shrubs. Inflorescences axillary or superaxillary, fasciculate or cymose, 1-flowered. Flowers mostly bisexual. Pedicel slender, usually elongate. Tolus elevated, usually long pubescent. Sepals 3, small, valvate, connate at base. Petals 6, in 2 whorls, with each whorl valvate; outer petals similar to sepals; inner petals large, erect, thin, base shallowly saccate and shortly clawed, margin initially cohering but readily free, apex usually revolute. Stamens many; connectives narrow and not concealing anther locules, apex subapiculate. Carpels many, oblong; ovules 1–8 per carpel; stigmas capitate, ovoid, or globose. Fruit apocarpous; monocarps many, subsessile to long stipitate, globose to ovoid. Seeds 1 to several per monocarp.

About 38 species: tropical and subtropical Asia and Australia; seven species (three endemic) in China.

1. Miliusa tenuistipitata


云南独活 山南湾野独活

Trees to 12 m tall, d.h. to 30 cm, most parts pubescent. Petiole 1–4 mm; leaf blade obovate-elliptic to obovate-oblong, 7.5–19 × 2.8–7 cm, membranous, secondary veins 7–9 on each side of midvein and inconspicuous on both surfaces, base rounded to broadly cuneate and sometimes slightly oblique, apex acuminate to shortly acuminate. Inflorescences axillary, 1-flowered; bracts lanceolate, ca. 3 mm. Flowers ca. 1 cm. Pedicel 1–1.4 cm. Sepals ovate-oblong, ca. 4 × 1.5 mm. Outer petals 2.5–5 × ca. 2 mm; inner petals ovate, ca. 9 × 5 mm, puberulent. Stamen connectives slightly elevated. Carpels 4–8, oblong, puberulent; ovule 1 per carpel; stigmas globose, glabrous. Fruiting pedicel 1.7–3.5 cm; monocarp stipules 0.9–2.1 cm; monocarps globose, ca. 7 mm in di., glabrous, tuberculate. Seeds 1 per monocarp. Fl. May, fr. Jun.

1. Miliusa tenuistipitata


Miliusa bannaensis X. L. Hou.

Trees to 6 m tall. Branchlets grayish brown, reticulate striate brown tomentose or glabrous. Petiole 3.4–(8) mm; leaf blade oblongate to broadly oblanceolate, 4.18–(26) × 1.5–8(–10) cm, papery, more densely pubescent on veins but sometimes glabrous, secondary veins 12–15 on each side of midvein, base cuneate to rounded, apex obtuse to bluntly acuminate. Inflorescences axillary at leafless nodes, 2–6–flowered; peduncle 1–2 mm; bracts 1 or 2, broadly ovate, 1.5–2 × 1.5–2 mm. Pedicel (1–)2–3 cm; pendulous; bracteoles 1 or 2 at base of pedicel and 1 below middle, similar to bracts, persistent. Sepals triangular to broadly lanceolate, 2 mm, outside pubescent. Petals pale purple; outer petals similar to sepals, 3.5 × 0.7–1 mm, pubescent; inner petals broadly lanceolate to oblong, ca. 2 × 1.3 cm, outside pubescent, inside puberulent and basally cuneate.

Meliaceae

Trees; leaf blade secondary veins 13–20 on each side of midvein; pedicel 0.5–0.7 cm, superaxillary; inner petals ca. 0.3 cm ................................................................. 3. M. glochidioides

3b. Leaves drying dark reddish brown and with shortly caudate tips and is found in Indonesia, Malaysia, and the Philippines.

Meliaceae

Trees or erect shrubs. Inflorescences axillary or superaxillary, fasciculate or cymose, 1-flowered. Flowers mostly bisexual. Pedicel slender, usually elongate. Tolus elevated, usually long pubescent. Sepals 3, small, valvate, connate at base. Petals 6, in 2 whorls, with each whorl valvate; outer petals similar to sepals; inner petals large, erect, thin, base shallowly saccate and shortly clawed, margin initially cohering but readily free, apex usually revolute. Stamens many; connectives narrow and not concealing anther locules, apex subapiculate. Carpels many, oblong; ovules 1–8 per carpel; stigmas capitate, ovoid, or globose. Fruit apocarpous; monocarps many, subsessile to long stipitate, globose to ovoid. Seeds 1 to several per monocarp.

About 38 species: tropical and subtropical Asia and Australia; seven species (three endemic) in China.

1. Miliusa tenuistipitata


Miliusa bannaensis X. L. Hou.

Trees to 6 m tall. Branchlets grayish brown, reticulate striate brown tomentose or glabrous. Petiole 3.4–(8) mm; leaf blade oblongate to broadly oblanceolate, 4.18–(26) × 1.5–8(–10) cm, papery, more densely pubescent on veins but sometimes glabrous, secondary veins 12–15 on each side of midvein, base cuneate to rounded, apex obtuse to bluntly acuminate. Inflorescences axillary at leafless nodes, 2–6–flowered; peduncle 1–2 mm; bracts 1 or 2, broadly ovate, 1.5–2 × 1.5–2 mm. Pedicel (1–)2–3 cm; pendulous; bracteoles 1 or 2 at base of pedicel and 1 below middle, similar to bracts, persistent. Sepals triangular to broadly lanceolate, 2 mm, outside pubescent. Petals pale purple; outer petals similar to sepals, 3.5 × 0.7–1 mm, pubescent; inner petals broadly lanceolate to oblong, ca. 2 × 1.3 cm, outside pubescent, inside puberulent and basally cuneate.
conceave. Stamens 14–16, in 2 series, ca. 1.5 mm; connectives apically shortly cuspidate. Carpels many, ellipsoid to ovoid, sparsely white pubescent; ovule 1 per carpel; stigmas terete, glabrous. Fruiting peduncle ca. 2 mm, thicker than long; monocarp stipes 0.7–1.4 cm; monocarps 8–14, drying blackish, subglobose to ellipsoid-ovoid, 7–9 × ca. 5 mm, glabrous; epicarp tuberculate, glabrous. Seed 1 per monocarp. Fl. Apr–Sep, fr. Jun–Feb.

Open forests; 500–1500 m. S Yunnan [N Thailand].


广西野独活 guang xi ye du huo

Shrubs to 1.5 m tall. Branchlets terete, ferruginous pilose to glabrescent. Petiole to 2 mm; leaf blade elliptic to narrowly ovate-lanceolate, 3–8 × 1–3 cm, sparsely pilose to glabrescent, secondary veins 13–20 on each side of midvein, base obliquely rounded, apex shortly acuminate. Inflorescences superaxillary, 1- or 2-flowered; bracts ovate, 0.5–1 mm, sericeous. Pedicel filiform, 0.5–0.7 cm, glabrous. Sepals broadly ovate, ca. 1 mm, outside minutely strigose, inside glabrous. Outer petals as long as sepals; inner petals ovate, ca. 3.5 × 2.5 mm, outside minutely strigose, inside glabrous. Stamens ca. 20; filaments as long as anther locules; connectives broader than anther locules, suban- thecious. Carpels ca. 10, glabrous. Fruit not seen. Fl. Jul, fr. Aug–Oct.

- Forested slopes; below 900 m. Guangxi.

The Annonaceae Checklist (Rainer & Chatrou, eds., AnnonBase in Species 2010 & ITIS Catalogue of Life; http://herbarium.botanik.univie.ac.at/annonaceae/listTax.php; accessed on 1 Oct 2010) treats this species as a synonym of Orophea polycarpa. The short pedicels are certainly anomalous among other Chinese species of Miliusa and more typical of Orophea, but there are serious discrepancies in the descriptions of these two taxa within China, most notably in petal sizes and stamen numbers, such that we do not wish to follow the checklist here.


野独活 ye du huo

Miliusa chunii W. T. Wang; M. filipes Merrill & Chun (1935), not Ridley (1920).

Shrubs 2–5 m tall. Branchlets slightly pubescent. Petiole 2–3 mm; leaf blade elliptic, elliptic-oblong, or oblong, 7–15 × 2.5–4.5 cm, membranous, glabrous or sparsely puberulent on midvein and secondary veins but glabrescent, secondary veins 10–12 on each side of midvein, base cuneate to rounded and oblique, apex acuminate to shortly acuminate. Inflorescences axillary, 1-flowered. Flowers 1–1.5 cm in diam. Pedicel filiform, 4–6.5 cm, pendulous, glabrous. Sepals ovate, ca. 2 mm, slightly pubescent. Petals red; outer petals slightly longer than sepals; inner petals ovate, 1.2–2.5 × 0.7–1.5 cm, apex reflexed. Anthers ovoid to obovoid. Carpels oblong to lens-shaped, slightly pubescent; ovules 2 or 3 per carpel; stigmas terete, puberulent. Fruiting peduncle 4–7.5 cm, slender; monocarp stipes 1–2 cm; monocarps globose, 7–10 mm in diam. Seeds 1–3 per monocarp. Fl. Apr–Jul, fr. Jul–Dec.

5. Miliusa velutina (Dunal) J. D. Hooker & Thomson, Fl. Ind. 1: 151. 1855.

中华野独活 zhong hua ye du huo

Evodia hyi H. Léveillé.

Trees to 6 m tall, most parts pubescent and densely so when young. Petiole 2–3 mm; leaf blade elliptic, oblong-elliptic, or rarely oblong, 5–13 × 2–5 cm, thinly papery to membranous, secondary veins 9–11 on each side of midvein, base obtuse to rounded and slightly oblique, apex acuminate to obtuse. Inflorescences axillary, erect to pendulous, 1-flowered; bracts 2–4, pubescent. Flowers 1–1.5 cm in diam. Pedicel 3.5–7.5 cm; bracteoles 2–4, near pedicel base. Sepals lanceolate-caudate, ca. 3 mm, apex obtuse and spreading. Outer petals as long as sepals; inner petals purplish red, ovate, 10–15 × 6–8 mm. Stamens connectives apically apiculate. Carpels ovoid, pubescent; ovules 2 per carpel; stigmas ovoid to subcapitate, glabrous. Monocarp stipes 1.3–2.1 cm, pendulous, puberulent; monocarps globose to obovoid, 7–10 × 7–8 mm, glabrous. Seeds 1 or 2 per monocarp. Fl. Apr–Sep, fr. Jul–Dec.

- Dense forests, scrub; 500–1500 m. Guangdong, Guangxi, Gui- zhou, S Yunnan.


大叶野独活 da ye ye du huo

Uvaria velutina Dunal, Monogr. Anonac. 91. 1817; Guatteria velutina (Dunal) A. Candolle; U. villosa Roxburgh.

Trees to 20 m tall. Branches tomentose when young. Petiole 2–7 mm, tomentose; leaf blade elliptic, ovate, or oblong, 8–15[–30] × 5–10[–16] cm, secondary veins ca. 16 on each side of midvein, base obliquely rounded to cordate, apex acute to shortly acuminate. Inflorescences leaf-opposed or on short few-leaved branches, cymose, 3–6-flowered. Peduncle 6–25 mm, tomentose; bracts minute, caducous. Pedicel 5–10 cm, slender; bracteoles similar to bracts. Torus glabrous. Sepals and outer petals ovate-triangular, 2–8 × 1.5–3.5 cm; inner petals dark brown, ovate-lanceolate to lanceolate-rhombic, ca. 10[–18] × 6[–10] mm, outside with very dense appressed golden hairs, inside glabrous. Carpels many, pubescent; ovules 2 per carpel, stigma clavate. Monocarp stipes 5–8 mm; monocarps globose to ovoid, ca. 20 × 16 mm, pilose. Fl. May, fr. Jul. 2n = 18.

Forested slopes; 500–700 m. S Yunnan [Cambodia, India, Laos, Malaysia, Myanmar, Pakistan, Thailand, Vietnam].


囊瓣木 nang ban mu

Saccopetalum horsfieldii Bennett, Pl. Jav. Rar. 165. 1840; Alphonsea prolifica Chun & F. C. How; Miliusa prolifica (Chun & F. C. How) P. T. Li; M. tectona C. E. Parkinson; S. arboreum Elmer; S. lineatum Craib; S. prolificum (Chun & F. C. How) Tsiang; S. unguiculatum Fischer.

假鹰爪属 jia ying zhua shu

Li Bingtao (李秉滔 Li Ping-tao); Ng Kwok Wun (吴帼媛), Richard M. K. Saunders

Shrubs, erect or scandent, rarely treelets, indument of simple hairs. Petiole short; leaf blade venation arcuately looped near margin. Inflorescences solitary, axillary, superaxillary, or leaf-opposed, 1- to 2-flowered. Flowers bisexual. Sepals 3, valvate. Petals 6, in 2 whorls; each whorl valvate, subequal or outer whorl slightly larger than inner whorl; inner whorl basally constricted around reproductive organs to form enclosed floral chamber. Stamens many; connectives apically truncate or rounded; pollen inaperturate, in monads. Carpels many, free; ovary densely hairy; ovules 1–8 per carpel; stigmas oblong or ovoid, bent, with 1 U-shaped opening and a groove continued down adaxial side of carpel. Fruit apocarpous; monocarps many, shortly stipitate, fleshy, ellipsoid when 1-seeded or moniliform (rarely only slightly so) when more than 1-seeded. Seeds subglobose or ellipsoid.

About 25–30 species: tropical and subtropical Asia; five species (two endemic) in China.

1a. Outer petals significantly smaller than inner petals; sepals ca. 1 mm; multi-seeded monocarps only slightly moniliform.

1b. Outer petals slightly larger than or subequal to inner petals; sepals 4–11 mm; multi-seeded monocarps distinctly moniliform.


毛叶假鹰爪 mao ye jia ying zhua

Unona dumosa Roxburgh, Fl. Ind. 2: 670. 1824.

Climbers to 4 m tall, woody. Branches densely hairy when young. Petiole 5–10 mm; leaf blade obovate-elliptic to oblong, 5–16 × 2–7 cm, membranous to thinly papery, abaxially densely erect hairy, secondary veins 9–15 on each side of midvein, base shallowly cordate to truncate, apex shortly acuminate to acute. Inflorescences extra-axillary or leaf-opposed, 1-flowered. Pedicel 1–3 cm. Flowers pendulous. Sepals ovate to lanceolate, 4–11 × 2.5–6.5 mm. Outer petals ovate to oblong, 4–6.5 × 1.5–3.5 cm; inner petals ovate to lanceolate, 3–4 × 2.5(–4.5) × 0.5–0.8(–2) cm. Stamens connectives apically truncate to rounded. Carpels many; stigmas clavate, apex 2-cleft. Fruit pedicel 2–4 cm; monocarp stipes 4–7 mm; monocarps ellipsoid or moniliform, 0.8–5.5 × 0.5–0.8 cm, sparsely to densely hairy. Fl. Apr–Aug, fr. Jul–Apr.

Open forests, thickets; 500–1700 m. Guangxi, Guizhou, S Yunnan [Bhutan, India, Laos, Singapore, Thailand, Vietnam].


大叶假鹰爪 da ye jia ying zhua

Unona desmos Dunal var. grandifolia Finet & Gagnepain, Bull. Soc. Bot. France 53(Mém. 4): 81. 1906; Desmos cochin chinensis Loureiro var. grandifolius (Finet & Gagnepain) Jovet-Ast ["Ast"].

Climbers to 5 m tall, woody. Branches subglabrous to hairy when young. Petiole 5–10 mm; leaf blade oblong, 15–28 × 5.5–8 cm, papery to thinly leathery, abaxially sparsely to densely appressed hairy, secondary veins 12–17 on each side of
midvein and adaxially flattened, base shallowly cordate to truncate, apex shortly acuminate. Inflorescences fasciculate, (1–)4-flowered. Flowers pendulous. Pedicel 2.5–8 cm, puberulent, glabrescent; bracteoles near pedicel base, ovate, ca. 2.5 mm, abaxially puberulent, adaxially sparsely puberulent. Sepals ovate, 4–10 × 4–7 mm. Outer petals elliptic to lanceolate, 3.5–6 × 1.5–3 cm; inner petals lanceolate, 3–5 × 0.6–1 cm, puberulent on both surfaces. Anthers oblong, ca. 1.5 mm; connectives apically truncate to rounded. Carpels ca. 15; stigmas clavate, apex 2-cleft. Fruiting pedicel 6–8 cm; monocarp stipes ca. 1.6 cm; monocarps ellipsoid or moniliform, 1–5 × ca. 0.6 cm, hairy. Fl. Mar–Apr, fr. May–Sep.

Yunnan [Vietnam].

Indonesia, Laos, Malaysia, Nepal, Philippines, Thailand, Vietnam].

Guangxi, S Guizhou, Hainan, SE Yunnan [Bhutan, Cambodia, India, Nepal, Philippines, Thailand, Vietnam].

Dense forests or thickets in valleys; 100–500 m. Guangxi, S Yunnan [Vietnam].


假鹰爪 jia ying zhua

Artabotrys esquiriolii H. Léveillé; Unona chinensis (Loureiro) Candolle; U. discolor Vahl.

Climbers to 4 m tall, woody. Branches stout, sparsely hairy when young, with raised grayish white lenticels. Petiole 3–8 mm; leaf blade oblong to elliptic, rarely broadly ovate, 6–14 × 2–6.5 cm, membranous to thinly papery, abaxially glaucous and sparsely appressed hairy, adaxially glossy, secondary veins 7–12 on each side of midvein, base rounded to slightly oblique, apex acute to acuminate. Inflorescences superaxillary or leaf-opposed, 1-flowered. Flowers 3–6 cm wide, pendulous. Pedicel 2–6.5 cm. Sepals ovate to lanceolate, 4–10 × 2–4.5 mm. Outer petals oblong to oblong-lanceolate, 3.5–6 × 1–2 cm; inner petals lanceolate, 4–7 × 1–2 cm. Stamen connectives apically truncate to rounded. Carpels 25–35; stigmas clavate, apex 2-cleft. Fruiting pedicel 2–6 cm; monocarp stipes 4–14 mm; monocarps ellipsoid or moniliform, 0.8–6 cm × 4–6 mm, with 2–6 joints; joints yellowish brown, subglobose, ca. 7 × 6 mm, sparsely hairy, apex of terminal obtuse to shortly rostrate. Fl. Apr–Oct, fr. Jun–Dec. 2n = 20.

Wastelands and thickets in valleys; 100–1500 m. Guangdong, Guangxi, S Guizhou, Hainan, SE Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, Philippines, Thailand, Vietnam].

The bast fibers of Desmos chinensis are used for cordage; the roots and leaves are used medicinally; and the leaves are used in brewing liquor in Hainan.


云南假鹰爪 yun nan jia ying zhua


Climbers, to 6 m tall, woody. Branches densely hairy when young. Petiole 3–8 mm; leaf blade oblong to obovate-oblong, 10–16 × 3.5–6.8 cm, membranous to thinly papery, abaxially appressed hairy, secondary veins 10–14 on each side of midvein and adaxially elevated, base rounded, apex acuminate. Inflorescences axillary, 1-flowered. Pedicel to 2.5 cm. Sepals broadly ovate, ca. 1 mm. Outer petals ovate, ca. 3 mm; inner petals ovate to obovate, ca. 2.8 × 2 cm, outside densely puberulent, inside sparsely puberulent. Stamen oblong, ca. 2 mm; connectives apically truncate. Carpels ca. 13, oblong, ca. 2 mm, glabrous, very sparsely hairy, or pilose; ovules 2–5 per carpel; stigmas globose. Monocarp stipes ca. 1 cm; monocarps slightly moniliform, to 3.5 × 0.5 cm, with 2 or 3 joints; joints cylindric to ellipsoid, pilosulous. Fl. Oct, fr. Aug.

- Mixed forests; 1000–1400 m. S Yunnan (Xishuangbanna).

The taxonomic placement of this species within Desmos is questionable and requires further research.


亮花假鹰爪 liang hua jia ying zhua


Climbers or woody climbers, to 6 m tall. Branches pressured ferruginous pubescent when young, glabrescent. Petiole 3.5–5 mm; leaf blade elliptic, oblong, or obovate-oblong, 5.5–13.5 × 2–4.5 cm, membranous, abaxially sparsely hairy but glabrescent, adaxially glabrous except for puberulent midvein, secondary veins 7–11 on each side of midvein, base cuneate, apex acuminate. Inflorescences leaf-opposed, 1-flowered. Pedicel 2–2.2 cm. Sepals ovate-triangular, ca. 1 × 1 mm. Outer petals ovate-triangular, ca. 4 mm; inner petals obovate-oblong to lanceolate, 2.7–3.5 × 1–1.3 cm, outside pubescent, inside densely pubescent. Stamen connectives apically truncate. Carpels ca. 12, ca. 2.2 mm, densely tomentose; ovules ca. 8 per carpel; stigmas sessile, globose. Monocarp stipes 4–6 mm; monocarps slightly moniliform, 1.8–2.7 × 1–1.2 cm, with 3–5 joints, glabrous. Fl. Aug–Sep, fr. Oct–Nov.

- Forested slopes; 1200–2300 m. S Yunnan (Xishuangbanna).

The taxonomic placement of this species within Desmos is questionable and requires further research.


皂花属 zao hua shu

Li Bingtao (李秉滔 Li Ping-tao); Wang Jing (王静), Richard M. K. Saunders

Unona sect. Dasymaschalon J. D. Hooker & Thomson, Fl. Ind. 1: 134. 1855.

Small trees [rarely climbers], indument of simple hairs. Petiole short; leaf blade venation arcuately looped near margin. Inflorescences axillary, 1-flowered. Flowers bisexual. Sepals 3, valvate. Petals (2 or)3, in 1 whorl alternate with sepals, valvate, apically connivent to form a mitriform dome (floral chamber) over reproductive organs and often with very small basal apertures between
petals. Stamens many; connectives apically truncate or apiculate; pollen inaperturate, in monads. Carpels many, free; ovary densely hairy; ovules 1 to many per carpel. Fruit apocarpous; monocarps stipitate, ellipsoid when 1-seeded or moniliform when more than 1-seeded, fleshy, with a terminal apiculus. Seeds 1–6 per monocarp, globose or ellipsoid.

About 30 species: tropical and subtropical Asia; six species (two endemic) in China.

Dasymaschalon was included within Desmos in FRPS (30(2): 45–53. 1979) but is supported by molecular studies and is easily distinguished morphologically by the absence of an inner whorl of petals (J. Wang et al., Syst. Bot. 34: 252–265. 2009).

1a. Leaf blade midvein adaxially hairy; petiole densely hairy; sepals ovate, 7–16 × 4–9 mm; fruiting pedicel densely hairy ......................................................................................................................................................................................... 1. D. trichophorum

1b. Leaf blade midvein adaxially glabrous; petiole glabrous or sparsely hairy; sepals triangular, 1–4 × 1.5–4 mm; fruiting pedicel glabrous or sparsely hairy.

