

24. MALLOTUS Loureiro, Fl. Cochinch. 2: 635. 1790.

野桐属 ye tong shu

Qiu Huaxing (丘华兴 Chiu Hua-hsing, Kiu Hua-shing, Kiu Hua-xing); Michael G. Gilbert

Coelodiscus Baillon; *Echinus* Loureiro; *Rottlera* Roxburgh.

Trees or shrubs, rarely climbers, usually dioecious; indumentum usually of simple and stellate hairs, and whitish to reddish glandular scales. Leaves alternate or opposite with one member of pair smaller; stipules usually subulate; leaf blade undivided or lobate, sometimes peltate, abaxially often glandular-scaly, adaxially often distinctly glandular, base usually with 2 or more glands, venation palmate or pinnate. Inflorescences terminal or axillary, mostly unbranched, less often branched, usually many flowered. Male flowers usually several per bract; calyx 3–5-partite, valvate; petals and disk absent; stamens 15–250; filaments free; anthers 2-locular, connective often broad; pistillode absent [or rarely present]. Females flowers 1(or 2) per bract; calyx 3–5-lobed, sometimes spathaceous and caducous; ovary (2 or)3(or 4)-locular; styles simple, plumose or long papillose; ovules 1 per locule. Capsule (2 or)3(or 4)-locular, smooth or softly spiny. Seeds subglobose or ovoid, smooth, sometimes with aril.

About 150 species: tropical and subtropical regions in Asia, a few species in Africa and Australia; 28 species (seven endemic) in China.

Phylogenetic studies (Sierra et al., *Blumea* 51: 519–540. 2006; Kulju et al., *Blumea* 52: 115–136. 2007) have revealed that *Mallotus* and *Macaranga* are closely related and that the species of *Cordemoysa* are distinct from both. These also show that *Trevisia* is embedded within *Mallotus* but its inclusion has serious nomenclatural consequences and so this is not followed here until the situation is resolved.

Govaerts et al. (World Checkl. Euphorbiaceae: <http://www.kew.org/wcsp/home.do>) indicated that *Mallotus dispar* (Blume) Müller Argoviensis, recorded from Indonesia, Malaysia, Myanmar, Thailand, Philippines, and Vietnam, occurs in Hainan and Taiwan, but we have not seen the support for this statement. It most closely resembles *M. decipiens* and *M. yunnanensis* but differs by the larger stipules, 5–6 mm, longer petiole, 4–5 cm, and more densely softly spiny capsule.

Mallotus neocavaleriei H. Léveillé (Fl. Kouy-Tchéou, 165. 1914–1915) is a synonym of *Deeringia amaranthoides* (Lamarck) Merrill in the Amaranthaceae (see Fl. China 5: 416. 2003).

- 1a. Leaves always opposite, sometimes very unequal, or with one member stipulelike [or even obsolete].
 - 2a. Leaves palmately 3-veined.
 - 3a. Petiole 3–12 cm, stipules obsolete; male inflorescence 6–15 cm; stamens 80–100 1. *M. tiliifolius*
 - 3b. Petiole 0.5–3 cm, stipules 2–4 mm; male inflorescence 4–6 cm; stamens 30–40.
 - 4a. Branchlet indumentum dull yellow; leaf blade thinly leathery 2. *M. decipiens*
 - 4b. Branchlet indumentum densely brownish; leaf blade stiffly papery 3. *M. yunnanensis*
 - 2b. Leaves pinnately veined, basal lateral veins similar to distal lateral veins.
 - 5a. Female inflorescence 10–18 cm; male inflorescence 5–15 cm; capsule densely softly spiny, spines 2–3 mm 5. *M. esquirolii*
 - 5b. Female inflorescence 2–8 cm; male inflorescence 2–6 cm; capsule sparsely shortly softly spiny, spines ca. 1 mm.
 - 6a. Leaf blade abaxially gray pubescent along veins, and barbate in vein-axils, lateral veins 4–6 pairs 3. *M. yunnanensis*
 - 6b. Leaf blade abaxially ferruginous stellate-pubescent, lateral veins 7–9 pairs 4. *M. anomalus*
- 1b. At least some leaves alternate.
 - 7a. Leaves alternate and opposite on same branch; dried plant smelling of fenugreek; female calyx spathaceous; capsule softly spiny.
 - 8a. Leaves adaxially sparsely glandular-scaly; capsule gray tomentulose, densely and shortly softly spiny 6. *M. thorelii*
 - 8b. Leaves adaxially not glandular-scaly; capsule pilose or glandular-scaly, more laxly softly spiny.
 - 9a. Leaf blade oblong or elliptic, base obtuse or narrowly cordate, abaxially stellate-hirsute only along midrib 7. *M. peltatus*
 - 9b. Leaf blade ovate or orbicular, base often rotund.
 - 10a. Leaves clearly peltate, apex caudate-acuminate, abaxially stellate-pilose, palmately 7–9-veined 8. *M. roxburghianus*
 - 10b. Leaves not or only obscurely peltate, apex acuminate, abaxially glaucous, palmately 3-veined 9. *M. garrettii*
 - 7b. Leaves either strictly alternate or strictly opposite; plant not smelling of fenugreek; female calyx not spathaceous; capsule smooth or softly spiny.
 - 11a. Capsule smooth, densely brightly colored glandular-scaly, or tomentose.
 - 12a. Erect shrubs or trees.
 - 13a. Leaf blade abaxially, ovary, and fruit with red or crimson gland-scales; seed ca. 4 mm in diam. 10. *M. philippensis*

