

#### 4. FLACOURTIA Commerson ex L'Héritier, Stirp. Nov. 3: 59. 1786.

刺篱木属 *ci li mu shu*

*Stigmarota* Loureiro.

Trees or shrubs, dioecious or hermaphroditic, rarely polygamous, usually spiny. Leaves alternate, petiolate; stipules small, early caducous; leaf blade pinnate-veined, sometimes 3–5-veined from base, margin glandular-toothed, rarely entire. Inflorescences axillary, or terminal on abbreviated lateral twigs, usually short, lax, racemose, or in form of small paniculate or umbel-like clusters. Flowers hypogynous, unisexual or bisexual, small; pedicels articulate. Sepals 4–7, imbricate, slightly connate at base, green, small. Petals absent. Disk fleshy, entire or comprised of distinct glands. Staminate flowers: stamens many, exserted, filaments free, filiform; anthers ellipsoid, small, versatile, longitudinally dehiscent, connective not projected beyond thecae; disk extrastaminal; abortive ovary much reduced or absent. Pistillate flowers: disk surrounding base of ovary; ovary superior, globose, ovoid, or bottle-shaped, incompletely 2–8-loculed by false septa; placentas 2-ovuled; styles isomerous with placentas, free or united, columnar; stigmas slightly dilated, flattened, reniform, recurved; staminodes usually absent. Fruit a berrylike indehiscent drupe with pyrenes  $2 \times$  as many as styles, globose, in dried material characteristically longitudinally angled, squarish or rectangular in longitudinal cross-section, with flattish apex and base, contracted or not at equator, disk persistent at base, style or stigma remnants persistent at apex. Seeds ellipsoid, compressed.

Between 15 and 17 species: tropical Africa and Asia; five species (one endemic) in China.

In Chinese species: plants usually dioecious; stamens (10–)15–30(–50), number apparently variable within each species.

*Flacourtia* species are often cultivated and harvested for fruit, medicinal use, or wood.

Male flowers of *Flacourtia* are easily confused with those of *Xylosma*; female flowers of the two genera are easily distinguished by style and stigma morphology, young fruits by style morphology and internal structure.

##### Key to material with female flowers or fruit

- 1a. Abaxial surface of leaf softly and densely pubescent throughout ..... 5. *F. mollis*
- 1b. Abaxial surface of leaf glabrous or sparsely hairy.
  - 2a. Styles completely united to form a distinct column with stigmas slightly spreading at apex ..... 1. *F. jangomas*
  - 2b. Styles free, or joined only at base.
    - 3a. Styles free, arranged in a ring, becoming well-spaced as fruit develops; leaves ovate-oblong, elliptic-oblong, or oblong-lanceolate,  $6-16 \times 4-7$  cm ..... 2. *F. rukam*
    - 3b. Styles joined at base, remaining so in fruit; leaves obovate, oblong-obovate, elliptic, or elliptic-lanceolate,  $2-10 \times 1.5-6$  cm.
      - 4a. Leaves  $2-4 \times 1.5-3$  cm, obovate or oblong-obovate; fruit 8–10 mm in diam. .... 3. *F. indica*
      - 4b. Leaves  $4-10 \times 2.5-6$  cm, elliptic to elliptic-lanceolate; fruit 15–25 mm in diam. .... 4. *F. ramontchi*

##### Identification of material with male flowers

*Flacourtia mollis* can be recognized by its leaf indumentum, and *F. indica* (as defined here) by its leaf size and shape. The remaining three species are much more difficult, at least from herbarium material, as staminate flowers seem to offer no useful characters; leaves on flowering specimens are often young, and therefore, generally small, and in all three species the leaf shape and size is variable, with character states overlapping between the species. *Flacourtia jangomas* usually has ovate to ovate-elliptic or more rarely ovate-lanceolate leaves, and *F. ramontchi* elliptic leaves, but all of these shapes seem to occur also in *F. rukam*. Most flora keys rely heavily on style characters to distinguish species. Staminate herbarium material might easily be misidentified. A molecular study based on fertile material could help resolve this problem.