2a. Leaf blade 6–8.5 cm; petiole 2.3–3.3 mm; stamen connectives apically apiculate; pollen verrucate; monocarp stipes 2.5–3 mm; seeds 5–6 mm ......................................................................................................................................... 2. D. robinsonii

2b. Leaf blade 10.5–21.5 cm; petiole 4.4–11 mm; stamen connectives apically truncate to rounded; pollen echinate; monocarp stipes 4–18 mm; seeds 6.5–24 mm.

3a. Leaf blade base slightly cordate; floral chamber ca. 20% of petal length ............................................................................ 3. D. glaucum

3b. Leaf blade base rounded or slightly attenuate; floral chamber 50%–90% of petal length.

4a. Petiole glabrous; petals ca. 7 cm; monocarps 8.5–10 mm wide; monocarp stipes ca. 1.8 cm ................................................................ 4. D. tibetense

4b. Petiole sparsely hairy; petals 2–4.5 cm; monocarps 4.5–8 mm wide; monocarp stipes 0.6–1.3 cm.

5a. Floral chamber ca. 50% of petal length; monocarps 1.1–2 cm; seeds globose, ca. 1.3 × as long as wide .............................................................................................................. 5. D. rostratum

5b. Floral chamber ca. 90% of petal length; monocarps 3–5 cm; seed ellipsoid, 3.5–6 × as long as wide ............................................................................................................................................... 6. D. sootepense


皂帽花  zao mao hua

Trees to 3.5 m tall. Branches very densely hairy when young. Petiole 2.5–5.5 mm, densely hairy; leaf blade elliptic to obovate, 7–15 × (2.5)–4–8 cm, papery, abaxially glaucous and sparsely to densely hairy, adaxially or sparsely hairy, midvein hairy and abaxially more densely so, secondary veins 10–14 on each side of midvein and adaxially impressed, base rounded to shallowly cordate, apex acute. Flowers axillary or terminal on young growth. Pedicel 1–2 cm, densely hairy. Sepals 7–16 × 4–9 mm. Petals purplish red, triangular to ovate, 1.6–3 × 0.7–1 cm, papery, not twisted, outside densely hairy; floral chamber 4–6.5 mm, 20%–30% of petal length. Stamens 40–70 per flower; connectives apically apiculate; pollen echinate. Carpels 15–25, hispid; stigmas sparsely papillate. Fruiting pedicel 1–2.4 cm, densely hairy; monocarp stipes 3.5–6.5 mm; monocarps dark purple, subglobose when 1-seeded or moniliform when more than 1-seeded, 8.5–13 × 2.7–5.5 mm, with grayish white bristles, glabrescent, terminal apiculus 0.2–0.8 mm; joints 3–8, subglobose, 5–6 × ca. 5 mm, constrictions 1.2–2.3 mm wide, 25%–35% of monocarp width. Seeds 3–8 per monocarp, subglobose, 5.2–6 × 4.8–5 mm. Fl. Apr–Jul; fr. Jul–Dec.

- Sparsely forested slopes on sandy soil; below 100 m. Guangdong, Guangxi, Hainan.

Specimens of Dasymaschalon trichophorum have previously been misidentified as D. macrocalyx Finet & Gagnepain (Desmos macrocalyx (Finet & Gagnepain) P. T. Li), which does not occur in China.


钝叶假鹰爪  dun ye jia ying zhua

Desmos robinsonii (Jovet-Ast) P. T. Li.

Tress to 2 m tall. Branches sparsely hirsut when young, glabrescent. Petiole 2.3–3.3 mm, sparsely hairy; leaf blade elliptic, 4–10 × 1.5–3.5 cm, thinly leathery, both surfaces glabrous, abaxially glaucous, midvein abaxially very sparsely hairy and adaxially glabrous, secondary veins 7–9(–11) on each side of midvein and adaxially impressed, base rounded to slightly cordate, apex acute, obtuse, or subrounded. Flowers axillary or subterminal on young growth. Pedicel ca. 4.5(–11) mm, very sparsely hairy. Sepals 2.7–3.7 × 2.2–2.7 mm. Petals triangular, 2.3–2.6 × ca. 0.6 cm, leathery, not twisted, outside very sparsely hairy; floral chamber ca. 1.2 cm, ca. 50% of petal length. Stamens ca. 60; connectives apically apiculate; pollen verrucate. Carpels ca. 12; stigmas densely papillate. Fruiting pedicel 6–8 mm, very sparsely hairy; monocarp stipes 2.5–3 mm; monocarps moniliform, with 3–3 subglobose joints, glabrous, ca. 4.5 mm wide, constrictions 2.5–2.9 mm wide, terminal apiculus ca. 0.8 mm. Seeds 3–5 per monocarp, subglobose, 5.3–5.8 × 4.4–4.9 mm. Fl. Apr–Jun, fr. Jun–Oct.

Open forests on limestone; ca. 600 m. Guizhou (Libo) [Vietnam].

The name Dasymaschalon robinsonii was first published in 1938 (Fl. Indo-Chine, Suppl. 1: 115) but not validly so.


白叶皂帽花  bai ye zao mao hua

Dasymaschalon rostratum Merrill & Chun var. glaucum (Merrill & Chun) Bân.

Tress to 8 m tall. Branches glabrous or hairy when young. Petiole 4.5–10 mm, sparsely hairy; leaf blade elliptic to obovate, 10.5–21 × 4–8 cm, leathery to subleathery, both surfaces glabrous, abaxially glaucous, midvein abaxially glabrous and...
adaxially sparsely hairy, secondary veins 8–15 on each side of midvein and flush or adaxially slightly impressed, base slightlycordate, apex acuminate. Flowers on young growth. Pedicel 1.7–1.9 cm, very sparsely hairy. Sepals 2.5–3 × 2.5–3.3 mm. Petals purplish red, ovate, 2.6–4.2 × 0.8–1 cm, leathery, spirally twisted, outside densely hairy; floral chamber ca. 6 mm, ca. 20% of petal length. Stamens many; connectives apically truncate to rounded; pollen echinate. Carpels many; stigmas with sparsely hairy. Fruiting pedicel 0.7–5.5 cm, glabrous or sparsely hairy; monocarp stipes 4–15–15 mm; monocarps red to brown, ellipsoid when 1-seeded or moniliform when more than 1-seeded, 1.6–5.5 cm × 5–8 mm, terminal apiculus 0.3–4 mm; constrictions 1.2–3.5 mm wide. Seeds 1–6 per monocarp, ellipsoid, 6.5–13 × 4.8–7 mm. Fl. Aug–Oct, fr. Apr–Feb.

Forested slopes on limestone or sandstone; 200–2400 m. Guangxi, Hainan [Laos, Thailand, Vietnam].


西藏皂帽花 xi zang mao hua

Trees to 5 m tall. Branches glabrous or hairy when young. Petiole 0.9–1.1 cm, glabrous; leaf blade oblong, 13.5–20 × 4.5–5.5 cm, papery, both surfaces glabrous, abaxially glaucous, midvein glabrous on both surfaces, secondary veins ca. 12 on each side of midvein and adaxially flush, base slightly cuneate, apex acuminate. Flowers on young growth. Pedicel 1.2–1.5 cm, sparsely hairy. Sepals ca. 1.5 × 1.5 mm. Petals triangular, ca. 7 × 1.2 mm, leathery, not twisted, outside sparsely hairy; floral chamber ca. 5.5 mm, ca. 80% of petal length. Stamens ca. 100; connectives apically rounded; pollen echinate. Carpels not seen. Fruiting pedicel 1–2.3 cm, glabrous; monocarp stipes ca. 1.8 cm; monocarps ellipsoid when 1-seeded or moniliform when more than 1-seeded, ca. 2.1 × 1 cm, terminal apiculus ca. 0.2 mm; constrictions ca. 6 mm wide. Seeds 1 or 2 per monocarp, ellipsoid, 16–19 × ca. 10 mm. Fl. Mar–Jul, fr. Jun–Aug.

- Semi-evergreen subtropical forests; 500–1300 m. SE Xizang.


喙果皂帽花 hui guo mao hua

Desmos rostratus (Merrill & Chun) P. T. Li.

Trees to 4 m tall. Branches sparsely hairy when young. Petiole 5–10 mm, sparsely hairy; leaf blade elliptic to oblong, 13–21.5 × 3.5–7.5 cm, papery, both surfaces glabrous or very sparsely hairy, abaxially glaucous, midvein adaxially sparsely hairy and adaxially glabrous, secondary veins 10–16 on each side of midvein and adaxially flush, base rounded to slightly attenuate, apex acute to acuminate. Flowers on young growth. Pedicel 1.2–4 cm, sparsely hairy. Sepals 2–3.5 × 1.5–3.5 mm. Petals ovate, 2–4 × 0.7–1.2 cm, leathery, generally not twisted, outside densely hairy; floral chamber 1–2 cm, ca. 50% of petal length. Stamens ca. 120; connectives apically truncate; pollen echinate. Carpels ca. 10; stigmas glabrous. Fruiting pedicel 2–5 cm, very sparsely hairy; monocarp stipes 6–13 mm; monocarps orangish red, subglobose when 1-seeded or moniliform when more than 1-seeded, 1.1–2 × 0.6–0.8 cm, terminal apiculus 2–4 mm; constrictions 2–3 mm wide. Seeds 1 or 2 per monocarp, subglobose, 8–9 × 6–7 mm. Fl. Apr–Oct, fr. Jul–Dec.

Sparsely forested slopes; 300–1000 m. ?Fujian, Guangdong, Guangxi, Hainan, SE Xizang, S Yunnan [Vietnam].

Dasymaschalon rostratum has been reported from Fujian (X. L. Hou & S. J. Li, J. Trop. Subtrop. Bot. 11: 171–173. 2003), but two of us (Wang and Saunders) believe the identity of this report is suspect and needs to be confirmed.


黄花皂帽花 huang hua mao hua

Desmos sootepensis (Craib) J. F. Maxwell.

Trees to 10 m tall. Branchlets pilose, glabrous or glabrescent with age. Petiole 5–9 mm, sparsely hairy; leaf blade elliptic, 10–18 × 3–7 cm, papery, abaxially glaucous and very sparsely hairy, adaxially glabrous or very sparsely hairy, midvein abaxially sparsely hairy and adaxially glabrous, secondary veins 9–12–18 on each side of midvein and flush or adaxially impressed, base rounded to very slightly attenuate, apex acuminate. Flowers on young growth. Pedicel 1–3 cm, sparsely hairy, bracteolate at base. Sepals broadly ovate, 1–2.5–3 mm, ca. 90% of petal length. Stamens ca. 140; connectives apically truncate; pollen echinate. Carpels ca. 20, oblong, ca. 3 mm; ovules 2–7 per carp; stigmas glabrous or sparsely hairy. Fruiting pedicel 1.5–3 cm, glabrous or sparsely hairy; monocarp stipes 6–12 mm; monocarps red, ellipsoid when 1-seeded or moniliform when more than 1-seeded, 3–6 × 0.4–0.7 cm, terminal apiculus 1.5–2.5 mm; constrictions 2–2.5 mm wide. Seeds 1–4 per monocarp, ellipsoid, 17–24 × 4–5 mm. Fl. Apr–Jul, fr. Jun–Sep.

Evergreen broad-leaved forests on rocky/sandy alluvium; 600–1300 m. S Yunnan [N Thailand].

8. GONIOTHALAMUS (Blume) J. D. Hooker & Thomson, Fl. Ind. 1: 105. 1855.

哥纳香属 ge na xiang shu

Li Bingtao (李秉滔) Li Ping-tao; Michael G. Gilbert


Trees or erect shrubs. Petiole short; leaf blade large, secondary veins arcuately looped near margin. Inflorescences axillary or extra-axillary, 1-flowered or several flowers in fascicles. Pedicel bracteolate at base. Sepals 3, valvate. Petals 6, in 2 whorls, with each whorl valvate; outer petals flat, thick; inner petals small, base shortly clawed, apex forming a cap. Stamens many; anther locules linear or oblong, exotorse; connectives oblong or clavate, 3-angular, apex truncate or rarely rounded. Carpels many; ovules 1–10 per
carpel, ± basal; styles elongate; stigmas entire or apex 2-lobed. Fruit apocarpous; monocarps subsessile to shortly stipitate, oblong-ellipsoid or ovoid. Seeds 1–10 per monocarp.

About 130–140 species: tropical and subtropical Asia; 11 species (five endemic) in China.


1a. Leaf blade margin and midvein abaxially densely rust-colored hirsute.
2a. Leaf blade 56–76 × 13–19 cm; monocarps 6–9 × ca. 2 cm ............................................................... 1. G. cheliensis
2b. Leaf blade 20–41 × 5.5–11.5 cm; monocarps 2–3 × 0.6–0.8 cm ............................................................... 2. G. donnaiensis
1b. Leaf blade glabrous throughout.
3a. Inflorescences 3- or 4-flowered; leaf blade abaxially grayish green; inner petals ca. 2 × as long as outer petals ........................................................................................................................................ 11. G. laoticus
3b. Inflorescences 1- or 2-flowered; leaf blade abaxially green, sometimes drying brownish; inner petals much shorter than outer petals.
4a. Leaf blade narrowly lanceolate to oblong-lanceolate.
5a. Branchlets and petioles pubescent; stigmas deeply 2-cleft ................................................................. 3. G. chinensis
5b. Branchlets and petioles glabrous; stigmas entire or shallowly 2-cleft.
6a. Ovaries pubescent; ovules 2 per carpel ............................................................................................ 4. G. gardneri
6b. Ovaries glabrous; ovules 1 per carpel ............................................................................................ 5. G. gabriacianus
4b. Leaf blade oblong, oblong-elliptic, elliptic, or obovate.
7a. Pedicel ca. 4 mm; styles ca. 2 × as long as ovaries; ovules basal; leaf blade secondary veins 7–9 on each side of midvein ................................................................. 6. G. yunnanensis
7b. Pedicel 9–15 mm; styles 1–1.5 × as long as ovaries; ovules lateral; leaf blade secondary veins 9–21 on each side of midvein ................................................................. 7. G. leiocarpus
8a. Ovaries pubescent; ovules 2 per carpel, subbasal; style oblong, ± long as ovary, glabrous. Monocarps 3–6 × 2–2.5 cm .................................................................................................... 10. G. howii
8b. Ovaries glabrous; ovules 1 per carpel ............................................................................................ 4.
6a. Ovaries pubescent; ovules 2 per carpel, subbasal; style oblong, ± long as ovary, glabrous. Monocarps 4–12, connate, ovate-oblanceolate, 2–3 × 0.6–0.8 cm, both ends acuminate. Seeds 1 or 2 per monocarp, yellowish, ovoid, ca. 1.5 × 5 mm, ribbed at bilateral plane. Fl. May–Sep, fr. Aug–Oct.


景洪哥纳香 jing hong ge na xiang

Trees to 5 m tall. Branches dark gray hispid. Petiole 2–2.5 cm, stout, rust-colored hispid; leaf blade obovate, 56–76 × 13–19 cm, papery, abaxially sparsely hispid, adaxially glabrous, midvein densely rust-colored hispid, secondary veins 26–30 on each side of midvein and prominent on both surfaces, base cuneate, margin densely rust-colored hispid, apex caudate with a 1–3 cm acumen. Flowers not seen. Fruiting carpels oblong-elliptic, 6–9 × 1.5–2 cm, densely rust-colored hispid, lenticulate, acuminate on both ends. Seeds 4, oblong, ca. 2.5 × 1.5 cm. Fl. Mar, fr. Apr–Sep.

Forested slopes; ca. 1500 m. S Yunnan.

Goniothalamus cheliensis is listed as Endangered (EN A2c) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 6 Oct 2010).


田方骨 tian fang gu

Trees to 5 m tall. Most parts densely rust-colored hispid when young. Petiole 1–1.5 cm, stout; leaf blade obovate-lanceolate to oblong-lanceolate, 20–41 × 5.5–11.5 cm, papery, adaxially glabrous or hisurate along midvein, secondary veins 17–22 on each side of midvein, base cuneate, apex caudate with a 1–3 cm acumen. Flowers solitary. Pedicel short. Sepals broadly ovate, ca. 8 × 6 mm, inside glabrous. Petals reddish; outer petals ovate-lanceolate to oblong-lanceolate, ca. 2.3 × 0.5 cm; inner petals ovate-triangular, ca. 1.5 × 0.5 cm, inside glabrous, base attenuate into a ca. 3 mm claw. Stamens oblong, ca. 2 mm; anther locule with transverse stripes; connectives api- cally rounded to subtruncate. Carpels cylindric-ovoid, ca. 4.5 mm, hisurate; ovules 2 per carpel, subbasal; style oblong, ± long as ovary, glabrous. Monocarps 4–12, connate, ovate-oblanceolate, 2–3 × 0.6–0.8 cm, both ends acuminate. Seeds 1 or 2 per monocarp, yellowish, ovoid, ca. 1.5 × 5 mm, ribbed at bilateral plane. Fl. May–Sep, fr. Aug–Oct.

Densely forested slopes; 200–800 m. SW Guangxi, S Guizhou, SE Yunnan [Vietnam].

The bark of Goniothalamus donnaiensis is used as medicine for traumatic injuries and fractures.


哥纳香 ge na xiang

Shrubs to 4 m tall. Branchlets pubescent when young, glabrescent. Petiole 5–12 mm, robust, pubescent or glabrous; leaf blade oblong-elliptic to oblong-lanceolate, 13–30 × 3–8 cm,
Goniothalamus saigonensis

Trees to 5 m tall, Bark brown. Branches pale brown, glabrous. Petiole 5–13 mm, drying blackish, slightly rugose; leaf blade oblong-elliptic, oblong, or sometimes obovate-oblong, 7–23 × 2.8–7 cm, thinly papery, glabrous, secondary veins 7–15(–21) on each side of midvein and adaxially depressed to slightly raised, base broadly cuneate, apex acute to acuminate. Inflorescences axillary, sometimes from leafless nodes, 1- or 2-flowered; peduncle 1–2 mm; bracts 2–4, ovate, 1–2 mm. Pedicel (2–)3–4(–13) mm, sparsely pubescent. Sepals broadly ovate-triangular, 5–8 × 4–8 mm, outside puberulent, inside glabrous. Petals reddish yellow; outer petals broadly lanceolate, 2.5–5.7–1.3 cm, rust-colored pubescent, inside densely rust-colored tomentulose; inner petals obovate to oblong-ovate, 7–11 × 4–5 mm, connate above middle, pubescent, base attenuate to a ca. 2 mm claw. Stamens many, (1.5–)2.2–3 mm; connectives apically truncate. Carpels ca. 14, ca. 3 mm, puberulent or glabrous; ovules 2 per carpel, basal; styles ca. 2 × as long as ovaries. Monocarp stipes ca. 4 mm; monocarps 5–16, ellipsoid, 1.8–2.5 × 0.8–0.9 cm, glabrous, minutely punctate, apex shortly cuspidate. Seeds (1 or)2 per monocarp. Fl. Apr–Jun, fr. Nov.

Densely forested slopes; 100–800 m. S Yunnan.

Goniothalamus lii X. L. Hou & Y. M. Shui

Trees to 5 m tall. Bark brown. Branches pale brown, glabrescent. Petiole 5–13 mm, drying blackish, slightly rugose; leaf blade oblong-elliptic, oblong, or sometimes obovate-oblong, 7–23 × 2.8–7 cm, thinly papery, glabrous, secondary veins 7–15(–21) on each side of midvein and adaxially depressed to slightly raised, base broadly cuneate, apex acute to acuminate. Inflorescences axillary, sometimes from leafless nodes, 1- or 2-flowered; peduncle 1–2 mm; bracts 2–4, ovate, 1–2 mm. Pedicel (2–)3–4(–13) mm, sparsely pubescent. Sepals broadly ovate-triangular, 5–8 × 4–8 mm, outside puberulent, inside glabrous. Petals reddish yellow; outer petals broadly lanceolate, 2.5–5.7–1.3 cm, rust-colored pubescent, inside densely rust-colored tomentulose; inner petals obovate to oblong-ovate, 7–11 × 4–5 mm, connate above middle, pubescent, base attenuate to a ca. 2 mm claw. Stamens many, (1.5–)2.2–3 mm; connectives apically truncate. Carpels ca. 14, ca. 3 mm, puberulent or glabrous; ovules 2 per carpel, basal; styles ca. 2 × as long as ovaries. Monocarp stipes ca. 4 mm; monocarps 5–16, ellipsoid, 1.8–2.5 × 0.8–0.9 cm, glabrous, minutely punctate, apex shortly cuspidate. Seeds (1 or)2 per monocarp. Fl. Apr–Jun, fr. Nov.

Densely forested slopes; 100–800 m. S Yunnan.

台湾哥納香 tai wan ge na xiang

_Uvaria amuyon_ Blanco, Fl. Filip. 463. 1837; _Polyalthia sasakii_ Yamamoto.

Shrubs or small trees, 2–5 m tall. Petiole 6–8 mm, sparsely pubescent; leaf blade oblong-elliptic to elliptic, 8–16 × 3.5–5.5 cm, papery, glabrous, abaxially with brown specks, secondary veins 8–11 on each side of midvein and adaxially slightly prominent, base broadly cuneate, apex obtuse. Inflorescences axillary. Pedicel ca. 6 mm. Sepals ovate-triangular, outside pubescent. Outer petals lanceolate, ca. 3.5 × 0.7 cm, thick, outside pubescent; inner petals ovate, smaller than outer petals. Stamens many; connectives broadly 3-angular. Carpels cylindric; ovules 1–3 per carpel; styles linear, ca. 3.5 mm. Fruiting carpels ovoid to ellipsoid, 1–1.8 × 0.6–0.9 cm. Seeds 1 or 2 per monocarp. Fl. May–Jul, fr. May–Oct.

Mixed woods; 300–500 m. S Taiwan [Philippines].


大花哥納香 da hua ge na xiang

Trees to 8 m tall. Branchlets pubescent, glabrescent. Petiole 0.7–1.5 cm, robust; leaf blade oblong, 17–35 × 5.5–9 cm, papery, glabrous, midvein stout and adaxially depressed, secondary veins 14–20 on each side of midvein and slightly elevated on both surfaces, base round to broadly cuneate, apex obtuse to shortly acuminate. Inflorescences axillary or extra-axillary, 1-flowered. Pedicel 1–1.5 cm, puberulent. Flowers terminal, leaf opposite, or extra-axillary, solitary or in cymes; sympodial rachides simple or branched, internodes short or long. Flowers bisexual, pendulous. Pedicel short or long, with bracteals and submedian bracteoles. Sepals broadly ovate, in 1 series; styles oblong, as long as ovary; stigmas apically 2-cleft. Monocarps ovoid to cylindric-ovoid, 3–6 × 2.5 cm, glabrous. Fl. Mar–Sep, fr. May–Jan.