- 13b. Leaf blade abaxially, ovary, and fruit with golden-yellow gland-scales; seed ca. 6 mm in diam. 11. *M. pallidus*
- 12b. Climbing shrubs.
- 14a. Leaf blade longer than wide, thickly papery or leathery; ovary and fruit 3-locular, densely orange-yellow stellate-tomentose; seed ca. 6 mm in diam. 12. *M. millietii*
- 14b. Leaf blade about as long as wide, papery or membranous, abaxially sparsely yellowish glandular-scaly; ovary and fruit 2- or 3-locular, yellowish-brownish tomentulose; seed ca. 5 mm in diam. 13. *M. repandus*
- 11b. Capsule softly spiny.
- 15a. Leaves always peltate, palmately veined.
- 16a. Leaves adaxially sparsely glandular-scaly and villous; capsule sparsely shortly softly spiny and densely yellowish glandular-scaly 14. *M. dunnii*
- 16b. Leaves adaxially not glandular-scaly; capsule densely stellate-pubescent and softly spiny, forming a continuous uniform layer.
- 17a. Leaves undivided, narrowly peltate or peltate.
- 18a. Branchlets ferruginous tomentose; stipules triangular, 3–5 mm; capsule setae 6–8 mm 15. *M. metcalfeanus*
- 18b. Branchlets brown pulveraceous-tomentose; stipules obsolete; capsule setae ca. 3 mm 16. *M. conspurcatus*
- 17b. Leaves often tricuspidate or 1- or 2-lobed, broadly peltate.
- 19a. Female inflorescence branched or unbranched (var. *croizatianus*, var. *pedicellaris*); branchlets densely floccose or tomentose; stipules subulate, 5–15 mm 17. *M. barbatus*
- 19b. Female inflorescence unbranched; branchlets densely stellate-tomentose; stipules filiform or lanceolate, 3–8 mm.
- 20a. Branchlets reddish brown tomentose; stipules filiform, 6–8 mm; capsule ca. 20 mm in diam. 18. *M. luchenensis*
- 20b. Branchlets yellowish brown tomentose; stipules narrowly lanceolate, 3–4 mm; capsule 12–15 mm in diam. 19. *M. lotingensis*
- 15b. At least some leaves not peltate, sometimes also narrowly peltate on same branch.
- 21a. Capsule ca. 10 mm in diam., densely softly spiny; female inflorescence branched or unbranched; leaf blade 3-veined from base.
- 22a. Female inflorescence branched; capsule 4-locular, spines subulate; leaf base with 2–4 glands 20. *M. tetracoccus*
- 22b. Female inflorescence unbranched; capsule 3(or 4)-locular, spines not subulate; leaf base with 2 conspicuous glands.
- 23a. Female inflorescence and infructescence pendulous, more than 15 cm, whitish tomentose; capsule setae filiform, yellowish when dried 21. *M. apelta*
- 23b. Female inflorescence or infructescence erect, 8–20 cm, gray or yellowish tomentose or pilosulose; capsule setae linear, brown when dried.
- 24a. Female inflorescence 8–15 cm, peduncle ca. 5 mm thick 22. *M. tenuifolius*
- 24b. Female inflorescence 10–20 cm, peduncle ca. 3 mm thick 23. *M. nepalensis*
- 21b. Capsule 10–20 mm in diam., sparsely softly spiny, subulate; female inflorescence branched; leaf blade 3- or 5-veined from base.
- 25a. Branchlet indumentum whitish; capsule ca. 6 mm in diam., setae ca. 2 mm 24. *M. microcarpus*
- 25b. Branchlet indumentum brownish, yellowish-brownish, or reddish; capsule 8–12 mm in diam., setae 3–7 mm.
- 26a. Branchlets tomentose; styles 6–7(–10) mm, partly connate; capsule setae 5–7 mm 28. *M. lianus*
- 26b. Branchlets tomentulose; styles 3–5 mm, almost free; capsule setae 3–4 mm.
- 27a. Leaf blade 3-veined from base; capsule 10–12 mm in diam.; leaves never peltate; branchlet indumentum yellowish-brownish 25. *M. oreophilus*
- 27b. Leaf blade 3–5-veined from base; capsule less than 10 mm in diam.; some leaves narrowly peltate; branchlet indumentum dull brown or reddish.
- 28a. Branchlets dull brownish tomentulose; ovary and capsule densely orange-reddish glandular-scaly 26. *M. japonicus*
- 28b. Branchlets reddish tomentulose; ovary and capsule tomentulose 27. *M. paniculatus*