1. *Flacourtia jangomas* (Loureiro) Raeuschel, Nomencl. Bot., ed. 3, 290. 1797.

云南刺篱木 *yun nan ci li mu*

*Stigmarota jangomas* Loureiro, Fl. Cochinch. 2: 634. 1790; *Flacourtia cataphracta* Roxburgh ex Willdenow.

Large shrubs or small trees, 5–10 m tall, deciduous; trunk and older branches usually unarmed, young branches with simple or divaricate spines; bark yellow-brown, reddish brown, or light brown, flaky; young branches smooth, glabrous or sparse-

ly pubescent, lenticellate. Petiole 4–8 mm, pubescent or glabrescent; leaf blade dark green abaxially, shiny adaxially, in fresh state pinkish to reddish or orange-brown when young, narrowly ovate, ovate-elliptic, or ovate-oblong, rarely oblong-lanceolate or (slightly) obovate-lanceolate,  $7-14 \times 2-5$  cm, thinly leathery to papery, both surfaces practically glabrous, any hairs present very short, midvein slightly raised on both surfaces, lateral veins 3–6 pairs, conspicuous adaxially, base acute, obtuse, or rounded, margin entire or serrate to crenate, apex obtuse or gradually tapering to narrowly acuminate, rarely more abruptly acuminate. Inflorescences axillary, racemose; rachis

0.5–2 cm, puberulous. Pedicels 5–10(–15) mm, very slender, minutely and sparsely puberulous or glabrous; bracts ovate, 0.5–1 mm, outside glabrous or sparsely hairy, inside pubescent, margin entire, ciliate. Flowers appearing with or before young leaves, white to greenish, honey-scented. Sepals 4 or 5, ca. 2 mm, ovate-triangular, apex obtuse, outside practically glabrous, inside pubescent, margin ciliate, hairs very short, often barely visible in female flowers. Staminate flowers: stamen filaments 2–3 mm, glabrous. Pistillate flowers: ovary bottle-shaped to globose, 2–3 mm; styles 4–6, united into a distinct column ca. 1 mm, not or slightly free at their apices; stigmas slightly reniform, dilated, recurved. Fruit brownish red or purple, finally blackish, subglobose, fleshy, 1.5–2.5 cm in diam., in dried material sometimes constricted at equator, style column persistent. Seeds 4 or 5(–10). Fl. Apr–May, fr. May–Oct.

• Mountain rain forests, evergreen broad-leaved forests; 700–800 m. W Guangxi, S Hainan, S Yunnan.

According to Sleumer (Fl. Males., ser. 1, 5(1): 73. 1954), *Flacourtia jangomas* is not known in the wild state. The species is cultivated around villages, and naturalized from them, throughout tropical regions, especially in E Africa and tropical Asia.

*Morse 498* (K), from Guangxi, determined as “cf. *Flacourtia jangomas*” by Sleumer (determination slip dated 1954 on herbarium sheet), has pubescent stamen filaments. The leaves are small, ovate to narrowly elliptic, and possibly young. The specimen might represent immature *F. ramontchi*.