● Forested slopes; 300–800 m. Hainan, S Yunnan.

10. **Goniothalamus howii** Merrill & Chun, Sunyatsenia 5: 60. 1940.

海南哥納香 hai nan ge na xiang

_Trees to 15 m tall, glabrescent except for flowers. Petiole 7–10 mm; leaf blade oblong to sometimes elliptic, 10–25 × 4–8 cm, papery, brownish when dry, secondary veins 10–15 on each side of midvein, base cuneate to rounded, apex shortly acuminate to obtuse. Inflorescences axillary, 1-flowered. Pedicel 1–2 cm, puberulent, several bracteoles at base. Sepals broadly ovate, ca. 5 mm, outside puberulent. Petals yellowish green; outer petals broadly ovate, 2.2–2.5 × 1.6–1.8 cm, leathery, sparsely pubescent; inner petals broadly ovate to subrhomboid, 1.3–1.5 cm, thickly leathery, densely hispid. Stamens oblong; connectives orbicular. Carpels 15–18, pubescent; ovules 6 per carpel, in 1 series; styles oblong, as long as ovary; stigmas apically 2-cleft. Monocarps ovoid to cylindric-ovoid, 3–6 × 2.5 cm, glabrous. Fl. Mar–Sep, fr. May–Jan._

● Forested slopes; 300–1600 m. S Yunnan [N Taiwan].


柄芽银钩花 bing ya yin gou hua


_Trees to 10 m tall, glabrous except for flowers. Branches robust. Petiole ca. 7 mm; leaf blade oblong, 13–18 × 3–5 cm, leathery, abaxially pale gray/glaucous, adaxially glossy, midvein adaxially concave, secondary and reticulate veins obscure, base attenuate, apex obtuse and shortly cuspidate. Inflorescences 3–4-flowered. Flowers ca. 1.2 cm. Pedicel 6–7 mm, robust, bracteolate at base. Sepals broadly ovate to suborbicular, erect, outside puberulent, inside glabrous. Outer petals lanceolate, suberect, both surfaces pubescent; inner petals obovate, ca. 2 × as long as outer petals, both surfaces pubescent, base clawed, margin ciliate. Stamens many; connectives semi-orbicular, papillose. Carpels 10, cylindric, glabrous; ovules 8–10 per carpel; stigmas fusiform, papillose. Fruit not seen. Fl. Apr–Jun, fr. Jul–Oct._

Dense woods; ca. 700 m. S Yunnan [Laos, C and N Thailand].

Weerasooriya and Saunders (Syst. Bot. 30: 262. 2005) follow Bân and exclude this species from _Mitrephora_.

9. **MITREPHORA** J. D. Hooker & Thomson, Fl. Ind. 1: 112. 1855, not _Mitrephora_ Necker ex Rafinesque (1813), nor Léveillé (1846) [Fungi].

银钩花属 yin gou hua shu

_Li Bingtao (李秉滔 Li Ping-tao); Aruna D. Weerasooriya, Richard M. K. Saunders


Trees to 40 m tall. Petiole short; leaf blade venation arcuately looped near margin, secondary veins 4–24 on each side of midvein. Flowers terminal, leaf opposite, or extra-axillary, solitary or in cymes; sympodial rachides simple or branched, internodes short or long. Flowers bisexual, pendulous. Pedicel short or long, with bracteals and submedian bracteoles. Sepals 3, valvate, basally ±
conenate. Petals 6, in 2 whorls, free, with each whorl valvate; outer petals usually smaller than inner petals, without a basal claw; inner petals with base clawed, apically connivent to form a mitriform dome. Stamens many; anthers cuneate, extrorse; connectives apically truncate. Carpels few to many, free; ovules several per carpel, in 2 series. Fruit apocarpous; monocarps sessile or stipitate, globose, obvoid, or cylindric, sometimes longitudinally ridged, smooth or rarely warty.

About 47 species: tropical and subtropical Asia; three species in China.


银钩花 (Pierre) Kuntze; Mitrephora bousigoni ana (Pierre) Finet & Gagnepain; M. teysmannii Pierre; M. microphylla Craib; M. edwardsii Pierre; M. thoriei Pierre; M. thoriei var. bousigoni ana (Pierre) Finet & Gagnepain; M. thoriei var. microphylla Finet & Gagnepain; ?M. vandiflora Kurz.

Trees to 20 m tall. Branches densely hairy when young. Petiole 4–12.5 mm, densely hairy; leaf blade ovate, lanceolate, or rarely oblong, 6.5–21.5 × 3–10 cm, leathery, abaxially densely hairy, adaxially glabrous, secondary veins (8–)14–20 on each side of midvein, base rounded to slightly cordate, apex acute to shortly acuminate. Inflorescence rachides unbranched, internodes short. Pedicel 1.1–2.3 cm; bracteoles 4.5–7.5 × 3.5–9 mm. Sepals ovate, 5–9 × 5–9 mm. Outer petals pale yellow turning dark yellow, lanceolate to oblanceolate, 1.6–2(–3.4) × 0.7–1.8 cm, margin undulate on older flowers; inner petals purple, 1.1–1.3 × 0.6–0.9 cm. Stamens 1.5–1.9 mm. Carpels 6 or 7, 2–2.5 cm; ovules 8–10 per carpel. Fruiting pedicel ca. 1.3 cm; monocarp stipes 1.4–1.8 cm; monocarps obvoid, ca. 3.8 × 2.5 cm, sparsely hairy, smooth, with longitudinal ridge. Seeds ca. 1.2 × 1 cm. Fl. Mar–May, fr. Sep–Oct.

Riverine forests; ca. 800 m. Guangxi, S Guizhou, Hainan, S Yunnan [Laos, Malaysia (peninsular), Vietnam].

Previous workers (e.g., FRPS 30(2): 58. 1979) have confused Mitrephora macclurei with M. teysmannii Scheffer (generally under the synonym M. maingayi J. D. Hooker & Thomson). They are most easily distinguished by the outer petals, which in M. teysmannii are cream-colored with reddish streaks (becoming dark yellow with reddish brown streaks with age) and have undulate margins, whereas in M. macclurei the outer petals are uniformly white (becoming yellow with age) and lack undulate margins. The Chinese material corresponds to M. macclurei. It is cultivated in Guangdong.


云南银钩花 (Pierre) Kuntze; Mitrephora wangii (Pierre) Kuntze; K. tomentosa (J. D. Hooker & Thomson) Kuntze; Mitrephora bousigoni ana (Pierre) Finet & Gagnepain; M. teysmannii Pierre; M. microphylla Craib; M. edwardsii Pierre; M. thoriei Pierre; M. thoriei var. bousigoni ana (Pierre) Finet & Gagnepain; M. teysmannii Pierre; M. teysmannii (Pierre) Finet & Gagnepain; M. wendi fiora Kurz.

Trees to 10 m tall. Branches densely hairy when young. Petiole 6.5–11.5 mm, sparsely hairy; leaf blade oblong-lanceolate, 10.5–24(–27) × 3.5–8 cm, leathery, abaxially sparsely hairy, adaxially glabrous, secondary veins 10–14 on each side of midvein, base cuneate to broadly cuneate, apex shortly acuminate to acuminate. Inflorescence rachides unbranched, internodes short. Pedicel 1.2–1.7 cm; bracteoles 1.5–2 × 1–1.5 mm. Sepals ovate, 3.5–6 × 3.5–4.5 cm. Outer petals white turning yellow, elliptic to ovate, 1.8–2.5 × 1.1–2 cm, margin never undulate; inner petals purple, 1.1–1.3 × 0.6–0.9 cm. Stamens 1.5–1.9 mm. Carpels 7 or 6; carpels 8–10 per carpel. Fruiting pedicel ca. 1.3 cm; monocarp stipes 1.4–1.8 cm; monocarps obvoid, ca. 3.8 × 2.5 cm, sparsely hairy, smooth, with longitudinal ridge. Seeds ca. 0.9 × 1 cm. Fl. Jan–Apr, fr. May–Sep.

Wet and dry evergreen broad-leaved forests; below 100–1200 m. W Guangxi, S Guizhou, Hainan, S Yunnan [Cambodia, India (Assam), Laos, Thailand, Vietnam].

The wood of Mitrephora tomentosa is used for building carts and structural timbers. The bark is a source of saponins and is used as a soap.


山蕉 (J. D. Hooker & Thomson) Kuntze; Mitrephora thoriei var. maingayi (J. D. Hooker & Thomson) Kuntze; Mitrephora teysmannii var. maingayi (J. D. Hooker & Thomson) Kuntze; Mitrephora teysmannii (Pierre) Finet & Gagnepain; M. teysmannii var. microphylla Finet & Gagnepain.

M. teysmannii var. microphylla is listed as Vulnerable (VU A2c) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 6 Oct 2010).

金钩花属 jin gou hua shu
Li Bingtao (李秉滔 Li Ping-tao); Yvonne C. F. Su (许传芳), Richard M. K. Saunders

Trees to 40 m tall, dioecious, monoecious, andro dioecious, or hermaphroditic. Petiole short or absent; leaf blade venation acutely looped near margin. Inflorescences on young branches [rarely on trunks], rhipidial, solitary or in clusters; peduncle short or long; sympodial rachides short or long. Flowers unisexual [or bisexual], pendent. Pedicel short or long, with submedian bracteoles. Sepals 3, valvate, free or basally connate, membranous. Petals 6, in 2 whorls, free, with each whorl valvate; outer petals generally shorter than inner petals, generally without basal claw, membranous; inner petals sometimes with adaxial glands, base generally clawed, apically connivent to form a mitriform dome. Male flowers: stamens 0–7, extrorse, often lobed; sepals broadly ovate, ca. 4 × 4 mm, outside densely tomentulose, inside glabrous. Female flowers: staminodes 0–7, cuneate, extrorse, often with a ring of staminodes; connectives apically truncate. Female flowers: staminodes 7–9; carpels 1–7, free; ovules 1–5 or 6–20 per carpel, in [1 or] 2 series. Fruit apocarpous; monocarps shortly stipitate [or sessile], generally globose [or ellipsoidal], mostly with longitudinal groove, [smooth or] rugose. Seeds smooth or rugose.

About 56 species: tropical and subtropical Asia; one species in China.


金钩花 jin gou hua


Trees to 40 m tall, monoecious. Branches pale gray, densely puberulent when young, glabrescent. Petiole 3–11 mm, very densely puberulent; leaf blade obovate-elliptic to elliptic, 10–23 × 3.5–8.5 cm, thinly leathery, abaxially glossy and sparsely puberulent, secondary veins 6 or 7 on each side of midvein, base broadly cuneate to obtuse, apex acuminate. Inflorescences on young branches, in clusters of 3–6, each 1- or 2-flowered; peduncle inconspicuous; sympodial rachides short. Flowers unisexual. Pedicel 1–3 cm. Sepals ovate, 1–1.5 × 2–2.5 mm. Petals yellow; outer petals ovate, 2–3 × 1.5–3 mm; inner petals clawed-triangular, 5–8 × 3–5.5 mm, basal claw 2.5–5 mm. Male flowers: stamens 46–56. Female flowers: staminodes 7–9; carpels 7–14; ovules 5 or 6 per carpel, in 2 series. Fruiting pedicel 2–3 cm; monocarp stipes 1–1.4 cm; monocarps green, globose, 1.6–2.2 × 1.6–2.1 cm, densely puberulent. Seeds rugose. Fl. Feb–Apr, fr. Apr–Jul.

Evergreen and deciduous broad-leaved forests at base of limestone mountains; 200–700(–1500) m. S Yunnan [Myanmar, Thailand, Vietnam].


木瓣树属 mu ban shu shu
Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

_Xylopicrum_ P. Browne.

Trees [or shrubs]. Flowers axillary, solidary [or fasciculate]. Flower buds lanceolate [to subulate]. Pedicel usually short, bracteolate at apex [or base]. Sepals 3, valvate, thick, connate at base sometimes into a cup-shaped calyx. Petals 6, in 2 whorls, with each whorl valvate, connivent or scarcely open, elongated, thick, woody when dry, inside basally concave, middle narrowly convex; outer petals larger and longer than inner petals. Stamens many; anther locules oblong, extrorse, transversely sejate; connectives 3-angular, apex truncate-dilated. Carpels few to many, free; ovules 2–6 per carpel, sutural; styles elongated; stigmas clavate [capitate, or oblong], extended. Fruit apocarpous; monocarps stipitate, oblong [to elongated], moniliform, often dehiscent. Seeds [1–]3–8[to many] per monocarp, ovoid; aril present but often inconspicuous.

About 160 species: Africa, America, SE Asia; one species in China.

1. XYLOPIA vielana Pierre, Fl. Forest. Cochinch. t. 34. 1881.

木瓣树 mu ban shu

Trees to 20 m tall. Branches dark brown, densely tomentulose when young, glabrescent, densely lenticellate. Petiole 4–8 mm, tomentose to glabrescent; leaf blade elliptic to ovate, 3–7 × 1.2–3 cm, papery, abaxially tomentulose, adaxially appressed pubescent, secondary veins 6 or 7 on each side of midvein, base obtuse to rounded, apex obtuse to shortly acuminate. Inflorescences axillary, 1-flowered. Flower buds lanceolate, with 3 longitudinal ribs. Flower ca. 2 × 0.5–0.8 cm, recurved. Pedicel 2–3 mm, tomentulose, bracteolate at apex. Calyx shallowly 3-lobed; sepals broadly ovate, ca. 4 × 4 mm, outside densely tomentulose, inside glabrous. Outer petals lanceolate, ca. 15 × 3 mm, concave, thick, woody when dry, tomentulose; inner petals linear-lanceolate, ca. 14 × 2 mm, tomentulose, with adaxially elevated central rib. Stamens oblong, ca. 2.5 mm; anther locules transversely sejate; connectives narrowly 3-angular, pubescent. Carpels ca. 4 mm, densely villous; styles slender; stigmas clavate, villous. Monocarp stipes ca. 1.5 cm; monocarps oblong, 2.5–3.5 × 0.8–1 cm. Seeds 3–8 per monocarp, ovoid. Fl. Mar–Jun, fr. Jun–Oct.

Forested slopes; 400–700 m. S Guangxi [Cambodia, N Thailand, Vietnam].

鹿茸木属 lu rong mu shu
Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Shrubs [or trees], with simple hairs. Leaves with closely spaced oblique secondary veins. Inflorescences axillary, 1–3-flowered. Flowers bisexual. Torus conic. Sepals 3, valvate, united at base. Petals 6, in 2 whorls, with each whorl valvate, flat; outer petals slightly longer than or ± as long as inner. Stamens many; anther locules cuneate; connectives apically rhomboidal. Carpels 2–7(–12), sessile, villous; ovules several per carpel, in 2 series; stigmas sessile, subcapitate. Fruit apocarpous; monocarps 1–3[–5], usually sessile, ovoid [oblong or ellipsoid]. Seeds [several to] many per monocarp.

About nine species: S and SE Asia; one species (endemic) in China.


鹿茸木 lu rong mu

Shrubs to 3 m tall. Bark dark gray. Branches densely villous when young, glabrescent. Petiole 2–3 mm, villous; leaf blade oblong to elliptic, 6–18 × 2.5–5.5 cm, membranous, abaxially glaucous and villous, adaxially glossy and glabrous except for pubescent midvein, midvein adaxially impressed, secondary veins ca. 10 on each side of midvein and prominent on both surfaces, base rounded to sometimes shallowly cordate, apex acuminate. Flowers axillary, reportedly light red. Fruiting pedicel much longer than monocarps. Monocarps 1–3, sessile, ovoid, 1.8–3 × 1–1.5 cm, obscurely moniliform, very shallowly transversely constricted between seed, densely tomentose, base rounded, apex apiculate. Seeds 10 per monocarp, in 2 series. Fl. Jul, fr. Jul–Aug.

● Open woodland in valleys; ca. 600 m. Hainan.

Flowers are needed to confirm the generic placement of this taxon. The Annonaceae Checklist (Rainer & Chatrou, eds., AnnonBase in Species 2010 & ITIS Catalogue of Life; http://herbarium.botanik.univie.ac.at/annonaceae/listTax.php; accessed on 1 Oct 2010) suggests that it might be better placed within Pseuduvaria or Mitrephora. Meiogyne kwangtungensis is only known from the type collection, which is in fruit although the protologue does report the flower color to be light red.


蕉木属 jiao mu shu
Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Trees, with simple hairs. Inflorescences axillary or superaxillary, 1- or 2-flowered. Flowers bisexual. Pedicel short, bracteolate at base. Sepals 3, valvate, connate at base. Petals 6, in 2 whorls, with each whorl valvate, subequal but inner petals narrower than outer petals, thick and fleshy to leathery when dry, inside basally concave to cucullate. Stamens many; anther locules oblong-obovoid; connectives broad and thickened, apex truncate to subtruncate. Carpels 2–12; ovules 6–10 per carpel, in 2 series; styles subsessile; stigmas large, erect, base constricted, apex entire. Fruit apocarpous; monocarps stipitate, slightly constricted between seeds, rust-colored tomentulose. Seeds many per monocarp, in 2 series.

● One species: China.

The IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 6 Oct 2010) treats the only member of this genus, Chieniodendron hainanense (under the name Oncodostigma hainanense), as Endangered (EN A2c).

Heusden (Blumea 38: 492–494. 1994) includes Chieniodendron within Meiogyne.


蕉木 jiao mu

Fissistigma hainanense Merrill, J. Arnold Arbor. 6: 131. 1925; Desmos hainanensis (Merrill) Merrill & Chun; F. maculatae Merrill (1923), not Merrill (1922); Meiogyne hainanensis (Merrill) Bân; Oncodostigma hainanense (Merrill) Tsiang & P. T. Li.

Trees to 16 m tall, evergreen, d.b.h. to 50 cm. Branchlets, bracteoles, pedicels, outer petals on both surfaces, inner petals outside, and fruit rust-colored pubescent. Petiole 4–5 mm, pubescent; leaf blade oblong to oblong-lanceolate, (4–)6–10(–16) × (1.5–)2–3.5(–5) cm, thinly papery, drying brown or brownish green, glabrous except for veins, midvein adaxially impressed, secondary veins 6–10 on each side of midvein, base rounded, apex shortly acuminate. Bracts ovate, 2–4 mm. Flowers ca. 1.5 cm in diam. Pedicel 6–7 mm; bracteoles ovate, 2–4 mm. Bud globose. Sepals ovate-triangular, 4–5 mm. Petals yellowish green; outer petals oblong-ovate, 1.4–1.7 × 1–1.1 cm; inner petals slightly thicker and shorter, ca. 1.4 × 0.8–0.9 cm, cucullate, inside basally concave and glabrous. Stamens ca. 2 mm. Carpels oblong, densely villous; stigmas clavate, erect, apex entire and puberulent. Monocarps to 8, shortly stipitate, ellipsoid, cylindrical, or obovoid, 2–5 × 2–2.5 cm, constricted between seeds, longitudinally ridged on one side. Seeds 6–10 per monocarp, pale yellowish brown, obliquely quadrate. Fl. Apr–Dec, fr. Aug–Mar.

● Dense forest in valleys; 300–600 m. S Guangxi, Hainan.

暗罗属 an luo shu

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Trees or shrubs. Inflorescences axillary, internodal, or leaf-opposed, sessile or shortly pedunculate, 1- to many flowered. Flowers usually bisexual. Sepals 3, usually small, valvate or rarely subimbricate in bud, free. Petals 6, in 2 whorls, free, valvate or rarely subimbricate in bud, subequal, flat and spreading; inner petals sometimes slightly larger or smaller than outer, concave and arched over stamens. Stamens usually many; anther locules cuneate; connectives apically orbicular or rhomboidal, concealing anther locules, apex flat-topped or slightly convex. Carpels rather few to many, free; ovules 1 or 2(or 3) per carpel, basal or sutureal; styles absent, very short, or long; stigmas mostly dilated. Fruit apocarpous; monocarps few to many, short to long stipitate, mostly globose or ovoid, fleshy. Seeds 1 or 2(or 3) per monocarp, with a longitudinal circumferential groove.

About 120 species: Old World tropics from Africa to the W Pacific, with the center of distribution in SE Asia; 17 species (six endemic, one introduced) in China.

Molecular data (Mols et al., Amer. J. Bot. 91: 590–600. 2004) have shown that Polyalthia as traditionally delineated is polyphyletic and will eventually have to be divided among several genera.

Key to flowering material

1a. Inner petals 0.2–1 cm.

2a. Petals 6–9 cm .......................................................... 8. P. cerasoides

2b. Petals 2–2.5 mm.

3a. Leaf blade leathery, glabrous; carpels at least partly hairy ............................................. 9. P. littoralis

3b. Leaf blade membranous to papery, adaxially minutely hairy along midrib; carpels glabrous or pubescent.

4a. Inner petals ca. 3.5 mm; carpels ca. 7, glabrous .................................................. 10. P. florulenta

4b. Inner petals ca. 10 mm; carpels many, pubescent.

5a. Leaf blade 5–11 × 2–4 cm, secondary veins inconspicuous; stigmas glabrous .................. 12. P. suberosa

5b. Leaf blade 13.5–24 × 4–5 cm, secondary veins raised; stigmas villous ......................... 15. P. lancilimba

1b. Inner petals (1–)1.3–9 cm.

6a. Petals 6–9 cm.

7a. Sepals ca. 12 mm ............................................................................................................. 2. P. litseifolia

7b. Sepals 3–5 mm ................................................................................................. 17. P. liukiuensis

6b. Petals (1–)1.3–5.5 cm.

8a. Petals 0.6–3 cm wide.

9a. Leaf blade secondary veins 24–28 on each side of midvein .............................................. 7. P. pingpienensis

9b. Leaf blade secondary veins 7–18 on each side of midvein.

10a. Petiole puberulent; leaf blade secondary veins 7–10 on each side of midvein; inflorescences several flowered; petals 2–3.5 × 1–1.5 cm .......................................................... 11. P. laui

10b. Petiole glabrous; leaf blade secondary veins 14–18 on each side of midvein; inflorescences 1-flowered; petals 3–5.5 × 1.5–3 cm ................................................................. 16. P. rumpphi

8b. Petals 0.2–0.5 cm wide.

11a. Pedicel 1–1.8 cm; petals white, 1–1.3 cm ...................................................... 14. P. obliqua

11b. Pedicel 2–4 cm; petals green to yellow, 1.3–3.8(–5) cm.