1. *Mallotus tiliifolius* (Blume) Müller Argoviensis, *Linnaea* 34: 190. 1865 [*"tiliaefolius"*].

椴叶野桐 duan ye ye tong

Rottlera tiliifolia Blume, *Bijdr.* 607. 1826 [*"tiliaefolia"*]; *Mallotus playfairii* Hemsley.

Shrubs or small trees, 3–7 m tall. Branchlets and inflorescences grayish ochraceous tomentulose. Leaves opposite, each pair slightly unequal; stipules obsolete; petiole 3–12 cm; leaf blade triangular, triangular-ovate, or rhombic-ovate, 5–20 × 4.5–20 cm, chartaceous, adaxially sparsely stellate-puberulent, abaxially tomentulose, sparsely reddish glandular-scaly, base rounded to cordate, with 2–4 maculate glands, margin entire or repand, apex acute or acuminate; basal veins 3. Male inflorescences terminal, unbranched, 6–15 cm; bracts subulate, 1.5–2 mm. Male flowers 3–9-fascicled; pedicel 2–3 mm; calyx lobes 3–5, oblong or lanceolate, 2–3 mm; stamens 80–100. Female inflorescences 3–15 cm. Female flowers: sepals 3–5, ovate-lanceolate, 2.5–3 mm, tomentulose; ovary tomentose and softly spiny; styles 3, 4–5 mm, connate at middle, plumose. Fruiting pedicel ca. 5 mm; capsule 3-locular, ca. 12 mm in diam., tomentulose and sparsely shortly softly spiny. Seeds subglobose, ca. 5 mm in diam. Fl. Apr–Jun, fr. Aug–Oct.

Coastal regions, thickets; below 100 m. Hainan, Taiwan [Indonesia, Malaysia, Philippines, Thailand; N Australia, Pacific islands (Fiji)].

2. *Mallotus decipiens* Müller Argoviensis, *Linnaea* 34: 194. 1865.

短柄野桐 duan bing ye tong

Shrubs or small trees, 2–6 m tall. Branchlets densely dull yellow stellate-pubescent. Leaves opposite, each pair unequal; stipules oblong, 3–4 mm, leathery, pubescent; petiole 5–10 mm, tomentose; leaf blade obovate or oblong-ovate, 5–16 × 3–8 cm, thinly leathery, adaxially glabrescent, abaxially pubescent and yellowish granular-glandular, base cuneate, with 2 glands, margin repand-denticulate, apex acute or acuminate; basal veins 3. Male inflorescences terminal or axillary, unbranched, 4–6 cm, tomentulose; bracts lanceolate, small. Male flowers 3–5-fascicled; calyx lobes 3, ovate, ca. 2 mm, puberulent; stamens 30–40. Female raceme 5–11 cm, tomentulose; bracts lanceolate, ca. 2 mm. Female flowers: sepals 4 or 5, oblong, ca. 3 mm, pubescent; ovary tomentose; styles 3, ca. 3 mm, base connate, ca. 1 mm, plumose. Capsule 3-locular, 8–9 mm in diam., puberulent and sparsely shortly softly spiny. Seeds globose, ca. 3.5 mm in diam. Fl. Mar–Apr, fr. May–Jun.

Mountain valleys, forests; 400–800 m. SW Yunnan [Myanmar, Thailand].

3. *Mallotus yunnanensis* Pax & K. Hoffmann in Engler, *Pflanzenr.* 63(IV. 147. VII): 188. 1914.

云南野桐 yun nan ye tong

Mallotus hainanensis S. M. Hwang.