**2. *Flacourtia rukam*** Zollinger & Moritz, Syst. Verz. 2: 33. 1846.

大叶刺篱木 da ye ci li mu

Trees, 5–15 m tall; bark gray-brown, not flaky; when young with simple or branched thorns to 10 cm on trunk and branches (thornless in cultivated forms); branchlets terete, glabrous to densely pubescent when young. Petiole 4–8 mm, glabrous or pubescent, hairs spreading; young leaves flaccid, drooping, rose-red to brown; mature leaves ovate-oblong, elliptic-oblong, or oblong-lanceolate, 6–16 × 4–7 cm, subleathery, both surfaces glabrous or minutely puberulous, in older leaves hairs mostly confined to midveins and lateral veins, midvein raised and sometimes prominent abaxially, impressed adaxially, lateral veins 5–11 pairs, base obtuse to rounded, less often acute, margin serrulate, serrate, or dentate, teeth obtuse, apex gradually to abruptly acuminate, acumen 0.5–2 cm, tip obtuse. Inflorescences axillary, racemose, 0.5–1 cm, puberulous; bracts ovate, ca. 1 mm, pubescent. Pedicels 3–4 mm, puberulous to pubescent, hairs ± appressed, short. Flowers yellowish green, scentless. Sepals (3 or)4 or 5( or)6, ovate, 1–1.5 mm, both surfaces pubescent, outside sparsely pubescent, inside more densely so, margin ciliate, apex acute or obtuse. Staminate flowers: stamen filaments 3–4 mm, glabrous; disk orange-red to yellowish. Pistillate flowers: ovary bottle-shaped; placentas 4–6(–8); styles 4–6(–8), free, divergent, 0.7–1.5 mm; stigmas recurved, slightly dilated, reniform; staminodes (reduced stamens) or developed stamens (?functional) occasionally present. Fruit light green, pink, purplish, or dark red, globose, 2–2.5 cm in diam., 4–7-angled in dried state, persistent styles well-spaced, set in a circle at fruit apex. Seeds ca. 12. Fl. Apr–May, fr. Jun–

Oct.

Evergreen broad-leaved forests; below 2000 m. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [India, Indonesia, Malaysia, Thailand, Vietnam, both wild and cultivated].

**3. *Flacourtia indica*** (N. L. Burman) Merrill, Interpr. Herb. Amboin. 377. 1917.

刺篱木 ci li mu

*Gmelina indica* N. L. Burman, Fl. Indica, 132. 1768; *Flacourtia parvifolia* Merrill.

Shrubs or small trees, 2–4 m tall, deciduous; bark gray-yellow, fissured, flaky; old branches usually not spiny; young branches with axillary, simple spines; branchlets puberulous or subglabrous. Petiole red, short, 3–5 mm, puberulous; leaf blade greenish abaxially, deep green adaxially, rose red when young, obovate to oblong-obovate, 2–4 × 1.5–3 cm, thickly papery, abaxially glabrous or sparsely pubescent, hairs spreading and short, adaxially glabrous, midvein raised abaxially, flat adaxially, lateral veins 5–7 pairs, reticulate veins conspicuous, base mostly acute to obtuse, margin serrulate above middle, apex rounded, sometimes retuse. Inflorescences axillary or terminating short lateral twigs, racemose, short; rachis 0.5–2 cm, puberulous. Pedicels 3–5 mm, puberulous, hairs spreading. Sepals 5 or 6, ovate, ca. 1.5 mm, outside glabrous or with a few scattered short hairs, inside sparsely to densely pubescent, margin white ciliate in dried material, apex obtuse. Staminate flowers: stamen filaments 2–2.5 mm, pubescent or less often glabrous. Pistillate flowers: ovary globose, placentas 5 or 6; styles 5 or 6, united only at base, radiating, 1–2 mm, slender. Fruit dull to blackish red, globose, 8–10 mm in diam., longitudinally 5- or 6-angled, styles persistent. Seeds 5 or 6. Fl. Jan–Mar, fr. Mar–Jul.

Broad-leaved forests; sea level to 1400 m. Fujian, Guangdong, Guangxi, Hainan [widespread and cultivated in tropical and subtropical regions of Africa, Asia, and the Pacific islands].

The taxonomy of *Flacourtia indica* is complex. Some authors have treated the species in a broad sense, and include in synonymy not only *F. ramontchi* (see below) but also several other entities found across tropical Asia and Africa. For an introduction to the problem, see Matthew (Fl. Tamilnadu Carnatic 3(1): 59–61. 1983), Mitra (in Sharma et al., Fl. India 2: 402–403. 1993), Sleumer (Fl. Males., ser. 1, 5(1): 76–77. 1954), and Verdcourt (in Dassanayake & Clayton, Rev. Handb. Fl. Ceylon 10: 222–224. 1996). Some of the taxonomic confusion might be due to a loss of significant field characters during the preparation of herbarium material (Verdcourt, loc. cit.). In the present account, *F. ramontchi* is treated as a separate species because, on the evidence of herbarium material at PE, it seems to be a distinct and recognizable entity within China. Descriptions of *F. ramontchi* vary; for example, compare that below with Matthew (loc. cit.).