12a. Leaf blade margin undulate, secondary veins 18–24 on each side of midvein ............. 13. P. longifolia

12b. Leaf blade margin not undulate, secondary veins 13–20 on each side of midvein.

13a. Petals densely minutely hairy, to 3.8(–5) cm .................................................. 4. P. fragrans

13b. Petals glabrous or only very sparsely hairy on inside, 1.3–3.5 cm.

14a. Leaf blade with pellucid dots; ovaries pubescent and with 1 basal ovule ............... 5. P. similium

14b. Leaf blade without pellucid dots; ovaries glabrous and with 2 ovules.

15a. Branches and leaf midvein and secondary veins pubescent; leaf blade 18–28 × 5–8.5 cm, smooth; petals ca. 3 cm ......................................................... 6. P. viridis

15b. Branches and leaf midvein and secondary veins glabrous; leaf blade 9–17 × 2.5–5 cm; petals ca. 1.3 cm.

16a. Leaf blade membranous, densely verrucate, secondary veins 15–18 on each side of midvein, apex acuminate .................................................... 1. P. verrucipes

16b. Leaf blade thinly papery, not verrucate, secondary veins 8–10 on each side of midvein, apex caudate ......................... 3. P. chinensis
Key to fruiting material (not seen for P. lancilimba)

1a. Monocarps 0.5–0.8 cm, spherical.

2a. Monocarp stipes 1.5–2 cm ................................................................. 8. P. cerasoideae

2b. Monocarp stipes 0.3–1 cm.

3a. Monocarps to 7, stipes 3–4.5 mm .......................................................... 10. P. florulenta

3b. Monocarps to 18, stipes 8–10 mm ...................................................... 12. P. suberosa

1b. Monocarps 1–5 cm, globose, ovoid, or cylindric.

4a. Monocarps ovoid or cylindrical, smooth or more coarsely verrucose.

5a. Monocarps 1–1.5 cm.

6a. Leaf blade secondary veins 24–28 on each side of midvein, parallel .................................. 7. P. pingpienensis

6b. Leaf blade secondary veins 7–13 on each side of midvein, acuminate ascending.

7a. Monocarp stipes 0.2–0.5 cm ............................................................... 9. P. litiiformis

7b. Monocarp stipes 1–7 cm .................................................................. 16. P. ruphii

5b. Monocarps 1.7–5 cm.

8a. Young stems glabrous.

9a. Pedicel 0.5–0.7 cm; petals ca. 1.3 cm; monocarp stipes 0.5–0.7 cm.

10a. Leaf blade membranous, densely verrucate, secondary veins 15–18 on each side of midvein, apex acuminate .................................................. 1. P. verrucipes

10b. Leaf blade thinly papery, not verrucate, secondary veins 8–10 on each side of midvein, apex caudate .......................................................... 3. P. chinensis

9b. Pedicel 2–3.5 cm; petals 2.2–9 cm; monocarp stipes 1–7 cm.

11a. Leaf blade secondary veins 10–16 on each side of midvein ................................. 2. P. litseifolia

11b. Leaf blade secondary veins 8 or 9 on each side of midvein ........................................ 17. P. linquinensis

8b. Young stems hoary or minutely hairy.

12a. Monocarp stipes 1–2 cm .................................................................. 13. P. longifolia

12b. Monocarp stipes 2.5–5 cm.

13a. Young branches hoary; monocarps hoary .............................................. 4. P. fragrans

13b. Young branches pubescent or puberulent; monocarps glabrous.

14a. Leaf blade with pellucid dots, membranous to papery ........................................ 5. P. simiarum

14b. Leaf blade without pellucid dots, thinly leathery to leathery.

15a. Leaf blade 18–28 cm, secondary veins pubescent ...................................... 6. P. viridis

15b. Leaf blade 8–20 cm, secondary veins glabrous .......................................... 11. P. laui


疣叶暗罗 you ye an luo

Trees to 12 m tall. Branches grayish black, glabrous. Petiole 3–7 mm, with transverse striations; leaf blade oblong to oblong-lanceolate, 10–17 × 2.5–5 cm, membranous, both surfaces glabrous and densely verrucate, midvein abaxially elevated and adaxially flat, secondary veins 15–18 on each side of midvein, delicate, and prominent on both surfaces, base broadly cuneate to obtuse, apex acuminate. Inflorescences axillary, 1- or 2-flowered. Pedicel 5–7 mm; bracteoles at middle and base, ovate to semiobovate. Sepals orbicular to broadly ovate, apex rounded. Petals yellowish, linear-lanceolate, ca. 13 × 2–3 mm, membranous, glabrous; outer petals larger than inner petals. Stamens numerous; connectives slightly convex. Carpels 10–16, oblong, glabrous; ovary with 2 basal ovules; stigma ovoid. Fruiting pedicel 5–7 × ca. 3 mm; monocarp stipes 5–8 mm, verrucate; monocarps ovoid, 2.2–5.1 × 1–1.5 cm, glabrous. Seed 1 per monocarp, yellowish, ovoid, 18–20 × 8–11 mm. Fr. Apr–Jul.

- Densely forested slopes; 1000–1900 m. S Yunnan.

Polyalthia verrucipes is listed as Endangered (EN A2c) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 7 Oct 2010).

X. L. Hou and P. T. Li (Acta Phytotax. Sin. 45: 369. 2007) included Polyalthia chinensis within P. verrucipes, but this is no longer accepted.


木姜叶暗罗 mu jiang ye an luo

Trees to 40 m tall. Bark grayish brown. Branches brown, glabrous. Petiole 6–10 mm, adaxially furrowed, glabrous, [with axillary bud at base]; leaf blade elliptic to broadly elliptic, 9–20 × 4.5–8 cm, membranous to subleathery, both surfaces glabrous and densely papillose, secondary veins 10–16 on each side of midvein, reticulate veins elevated on both surfaces, base rounded to broadly cuneate, apex shortly acuminate to obtuse. Inflorescences axillary, 1-flowered. Pedicel 2–3.5 cm, glabrous. Sepals triangular-lanceolate, ca. 12 mm, outside puberulent, inside glabrous. Petals broadly linear, 6–9 × 0.7–1.1 cm, subequal, glabrous, margin slightly revolute, with a midrib and 2–4 parallel secondary veins. Stamens many, ca. 1.5 mm; connectives apically truncate. Carpels 5 or 6, glabrous; ovules 3 per carpel; stigmas clavate, puberulent. Monocarp stipes 1–3 cm; monocarps oblong to ovoid, 3.5–5 × 2.5 cm, constricted between seeds, glabrous, verrucose. Seeds 3 per monocarp. Fl. Apr–Jul, fr. May–Sep.

- Sparsely forested slopes, moist valleys; ca. 600 m. S Yunnan.
ANONACEAE

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Montane forests; ca. 1000 m. SE Xizang (Médog).


Trees to 10 m tall. Bark grayish white. Branches gray, with many lenticellate and irregular stripes. Petiole ca. 5 mm; leaf blade oblong-elliptic to obovate-lanceolate, 9–13 × 2.5–3.8 cm, thinly papery, glabrous, adaxially glossy, secondary veins 8–10 on each side of midvein, reticulate veins abaxially slightly elevated, base cuneate to broadly cuneate, apex cuneate. Inflorescences axillary, 1- or 2-flowered. Pedicel ca. 7 mm; bracteoles at middle and base, semiornicular to ovate. Sepals many, oblong, glabrous; stigma slightly oblique. Carpels many, oblong, glabrous; stigma slightly oblique. Carpels each with 2 ovules. Fruit not seen. Fl. Aug.


Trees to 18 m tall. Branches hoary when young. Petiole 1–1.8 cm; leaf blade ovate-oblong to oblong-lanceolate, 10–24 × 5–12.5 cm, membranous, abaxially minutely puberulent on major veins but glabrescent, adaxially glabrous or puberulent, secondary veins 14–16 on each side of midvein, oblique, close-set, parallel, and abaxially very prominent, reticulate veins inconspicuous, base rounded, apex rounded to long acuminate. Inflorescences in axils of fallen leaves or on woody tubercles on branches, cymose, pedunculate, few to many flowered, hoary-tomentose. Flowers fragrant. Pedicel to 2.5 cm, slender; bracteoles inserted below middle of pedicel, orbicular. Sepals orbicular, ca. 3 mm in diam., recurved at anthesis, outside densely felted puberulent. Petals greenish yellow to pale yellow, linear, 3.8(–5) × ca. 0.5 cm, subequal, densely minutely hairy. Stamens many; connectives apically truncate. Carpels many, hairy. Fruiting pedicel to 3.5 cm; monocharp stipes to 5 cm, densely pubescent; monocharps broadly ovoid, 2.5–4 cm, walls thin and brittle, surface hoary. Seed 1 per monocharp. Fl. Apr–May, fr. Jun–Aug.

Forested slopes; ca. 700 m. S Yunnan [India].


Trees to 25 m tall. Bark grayish white. Branches puberulent when young, glabrous and sparsely lenticellate with age. Petiole 5–10 mm, robust; leaf blade ovate-oblong, oblong, lanceolate, or oblong-lanceolate, 9–28 × 3.5–12.5 cm, membranous to papery, hyalopunctate, glabrous or puberulent only on midvein, secondary veins 13–20 on each side of midvein, oblique, close-set, parallel, and prominent on both surfaces, base rounded to broadly cuneate and sometimes oblique, apex acuminate, shortly acuminate, or obtuse. Inflorescences axillary or on older or short branches, 1- to several flowered; bracts ovate, tomentulose. Pedicel obovoid, 2.5–4 cm, tomentulose, bracteolate near base to middle. Sepals ovate-triangular, ca. 5 × 5 mm, outside pubescent, inside glabrous. Petals yellowish green; outer petals longer than inner petals; inner petals linear-lanceolate to linear, 1.5–3.5 × 0.3–0.4 cm, outside puberulent, inside glabrous. Stamens oblong; connectives apically broadly truncate to convex. Carpels oblong, pubescent; ovule 1 per carpel, basal; stigmas capitate, puberulent. Fruiting pedicel 2–3 cm; monocharp stipes 3–3.5 cm, glabrous; monocharps ovoid to ovoid-ellipsoid, 2.5–3 × 1.2–1.7 cm, glabrous. Seed 1 per monocharp. Fl. Apr–Sep, fr. Jul–Dec. 2n = 14.

Forested slopes; 500–1200 m. S and SW Yunnan [Bhutan, Cambodia, India, Laos, Myanmar, C and N Thailand, Vietnam].


Trees to 15 m tall. Branches tawny pubescent when young, gray lenticellate with age. Petiole ca. 1 cm, robust, transversely striate, tawny pubescent; leaf blade oblong to elliptic-oblong, 18–28 × 5–8.5 cm, thinly leathery, glabrous except for pubescent midvein and secondary veins, secondary veins 15–18 on each side of midvein, prominent on both surfaces and pubescent, base truncate, shallowly cordate, or sometimes rounded, apex acute. Inflorescences axillary, several flowered. Pedicel ca. 2.5 cm, pubescent. Sepals broadly ovate, 3.5–4 mm, outside pubescent, inside glabrous. Petals green, linear-oblong, ca. 3 cm × 4 mm, glabrous. Ovules 2 per carpel. Fruiting pedicel 2–7 cm, robust; monocharp stipes 3–5 cm, glabrous; monocharps oblong-ellipsoid, 2.5–4 × ca. 1.8 cm, glabrous. Seed 1 per monocharp. Fl. Apr–Jul, fr. Aug–Feb.

Densely forested slopes; 600–1100 m. S and SW Yunnan [Thailand].
of midvein, closely parallel, and prominent on both surfaces, base attenuate to obtuse, apex shortly acuminate. Inflorescences axillary or terminal, 1- or 2-flowered. Flowers ca. 3 cm in diam. Pedicel ca. 2.5 cm, puberulent or glabrous. Sepals broadly ovate, ca. 1.3 × 1.5 cm, outside puberulent, inside glabrous. Petals elliptic to ovate, 2.5–3.5 × ca. 1.6 cm, outside puberulent, inside glabrous; inner petals oblong, 2.2–2.7 × ca. 0.9 cm. Stamens oblong-cuneate, ca. 4 mm; connectives apically rounded, puberulent. Carpels many, oblong, ca. 2.5 mm, villous; ovule 1 per carpel, basal; stigmas capitate. Fruiting pedicel ca. 4 cm; monocarp stipes 2–4 cm, glabrous; monocarps purple, ellipsoid, ca. 1.5 × 1 mm, apex mucronate. Fl. May, Fr. Oct.

- Densely forested slopes; 1000–1500 m. S Yunnan.

*Polyalthia pingpienensis* is listed as Endangered (EN A2c) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 7 Oct 2010). The epithet has been given incorrectly as "pingpienensis" in some standard indices.


细基丸 xi ji wan

*Uvaria cerasoides* Roxburgh, Pl. Coromandel 1: 30. 1795; *Polyalthia cerasoides* Merrill.

Trees to 20 m tall. Bark grayish brown. Branchlets densely pubescent, glabrescent, lenticellate with age. Petiole 2–3 mm, sparsely hispid; leaf blade oblong, oblong-lanceolate, or sometimes elliptic, 6–19 × 2.5–6 cm, abaxially yellowish and pubescent, adaxially often bluish green when dry and glabrous except for minutely hairy midvein, secondary veins 7 or 8 on each side of midvein, base broadly cuneate to rounded, apex obtuse. Inflorescences axillary, 1-flowered. Flowers 1–2 cm in diam. Pedicel 1–2 cm, puberulent, with 1 or 2 leafy bracteoles below middle. Sepals oblong-ovate, 8–9 mm, outside pilose, apex acuminate. Petals green but black when dry, subequal or inner petals shorter than outer petals, oblong-ovate, 8–9 mm, thickly leathery, puberulent. Stamens cuneate; connectives apically truncate. Carpels oblong, pubescent; ovule 1 per carpel; stigmas ovoid, apex entire. Monocarp stipes 1.5–2 cm, weak; monocarps red but black when dry, ovoid to subglobose, ca. 6 mm in diam., glabrous. Fl. Mar–May, fr. Apr–Nov. 2n = 18.

Sparsely forested slopes; 100–1000 m. Guangdong, Guangxi, Hainan, Yunnan [Indonesia, Thailand, Vietnam].

A fine strong bast fiber obtained from the inner bark of *Polyalthia cerasoides* is used to make rope and sacks. The wood is used for farming tools and structural timbers. The flowers are very fragrant and are sometimes collected as a perfume.


陵水暗罗 ling shui an luo

*Guatteria littoralis* Blume, Fl. Javae, Annonaceae, 99. 1830; *Polyalthia zhui* X. L. Hou & S. J. Li.

Shrubs or small trees, to 5 m tall. Branchlets dark purple, striate, appressed grayish yellow pubescent, soon glabrous. Petiole yellowish, 3–5 mm, puberulent; leaf blade oblong to oblong-lanceolate, 9–19 × 2–6 cm, leathery, glabrous, abaxially glossy pale green, adaxially dark green, often bluish green when dry, secondary veins 8–10 on each side of midvein, at 60°–80° to midrib, arcuately ascending, and anastomosing 3–5 mm from margin, base cuneate to rounded, apex acuminate to bluntly acute. Inflorescences leaf-opposed, 1- or 2-flowered; peduncle ca. 1 mm. Flowers 1–2 cm in diam. Pedicel to ca. 3 mm, pubescent; bracteole 1, broadly ovate, 1–2 × ca. 2 mm, apex acuminate. Sepals triangular, ca. 2 mm, outside pubescent, apex acute. Petals white, oblong-elliptic, 6–8 mm, spreading, subequal or inner petals slightly shorter than outer petals, slightly thick, outside pubescent, apex acute to obtuse. Stamens many; connectives apically truncate, puberulent. Carpels 7–11(–30), puberulent; ovule 1 per carpel, basal; stigmas obovate, shortly 2-cleft. Monocarp stipes 2–5 mm, puberulent; monocarps 4–7(–11), red but purplish red when dried, ovoid-ellipsoid, 1–1.5 × 0.8–1 cm, glabrous, densely minutely dotted. Seed 1 per monocarp, red, ellipsoid, 10–12 × 6–8 mm. Fl. Apr–Jul, fr. Jul–Feb. 2n = 36.

- Forested slopes, margins of wet forests, along small streams; 100–800 m. Guangdong, Guangxi, Hainan, Yunnan [Indonesia, Thailand, Vietnam].

Molecular data (Mols et al., Amer. J. Bot. 91: 598. 2004) suggest that *Polyalthia littoralis* and related species are more closely related to the genus *Marsypopetalum* Scheffer rather than *Polyalthia* s.s. "Polyalthia caloneura," proposed but not validly published by X. L. Hou (http://www.abelunwen.com/lunwen-free-387600/; accessed on 25 Nov 2010), belongs here. *Polyalthia zhui* was based on material with immature flowers.


小花暗罗 xiao hua an luo

Shrubs ca. 2 m tall. Branchlets pubescent when young, glabrescent. Petiole 2–4 mm, pubescent; leaf blade oblong-lanceolate to oblongate, 5–14.5 × 2.3–4 cm, membranous, abaxially puberulent, adaxially glabrous except for minutely hairy midvein, secondary veins 10–13 on each side of midvein, obliquely ascending, and anastomosing near margin, base broadly cuneate, apex obtuse to acuminate. Inflorescences leaf-opposed, 1-flowered. Flowers ca. 0.4 cm in diam. Pedicel 1–10 mm, pubescent; bracteoles 2 at middle of pedicel, ovate-lanceolate, ca. 3.5 × 1 mm, abaxially pubescent, adaxially glabrous. Sepals ovate, ca. 2 × 2 mm, outside pubescent, inside glabrous. Petals yellowish green; outer petals ovate-lanceolate, ca. 2.5 × 1.5 mm, concave, outside pubescent, inside glabrous; inner petals ovate, ca. 3.5 × 2 mm, flat. Stamens cuneate, ca. 0.5 mm; connectives apically truncate, puberulent. Carpels ca. 7, oblong, ca. 0.8 mm, glabrous; ovule 1 per carpel, basal. Fruiting pedicel 1–1.5 cm; monocarp stipes 3–5 mm, pubescent; monocarps to 7, red, globose, ca. 8 mm in diam., glabrous. Fl. Dec–Feb, fr. Jun–Aug.

- Forested slopes; 1100–1400 m. S and W Yunnan.


海南暗罗 hai nan an luo

Trees to 25 m tall, d.b.h. to 40 cm. Bark gray. Branches pubescent when young, glabrescent. Petiole 5–8 mm, trans-
versely rugosely striate, puberulent; leaf blade oblong to oblong-elliptic, 8–20 × 3.5–8 cm, thinly leathery to leathery, glabrous, adaxially shiny, secondary veins 14–18 on each side of midvein, parallel, ascending to margin, and adaxially conspicuously, base broadly cuneate to rounded, apex acuminate. Inflorescences axillary or on old branches, several flowered. Pedicel 1.5–3 cm, puberulent; bracteoles at base of pedicel, broadly ovate. Sepals broadly ovate, ca. 5 × 5 mm, outside puberulent, inside glabrous, apex obtuse to acute. Petals yellowish, oblong-ovate to ovate-lanceolate, 2–3.5 × 1–1.5 cm, outside puberulent or glabrous, inside glabrous; inner petals slightly longer than outer petals. Stamens cuneate; connectives apically obtuse. Carpels many, oblong, densely pubescent; ovule 1 per carpel, basal; stigmas capitately. 


长叶暗罗 chang ye an luo

Uvaria longifolia Sonnerat, Voy. Indes Orient. 2: 260. 1782; Guatteria longifolia (Sonnerat) Wallch; Unona longifolia (Sonnerat) Dunal.

Trees to 20 m tall; trunk straight. Branches finely striate, minutely puberulent when young, soon glabrous. Petiole 5–10 mm; leaf blade ovate-oblong to ovate-lanceolate, 11–31 × 2.5–8 cm, stiffly membranous to thinly leathery, glabrous, abaxially pale, adaxially dark glossy green, secondary veins 18–24 on each side of midvein, reticulate veins raised on both surfaces, base cuneate, obtuse, or rounded, margin undulate, apex acuminate. Inflorescences axillary, fasciculate and shortly pedunculate, racemose, or umbelliform and sessile, mostly many flowered; peduncle to 0.7–1.5 cm; rachis to 1 cm. Pedicel 2–4 cm; bracteoles usually 1, at middle of petiole, to 1 mm, tomentose. Sepals ovate-triangular, 1.5–3 × 1.5–1.8 mm, outside tomentose, inside glabrous. Petals greenish yellow, narrowly triangular-lanceolate, 1.3–1.5 × 0.2–0.4 cm, subequally spreading, inside puberulent except basally, base broad, apex acute. Stamens 8–10 cm; connectives apically convex. Carpels 20–25, ca. 1.5 mm, apex tomentose; ovule 1 per carpel; stigmas sessile, rectangular to oblong, pubescent, with a groove on inner side and continuing down inner side of ovary. Monocarp stipes 1–2 cm; monocarps 4–8, purple, ovoid, 2.5–5 × ca. 1.5 cm, glabrous. Seed pale brown, ovoid, ca. 2 × 1.4 cm, usually with a longitudinal groove. Fl. May–Jun, fr. Jul–Sep. 2n = 18.

Cultivated; 300–400 m. Hainan, Taiwan, Yunnan [native to India and Sri Lanka].

Polyalthia longifolia is grown for its wood and as an ornamental throughout SE Asia.


沙煲暗罗 sha bao an luo

Polyalthia consanguinea Merrill.

Trees to 12 m tall. Bark dark gray. Branchlets reddish, minutely rust-colored pubescent, soon glabrous, with many lenticels when young. Petiole 3–5 mm, swollen, puberulent; leaf blade oblong-lanceolate to oblanceolate, 10–20 × 2.5–7 cm, thinly leathery to papery, abaxially dull, drying silvery green, and pubescent along midvein, adaxially glabrous and shiny, secondary veins 10–14 on each side of midvein, curving, forming a wide angle with midvein, anastomosing doubly, and adaxially flat, base narrowed and sometimes inequilateral, margin slightly revolute, apex bluntly acuminate. Inflorescences axillary, sometimes formed after leaf fall, 1–3-flowered. Pedicel 1–1.8 cm, pubescent; bracteoles 2 or 3, minute, 2 basal and other medial on pedicel. Sepals ovate-triangular, 2–3 mm, outside pubescent, inside glabrous, apex slightly obtuse. Petals white, oblong, 10–13 × 3–4.5 mm, subequally spread, outside pubescent, inside glabrous and rough, margins revolute, apex slightly obtuse. Stamens ca. 1 mm; connectives apically flat-topped to

Open forests at lower elevations. S Guangdong, S Guangxi, Hainan [India, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].
convex, pubescent. Carpels ovate-oblong, ca. 1.5 mm, pubescent; ovules 2 per carpel; stigmas ovoid, pubescent. Monocarp stipes 0.7–2 cm; monocarps reddish brown, globose, 1–2 cm in diam., thinly walled, glabrous, densely minutely verrucate. Seeds 2 per monocarp, verrucose. Fl. Jan–Apr, fr. Jun–Dec.