Shrubs 1–3 m tall. Branchlets densely brownish stellate-pubescent. Leaves opposite, each pair somewhat unequal; stipules subulate to lanceolate, 2–4 mm, deciduous; petiole 0.5–3 cm; leaf blade elliptic, broadly ovate, or rhombic-ovate, 4–15 ×

2–5 cm, chartaceous, adaxially glabrous, abaxially gray pubescent along veins, and barbate in vein axils, scattered glandular-scaly, base cuneate or obtuse, sometimes slightly cordate, with 2–4 glands, margin repand-denticulate or subentire, apex acute or acuminate; basal veins 3, lateral veins 4–6 pairs. Male inflorescences axillary, sometimes terminal, unbranched, 2–6 cm, pubescent; bracts lanceolate or triangular, 2–4 mm. Male flowers 3-fascicled; pedicel 1–2 mm; calyx lobes 3 or 4, ovate, ca. 2 mm, pubescent; stamens 35–40. Female raceme 2–8 cm, with 2–9 flowers, pubescent. Female flowers: sepals 3–5, lanceolate or oblong-lanceolate, ca. 3 mm, pubescent; styles 3, ca. 3 mm, base connate, plumose. Capsule 3-locular, ca. 8 mm in diam., yellowish pubescent, sparsely shortly softly spiny and glandular-scaly; pedicel ca. 2 mm. Seeds globose, ca. 3.5 mm in diam., brown. Fl. and fr. Apr–Dec.

Mountain slopes or limestone, thickets; below 100–1400 m. Guangxi, S Guizhou, Hainan, Yunnan [N Vietnam].

4. *Mallotus anomalus* Merrill & Chun, *Sunyatsenia* 5: 99. 1940.

锈毛野桐 xiu mao ye tong

Shrubs 1–3 m tall. Branchlets and inflorescences densely ferruginous stellate-pubescent. Leaves opposite, each pair slightly unequal; stipules triangular, 4–5 mm; petiole 1–7 cm; leaf blade broadly elliptic, obovate, or oblong-obovate, 5–30 × 3–18 cm, chartaceous, adaxially pubescent along veins, abaxially ferruginous tomentulose, base obtuse, sometimes subcordate, with 2–4 glands, margin repand-serrate, apex acute; lateral veins 7–9 pairs. Male inflorescences axillary, unbranched, 2.5–4 cm; bracts lanceolate, 3–5 mm. Male flowers 3–5-fascicled; pedicel ca. 3 mm; calyx lobes 3, long ovate, ca. 4 mm, pubescent; stamens 25–30. Female racemes 2–4 cm, with 3–8 flowers; bracts triangular or ovate-lanceolate, ca. 3 mm. Female flowers: sepals 3, lanceolate, 4–7 mm, pubescent; ovary densely pubescent; styles 3, 3–4 mm, base connate, plumose. Capsule 3-locular, ca. 12 mm in diam., pubescent and sparsely shortly softly spiny; pedicel 1–1.5 cm. Seeds ovoid, 4–6 mm, brown. Fl. and fr. Mar–Dec.

• Mountain slopes or valleys, forests, thickets; below 100–400 m. S Hainan.

5. *Mallotus esquirolii* H. Léveillé, *Repert. Spec. Nov. Regni Veg.* 9: 327. 10 May 1911 (not H. Léveillé, 15 Aug 1911).

长叶野桐 chang ye ye tong

Mallotus eberhardtii Gagnepain; *M. grossedentatus* Merrill & Chun.

Shrubs or small trees, 2–10 m tall. Branchlets and inflorescences densely gray stellate-puberulent. Leaves opposite, each pair somewhat unequal or exceedingly unequal, rarely alternate; stipules lanceolate, 3–4 mm; petiole 1.5–8 cm, puberulent; leaf blade oblong-obovate, elliptic, rarely oblanceolate, 10–22 × 5–10 cm, papery or thinly leathery, adaxially glabrous, abaxially stellate puberulent along veins, very sparsely or scarcely yellow glandular-scaly, base cuneate, sometimes broadly cuneate, with basal glands 2–4, margin repand-dentate or denticulate, apex acuminate or subcaudate; smaller leaves elliptic or ovate, 6–10 × 4–6.5 cm, sometimes

subsessile; lateral veins 8–12 pairs. Male inflorescences terminal or axillary, unbranched, 5–15 cm; bracts triangular, ca. 1.5 mm. Male flowers 2–5-fascicled; pedicel 2–5 mm; calyx lobes 3, elliptic, ca. 3 mm, tomentulose; stamens 40–50. Female inflorescences 10–18 cm, unbranched; bracts triangular, 1.5–2.5 mm. Female flowers: pedicel 4–5 mm; sepals 4 or 5, lanceolate, ca. 3 mm; ovary densely softly spiny; styles 3, ca. 4 mm, base connate, plumose. Capsule 3-locular, 12 mm in diam., puberulent, densely softly spiny, 2–3 mm. Seeds subglobose, brownish, ca. 6 mm in diam. Fl. Apr–Oct, fr. Jun–Dec.

Limestone mountain valleys or mountain slopes, forests; 300–1500 m. Guangxi, Guizhou, Hainan, E Yunnan [N Vietnam].

6. *Mallotus thorelii* Gagnepain, Notul. Syst. (Paris) 4: 53. 1923.