**4. *Flacourtia ramontchi*** L’Héritier, Stirp. Nov. 3: 59. 1786.

大果刺篱木 da guo ci li mu

Trees, to 20 m tall; bark gray-brown; flowering and fruiting branches usually not spiny; branchlets puberulous or subglabrous. Petiole 4–8 mm, usually glabrous, rarely sparsely puberulous; leaf blade greenish abaxially, deep green and shiny adaxially, broadly elliptic, elliptic, or elliptic-lanceolate, 4–10 × 2.5–6 cm, papery, both surfaces glabrous, midvein raised abax-

ially, lateral veins 4–6 pairs, reticulate veins conspicuous, base cuneate, margin serrate, apex obtuse or acute, rarely retuse. Inflorescences terminal or axillary, racemose, 1–2 cm, puberulous. Sepals 5 or 6, ovate, ca. 1.5 mm, outside glabrous, inside puberulous, margin ciliate, apex obtuse. Staminate flowers: disk entire or shallowly lobed. Pistillate flowers: disk entire; ovary globose; placentas 5 or 6, each with 2 ovules; styles 5 or 6, free; stigmas 2-lobed. Fruit globose, 1.5–2.5 cm in diam., not longitudinally angled, with persistent styles. Seeds 4–6. Fl. Apr–May, fr. Jun–Oct.  $2n = 22$ .

Evergreen broad-leaved forests; 200–1700 m. Guangxi, Guizhou, Yunnan [India, Malaysia, Philippines, Sri Lanka, Vietnam; Africa].

See taxonomic note under *Flacourtia indica*.

**5. *Flacourtia mollis*** J. D. Hooker & Thomson, Fl. Brit. India 1: 192. 1872.

毛叶刺篱木 mao ye ci li mu

Small trees or shrubs, 3–4 m (?or more) tall, apparently unarmed; branchlets ± rusty pubescent, hairs spreading, rather long. Petiole 5–10 mm, stoutish, densely hairy, hairs spreading, brownish, straight, long (0.5–1 mm); leaf blade ovate to ovate-elliptic, 11–18 × 4.5–7.5 cm, thickly papery, abaxially softly pubescent throughout, soft to the touch, hairs spreading and long (0.5–1 mm), adaxially glabrous except near petiole apex, midvein impressed above, lateral veins 4–6 pairs, prominent abaxially, base broadly acute to rounded, margin shallowly serrate to serrulate, entire toward base, apex obtuse, contracting to a narrow acumen 1–2 cm, extreme tip obtuse. Inflorescences mostly axillary, racemose with axis ca. 1 cm, or reduced to glomerules or fascicles; rachises densely hairy, appearing nearly bristly at × 10 mag., hairs spreading, ca. 0.5 mm; bracts ovate to lanceolate, 1–2 mm, both surfaces sparsely bristly. Pedicels ca. 1 mm in pistillate flowers, ca. 3 mm in staminate flowers (few specimens seen), bristly. Sepals 4–6, ovate, 1–1.5 mm, unequal in size, both sides and margin sparsely bristly, or adaxially nearly glabrous, apex acute. Staminate flowers: stamens filaments 3–4 mm, glabrous. Pistillate flowers: ovary bottle-shaped, 1.5–2 mm, glabrous; styles connate into a short column ca. 0.5 mm; stigmas 4–6, radiating, recurved, flattened-reniform. Dried fruit oblong-polygonal to obovoid-polygonal, to ca. 1 cm (?immature), longitudinally angled.

Mountain forests; 1000–1700 m. Yunnan [Myanmar].

*Flacourtia mollis* is sometimes misidentified as the Indian en-

demic *F. montana* J. Graham. The two species can be distinguished by the abaxial indumentum of the leaf: in *F. mollis*, it is softly hairy throughout; in *F. montana*, it is sparsely hairy only along the midvein and lateral veins. Gatherings of *F. mollis* seem scarce; more material is required to confirm and improve the above description.

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