Woodlands at middle elevations. Hainan [Malaysia].


剑叶暗罗 jian ye an luo

Trees. Bark gray. Branchlets puberulent, glabrescent. Petiole 2–3 mm, pubescent; leaf blade oblong-lanceolate to oblong-elliptical, 13.5–24 × 4–5 cm, papery, abaxially pubescent along midvein, adaxially glabrous, secondary veins 10–13 on each side of midvein, adaxially flat, base broadly cuneate, apex acuminate to shortly acuminate. Inflorescences axillary, 1- or 2-flowered; peduncle short. Pedicel 5–10 mm, pubescent, bracteolate at base. Sepals broadly ovate, ca. 2 × 3 mm, outside puberulent, inside glabrous. Petals oblong, 6–10 × 2.5–4 mm, all similar and almost equal in length, leathery, outside pubescent, inside glabrous, apex obtuse. Stamens ovate-cuneate; connectives apically broadly truncate, puberulent. Carpels many, ovate-oblong, villous; ovules 2 per carpel, sutural; stigmas sessile, capitate, villous. Fruit not seen. Fl. Apr–May, fr. Jun–Aug.

● Forested slopes; ca. 200 m. SE Yunnan (Hekou).

Polyalthia lancilimba is listed as Critically Endangered (CR B1ab(i,ii,v)) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 7 Oct 2010).


香花暗罗 xiang hua an luo

Guatteria rumphii Blume ex Henschel, Vita Rumphii, 153. 1833; G. jenkinsii J. D. Hooker & Thomson; Polyalthia jenkinsii (J. D. Hooker & Thomson) J. D. Hooker & Thomson.

Trees to 15 m tall. Branches minutely rust-colored pubescent when young, soon glabrous. Petiole 5–12 mm, glabrous; leaf blade oblong-lanceolate, 10–17 × 3–7 cm, papery to leathery, glabrous, adaxially shiny dark green, secondary veins 7–10 on each side of midvein and prominent on both surfaces, base cuneate to rounded and sometimes oblique, apex acuminate. Inflorescences axillary, 1-flowered. Flowers 4–7 cm in diam. Pedicel 1–2 cm, appressed pubescent. Sepals subovate to triangular, 6–15 × 3–8 mm, outside puberulent, apex acute. Petals greenish to yellowish, elliptical, oblong-elliptical, or oblong, 3–5.5 × 1.5–3 cm, thin, puberulent or glabrous, apex obtuse; inner petals slightly shorter than outer petals. Stamens oblong; connectives apically broadly rounded, concealing anther cells. Carpels many, oblong, pubescent; ovule 1 per carpel, basal; stigmas clavate to capitate. Fruiting pedicel ca. 2 cm × 2 mm; monocarp stipes 5–10 × 1 cm, glabrous; monocarps many, ellipsoid, ca. 10 × 5 mm, base rounded, apex acute. Fl. May–Oct, fr. Jul–Apr. 2n = 18.

Forested slopes at lower to middle elevations. Hainan [Indonesia, Malaysia, Philippines, Thailand].


琉球暗罗 liu qiu an luo

Trees to 12 m tall. Branches dark brown, longitudinally reticulately striate when dried, glabrous. Petiole dark; leaf blade oblong-elliptical, 14–17 × 7–9 cm, thinly leathery, glabrous, midvein abaxially raised and adaxially flat, secondary veins 8 or 9, at ca. 45° to midrib, and then arcuately ascending, reticulate veins elevated on both surfaces, base rounded, apex acuminate. Inflorescences axillary, 1–6-flowered; peduncle 1–1.5 cm. Pedicel 2–3 cm; glabrous or sparingly hairless. Sepals rounded-triangular, 3–5 mm. Petals green to yellowish green, narrowly lanceolate, 6–7 cm, subequal. Fruiting pedicule ca. 2 × 0.5 cm; pedicel 2.5–3 cm; monocarps black when mature, ellipsoid, 1.7–2.5 × 1.5–2 cm, longitudinally 2-grooved. Fl. Aug. 2n = 18.

Thickets on coral limestone at low elevations. Taiwan (Lan Yu) [Japan (Ryukyu Islands)].


海岛木属 hai dao mu shu

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert


Shrubs or small trees, indument of simple hairs, sometimes absent. Inflorescences extra-axillary or sometimes leaf-opposed, sometimes fasciculate on woody axes; flowers solitary or paired. Flowers polygamous or bisexual. Flower buds very broadly ovoid to cylindrical. Sepals 3, small, imbricate, free or united at base. Petals 6, in 2 whorls, unequal, each whorl minutely imbricate or valvate, outer petals spreading, inner petals larger, spreading or connivent and concave. Male flowers: torus conical, broadly conical-ovoid, or cylindrical; stamens many; connective apex shieldlike to tongue-shaped, minutely pubescent or glabrous. “Female” flowers: stamens few; carpels many, densely hairy; ovule 1, basal. Styles absent; stigmas ± globose. Bisexual flowers: torus cylindrical; stamens and carpels many. Fruit apocarpos; monocarps 2 to > 20, shortly stipitate, ellipsoid to oblong or ovoid, thin walled, glabrous or pubescent. Seeds solitary, ellipsoid to oblong, smooth, shiny, with circumferential, longitudinal groove.

Four species: Bangladesh, China, India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam; one species in China.

Trivalvaria has not been recognized for China in previous Flora accounts, but see Heusden (Nordic J. Bot. 17: 169–180. 1997).

海島木 hai dao mu

*Guatteria costata* J. D. Hooker & Thomson, Fl. Ind. 1: 143. 1855; *Ellipeia costata* (J. D. Hooker & Thomson) King; *Polyalthia costata* (J. D. Hooker & Thomson) J. D. Hooker & Thomson; *P. nemoralis* Aug. Candolle; *P. oligogyna* Merrill & Chun.

Shrubs or small trees, to 5 m tall. Branches densely to very sparsely pubescent when young, glabrescent. Petiole 2–10 mm, densely pubescent to glabrous; leaf blade ovato-elliptic to (ovate-)oblong, 6–25 × 2–9 cm, membranous to thinly leathery, abaxially sparsely to densely pubescent, adaxially glabrous or rarely pubescent, base cuneate to ± rounded, apex acuminate to cuneate, sometimes rounded, midvein adaxially impressed, lateral veins adaxially faint to indistinct. Inflorescences extra-axillary or sometimes ± leaf-opposed, rarely from old branches, often on woody axis with scars of previous flowers, 1- or 2-flowered; bracts 1 or 2, triangular to ovate, 1.5–3(–5) mm. Flowers polygamous (male and bisexual). Pedicel 2.5–5(–8) mm, pubescent. Buds 2.5–5(–8) mm. Sepals triangular to very broadly ovate, 2.3–3.5 × 1.5–4 mm, outside densely pubescent, apex acuminate to rounded. Petals white to dirty pale yellow, minute

ly imbricate, (obl) lanceolate, narrowly ovate to broadly triangular, 2.8–(8–)1 × 1.4–4.5 mm, spreading outside pubescent, inside glabrous; inner petals ovate to lanceolate, 4.12 × 1–4 mm, apex rounded to bluntly acute. Male flowers: torus conical; stamens many, 1.3–2.6 mm; connective apex shieldlike, sometimes tongue-shaped on outer stamens, glabrous or densely puberulent. Bisexual flowers: torus cylindrical; stamens many; carpels 2–10, densely hairy; stigma pubescent. Fruiting pedicle 3.5–(8) mm; monocarp stipes 1–6 mm; monocarps to 5, sometimes glaucous, ripening red, ellipsoid to oblong, 10–28 × 5–11 mm, sparsely pubescent, verruculose, with circumferential longitudinal groove.

Hainan [India (Andaman Islands), Laos, Malaysia, Myanmar, Thailand, Vietnam].

The Chinese material of *Trivalvaria costata* was included within *Polyalthia nemoralis* (as the synonym *P. oligogyna*) in FRPS (30(2): 87. 1979). “*Polyalthia dubia*” (Kurz, Rep. Veg. Andaman Isl. 29. 1870) belongs here but is a nomen nudum and was therefore not validly published (Vienna Code, Art. 32(1d)); as a result, “*P. dubia* var. *glabrescens*” (Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 43(2): 53. 1874) was also not validly published (Art. 43.1). *Popowia kurzii* King (J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 61(2): 96. 1892) was also applied to this species, but that name was nomenclaturally superfluous (and is therefore illegitimate: Art. 52.1), because the earlier name *Guatteria macrophylla* Blume was cited as a synonym in the protologue.


**异萼花属** yi e hua shu

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

*Enicosanthellum* Bân.

Trees or shrubs, indument of simple or stellate hairs. Petiole often short to absent. Inflorescences terminal or sometimes leaf-opposed, 1–3-flowered. Pedicel slender, pendent, without bracteoles. Sepals 2 or 3, relatively large, valvate, free, eventually ± reflexed. Petals 4–6, in (1 or)2 whorls, ± equal, free [or united into cup, sometimes adnate to torus], sometimes imbricate at tips. Torus usually much wider than high, enclosed in fruit. Stamens many; connective depressed-globose, wider than anther locules. Carpels many; ovules (1 or)2 or 3, lateral. Styles oblong, often hairy at apex. Fruit apocarpous; monocarps usually many, each on long stipelike carpophore articulate at apex, usually ± ellipsoid, fleshy. Seeds usually 2, shiny chestnut-brown, ellipsoid or flattened-ellipsoid.

Nine species: China, Indonesia, Laos, Malaysia, Vietnam; two species in China.

The fruit of *Disepalum* are very distinct because of the different origin of the carpophores bearing the monocarps. In most members of the Annonaceae the monocarps are borne on stipes formed by extension of the monocarps themselves. In *Disepalum* the monocarps are borne on carpophores derived from the torus that differ in color and texture from the monocarps and are abruptly separated from them by an articulation at the apex. The Chinese species had previously been placed in *Polyalthia* or placed in their own genus *Enicosanthellum*. *Disepalum* s.s. has extremely distinctive flowers, but Johnson (Brittonia 41: 356–378. 1989) argues that the very unusual fruit make a good case for including *Enicosanthellum* within *Disepalum*.

1a. Leaf blade with translucent dots, membranous; petals oblong or oblanceolate, 1.3–2.6 × 0.6–1.2 cm; carpels 18–35; carpophores 0.7–1.3 cm ................................................................. 1. *D. petelotii*

1b. Leaf blade without translucent dots, papery to thinly leathery; flowers 5–10 cm in diam.; petals broadly obovate, 2.2–3.4 × 1.2–3 cm; carpels 60–200; carpophores 3–4.7 cm ............................................................. 2. *D. plagioneurum*


窄叶异萼花 zhai ye yi e hua


Shrubs or small trees, 2–7 m tall. Branches dark gray, longitudinally wrinkled, puberulent when young, glabrescent. Petiole 5–7 mm, appressed pubescent; leaf blade narrowly elliptic, oblong, obl :ong-lanceolate, or oblanceolate, 8–20 × 2.4–4.5 cm, membranous and translucent punctate when young, later papery, abaxially golden to rust-colored sericeous but glabrescent or with scattered appressed hairs with age, adaxially shiny green and glabrous, secondary veins 7–13 on each side of mid-
The flowers of Popowia pisocarpa are fragrant and are used as a perfume.
18. ALPHONSEA J. D. Hooker & Thomson, Fl. Ind. 1: 152. 1855.

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Trees or shrubs, glabrous or with simple hairs. Petiole short; leaf blade usually leathery to thinly leathery, shiny. Inflorescences intermodal, leaf-opposed, rarely extra-axillary or axillary, 1-flowered or flowers to 12 forming clusters. Flowers bisexual. Torus cylindrical to hemispheric, hairy. Sepals 3, much smaller than petals, valvate in bud. Petals 6, in 2 whors, basally saccate, apically recurved and valvate in bud; outer petals spreading, as long as inner petals but slightly wider. Stamens many, in several series; connectives produced but not concealing dorsal anther locules, apex apiculate. Carpels 1–8(–15), free; ovules 4–24 per carpel, in 2 series; styles cylindrical, short; stigmas inconspicuously capitulate, with a slit down inner side. Fruit apocarpous; monocarp stipes with thick walls or almost absent; monocarps few, globose or cylindrical, succulent or woody, glabrous, tomentose, or verrucose. Seeds several per monocarp, not separating from fruit wall.

About 23 species: S and SE Asia; six species (four endemic) in China.

1a. Young stems and abaxial leaf surfaces densely villous to tomentose ............................................................ 1. A. mollis

1b. Stems and abaxial leaf surfaces glabrous or obscurely puberulent only along midvein.

2a. Leaf blade apex caudate with a 1–1.7 cm acumen, secondary veins 15–19 on each side of midvein; flowers solitary; monocarp cylindrical ......................................................... 6. A. tsangyuanensis

2b. Leaf blade apex acute to acuminate but without an acumen, secondary veins 9–13 on each side of midvein; flowers fascicled; monocarps ovoid, subglobose, elliptoid, or obovoid.

3a. Peduncle with 4–12 bracts, pedicel with up to 8 persistent bracteoles; monocarp verrucose.

4a. Peduncle with 8–12 bracts; sepals longer than wide, apex acuminate or acute ........................................ 2. A. squamosa

4b. Peduncle with 4 or 5 bracts; sepals shorter than wide, apex rounded ....................................................... 3. A. boniana

3b. Peduncle and fruiting pedicel with not more than 2 bracteoles; monocarp smooth.

5a. Leaf blade adaxially not glossy, glaucous when dry; outer petals glabrous inside; carpel 1, with ca. 22 ovules ........................................................................................................ 4. A. monogyna

5b. Leaf blade adaxially glossy, yellowish green when dry; outer petals pubescent inside; carpels 3–5, with 10–12 ovules per carpel ................................................................. 5. A. hainanensis


Trees to 20 m tall, evergreen, d.b.h. to 40 cm. Bark grayish brown, bast reddish. Branches densely tomentose when young, glabrescent. Petiole 2–3 mm, pubescent; leaf blade elliptic to ovate-oblong, 6–12 × 2.5–5.6 cm, papery, abaxially villous, adaxially glabrous except for puberulent area along midvein, secondary veins ca. 10 on each side of midvein and slender, reticulate veins conspicuous, base obtuse to rounded, apex shortly acuminate. Inflorescences 1- or 2-flowered. Pedicel 1–2 cm, pubescent, bracteolate. Sepals triangular, ca. 1 × 1 mm. Petals yellowish white; outer petals ca. 11 × 7 mm, outside tomentose, inside glabrescent, apex recurved; inner petals slightly shorter than outer petals. Stamens many; anthers ovoid; connectives apically acute. Carpels 3, tomentose. Monocarps 1 or 2, yellow when ripe, ovoid to ellipsoid, 2–4 × 1.5–2.5 cm, fulvous tomentose. Seeds several per monocarp, grayish brown, orbicular and flat, 1–1.5 cm in diam. Fl. Mar–May, fr. Jun–Aug.

- Evergreen broad-leaved forests on slopes; 600–1000 m. Guangdong, SW Guangxi, Hainan, Yunnan.

The fruit of Alphonsea mollis are edible when ripe. The wood is used for the construction of carts, agricultural implements, etc.


Trees to 5 m tall. Bark grayish white. Branches pubescent when young, glabrous and lenticellate with age. Petiole 3–4 mm, transversely striate, puberulent or glabrescent; leaf blade elliptic, ovate, or sometimes oblong-elliptic, 4.5–11.5 × 2–4.5 cm, papery, puberulent or glabrous, midvein adaxially impressed, secondary veins 10–13 on each side of midvein and adaxially flat, base rounded, apex shortly acuminate to acute. Inflorescences superaxillary, 1- or 2-flowered; peduncle ca. 6 mm; bracts 11 or 12. Pedicel ca. 1 cm, with 7 or 8 persistent bracteoles. Sepals triangular, ca. 3 × 2 mm, outside pubescent, inside glabrous, apex acuminate or acute. Outer petals ovate, ca. 7 × 5 mm; inner petals slightly smaller than outer petals. Stamens ovoid; connectives apically acute. Carpels 1–5, ovoid-oblong, pubescent; ovules ca. 10 per carpel, in 2 series; stigmas subglobose, glabrous, apex 2-cleft. Fruiting pedicel ca. 1.3 cm, with 7 or 8 bracteoles; monocarps 1–5, ovoid to subglobose, 2–2.5 × 1.2–2 cm, densely pubescent. Fl. Mar–Jun, fr. Jun–Sep.

Forest slopes, usually in ravines; 1500–2300 m. Guangxi, Yunnan [Vietnam].

Alphonsea squamosa was treated as a synonym of the following species, A. boniana, by Kessler (Bot. Jahrb. Syst. 118: 86–87. 1995).


Trees or shrubs, glabrous when young, glabrescent. Petiole ca. 3 mm, transversely striate, puberulent or glabrous; leaf blade elliptic to oblong-elliptic, 5–11 × 1.4–3 cm, thinly leathery, abaxially greenish and glabrous except occasionally for puberulent midvein, adaxially shiny green and glabrous, secondary veins 10–13 on each side of midvein, slender,
abaxially slightly prominent, and adaxially flat, base broadly cuneate, apex acuminate to shortly acuminate. Inflorescences leaf-opposed or superaxillary, 1- or 2-flowered; peduncle 2–3 mm, glabrous, with 4 or 5 bracts. Pedicel 4–7 mm, puberulent, with several bracteoles from base to middle. Sepals broadly ovate-reniform, ca. 1 × 2 mm, outside puberulent, inside glabrous, apex rounded. Outer petals ovate-lanceolate, ca. 7 × 4 mm, incurved at base, outside densely pubescent, inside glabrous; inner petals lanceolate, ca. 6 × 3.5 mm, incurved at base. Stamens 3, whorled; anther locules ovoid; connectives apically acute. Carpel 1, oblong, ca. 4 mm, densely villous; ovules 6–12, in 1 or 2 series; stigmas subglobose, glabrous, apex 2-cleft. Fruit not seen. Fl. Apr, fr. May–Jun.

Sparsely forested slopes; 300–700 m. SE Yunnan [Thailand, Vietnam].


藤春 teng chun

Trees to 12 m tall. Peduncles, pedicels, sepals, and petals outside pubescent. Petiole 5–7 mm; leaf blade elliptic to oblong, 7–14 × 3–6 cm, thinly leathery to papery, glaucous when dry, glabrous, secondary veins 9–11 on each side of midvein, slender, and slightly prominent, reticulate veins prominent on both surfaces, base broadly cuneate to slightly obtuse, apex acute to acuminate. Inflorescences leaf-opposed; bracts ovate, puberulent. Pedicel 5–10 mm, with 1 or 2 bracteoles at base. Sepals broadly ovate, ca. 2 mm. Outer petals oblong-ovate to ovate, ca. 1 cm, apex acute; inner petals smaller than outer petals, outside puberulent, inside glabrous or glabrescent. Stamens in 3 whorls; anther locules ovoid, ca. 1 mm; connectives apically acute. Carpels 3–5, densely pubescent; ovules 10–12 per carpal, in 2 series. Fruiting carpels yellowish green, subglobose to obovate, ca. 4 × 3–4 cm, densely tomentose. Seeds flat, semi-irobicular. Fl. Oct–Mar, fr. Mar–Aug.

- Evergreen broad-leaved forests on slopes; 400–700 m. SW Guangxi, Hainan, Yunnan.

The fruit of *Alphonsea hainanensis* are edible when ripe. Its wood is hard and used for the construction of carts and agricultural implements, etc.

*Alphonsea hainanensis* is listed as Endangered (EN A2c) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 8 Oct 2010).

5. **Alphonsea hainanensis** Merrill & Chun, Sunyatsenia 5: 62. 1940.

海南藤春 hai nan teng chun

Trees to 20 m tall, evergreen, d.b.h. to 30 cm. Bark grayish brown, smooth, 5–6 mm thick; inner bark reddish brown, fragrant. Branchlets appressed ferruginous puberulent when young, glabrescent. Petiole 3–5 mm, puberulent or glabrous; leaf blade broadly ovate to elliptic, 4.9 × 2–3.5 cm, thickly papery, glabrous, adaxially shiny and green, secondary veins 7–10 on each side of midvein, slender, and prominent on both surfaces, base broadly cuneate to rounded, apex acute to shortly acuminate. Inflorescences leaf-opposed or subopposite, 2- or 3-flowered; peduncle subsessile; bracts broadly ovate. Pedicel 5–13 mm, pubescent, bracteolate at base. Sepals reniform, ca. 1 mm, outside pubescent, inside glabrous. Outer petals ovate to oblong-ovate, ca. 9 mm, pubescent, apex obtuse; inner petals smaller than outer petals, outside puberulent, inside glabrous or glabrescent. Stamens in 3 whorls; anther locules ovoid, ca. 1 mm; connectives apically acute. Carpels 3–5, densely pubescent; ovules 10–12 per carpel, in 2 series. Fruiting carpels yellowish green, subglobose to obovate, ca. 4 × 3–4 cm, densely tomentose. Seeds flat, semi-irobiccular. Fl. Oct–Mar, fr. Mar–Aug.

- Evergreen broad-leaved forests on slopes; 400–700 m. SW Guangxi, Hainan, Yunnan.

The fruit of *Alphonsea hainanensis* are edible when ripe. Its wood is hard and used for the construction of carts and agricultural implements, etc.

*Alphonsea hainanensis* is listed as Endangered (EN A2c) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 8 Oct 2010).


多脉藤春 duo mai teng chun

Trees to 12 m tall, glabrous except for flowers. Petiole 3–5 mm; leaf blade oblanceolate, 6–16 × 2.5–4.5 cm, papery, midvein abaxially elevated and adaxially impressed, secondary veins 15–19 on each side of midvein, abaxially slightly prominent, and adaxially flat, base broadly cuneate to obtuse, apex caudate with a 1–1.7 cm tip. Inflorescences leaf-opposed, 1-flowered. Pedicel ca. 3 mm, puberulent. Flower buds conic, ca. 10 × 8 mm. Sepals triangular, outside tomentulose, inside glabrous. Outer petals ovate-triangular, ca. 10 × 6 mm, outside tomentulose, inside glabrous; inner petals ca. 9 × 5 mm. Stamens many, in 3 whorls, ca. 1.5 mm; connectives apically apiculate. Carpels 4 or 5, oblanceolate, slightly flat, hirsute; ovules 5 per carpel, in 2 series; styles short; stigmas apically 2-cleft. Fruiting carpels oblong, ca. 4 × 2.5 cm, densely tomentose. Fl. Apr–Jun, fr. Aug–Oct.