灰叶野桐 hui ye ye tong

Shrubs or small trees, 3–5 m tall. Branchlets densely gray stellate-pubescent. Leaves alternate or subopposite; stipules triangular, ca. 4 mm, pubescent; petiole 5–8 cm, tomentose; leaf blade orbicular-ovate or triangular-ovate, 10–14 × 9–13 cm, papery, adaxially pubescent, scattered glandular-scaly, abaxially gray tomentose, densely glandular-scaly, base rotund, broadly peltate, margin sinuous-denticulate or subentire, apex abruptly caudate; basal veins 5. Male inflorescences usually terminal, unbranched, 8–10 cm, tomentulose. Female inflorescences unbranched, 15–18 cm, tomentulose; bracts long ovate, ca. 4 mm. Female flowers: pedicel ca. 5 mm; calyx lobes 4 or 5, lanceolate, ca. 2 mm, deciduous; ovary tomentose; style 3 mm, plumose. Capsule 3-locular, ca. 10 mm in diam., gray tomentulose, densely shortly softly spiny. Fl. Jun–Jul, fr. Aug–Sep.

Mountain valleys, forests; 1200–1300 m. S Yunnan [Cambodia, Laos, Thailand, N Vietnam].

The dried material smells of fenugreek.

7. *Mallotus peltatus* (Geiseler) Müller Argoviensis, Linnaea 34: 186. 1865.

山苦茶 shan ku cha

Aleurites peltata Geiseler, Croton. Monogr. 81. 1807; *Hancea muricata* Bentham; *Mallotus furetianus* Müller Argoviensis; *M. maclurei* Merrill; *M. oblongifolius* (Miquel) Müller Argoviensis; *Rottlera oblongifolia* Miquel.

Shrubs or small trees, 2–8 m tall. Branchlets stellate-hirsute and pubescent. Leaves alternate, sometimes subopposite; stipules oblong, ca. 3 mm, deciduous; petiole 0.5–4.5 cm; leaf blade oblong-obovate or elliptic, 5–18 × 2–6 cm, papery, abaxially stellate-hirsute along midvein, sparsely glandular-scaly, base obtuse or narrowly cordate, sometimes peltate, with 4 basal glands, margin subentire or repand-denticulate, apex acuminate; lateral veins 8–10 pairs. Male inflorescences racemose, terminal, 6–12 cm; bracts ovate-lanceolate, 2–3 mm. Male flowers 2–5-fascicled; pedicel 2–3 mm; calyx lobes 3, ovate, ca. 1.5 mm, glabrous; stamens 25–45. Female inflorescences racemose, 5–8 cm, with 4–7 flowers; bracts subulate, ca. 2 mm. Female flowers: calyx urceolate, 5–7

mm, stellate-pubescent, 3-denticulate, spathaceous, deciduous; ovary densely puberulent and softly spiny; styles 3, ca. 8 mm, connate at middle, plumose. Capsule 3-locular, 14 mm in diam., pubescent and glandular-scaly, sparsely softly spiny; pedicel ca. 5 mm. Seeds globose, ca. 5 mm in diam., brown marbled. Fl. Feb–Jun, fr. Jun–Nov.

Mountain slopes or valleys, forests, thickets; 200–1000 m. Guangdong, Hainan [India, Indonesia, Malaysia, Myanmar, New Guinea, Philippines, Thailand, Vietnam].

The dried material smells of fenugreek.

8. *Mallotus roxburghianus* Müller Argoviensis, Linnaea 34: 186. 1865.

圆叶野桐 yuan ye ye tong

Shrubs ca. 3 m tall. Branchlets yellow stellate-pubescent and villous. Stipules linear, 5–7 mm; petiole 5–10 cm; leaf blade orbicular-ovate, 8–20 × 7–18 cm, papery, adaxially villous, abaxially stellate-pilose and villous along veins, glandular-scaly, base rotund, broadly peltate, with 2–4 basal glands, margin repand-denticulate, apex caudate-acuminate; basal veins 7–9. Male inflorescences terminal, unbranched, 4–12 cm, tomentose; bracts linear, ca. 5 mm. Male flowers 3–5-fascicled; sepals 4, oblong, ca. 2 mm, pubescent; stamens 25–35. Female inflorescences 10–15 cm, tomentose. Female flowers: calyx urceolate, 6-lobed, lanceolate, ca. 3 mm, pubescent; ovary densely pilose; style 3–4 mm, base connate, plumose. Capsule 3-locular, ca. 12 mm in diam., pilose and shortly softly spiny; pedicel 5–7 mm. Seeds subglobose, ca. 4.5 mm, brownish. Fl. Jul–Aug, fr. Aug–Sep.