- Evergreen broad-leaved forests on slopes; 700–1500 m. S Yunnan.

*Alphonsea tsangyuanensis* is listed as Endangered (EN B2ab (i,i,v)) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 8 Oct 2010). The type collection of this species (Q. W. Wang 73312) was originally identified as *A. lutea* J. D. Hooker & Thomson (C. Y. Wu & W. T. Wang, Acta Phytotax. Sin. 6: 210. 1957).

19. **CANANGA** (Candolle) J. D. Hooker & Thomson, Fl. Ind. 1: 129. 1855, nom. cons., not Aublet (1775).

依兰属 yi lan shu

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Trees or shrubs. Petiole short; leaf blade large. Inflorescences axillary or extra-axillary, forming cymes, racemes, or with several flowers clustered on a peduncle. Flowers large. Sepals 3, valvate. Petals 6, in 2 whorls, subequal or inner petals slightly smaller, spreading, flat, valvate in bud. Stamens many; anther locules linear-lanceolate, lateral or subintorse; connectives ca. 1/3 size of stamens, apex apiculate. Carpels many, oblong; ovules many per carpel, in 2 series; styles slender; stigmas sticking together at anthesis, clavate. Fruit apocarpous; monocarps several to many, long stipitate, ovoid to subglobose. Seeds several per monocarp, in 2 series, pitted, sending spino processes into albumen.

Two species: tropical Asia and Australia; one species (introduced) in China.

1. Cananga odorata (Lamarck) J. D. Hooker & Thomson, Fl. Ind. 1: 130. 1855.

依兰 (yi lan)

Trees or shrubs. Bark pale gray. Branchlets dark colored, striate with age, minutely pubescent when young, glabrescent. Petiole 1–2 cm, narrowly grooved; leaf blade in 2 ranks, ovate, oblong, or broadly elliptic, 9–23 × 4–14 cm, membranous to rounded, obtuse, or truncate and often inequilateral, apex acute to acuminate. Inflorescences axillary or on short woody branches, racemose or cymose, 1- or several flowered; peduncle 2–5 mm; bracts minute, deciduous. Flowers pendulous. Pedicel 1–5 cm, pubescent, bracteolate. Sepals green, 1–5 cm, pubescent, connate at base, apex acute and reflexed. Petals green, yellowish, turning yellow and inside basally with a purplish brown blotch, with several veins minutely pubescent, basal claw small. Stamens oblong-oblancoate, 0.7–1 mm; connectives apically acute, pubescent. Carpels 10–12, ca. 4 mm, puberulent when young, glabrescent; stigmas clavate, lamellate, fused, with a U-shaped groove on inner side running down to base of ovary to form a convex pileate disk. Monocarp stipes 1.2–1.8 cm; monocarps several to many, long stipitate, ellipsoid-obovoid or globose, fleshy and berrylike. Seeds 1 or 2 per monocarp, without an aril.

Cultivated. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan [native to NE Australia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, and Thailand].

The flowers of Cananga odorata are the source of an essential oil used in perfumery, soaps, and cosmetics. The flowers are also laid between cloth to impart an agreeable scent.

1a. Tree 6–33 m tall ............................................ 1a. var. odorata
1b. Shrubs 1–2 m tall ............................................ 1b. var. fruticosa

1a. Cananga odorata var. odorata

依兰 (原变种) yi lan (yuan bian zhong)

Uvaria odorata Lamark, Encycl. 1: 595. 1785; Canangium odoratum (Lamarck) King.


Cultivated; 100–200 m. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan [native to NE Australia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, and Thailand].


小依兰 xiao yi lan


Cultivated; 100–200 m. Guangdong, Yunnan [native to Indonesia, Malaysia, and Thailand].


鹰爪花属 ying zhuo hua shu

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Climbing shrubs or woody lianas. Inflorescences 1- or few-flowered clusters; peduncle recurved, woody, persistent, forming a hook. Flowers bisexual, often fragrant. Torus flat or concave. Sepals 3, valvate, connate at base. Petals 6, in 2 whorls, pale yellowish, subequal, with each whorl valvate, base concave, apex connivent. Stamens many, outermost series sometimes forming staminodes; connectives apically dilated, apex truncate. Carpels 4 to many; ovules 2 per carpel, basal; stigmas ovoid, oblong, or clavate. Fruit apocarpous; monocarps fasciculate, sessile or shortly stipitate, ellipsoid-obovoid or globose, fleshy and berrylike. Seeds 1 or 2 per monocarp, without an aril.

About 100 species: Old World tropics and subtropics; eight species (four endemic, one introduced) in China.

Members of Artabotrys climb by means of the very distinctive, persistent, recurved, woody peduncles and pedicels, which hook onto the supporting vegetation.

1a. Monocarp apex long beaked; leaf blade base slightly oblique ........................................ 1. A. rhynchocarpus
1b. Monocarp apex not beaked; leaf blade base symmetric.

2a. Flowers many per peduncle; stamen connectives apically truncate ........................................ 2. A. multiflorus
2b. Flowers 1–3 per peduncle; stamen connectives apically triangular, semiorbicular, or subtruncate.

3a. Outer petals 1–1.8 cm.
4a. Leaf blade glabrous on both surfaces or only midrib abaxially puberulent; pedicel longer than peduncle ................................................................................................................................. 3. **Artabotrys hongkongensis**

4b. Leaf blade abaxially densely tomentose or pubescent; pedicel shorter than peduncle.

5a. Leaf blade adaxially shiny, secondary veins 10–12 on each side of midvein; outer petals ovate to broadly triangular .............................................................................................................................. 4. **Artabotrys fragrans**

5b. Leaf blade adaxially slightly glaucous, secondary veins 8 on each side of midvein; outer petals narrowly oblong .......................................................................................................................... 5. **Artabotrys pilosus**

3b. Outer petals 2–4.5 cm.

6a. Leaf blade adaxially minutely punctate; outer petals oblong-ovate .............................................................. 6. **Artabotrys punctulatus**

6b. Leaf blade adaxially not punctate; outer petals narrowly lanceolate or oblong-lanceolate.

7a. Leaf blade secondary veins 7–9 on each side of midvein; outer petals ca. 2 × 0.2 cm ................... 7. **Artabotrys hainanensis**

7b. Leaf blade secondary veins 8–16 on each side of midvein; outer petals 3–4.5 × 0.9–1.6 cm .... 8. **Artabotrys hexapetalus**


**喙果鹰爪花 hui guo ying zhua hua**

Shrubs to 10 m tall, climbing. Branchlets appressed pilose when young, glabrescent. Petiole 3–5 mm, appressed pilose; leaf blade oblong to oblong-lanceolate, 8–13 × 3–4 cm, papery, abaxially puberulent, adaxially glabrous, secondary veins 12–14 on each side of midvein and adaxially prominent, base cuneate, apex acuminate. Inflorescences leaf-opposed, 2–5-flowered; peduncle 0.8–1.5 cm, pilose. Pedicel 1.2–1.5 cm, pubescent. Stamens cuneate; connectives apically subtruncate, pubescent. Sepals broadly ovate, ca. 1.5 × 0.6 cm, tawny pubescent. Stamens cuneate, ca. 1.5 mm; connectives apically subtruncate, glabrous. Monocarp stipes 5–7 mm; monocarps oblong, 4.5–5 × 1.5–1.7 cm, apex conspicuously beaked. Seeds 2 per monocarp, flat, ca. 3 × 1.2 cm. Fl. Aug–Sep, fr. Oct.

- Dense woodlands; ca. 1200 m. SE Yunnan.


**多花鹰爪花 duo hua ying zhua hua**

Lianas. Branchlets dark brown, minutely puberulent when young, minutely lenticellate. Petiole 3–5 mm, appressed pilose; leaf blade elliptic to elliptic-oblong, 10–16.5 × 4–6.5 cm, appressed pubescent when young especially abaxially on midvein, glabrescent, midvein abaxially prominent, secondary veins 9–12 on each side of midvein, base narrow, apex acicular to bluntly acuminate. Inflorescences with 2 fascicles, one apical and another slightly below it on outer side, many flowered; peduncle 1.5–2 cm, stout, sharply curved, appressed bristly. Pedicel 0.8–1.5 cm, rufous hispid. Sepals ovate-triangular, 3–4 mm, outside rufous pubescent, inside glabrous. Petals green to yellow, oblong to oblong-lanceolate, 1.8–2.5 × 0.6–0.7 cm, subequal, base deeply convex; inner petals slightly narrower and more deeply concave than outer petals, connivent over stamens and carpels, outside thinly pubescent but densely gray pubescent on basal concave part, inside glabrous. Stamens oblong-cuneate, ca. 1.5 mm; connectives apically truncate. Carpels 12–21, narrowly oblong to lanceolate-oblong, 1.3–1.5 mm, glabrous; styles oblong to narrowly clavate, 1.3–1.5 mm. Fruit not seen. Fl. May–Aug, fr. Jul–Oct.

Thickets on limestone; 800–1000 m. Guangdong, Guangxi, Guizhou, Yunnan [Myanmar].

3. **Artabotrys hongkongensis** Hance, J. Bot. 8: 71. 1870.

香港鹰爪花 xiang gang ying zhua hua

Shrubs, to 8 m tall, climbing. Branchlets hispid. Petiole 2–5 mm, puberulent; leaf blade elliptic-oblong to oblong, 6–12 × 2.5–4 cm, leathery, glabrous or only midvein abaxially puberulent, adaxially lucid, secondary veins 8–10 on each side of midvein and adaxially prominent, base rounded and slightly oblique. Inflorescences 1-flowered. Pedicel slightly longer than hooked peduncle, puberulent. Sepals ovate-triangular, ca. 5 mm, glabrescent. Outer petals ovate-lanceolate, 1–1.8 cm, thickened, outside densely sericeous pubescent, base concave; inner petals basally concave. Stamens cuneate; connectives apically 3-angled, puberulent. Carpels ovate-oblong, glabrous; ovules 2 per carpel, basal; stigmas shortly clavate. Monocarps black when dry, elliptoid, 2–4 × 1.5–3 cm, apex subrounded. Fl. Mar–May, fr. May–Aug.

Dense woodlands, thickets; 300–1500 m. Guangdong, Guangxi, Guizhou, Hainan, Hunan, Yunnan [Vietnam].


香鹰爪花 xiang ying zhua hua

Lianas to 20 m. Branchlets pubescent, glabrescent. Petiole 5–8 mm, puberulent; leaf blade elliptic-oblong to lanceolate-oblong, 13–17 × 5–6 cm, densely puberulent when young and sparsely puberulent with age, adaxially lucid and glabrous, secondary veins 10–12 on each side of midvein and adaxially prominent, base cuneate to obtuse, apex shortly acuminate to obtuse. Inflorescences 1–3-flowered; peduncle ca. 2 cm, glabrous. Pedicel 1–1.2 cm, pubescent. Sepals triangular, golden pubescent. Outer petals broadly ovate-triangular, ca. 1.4 × 0.9 cm, densely villous except for base, base concave; inner petals triangular, 1–1.2 cm, pubescent except for base, base concave. Stamens connectives apically semiorbiculate. Carpels 4–7, ovoid, glabrous. Monocarps ellipsoid, ca. 4 × 2 cm, glabrous; epicarp smooth. Fl. Jul–Aug, fr. Sep–Oct.

Mixed woods; ca. 1000 m. Guangxi, Guizhou, S Yunnan [Vietnam].

The name **Artabotrys fragrans** was first published in 1938 (Fl. Indo-Chine Suppl. 1: 83) but not validly so.


毛叶鹰爪花 mao ye ying zhua hua

Shrubs to 5 m tall, climbing. Branches densely tomentose
when young. Petiole ca. 2 mm, densely tomentose; leaf blade oblong to oblong-elliptic, 5–17 × 2–7.5 cm, papery, abaxially densely tomentose, adaxially glabrous and slightly glaucous, secondary veins ca. 8 on each side of midvein and adaxially flat to slightly prominent, base rounded, apex acuminate to obtuse. Inflorescences leaf-opposed or extra-axillary, usually 1-flowered; peduncle longer than pedicel, flat, densely villous when young, glabrescent. Pedicel 6–12 mm, densely pubescent. Sepals ovate, ca. 4 mm, outside pubescent. Petals greenish to yellowish, narrowly oblong, 1.5–1.7 cm, pubescent. Stamens cuneate; connectives apically subtruncated. Carpels ca. 8, glabrous. Monocarps dark brown, oblong-ellipsoid, 1.5–2.2 × ca. 1.5 cm, glabrous. Fl. Apr–Jul, fr. May–Dec.

- Mixed woods; 200–500 m. Guangdong, Hainan.

The flowers of *Artabotrys pilosus* are fragrant and are used as perfume; its bast fiber is used to make ropes.


点叶鹰爪花  dian ye ying zhua hua

 Shrubs to 4 m tall, climbing. Branchlets puberulent when young. Petiole 4–8 mm, puberulent; leaf blade oblong-elliptic, 7–13.5 × 3–5.5 cm, papery, glabrous except for abaxially puberulent midvein, adaxially minutely plicate, secondary veins 12–14 on each side of midvein and adaxially prominent, base cuneate to broadly cuneate and oblique, apex acuminate to obtuse. Peduncle puberulent. Flowers 3–4 cm in diam. Pedicel 1.5–2 cm. Sepals broadly ovate-triangular, 5–7 mm, puberulent, basally slightly attenuate. Petals brownish green; outer petals oblong-ovate, ca. 2.5 cm, base concave; inner petals ca. 2 cm, concave and connivent, horizontally spreading from apical 1/3, basally attenuate. Stamens many, cuneate, ca. 1.5 mm; connectives apically subtruncated, glabrous. Carpels ca. 20, oblong, glabrous; stigmas clavate, longer than ovars, pubescent. Monocarps fusiform, slightly flattened, 3.5–4 × 1.5–1.7 cm. Fl. Apr–Jun, fr. Sep–Nov.

- Open woods; ca. 1500 m. S Yunnan.


海南鹰爪花  hai nan ying zhua hua


 Shrubs to 4 m tall, climbing. Branchlets glabrous. Petiole 4–8 mm, glabrous; leaf blade oblong to oblong-elliptic, 7–15 × 3–6 cm, papery, glabrous except for abaxially hairy main veins, secondary veins 7–9 on each side of midvein and adaxially prominent, base rounded to broadly cuneate, apex acuminate to acute. Inflorescences leaf-opposed, usually 1-flowered. Pedicel 1.2–1.5 cm. Sepals ovate, 4–5 mm, sparsely pubescent. Petals yellowish white, narrowly lanceolate, ca. 2 × 0.2 cm, subequal, base slightly broad and concave. Stamens oblong, ca. 14 × 2 mm; connectives apically rounded to subtruncate. Carpels 15, slightly longer than stamens; stigmas shortly clavate. Monocarps ellipsoid, ca. 2.5 × 1.2 cm. Fl. May–Jul, fr. Jul–Oct.

- Densely wooded slopes; 200–500 m. Guangdong, Guangxi, Hainan.


鷹爪花  ying zhua hua

 *Annona hexapetala* Linnaeus f., Suppl. Pl. 270. 1782; *A. uncinata* Lamarck; *Artabotrys odoratissimus* R. Brown, nom. illeg. superfl.; *A. uncutus* (Loureiro) Baillon; *A. uncinatus* (Lamarck) Merrill; *Unona uncinata* (Lamarck) Dunal; *Uvaria esculentula* Roxburgh ex Rottler, *U. odoratissima* Roxburgh; *U. uncuta* Loureiro.

 Shrubs to 10 m tall, climbing. Branchlets glabrous or glabrescent. Petiole 4–8 mm; leaf blade oblong to broadly lanceolate, 6–16(–25) × 2.5–6(–8) cm, papery, abaxially glabrous or only midvein puberulent, adaxially glabrous, secondary veins 8–16 on each side of midvein and adaxially prominent, base cuneate to acute, apex acuminate to acute. Inflorescences 1- or 2-flowered. Flowers 2.5–3 cm in diam., fragrant. Sepals green, ovate, 5–8 mm, sparsely puberulent. Petals greenish to yellowish, oblong-lanceolate, 3–4.5 × 0.9–1.6 cm, outside basally densely pubescent, contracted nearly to base but basally expanded. Stamens oblong; connectives apically 3-angular. Carpels oblong, glabrous. Monocarps ovoid, 2.5–4 × ca. 2.5 cm, glabrous, apex conspicuously apiculate. Seeds pale brown, 1.5–2 cm, smooth. Fl. May–Aug, fr. May–Dec. 2n = 16.

 Widely cultivated, rarely naturalized; 100–300 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Jiangxi, Taiwan, Yunnan, Zhejiang [native to S India and Sri Lanka].

 The flowers of *Artabotrys hexapetalus* are fragrant and are used as perfume and in tea; its fruit are used as medicine for scrofula.


尖花藤属  jian hua teng shu

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

*Polyalthia* sect. *Oxymitra* Blume, Fl. Javae, Annonaceae, 71. 1830; *Oxymitra* (Blume) J. D. Hooker & Thomson (1855), not Bischoff ex Lindenberg (1829).

Climbers [rarely trees], with simple hairs. Inflorescences leaf-opposed, extra-axillary, or superaxillary, 1-flowered, bracteate. Flowers (not known for only Chinese species) bisexual. Sepals 3, valvate, ± connate at base. Petals 6, in 2 whorls, free, valvate; outer petals flat or 3-ridged, long and narrow, leathery, basally broadened and concave; inner petals much shorter than outer, ovate, lanceolate, or oblong, narrowed at base and often with a gap between petals, cohering to cover stamens and carpels. Stamens many; connectives apically enlarged and concealing anther locules, apex truncate. Carpels many, oblong; ovules 1–5 per carpel, lateral;
styles clavate. Fruit apocarpous; monocarps stipitate, subglobose [or globose to ellipsoid-cylindric], moniliform when more than 1-seeded; epicarp thin to thick. Seed usually 1 per monocarp, subglobose.

About 50–60 species: Old World tropics; one species (endemic) in China.

There has been considerable confusion between *Friesodielsia* and the genus *Richella* A. Gray. Recent accounts (e.g. Kessler in Kubitzki, Fam. Gen. Fl. Pl. 2: 119. 1993) have restricted *Richella* to just 2 or 3 species, which molecular studies (Nakkuntod et al., Taxon 58: 127–132. 2009) show to be most closely related to *Goniothalamus*. Most species previously placed within *Richella* are now placed in *Friesodielsia*.


Richella hainanensis (Tsiang & P. T. Li) Tsiang & P. T. Li.

Climbers to 5 m tall, woody, glabrous except for slightly puberulent leaf blade midvein. Petiole 5–8 mm; leaf blade oblong to oblong-elliptic, 10–21.5 × 3.7–7.5 cm, papery, abaxially puberulent leaf blade midvein. Petiole 5–8 mm; leaf blade base shallowly cordate, apex acute to shortly acuminate. Flowers usually more than 2-flowered, often in cymes, glomerules, or panicles. Pedicel often with several bracteoles from base to middle. Flower buds ovoid or oblong-conic. Sepals 3, small, valvate, connate at very base. Petals 6, in 2 whorls, valvate, leathery, margin thickened; outer petals slightly larger than inner petals, erect or spreading, inside flat to convex; inner petals 3-edged, base concave. Stamens many; connectives slightly enlarged, apically oblique, obtuse, or slightly apiculate. Carpels many, free, often pubescent, slightly curved, grooved on inner side; ovules 1–16 per carpel, in 1 or 2 sutureal series; styles sometimes narrowly clavate but usually not enlarging; stigmas very short and not clearly differentiated from style, apex 2-cleft or entire. Fruit apocarpous; monocarps few to many, stipitate, spherical, ovoid, or oblong, thick walled, usually pubescent to tomentose. Seeds 1–10 per monocarp, in 1 or 2 series, smooth, shiny.

About 75 species: Old World tropics and subtropics; 23 species (eight endemic) in China.

1a. Inflorescence 1- or 2-flowered.

1b. Inflorescence usually more than 2-flowered, often in cymes, glomerules, or panicles.

5a. Leaf blade abaxially grayish white or grayish green and glaucous when dry.

5b. Leaf blade greenish or abaxially grayish green and not glaucous.

8a. Young branchlets ferruginous pubescent; cymes usually leaf-opposed or alternate; ovules 4 per carpel; ripe monocarps glabrescent. 7. *F. wallichii*

8b. Branchlets glabrous; panicles terminal or axillary; ovules ca. 22 per carpel; ripe monocarps densely fulvous tomentulose. 8. *F. tonkinense*
4b. Leaf blade abaxially densely tomentose, densely pubescent, or hispid.

9a. Flowers in panicles or cymes.

10a. Inflorescence rachides 1–28 cm.

11a. Leaf blade apex acute; flower buds ovoid; petals ovate; stamen connectives ovoid, apex obtuse ................................................................. 9. *F. latifolium*

11b. Leaf blade apex rounded or retuse; flower buds conic or lanceolate; petals oblong-lanceolate or ovate-elliptic; stamen connectives conic or broadly ovoid, apex acuminate or truncate.

12a. Peduncle to 28 cm; pedicel 2–3 mm; petals ovate-elliptic to ovate-oblong; stamen connectives apically acuminate; stigma apex 2-cleft ........................................ 10. *F. tungfangense*

12b. Peduncle 1 cm; pedicel 15 mm; petals oblong-lanceolate to narrowly lanceolate; stamen connectives apically truncate; stigma apex entire .................................. 11. *F. tientangense*

10b. Inflorescence rachides 0.1–0.5 cm.

13a. Leaf blade secondary veins adaxially flattened; stigma apex 2-cleft.

14a. Sepals connate at base, broadly triangular, ca. 3 × 3.5 mm; stamen connectives broadly triangular ......................................................... 12. *F. polyanthoides*

14b. Sepals free at base, ovate-triangular, ca. 2 × 2 mm; stamen connectives obliquely triangular .......................................................................................... 13. *F. poilanei*

13b. Leaf blade secondary veins adaxially concave; stigma apex entire.

15a. Leaf blade base cuneate to broadly cuneate; inner petals pubescent outside; ripe monocarps ca. 1.2 cm in diam. .................................................. 14. *F. acuminatissimum*

15b. Leaf blade base shallowly cordate; inner petals glabrous outside; ripe monocarps 2–2.5 cm in diam. ........................................................................ 15. *F. cavaleriei*

9b. Flowers in glomerules.

16a. Leaf blade secondary veins 25–35 on each side of midvein; ripe monocarps ca. 4 cm in diam. ....... 16. *F. balansae*

16b. Leaf blade secondary veins 13–20 on each side of midvein; ripe monocarps 1.5–3 cm in diam.

17a. Leaf blade secondary veins adaxially flattened.

18a. Branches and abaxial leaf blade surfaces densely tomentose; outer petals with a prominent abaxial midrib; stamen connectives subrounded or truncate ................. 17. *F. xylopetalum*

18b. Branches and abaxial leaf blade surfaces pubescent to glabrescent; outer petals without a prominent midrib; stamen connectives triangular or slightly obliquely triangular.

19a. Petals 2–2.1 cm; ovules 10 per carpel; stigmas apically 2-cleft ........................................... 18. *F. oldhamii*

19b. Petals 0.9–1.2 cm; ovules 4–6 per carpel; stigmas apically entire ........................................ 19. *F. polyanthum*

17b. Leaf blade secondary veins adaxially concave.

20a. Bracteoles many, longer than or as long as sepals; stigmas apically 2-cleft .................. 20. *F. bracteolatum*

20b. Bracteoles few or absent, if present shorter than sepals; stigmas apically entire.

21a. Leaf blade oblong-lanceolate to narrowly oblong, apex slightly acute; stamen connectives long lanceolate ......................................................... 21. *F. kwangsiense*

21b. Leaf blade broadly ovate, obovate, or obovate-elliptic, apex rounded or retuse; stamen connectives broadly or obliquely triangular.

22a. Leaf blade base rounded, truncate, or shallowly cordate; inflorescences leaf-opposed; sepals ovate-lanceolate, ca. 1 cm; outer petals ovate-oblong, ca. 1.5 cm; ovules 4 per carpel; ripe monocarps globose ....................... 22. *F. retusum*

22b. Leaf blade base broadly cuneate or rounded; inflorescences extra-axillary; sepals broadly triangular, ca. 5 mm; outer petals ovate, ca. 1 cm; ovules 10 per carpel; ripe monocarps oblong ........................................ 23. *F. shantzeense*


金果瓜馥木  jin guo gua fu mu

Climbers to 13 m tall. Branchlets, petioles, and flowers densely appressed reddish brown pubescent, glabrescent. Petiole 0.8–1.2 cm; leaf blade oblong to oblong-elliptic, 5–10 × 1.5–3 cm, leathery, abaxially densely appressed reddish brown pubescent, adaxially glabrous except for appressed pubescence on midvein, secondary veins 8–13 on each side of midvein, slender, and adaxially flat, base rounded, apex acute to shortly acuminate. Inflorescences leaf-opposed, 1-flowered; bracts tri-

Melodorum uonicum Dunn, J. Bot. 48: 323. 1910; Fissistigma clementis Merrill.

Climbers to 5 m tall. Branches glabrous. Petiole 5–10 mm, blackish and minutely transversely wrinkled when dried; leaf blade oblong, 4–20 × 1–5 cm, papery, abaxially yellowish, very sparsely puberulent, and reddish yellow when dry, adaxially glabrous, secondary veins 8–12[–18] on each side of midvein and adaxially flat to slightly prominent, tertiary veins inconspicuously raised, base rounded to cuneate, apex acute. Inflorescences axillary or subaxillary, sometimes ± grouped into terminal thyrses, 1- or 2-flowered; peduncle 1–3 mm; bracts minutely appressed pubescent, minutely bracteolate below middle. Sepals ovate-triangular, ca. 2 mm, outside pubescent, inside glabrous, apex obtuse; inner petals lanceolate, 1.2–1.4 × ca. 0.6 cm, inside basally concave and apically convex. Stamens oblong; connectives 3-angular. Carpels oblong, pubescent; ovules 9–16 per carpel, in 2 series; styles oblique, glabrous; stigmas apically 2-cleft. Monocarp stipes ca. 3 mm; monocarps ca. 8–16 × ca. 4 cm, pubescent to glabrescent. Seeds 9–16 per monocarp, in 2 series. Fl. Mar–Jun, fr. Jun–Dec.

Forest margins, scrub; 100–800 m. Fujian, Guangdong, Guizhou, Hainan, Hunan [Indonesia].

The fruit of Fissistigma uonicum are edible; its leaves are used as yeast powder to start fermentation when making liquor in Guangxi and Hainan.


毛瓜馥木 mao gua fu mu

Meiogyne maclurei (Merrill) Sinclair, Melodorum maclurei (Merrill) Jovet-Ast [“Ast”].

Climbers to 6 m tall, most parts fulvous to blackish brown tomentose. Petiole 5–8 mm, blackish brown tomentose; leaf blade lanceolate to elliptic-lanceolate, 7–12 × 2–3.5 cm, thinly leathery, abaxially fulvous to blackish brown tomentose, axially glabrous, secondary veins 13–17 on each side of midvein and adaxially flat, reticulate veins prominent, base obtuse, apex acute to acuminate. Inflorescences axillary, 1-flowered. Pedicel ca. 5 mm, robust. Sepals ovate-oblong, ca. 5 mm, blackish brown villous. Petals yellow; outer petals ovate-triangular, ca. 2.4 × 1.4 cm, thickened, outside fulvous pubescent, inside glabrous, apex obtuse; inner petals lanceolate, 1.2–1.4 × ca. 0.6 cm, inside basally concave and apically convex. Stamens oblong; connectives 3-angular. Carpels oblong, pubescent; ovules 9–16 per carpel, in 2 series; styles cylindric, short, glabrous; stigmas apically 2-cleft. Monocarp stipes short, thick; monocarps globose to shortly cylindric, 4–5 × ca. 4 cm, pubescent to glabrescent. Seeds 9–16 per monocarp, in 2 series. Fl. Mar–Jun, fr. Jun–Dec.

Forest margins, scrub; 100–800 m. Fujian, Guangdong, Guizhou, Hainan, Taiwan [Vietnam].

The fruit of Fissistigma maclurei are edible; its leaves are used as yeast powder to start fermentation when making liquor in Guangdong and Hainan.


白叶瓜馥木 bai ye gua fu mu

Melodorum glaucescens Hance, J. Bot. 19: 112. 1881; Fissistigma obtusifolium Merrill.

Climbers to 6 m tall, most parts glabrous except for inflorescences. Petiole 4–12 mm, blackish and minutely transversely wrinkled when dried, pubescent when young, glabrescent; leaf blade oblong, oblong-elliptic, or sometimes obovate-oblong, 3–20 × 1.2–6 cm, thinly leathery, abaxially grayish green and glaucous when dry, secondary veins 10–15 on each side of midvein and adaxially very slightly prominent or flat, tertiary veins inconspicuously raised, base rounded, apex rounded to slightly retuse. Inflorescences terminal, thyrsoid, to 6 cm, sometimes continuing vegetatively and cymes apparently axillary, cymes 2- or 3-flowered, brownish tomentose; peduncle very short. Pedicel to 1.2 cm. Sepals broadly triangular, ca. 2 mm. Outer petals broadly ovate, ca. 6 mm, fulvous pubescent; inner petals obovate-oblong, ca. 5 mm, grayish white pubescent. Stamens oblong; connectives 3-angular. Carpels ca. 15, ellipsoid, fulvous pubescent; ovule 1 per carpel; styles elongate, glabrous; stigmas api-cally 2-cleft. Monocarp stipes ca. 3 mm; monocarps ca. 8 mm in diam., globose. Seed 1 per monocarp. Fl. Jan–Sep, fr. Mar–Dec.

Sparsely forested slopes, scrub, often in ravines; 100–1000 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan [Vietnam].

A fine strong bast fiber obtained from the inner bark of Fissistigma glaucescens is used to make rope, sacks, and paper; its roots are used as medicine for rheumatism and injury; and its leaves are used as yeast powder to start fermentation when making liquor in Guangdong and Hainan.

5. Fissistigma pallens (Finet & Gagnepain) Merrill, Philipp. J. Sci. 15: 134. 1919.

苍叶瓜馥木 cang ye gua fu mu


Climbers to 12 m tall. Branches robust, grayish black, glabrous. Petiole ca. 2 cm, rugose, glabrous; leaf blade oblong, 15–20 × 6–8 cm, papery, abaxially grayish white and sparsely puberulent, adaxially glabrous, secondary veins 13–16 on each side of midvein, reticulate veins apparent, base obtuse to rounded, apex obtuse to acute. Inflorescences leaf-opposed or terminal, 1–3-flowered; peduncle ca. 1.5 cm; bracts triangular. Pedicel ca. 2 cm, puberulent, with triangular bract at base. Sepals triangular, outside puberulent. Petals ovate, ca. 1.5 × 1 cm, puberulent; inner petals slightly smaller than outer petals. Stamens oblong, ca. 2.5 mm; connectives broadly triangular, apex obtuse. Carpels many, cylindric, ca. 5 mm, villous; ovules ca. 30 per carpel, in 2 series; styles oblique, glabrous; stigmas 3-angular, apex entire. Fruit not seen. Fl. Mar–May, fr. Jun–Aug.

Forested slopes; 600–800 m. W Guangxi [Vietnam].

阔叶瓜馥木 kuo ye gua fu mu


Climbers to 12 m tall. Branches puberulent when young, glabrescent. Petiole 0.8–2 cm, abaxially groove, glabrous; leaf blade oblong, 14–30 × 5.5–12 cm, papery, abaxially puberulent when young but glabrescent and greenish with age, adaxially dark green and glabrous, secondary veins 15–20 on each side of midvein and adaxially flat, reticulate veins conspicuous, base truncate to shallowly cordate, apex shortly acuminate. Inflorescences leaf-opposed or subopposed, cymose, 2–8-flowered; peduncle 1–2 mm; bracts ovate, pubescent. Pedicel 0.5–2.3 cm, fulvous pubescent, bracteolate at middle. Flower buds broadly ovoid. Sepals triangular, ca. 4 × 4 mm, outside pubescent. Petals yellowish white; outer petals ovate-oblong, ca. 12 × (5–10) mm, outside fulvous pubescent, inside glabrous; inner petals ovate-triangular, ca. 8(–11) × 4(–7) mm, outside pubescent, inside glabrous. Stamens oblong, ca. 1.2 mm; connectives apically rounded. Carpels ca. 15, ovate-oblong, 2–3 cm, densely pubescent; ovules 10 per carpel, in 2 series; styles short; stigmatic, or obovoid, 3.5–6 × 3.5–4 cm, glabrous. Seeds 10–20 per monocarp, in 2 series. Fl. Mar–Nov, fr. Jul–Dec.

Open woodland slopes, moist disturbed scrub; 100–900 m. Guangxi, Guizhou, SW Hunan, Yunnan [Vietnam].


贵州瓜馥木 gui zhou gua fu mu


Climbers to 7 m tall. Branchlets ferruginous pubescent when young, glabrescent. Petiole 1–2.5 cm, blackish and minutely transversely wrinkled when dried, pubescent when young, glabrescent; leaf blade oblong-lanceolate, oblong-elliptic, or sometimes obovate-oblong, 7–24 × 2.4–6 cm, thinly leathery, abaxially ferruginous pubescent when young but glabrescent and greyish green with age, adaxially glabrous, secondary veins 10–14 on each side of midvein and adaxially flat, tertiary veins partly parallel and also often irregularly branched, reticulate veins inconspicuous, base rounded, obtuse, or sometimes broadly cuneate, apex obtuse to shortly acuminate. Inflorescences leaf-opposed or alternate, sometimes terminal, cymose, umbel-like, 3–7-flowered, ferruginous pubescent; peduncle short; bracts ovate, pubescent. Pedicel 0.3–2 cm, 1- or 2-bracteolate. Sepals ovate-triangular, ca. 3 × 2.3 mm, outside pubescent, inside glabrous. Petals leathery; outer petals ovate-oblong, 1.5–1.7 × ca. 0.7 cm, outside densely ferruginous pubescent, inside slightly puberulent; inner petals lanceolate, ca. 1.3 × 0.4 cm, inside basally glabrous and concave, apically puberulent. Stamens oblong; connectives ovoid. Carpels 2–6, densely pubescent; ovules 4 per carpel; styles cylindric, incurved; stigmas apically slightly 2-cleft. Monocarps subglobose, ca. 2.8 cm in diam., glabrous. Fl. Mar–Nov, fr. Jul–Dec.

Densely forested slopes, open forests in valleys; 400–1600 m. W Guangxi, S Guizhou, S Yunnan [NE India].


东京瓜馥木 dong jing gua fu mu


Climbers to 8 m tall. Branches grayish black to grayish brown, glabrous. Petiole 0.5–1.5 cm, grayish black, verrucate, abaxially grooved; leaf blade oblong to oblong-ovate, 16–20 × 4–6 cm, papery, abaxially sparsely pubescent when young but glabrescent, adaxially glabrous, secondary veins 10–14 on each side of midvein, obliquely ascending to margin, and adaxially flat, reticulate veins prominent, base rounded, apex shortly acuminate. Inflorescences terminal or axillary, paniculate, puberulent; peduncle 1–3.5 cm, with bracts at base; bracts triangular, margins ciliate. Pedicel 0.5–1.5 cm, bracteolate at base and middle. Sepals broadly triangular, ca. 4 × 5 mm, outside pubescent. Outer petals ovate, ca. 10 × 7.5 mm, margins thickened, puberulent, apex obtuse; inner petals oblong-ovate, ca. 10 × 5 mm, thickened at middle, outside and inside puberulent from middle to apex, inside concave from base to middle. Stamens oblong, ca. 3 mm; connectives ovoid, apex subrounded. Carpels subcylindric, villous; ovules ca. 22 per carpel, in 2 series; styles short; stigmas obliquely ovoid, glabrous, apex 2-cleft. Fruiting pedicel ca. 1.2 cm, fulvous tomentulose; monocarp stipes 1.5–2 cm; monocarps globose, 2–3 cm in diam., densely fulvous tomentulose. Seeds ca. 7 per monocarp, reddish brown, shiny, oblong, flat, ca. 1.5 × 0.9 cm. Fl. Nov–Jan, fr. Mar–May.

Forest slopes; 200–800 m. SE Yunnan [Vietnam].


大叶瓜馥木 da ye gua fu mu

*Unona latifolia* Dunal, Monogr. Anonac. 115. 1817; *Melodorum latifolium* (Dunal) J. D. Hooker & Thomson.

Climbers to 5 m tall. Branches tawny pubescent when young, glabrescent. Petiole 1–1.5 cm, robust, abaxially grooved, tawny pubescent; leaf blade oblong, oblong-elliptic, or obovate, 13–35 × 5–15 cm, papery, abaxially tawny pubescent and more densely so on veins, adaxially puberulent, secondary veins 18–22 on each side of midvein, at ca. 45° to midvein, anastomosing before margin, and adaxially impressed, reticulate veins dense and nearly at 90° to secondary veins, base rounded, apex acute. Inflorescences leaf-opposed, panicules borne on apical branches, to 20 cm, densely tawny pubescent; peduncle 1.5–1.8 cm; bracts broadly ovate, 3.4 × 3.4 mm, abaxially densely tawny pubescent. Pedicel ca. 2 cm, bracteolate at middle. Flower buds ovoid, recurved. Sepals broadly ovate, 5–6 × 5–6 mm, outside densely tawny pubescent. Outer petals outside reddish and basally orange, inside orangish red, ovate, 1.6–2.2 × 1.1–1.5 cm, thickened, outside brown pubescent, inside glabrous; inner petals ovate, 1.2–1.5 × 0.6–0.8 cm, glabrous. Stamens oblong,
ca. 2.5 mm; connectives ovoid, apex obtuse. Carpels oblong, densely villous; ovules 8 per carpel; stigmas pubescent. Monocarp stipes ca. 3 cm, pubescent; monocarps globose, ca. 2 cm in diam., densely brown pubescent. Seeds 4–8 per monocarp. Fl. Mar–Nov, fr. Jun–Jan.

Forested slopes; 500–1200 m. S Yunnan [India, Indonesia, Malaysia, Philippines, Thailand, Vietnam].


Climbers to 6 m tall, most parts densely red tomentose, glabresent. Petiole 1–1.5 cm; leaf blade spatulate to elliptic-oblong, 5–11 × 1.9–4.1 cm, leathery, abaxially yellowish brown pilose, adaxially glabrous, secondary veins 16–22 on each side of midvein and adaxially impressed, reticulate veins inconspicuous, base rounded to broadly cuneate, margin revolute, apex rounded to retuse. Inflorescences terminal or leaf-opposed, paniculate; peduncle to 28 cm; bracts broadly triangular, red tomentose. Pedicel 2–3 mm, 1- or 2-bracteolate. Flower buds conic, ca. 1.1 cm. Sepals broadly triangular, ca. 4 × 3 mm, glabrous. Outer petals ovate-elliptic, ca. 11 × 5 mm, inside glabrous; inner petals ovate-oblong, ca. 8 × 4 mm. Stamens oblong, ca. 1 mm; connectives conic. Carpels oblong, 1.5–2 mm, sericeous pubescent; ovules 10 per carpel, in 2 series; stigmas glabrous, apex 2-cleft. Fruit not seen. Fl. Oct, fr. Nov–Dec.

- Sparsely forested slopes; 400–600 m. W Hainan.

Fissistigma tungfangense is listed as Critically Endangered (CR) by the IUCN Red List of Threatened Species (Version 2010.3; http://www.iucnredlist.org; accessed on 8 Oct 2010).


天堂瓜馥木  tian tang gua fu mu

Climbers to 9 m tall. Branchlets densely yellowish pubescent when young, glabrous and lenticellate with age. Petiole 3–5 mm; leaf blade oblong to elliptic-oblong, 8.5–17.5 × 3.2–6 cm, leathery, abaxially yellowish pubescent, adaxially glabrous except for sparsely pubescent midvein, secondary veins 16–18 on each side of midvein, obliquely ascending, anastomosing before margin, and adaxially impressed, base rounded, apex rounded to retuse. Inflorescences leaf-opposed, paniculate, 1–4-flowered, yellowish pubescent; peduncle ca. 1 cm. Pedicel ca. 1.5 cm, bracteole above middle. Flower buds lanceolate in outline, ca. 2.8 × 0.8 cm. Sepals triangular, ca. 4 × 4 mm, outside pubescent, inside glabrous. Outer petals oblong-lanceolate, ca. 2.5 × 0.8 cm, outside glabrous, inside sparsely pubescent; inner petals narrowly lanceolate, ca. 2.3 × 0.6 mm, glabrous. Stamens oblong; connectives apically truncate. Carpels ovate-oblong, ca. 2.5 mm, densely sericeous pubescent; ovules 6–8 per carpel, in 2 series; stigma apex entire. Monocarp stipes ca. 3 cm, robust; monocarps globose, ca. 1.6 cm in diam., densely yellowish pubescent. Fl. Mar–Nov, fr. Jul–Dec.

- Forested valley slopes; 300–600 m. SW Guangdong, SE Guangxi, Hainan, Yunnan.


小萼瓜馥木  xiao e gua fu mu


Climbers to 10 m tall. Branches pubescent when young, glabrous and lenticellate with age. Petiole 1–1.3 cm, fulvous tomentose; leaf blade oblong, oblong-lanceolate, or sometimes obovate-oblong, 10–23 × 4–10 cm, leathery, abaxially fulvous tomentose, adaxially pubescent or glabrous, secondary veins 14–20 on each side of midvein, obliquely ascending to margin, and adaxially flat, base rounded, apex acute to shortly acuminate. Inflorescences leaf-opposed, subopposed, or sometimes terminal, pseudo-cymose, densely red fulvous tomentulose; peduncle ca. 3 mm; bracts ovate, ca. 1.5 mm, abaxially reddish fulvous tomentulose. Pedicel 1–1.5 cm, 1- or 2-bracteolate above middle. Flower buds conic. Sepals broadly triangular, ca. 3 × 3.5 mm, basally connate, outside tomentose, inside pubescent. Outer petals ovate-triangular, ca. 1.2 × 0.9 cm, outside red fulvous tomentose, inside apically puberulent; inner petals ovate-lanceolate, ca. 10 × 6 mm, outside pubescent, inside glabrous. Stamens oblong-cuneate, ca. 1.5 mm; connectives broadly 3-angular. Carpels ca. 10, sericeous pubescent; stigma apex 2-cleft. Fruiting pedicel ca. 2 cm; monocarp stipes to 4 cm; monocarps globose, ca. 2 cm in diam., densely red fulvous tomentose. Seeds reddish brown, oblong, ca. 1.5 × 0.6 cm. Fl. May–Nov, fr. Aug–Mar.

- Densely forested slopes; 500–1600 m. Guizhou, C and S Yunnan [Laos, Myanmar, N Thailand, Vietnam].


火绳藤  huo sheng teng


Climbers to 7 m tall. Branches sparsely puberulent when young, glabrous and lenticellate with age. Petiole 1–1.5 cm, pubescent; leaf blade oblong-lanceolate, 6.5–16 × 2–4.5 cm, leathery to thickly papery, abaxially densely grayish brown pubescent, adaxially glabrous except for sparsely puberulent midvein, secondary veins 14–20 on each side of midvein, obliquely ascending, and adaxially flat, base cuneate to broadly cuneate, apex acuminate. Inflorescences leaf-opposed or subopposed, cymose, 2–8-flowered; peduncle 1–3 mm. Pedicel 7–8 mm, obovate pubescent, 1- or 2-bracteolate at base to middle. Flower buds broadly ovoid, 4.5–4 × 5–4 mm. Sepals ovate-triangular, ca. 2 × 2 mm, outside puberulent, inside glabrous. Outer petals ovate-triangular, ca. 9 × 6 mm, outside obovate pubescent, inside apically puberulent; inner petals ovate-oblong, ca. 7 × 4 mm, outside pubescent, inside glabrous. Stamens oblong, ca. 1.5 mm; connectives obliquely 3-angular. Carpels oblong, ca. 3 mm, densely hispid; ovules ca. 8 per carpel, in 2 series; stigma apex 2-cleft. Fruiting monocarps globose, ca. 2 cm in diam. Fl. Mar–Dec, fr. Jun–Apr.

- Sparsely forested slopes, usually in valleys; 700–1000 m. S and SE Yunnan [Vietnam].
The basionym, *Melodorum poilanei*, was first published in 1938 (Fl. Indo-Chine Suppl. 1: 109) but not validly so.