Mountain slopes, forests; 800–1000 m. Yunnan (Yingjiang) [NE India].

The dried material smells of fenugreek.

9. *Mallotus garrettii* Airy Shaw, Kew Bull. 21: 387. 1968.

粉绿野桐 fen lü ye tong

Small trees 4–8 m tall. Branchlets and leaves glabrous. Stipules triangular, ca. 3 mm, deciduous; petiole slender, 2–9 cm; leaf blade ovate or oblong-ovate, 7–15 × 3.5–8.5 cm, papery, abaxially glaucous, sparsely glandular-scaly, base rotund or narrowly cordate, with 2 basal glands, margin entire or repand, apex acuminate; basal veins 3, lateral veins 4 or 5 pairs. Male inflorescences terminal or axillary, unbranched, 5–12 cm; bracts ovate, ca. 3 mm. Male flowers 3–5-fascicled; pedicel 1–3 mm; calyx lobes 3, ovate, ca. 2 mm, pilose; stamens 30–40. Female inflorescences 11–13 cm, pilose. Capsule 3-locular, coccus subglobose, ca. 8 mm in diam., sparsely glandular-scaly and shortly softly spiny; persistent style ca. 4 mm, connate at middle, plumose. Seeds globose, ca. 5 mm in diam., brownish marbled. Fl. Jun–Oct, fr. Oct–Dec.

Mountain valleys, forests; 1000–1500 m. S Yunnan [Laos, N Thailand].

The dried material smells of fenugreek.

10. *Mallotus philippensis* (Lamarck) Müller Argoviensis, Linnaea 34: 196. 1865.

粗糠柴 cu kang chai

Shrubs or small trees, 2–15 m tall. Branchlets, petiole, and inflorescences yellow-brownish stellate-tomentose. Stipules small, ca. 1 mm; petiole 2–9 cm; leaf blade ovate to lanceolate, 5–20 × 3–6 cm, leathery, adaxially glabrescent, abaxially gray-yellow tomentulose and sparsely red glandular-scaly, base cuneate or obtuse, with 2–4 basal glands, margin subentire, apex acuminate; basal veins 3. Male inflorescences unbranched, 5–10 cm; bracts triangular, ca. 1 mm. Male flowers 1–5-fascicled; pedicel 1–2 mm; calyx lobes 3 or 4, oblong, ca. 2 mm, tomentulose; stamens 15–30. Female inflorescences 3–8 cm, 10–15 cm in fruit; bracts triangular, ca. 1 mm. Female flowers: pedicel ca. 2 mm; calyx lobes 3–5, subovate, ca. 3 mm, tomentose; ovary tomentose and red glandular-scaly; styles 3, 3–4 mm, plumose. Capsule subglobose, 8–10 mm in diam., (2 or)3-locular, covered with a red glandular-scaly layer. Seeds subglobose, ca. 4 mm in diam., black. Fl. Mar–May, fr. Jun–Aug.

Mountain slopes or valleys, limestone hills or river valleys, forests; 300–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Laos, Malaysia, Myanmar, Nepal, New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; N Australia].

- 1a. Leaf blade ovate, oblong, or lanceolate, leathery, margin subentire, abaxially tomentulose; capsule crimson glandular-scaly 10a. var. *philippensis*
- 1b. Leaf blade elliptic-ovate or ovate-lanceolate, thinly leathery, margin repand-dentate, abaxially tomentose, veins elevated; capsule red glandular-scaly 10b. var. *reticulatus*

10a. *Mallotus philippensis* var. *philippensis*

粗糠柴(原变种) cu kang chai (yuan bian zhong)

Croton philippensis Lamarck, *Encycl.* 2: 206. 1786; *Euonymus hypoleucus* H. Léveillé; *Rottlera aurantiaca* Hooker & Arnott; *R. tinctoria* Roxburgh.

Branchlets and inflorescences yellow-brownish stellate-tomentose. Leaf blade ovate, oblong, or lanceolate, 5–20 × 3–6 cm, leathery, adaxially glaucescent, gray-yellow tomentulose, sparsely red glandular-scaly, margin subentire. Capsule crimson glandular scaly. Seeds subglobose, ca. 4 mm in diam. Fl. Mar–May, fr. Jun–Aug.

Mountain slopes or valleys, forests; 300–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Laos, Malaysia, Myanmar, Nepal, New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; N Australia].

10b. *Mallotus philippensis* var. *reticulatus* (Dunn) F. P. Metcalf, *J. Arnold Arbor.* 22: 207. 1941.

网脉粗糠柴 wang mai cu kang chai

Mallotus reticulatus Dunn, *J. Linn. Soc., Bot.* 38: 365.

1908.