### Fissistigma acuminatissimum Merrill, J. Arnold Arbor. 19: 29. 1938.

**Stamens oblong; densely reddish tomentose, inside glabrous; inner petals ovate-ovoidish; outer petals ovate-oblong, ca. 18 × 7 mm, outside sparsely pubescent and prominently slightly raised tubercles. Flowers fragrant. Stigma apex entire. Fruiting pedicel ca. 2.5 cm, pubescent; monocarp stipes ca. 1 cm; monocarps globose, ca. 1.2 cm in diam., with a winged margin. Fl. Mar–Nov, fr. Jun–Dec.**

Forested slopes; 500–1200 m. SW Guangxi, SE Yunnan [Vietnam].


**Climbers to 6 m tall. Branchlets densely pubescent when young, glabrescent. Petiole 0.8–2 cm, robust, abaxially grooved, densely brown pubescent; leaf blade oblong, oblong-elliptic, or obovate-oblong, 14–23 × 5–10 cm, thinly leathery, abaxially brown pubescent, adaxially sparsely appressed puberulent or puberulent only on midvein and secondary veins, secondary veins 25–35 on each side of midvein and adaxially flat to impressed when dry, reticulate veins prominent and at ca. 90° to secondary veins, based rounded to broadly cuneate, margin revolute, apex acute, obtuse, or retuse. Inflorescences leaf-opposed, terminal, or extra-axillary, in glomerules, many flowered, fulvous tomentulose; peduncle to 1 cm; bracts ovate, 3.5–5 × 2–3 mm, adaxially tomentulose. Flowers fragrant. Stigma apex entire. Fruiting pedicel ca. 2.5 cm, pubescent; monocarp stipes 1.5–2 cm, densely fulvous tomentulose; monocarps sub-globose, ca. 4.4 × 4 cm, sparsely fulvous hispid and with slightly raised tubercles. Seeds brown, oblong, ca. 2.4 × 1.7 cm, with a winged margin. Fl. Mar–May, fr. May–Sep.**

Forested slopes; 500–1200 m. SW Guangxi, SE Yunnan [Vietnam].


**Climbers to 6 m tall. Branchlets densely pubescent when young, glabrescent. Petiole 0.8–2 cm, robust, abaxially grooved, densely brown pubescent; leaf blade oblong-oblong-elliptic, or obovate-oblong, 14–23 × 5–10 cm, thinly leathery, abaxially brown pubescent, adaxially sparsely appressed puberulent or puberulent only on midvein and secondary veins, secondary veins 25–35 on each side of midvein and adaxially flat to impressed when dry, reticulate veins prominent and at ca. 90° to secondary veins, based rounded to broadly cuneate, margin revolute, apex acute, obtuse, or retuse. Inflorescences leaf-opposed, terminal, or extra-axillary, in glomerules, many flowered, fulvous tomentulose; peduncle to 1 cm; bracts ovate, 3.5–5 × 2–3 mm, adaxially tomentulose. Flowers fragrant. Stigma apex entire. Fruiting pedicel ca. 2.5 cm, pubescent; monocarp stipes 1.5–2 cm, densely fulvous tomentulose; monocarps sub-globose, ca. 4.4 × 4 cm, sparsely fulvous hispid and with slightly raised tubercles. Seeds brown, oblong, ca. 2.4 × 1.7 cm, with a winged margin. Fl. Mar–May, fr. May–Sep.**

Forested slopes; 500–1200 m. SW Guangxi, SE Yunnan [Vietnam].
ANNONACEAE

Climbers to 8 m tall. Branchlets fulvous pubescent. Petiole ca. 1 cm, pubescent; leaf blade obovate-elliptic to oblong, 6–13 × 2–5 cm, leathery, abaxially pubescent to glabrescent, adaxially glabrous, secondary veins 10–20 on each side of midvein and adaxially flat, base broadly cuneate to rounded, apex bluntly acute, rounded, or retuse. Inflorescences in glomerules, 1–8-flowered; peduncle ca. 2.5 cm. Flowers ca. 1.5 × 1–1.7 cm. Sepals broadly triangular, 3–(5–)7 × 5–6 mm, brown tomentose, apex acute. Petals pale yellow to golden; outer petals ovate-elliptic, 21–24 × 11–12 mm, thicker, outside pubescent, inside glabrous; inner petals ovate-lanceolate, ca. 20 × 6 mm, outside puberulent, inside concave and puberulent, margin ciliate. Stamens oblong, ca. 2 cm; connectives slightly curved. Carpels 24–26, golden hairy; ovules 10 per carpel; styles white; stigma apex 2-cleft. Monocarp stipes 2.5–4 cm; monocarps globose, 1.5–1.8 cm in diam., densely fulvous tomentose. Seeds 4 per monocarp, orbicular. Fl. Apr–Sep, fr. Jul–Feb.

- On shrubs, often along ravines; 500–1500 m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Taiwan, SE Yunnan, S Zhejiang.

A fine strong bast fiber is obtained from the inner bark of *Fissistigma oldhamii* and is used to make rope, sacks, and paper; its flowers yield a perfumed oil; the seed oil is used in cosmetics and industry; and its roots are used as medicine for traumatic injury and arthritis.


多花瓜馥木 duo hua gua fu mu

*Melodorum polyanthum* J. D. Hooker & Thomson, Fl. Ind. 1: 121. 1855.

Climbers to 8 m tall. Roots black, very aromatic. Branches dark gray to brown pubescent, glabrescent. Petiole 0.8–1.5 cm, blackish and transversely wrinkled when dried, pubescent; leaf blade oblong, obovate-oblong, or sometimes elliptic, 6–17.5 × 2–7.5 cm, thinly leathery, abaxially puberulent, adaxially glabrous, secondary veins 13–18 on each side of midvein, and adaxially flat, base rounded to broadly cuneate, apex acute, rounded, or sometimes retuse. Inflorescences axillary, leaf-opposed, or extra-axillary, glomerulate, usually 3–7-flowered, yellow to orange, pubescent; peduncle 1–2 cm. Flowers ca. 1.5 × 1–1.7 cm. Outer petals ovate-triangular to ovate-lanceolate, 13–17 × 7–8 cm, outside fulvous tomentose, inside glabrous; inner petals ovate-lanceolate, 10–11 × 4–5 mm, outside pubescent, inside glabrous. Stamens oblong; connectives ovoid-triangular. Carpels 4–6, obovate-oblong, ca. 3 cm, densely hispid; ovules 8–10 per carpel, in 2 series; styles elongate, inclining; stigma apex 2-cleft. Monocarp stipes ca. 3 cm; monocarps globose, ca. 1.5 cm in diam., tomentose. Fl. Mar–Jun, fr. Aug–Nov.

- Forested valley slopes, moist scrub; 800–1800 m. SE Yunnan [Myanmar].


广西瓜馥木 guang xi gua fu mu

Climbers to 6 m tall. Branches densely ferruginous pubescent when young, glabrous and lenticellate with age. Petiole ca. 5 mm, ferruginous tomentose; leaf blade oblong-lanceolate to narrowly oblong, 7–18 × 1.7–3.8 cm, papery, abaxially ferruginous tomentose, adaxially sparsely pubescent but denser along midvein, secondary veins 13–19 on each side of midvein, obliquely ascending, and adaxially impressed, base rounded, apex slightly acute. Inflorescences usually leaf-opposed, sometimes pseudoterminal, in glomerules, several flowered, densely ferruginous tomentose; peduncle very short to almost absent. Pedicel 2-bracteolate. Flower buds ovoid, ca. 1 cm. Sepals obovate-oblong, ca. 6 mm. Outer petals ovate-elliptic, ca. 8 × 4 mm; inner petals obovate-elliptic, smaller than outer petals, margins connivent. Stamen connectives apically long acuminate. Carpels obovate-oblong, villous; ovules ca. 10 per carpel, in 2 series; styles filiform; stigma apex entire. Fruit not seen. Fl. Feb–Sep, fr. Jun–Nov.

- Densely forested slopes, usually in valleys; 200–500 m. SW Guangxi, SE Yunnan.


凹叶瓜馥木 ao ye gua fu mu

Climbers to 10 m tall. Branches brown tomentose. Petiole 0.8–1.5 cm, abaxially grooved, densely tomentulose; leaf blade broadly ovate, obovate, or obovate-oblong, 9.26 × 4.5–13 cm, leathery to thinly leathery, abaxially brown tomentose, adaxially tomentulose only on midvein and secondary veins, secondary veins 15–22 on each side of midvein and adaxially ± impressed, tertiary veins prominently parallel, reticulate veins very dense, base rounded, truncate, or sometimes shallowly cordate, apex rounded to retuse and minutely apiculate. Inflorescences ± leaf-opposed, in umbel-like glomerules, 4–8-flowered or more; peduncle 5–10 mm; bracts caducous. Pedicel to 2 cm, bracteolate at middle. Sepals ovate-lanceolate, ca. 1 cm, as long as petals in bud, outside tomentulose, inside glabrous. Outer petals ovate-elliptic, ca. 15 mm, outside tomentulose, inside glabrous; inner petals ovate-lanceolate, shorter than outer petals, glabrous, slightly incurved at base. Stamens oblong; connectives broadly 3-angular. Carpels ca. 1.5 mm, densely sericeous pubescent; ovules ca. 4 per carpel, in 2 series; styles oblong, incurved, pubescent; stigma apex acute. Fruiting pedicel 1.5–2.2 cm, golden tomentulose; monocarp stipes very short; monocarps globose, ca. 3 cm in diam., golden tomentulose. Fl. May–Nov, fr. Jun–Dec.

- Densely forested slopes; 700–2000 m. S Guangdong, Guangxi, Guizhou, Hainan, SE Xizang, Yunnan.


番荔枝属 fan li zhi shu
Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Guanabana Miller.

Trees or shrubs, with an indument of simple or stellate hairs. Inflorescences terminal, leaf-opposed, extra-axillary, or sometimes cauliflorous, never axillary, 1-flowered or in few-flowered clusters. Pedicel usually short. Sepals 3, small, valvate. Petals 6, in 2 whorls or inner whorl rudimentary or absent, free or connate at base; outer petals valvate, fleshy but leathery when dry, connivent or somewhat spreading, inside basally concave, margin thick; inner petals imbricate or valvate. Stamens many; filament short; connectives apically convex or apiculate. Carpels many, often connate; ovule 1 per carpel, basal; styles clavate; stigmas apiculate. Fruit syncarpous, surface covered with knobs, bulges, spines, or less often smooth. Seeds many per syncarp, embedded in edible pulp.

About 100 species: mostly in tropical America, a few in tropical Africa; seven species (all introduced) in China.

Annona includes several trees that have become widely grown for their fruit.

1a. Inner petals present.
   2a. Carpels glabrous; ripe syncarp smooth ............................................................... 1. A. glabra
   2b. Carpels pubescent; ripe syncarp with soft prickles.
      3a. Leaf blade elliptic, 14–24 cm, secondary veins punctate at base; inner petals glabrous 2. A. montana
      3b. Leaf blade obovate-oblong to ovate-elliptic, 5–18 cm, secondary veins not punctate at base; inner petals pubescent ............................................................... 3. A. muricata

1b. Inner petals absent or reduced to minute scales.
   4a. Leaf blade abaxially tomentose.
      5a. Axillary vegetative buds glabrous; leaf blade adaxially pubescent; leaves associated with flowering branches not auriculate ............................................................... 4. A. cherimolia
      5b. Axillary vegetative buds pubescent; leaf blade adaxially glabrous; leaves associated with flowering branches auriculate ............................................................... 5. A. diversifolia

4b. Leaf blade abaxially pubescent or puberulent when young, glabrescent.
   6a. Outer petals outside surface and carpels hairy; ripe syncarp not pruinose, areoles flattened and separated by ± raised ridges; fruit pulp yellowish ........................................ 6. A. reticulata
   6b. Outer petals and carpels glabrous; ripe syncarp slightly pruinose, areoles convex and separated by deep grooves; fruit pulp whitish ............................................................... 7. A. squamosa

圆滑番荔枝 yuan hua fan li zhi

Trees to 12 m tall, evergreen. Branches glabrous, lenticellate. Axillary leaf buds ovoid, fulvous pubescent, apex obtuse. Petiole 0.8–2.5 cm; leaf blade ovate, elliptic-ovate, elliptic, or oblong, 6–20 × 3–8 cm, papery to thinly leathery, glabrous at maturity, secondary veins 7–12 on each side of midvein and forming a ca. 60° angle with midvein, glabrous and reticulate veins prominent on both surfaces when dry, base obtuse to rounded and slightly decurrent onto petiole, apex acute to obtuse. Inflorescences internodal or terminal on a short branchlet, 1-flowered. Flower buds ovoid to subglobose. Pedicel 1.5–2 cm, glabrous. Sepals broadly ovate, 3.4 × 3.4 cm, free, glabrous. Outer petals greenish yellow to pale yellow and inside basally with a red spot, broadly ovate, 1.5–3 × 1.3–2.5 cm, outside glabrous, inside minutely puberulent, apex obtuse; inner petals outside yellow, inside cuneate, 1.2–2.5 × 0.7–1.5 cm, minutely puberulent. Stamens oblong, 3–4 mm; connectives apically slightly convex. Carpels connate at anthesis, glabrous. Syncarp yellow or orange, ovoid, 5–12 × 5–8 cm, smooth, apex rounded. Seeds pale reddish brown, 1.3–1.5 cm. Fl. May–Jun, fr. Jul–Aug.

Cultivated; 100–200 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan, Zhejiang [native to tropical America].

The insipid fruit, pond apple, are mostly used for jellies or eaten raw. This tree is tolerant of saline soils and is considered a very troublesome invasive species in coastal areas of Australia.


山地番荔枝 shan di fan li zhi

Trees to 10 m tall, evergreen. Bark purplish brown. Branchlets green and smooth when young. Petiole 1.2–2 cm, adaxially grooved; leaf blade elliptic, papery, abaxially smooth and pale green, adaxially light to dark green, secondary veins 11–16 on each side of midvein, basally punctate, and adaxially slightly concave, base cuneate, apex shortly acuminate. Inflorescences terminal or axillary on apical branchlets, 1- or 2-flowered. Pedicel 2.5–4 cm, robust. Sepals ovate, ca. 6 mm. Outer petals yellowish brown, broadly ovate, apex acute; inner petals orange, shorter than outer petals, apex obtuse. Stamens many; filaments white, flat; anther locules brown; connectives apically dilated. Carpels oblong, 6–7 mm, free at anthesis; ovaries pubescent. Syncarp brownish yellow, ovoid, subglobose, or cordate-ovoid, slightly oblique, 9.5–14 × 9.5–12.5 cm, with dense soft prickles and dark brown hairs; pulp yellowish, aromatic. Fl. May–Jun, fr. Jul–Sep.

Cultivated; 100–200 m. Guangdong, Taiwan [native to W tropical America].

The fruit, mountain soursop, are of a good flavor.


刺果番荔枝 ci guo fan li zhi

Trees to 10 m tall, evergreen. Bark rugose. Petiole short; leaf blade obovate-oblong to ovate-elliptic, 5–18 × 2–7 cm, papery, abaxially greenish and glabrous, adaxially green and shiny, secondary veins 6–13 on each side of midvein and slightly prominent on both surfaces, base broadly cuneate to rounded, apex acute to obtuse. Inflorescences axillary, 1- or 2-flowered. Flowers ca. 3.8 cm in diam. Pedicel 0.5–2.5 cm, pubescent. Sepals ovate-elliptic to ovate-triangular, 3–5 mm. Petals green, later yellowish, inside basally without a red spot; outer petals thick, broadly triangular, 2.5–5 × 2–4 cm, inside finely pubescent, apex acute to obtuse; inner petals ovate-elliptic, 2.4 × 1.5–3.5 cm, slightly thin, imbricate, pubescent, base clawed, apex obtuse. Stamens 4–5 mm; filaments fleshy; connectives apically dilated. Carpels ca. 5 mm, pubescent. Syncarp green, ovoid and often oblique or curved, 10–35 × 7–15 cm, covered with soft prickles, base impressed, apex rounded; pulp white. Seeds brownish yellow, reniform, ca. 2 × 1 cm. Fl. Apr–Jul, fr. Jul–Dec. 2n = 14, 16.

Widely cultivated; 100–400 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [native to tropical America].

The fruit, soursop, is the largest among *Annona* species. It is eaten raw, used in sherbets, and used in drinks. The pulp is also consumed with wine or cognac.

4. **Annona cherimolia** Miller, Gard. Dict., ed. 8, Annona no. 5. 1768.

毛叶番荔枝 mao ye fan li zhi

Trees 3–7 m tall, deciduous. Branchlets tomentose, glabrescent. Axillary leaf buds ovoid, apex obtuse. Petiole 6–12 mm; leaf blade ovate, ovate-lanceolate, elliptic, obovate, or rarely orbicular, 5–25 × 2.5–10 cm, thinly papery, abaxially tomentose, adaxially pubescent, secondary veins 11–14 on each side of midvein and forming an angle from 60° to almost 90° with midvein, base rounded to obtuse and slightly decurrent onto petiole, apex obtuse to shortly acuminate. Inflorescences 1–3-flowered. Sepals ovoid, 2–4 mm, outside tomentose, inside glabrous. Petals outside greenish yellow to reddish, inside yellowish to whitish and basally purple-spotted, linear-oblong, 1.5–3 cm, tomentose, apex obtuse; inner petals absent or reduced to minute scales. Stamens oblong, 1.2–1.7 mm. Syncarp mostly green, ovoid, cordate, conic, or rarely globose, to 20 × 15 cm, smooth or tuberculare but not furrowed between areoles; pulp white. Seeds blackish brown, turning paler when dry, obovate, ca. 1 cm, slightly flattened, apex obliquely truncate. Fl. Mar–Jul, fr. Jun–Nov.

Widely cultivated; 100–300 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [native to tropical America].

The fruit, cherimoya, has good dessert qualities and is subacid and delicate. It is eaten raw, used in cooking drinks, and used in sherbets. It contains up to 18.4% sugar, 1.8% protein, and 0.4% fat.


异叶番荔枝 yi ye fan li zhi

Trees to 8 m tall, deciduous. Branchlets tomentose, glabrescent. Axillary leaf buds ovoid, brown tomentose, apex obtuse. Petiole ca. 1 cm; leaf blade broadly obovate to ovate-lanceolate, 7.5–20 × 3–10 cm, papery, abaxially gray pruinose and brown tomentose, adaxially smooth and glabrous, secondary veins 11–14 on each side of midvein and adaxially flat, base rounded to obtuse, apex rounded. Flowering branches associated with large auriculate leaves. Inflorescences 1–3-flowered.
Flowers ca. 3 cm. Sepals ovate, 2–4 mm, outside tomentose, inside glabrous. Petals reddish; outer petals linear-oblong, 1.5–3 cm, tomentose; inner petals absent. Stamens oblong, ca. 1.5 mm. Syncarp green to reddish, conic, ovoid, or spherical, ca. 20 × 15 cm, tuberculate; pulp white or brownish when ripe. Seeds blackish brown, ovoid to obovoid, ca. 1 cm. Fl. Apr–Aug. fr. Jun–Nov. $2n = 14$.

Cultivated; 100–200 m. Guangdong [native to Central America and S Mexico].

This species is cultivated for the fine fruit, ilama, which are eaten raw.


**牛心番荔枝**  **niu xin fan li zhi**

Trees to 6 m tall, evergreen. Branchlets grayish to white, puberulent. Petiole 1–1.5 cm; leaf blade oblong-lanceolate, 9–30 × 2–7 cm, papery, pubescent when young but glabrescent, secondary veins 9–18 on each side of midvein, forming an angle of 30°–60° with midvein, and flat, base cuneate to obtuse and slightly decurrent onto petiole, apex acuminate. Inflorescences leaf-opposed or in ternodal, cymose, several flowered. Flower buds lanceolate, apex obtuse. Sepals ovate, 2–3 mm, outside pubescent, inside glabrous. Petals yellowish green; outer petals oblong-lanceolate, fleshy, outside puberulent, inside glabrous; inner petals absent. Stamens oblong, 1–1.3 mm; connectives apically subtruncate. Carpels oblong, villous; stigmas muriculate. Syncarp greenish yellow, slightly pruinose, spherical to ovoid, 5–12.5 cm in diam., areoles rounded, convex, separated by deep grooves; pulp white. Seeds black-brown. Fl. Nov–Feb. fr. Mar–Jun. $2n = 14$.

Widely cultivated; 100–200 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan, Zhejiang [native to tropical America].

The fruit, sugar-apple or sweetsop, is edible. It contains more than 20% sugar, 2.3% protein, and 0.3% fat. The bast fiber is used for paper making; the roots are used medicinally for dysentery; and the seeds yield up to 20% oil.


**娄林果属**  **lou lin guo shu**

Li Bingtao (李秉滔 Li Ping-tao); Michael G. Gilbert

Trees or shrubs, indument of simple or rarely stellate hairs. Inflorescences few flowered or rarely 1-flowered. Sepals 3, small, valvate, free or rarely connate at base into a cup. Petals 6, in 2 whorls, with each whorl valvate, connate at base; outer petals outside with a spur or wing; inner petals minute. Stamens many; connectives disklike, apical appendage. Carpels many; ovule 1 per carpel, basal. Fruit syncarpous, globose to ovoid. Seeds many per syncarp, usually dark brown to almost black, flat, embedded in edible pulp.

About 42 species: Central America, tropical South America; one species (introduced) in China.


1. **Rollinia mucosa** (Jacquin) Baillon, Adansonia 8: 268. 1868.

**米糕娄林果**  **mi gao lou lin guo**


Trees to 10 m tall. Bark grayish brown, with rose-colored tissue below. Petiole 5–10 mm; leaf blade oblong-elliptic, 15–25 × 8–11 cm, leathery, abaxially pubescent, adaxially smooth and glossy, midvein prominent, secondary veins 11–16 on each side of midvein, base slightly cuneate, apex acuminate. Inflorescences 1-flowered. Flowers 2–3.5 cm in diam. Pedicel ca. 2 cm, thick and widening at apex. Sepals broadly triangular, 3–4 mm. Outer petals with conspicuous winglike dorsal appendage; inner petals small and scalelike. Stamens many, ca. 1 mm. Carpels many; styles terminal, short, densely hairy. Syncarp dark green at first, ripening yellow to pale yellow, spherical to oblong, 10–20 × 7–20 cm, with soft protuberances ending in a brown to black fleshy point at apex of each carpel; pulp white or cream, fleshy, with a soft fibrous and mucilaginous texture, juicy and with a pleasant aroma. Seeds dark brown to almost black, ca. 10 × 5 mm. Fl. May–Jun. fr. Jul–Nov.

Cultivated; 100–200 m. Guangdong [native to tropical South America].

This species is grown for the fine fruit, biriba. The abundant fleshy pulp surrounding the seeds is eaten.