Shrubs 2–7 m tall. Branchlets and inflorescences gray-yellowish tomentose. Leaf blade elliptic-ovate or ovate-lanceolate, 10–23 × 5–10 cm, thinly leathery, abaxially gray-tomentose, orange-red glandular-scaly, margin repand-dentate; veins elevated. Capsule 3-locular, ca. 10 mm in diam., densely red glandular-scaly. Seeds subglobose, black, ca. 5 mm in diam. Fl. Apr–Jun, fr. Sep–Nov.

• Limestone hills or river valleys; 100–700 m. Fujian, Guangdong, E Guangxi, S Jiangxi.

11. *Mallotus pallidus* (Airy Shaw) Airy Shaw, *Kew Bull.* 32: 78. 1977.

樟叶野桐 zhang ye ye tong

Mallotus philippensis (Lamarck) Müller Argoviensis var. *pallidus* Airy Shaw, *Kew Bull.* 26: 300. 1972; *M. philippensis* var. *menglianensis* C. Y. Wu.

Small trees 5–15 m tall. Branchlets gray stellate-tomentulose. Petiole 2–4 cm; leaf blade oblong-lanceolate, 8–16 × 3–5 cm, thinly leathery, adaxially glabrescent, abaxially tomentulose, base cuneate, with 2 basal glands, margin subentire, apex acuminate. Flowers 1–3-fascicled; flower buds ovoid, ca. 1.5 mm, tomentulose. Inflorescence 5–14 cm; bracts triangular, ca. 1 mm. Fruiting pedicel 2–3.5 mm; persistent sepals 5, triangular, ca. 1.5 mm; capsule subglobose, 3-locular, ca. 12 mm in diam., densely golden yellow glandular-scaly. Seeds subglobose, ca. 6 mm in diam., black. Fl. Jun–Jul, fr. Aug–Dec.

Mountain valleys or limestone ranges, forests; 1200–1400 m. W Hainan, S Yunnan [Thailand].

12. *Mallotus millietii* H. Léveillé, *Fl. Kouy-Tchéou*, 165. 1914–1915.

贵州野桐 gui zhou ye tong

Climbing shrubs, often 3–5 m tall. Branchlets, petioles, and inflorescences yellow stellate-tomentose and villous. Petiole 1.5–7 cm; leaf blade oblong-ovate, elliptic-ovate, or ovate, 5–17 × 3–10 cm, chartaceous or leathery, adaxially along veins stellate-pilose, abaxially dull yellow tomentose, scattered yellow glandular-scaly, base broadly cuneate, obtuse, or cordate, with 2–4 small basal glands, margin entire or repand-denticulate, apex acute, sometimes acuminate; basal veins 3. Male inflorescences unbranched, 5–16 cm; bracts subulate, ca. 2 mm. Male flowers 2–5-fascicled; pedicel 2–3 mm; calyx lobes 4, oblong or sublanceolate, 3–4 mm, tomentose; stamens 40–50. Female inflorescences 4–9 cm; peduncle 1–3 cm; bracts sublanceolate, ca. 2 mm. Female flowers: pedicel ca. 1.5 mm; sepals 4, triangular-lanceolate, ca. 3 mm, tomentose; ovary densely orange-yellow tomentose; styles 3, ca. 4 mm, base connate, ca. 1 mm, plumose. Fruiting pedicel 1.5–2 mm; capsule 3-locular, 1.2–1.5 cm in diam., densely orange-yellow tomentose. Seeds subglobose, ca. 6 mm in diam., black. Fl. May–Jun, fr. Aug–Oct.

• Limestone regions, hill slopes, forests, thickets; 500–1400 m.

Guangxi, Guizhou, Hubei, Hunan, Yunnan.

- 1a. Branchlets, petiole, and inflorescences yellow stellate-tomentose and villous; leaves abaxially dull yellow tomentose; capsule densely orange-yellow tomentose, pedicel less than 2 mm 12a. var. *millietii*
- 1b. Branchlets brownish stellate-tomentulose when young; leaves both surfaces glabrous; capsule densely brownish tomentose, pedicel 3–4 mm 12b. var. *atrichus*

12a. Mallotus millietii var. *millietii*

贵州野桐(原变种) gui zhou ye tong (yuan bian zhong)

Mallotus kweichowensis Lauener & W. T. Wang; *Phytolacca esquirolii* H. Léveillé.

Branchlets, petiole, and inflorescences yellow stellate-tomentose and stellate-villous. Leaf blade chartaceous or leathery, abaxially dull yellow tomentose. Infructescences 4–5 cm. Fruiting pedicel 1.5–2 mm; capsule densely orange-yellow tomentose. Fl. May–Jun, fr. Jul–Oct.

• Limestone regions, forests, thickets; 500–1400 m. Guangxi, Guizhou, SE Yunnan.

12b. Mallotus millietii var. *atrichus* Croizat, J. Arnold Arbor. 19: 147. 1938.

光叶贵州野桐 guang ye gui zhou ye tong

Branchlets brownish stellate-tomentulose when young, becoming glabrous. Leaf blade chartaceous, both surfaces glabrous. Infructescence 5–6 cm. Fruiting pedicel 3–4 mm; capsule densely brownish tomentose. Fl. May–Jun, fr. Jul–Oct.

• Limestone regions, thickets; 700–1000 m. Guangxi, Guizhou, W Hubei, W Hunan, E Yunnan.

13. Mallotus repandus (Willdenow) Müller Argoviensis, Linnaea 34: 197. 1865.

石岩枫 shi yan feng

Climbing shrubs, often 5–10 m tall. Branchlets, petioles, and inflorescences dull yellowish-brownish stellate-tomentulose. Stipules triangular, ca. 1 mm; petiole 1.5–6 cm; leaf blade triangular-ovate, oblong-ovate, or ovate, 3.5–10 × 2.5–7 cm, papery, adaxially glabrous, abaxially stellate-pubescent, scatteredly yellowish granular-glandular, base broadly cuneate, sometimes slightly peltate, with 4 basal glands, margin entire or repand, apex acute or acuminate; basal veins 3. Male inflorescences terminal, rarely axillary, branches few or absent, 5–15 cm; bracts subulate, ca. 1.5 mm. Male flowers 2–5-fascicled; pedicel 2–4 mm; calyx lobes 3 or 4, oblong, ca. 3 mm, tomentulose; stamens 40–75. Female inflorescences 5–8 cm; bracts lanceolate, ca. 2 mm. Female flowers: pedicel 2–3 mm; sepals 4 or 5, lanceolate, 2–3 mm, tomentulose; ovary 2- or 3-locular, dull yellow tomentulose; style 3–5 mm, almost free, plumose. Fruiting pedicel 8–12 mm; capsule 2-locular, ca. 10 mm in diam., yellowish-brownish tomentulose, scattered glandular-

scaly. Seeds subglobose, ca. 5 mm in diam., black. Fl. Mar–

May, fr. Jun–Sep.

Thickets, forests, forest fringes, hill or mountain valleys; below 100–1000 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, S Jiangxi, S Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; N Australia, Pacific islands (New Caledonia)].

- 1a. Male inflorescence often branched; ovary 2-locular, style ca. 3 mm, almost free; leaf blade abaxially dull yellowish-brownish tomentulose 13a. var. *repandus*
- 1b. Male inflorescence unbranched; ovary 3-locular; style 3.5–5 mm, base connate 1–1.5 mm; leaf blade abaxially pubescent or glabrescent.
 - 2a. Leaves ovate, orbiculate-ovate, or lanceolate-ovate, base cordate or subtruncate, abaxially glabrescent; style ca. 5 mm, base connate for ca. 1.5 mm 13b. var. *scabrifolius*
 - 2b. Leaves elliptic-lanceolate or ovate, base cuneate or obtuse, abaxially pubescent or glabrescent; style ca. 3.5 mm, base connate for ca. 1 mm 13c. var. *chrysocarpus*

13a. Mallotus repandus var. *repandus*

石岩枫(原变种) shi yan feng (yuan bian zhong)

Croton repandus Willdenow, Neue Schriften Ges. Naturf. Freunde Berlin 4: 206. 1803.

Climbing shrubs, often 5–10 m tall. Branchlets dull yellowish-brownish tomentulose. Leaf blade triangular-ovate to ovate, 3.5–10 × 2.5–7 cm, papery, abaxially pubescent and scattered yellowish glandular-scaly, base broadly cuneate, sometimes slightly peltate, apex acute or acuminate. Inflorescences unbranched or loosely branched, 5–15 cm, dull yellowish-brownish tomentulose. Male flowers: calyx lobes 3 or 4, oblong, ca. 3 mm, almost free; stamens 40–75. Female flowers: ovary 2-locular, yellowish-brownish tomentulose; style ca. 3 mm, almost free, plumose. Capsule 2-locular, yellowish-brownish tomentulose, scattered glandular-scaly; pedicel 8–12 mm. Fl. Mar–May, fr. Jun–Sep.

Scattered in thickets or forest fringes; below 100–500 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; N Australia, Pacific islands (New Caledonia)].

13b. Mallotus repandus var. *scabrifolius* (A. Jussieu) Müller Argoviensis in A. Candolle, Prodr. 15(2): 982. 1866.

卵叶石岩枫 luan ye shi yan feng

Rottlera scabrifolia A. Jussieu, Euphorb. Gen. 111. 1824; *Mallotus contubernalis* Hance; *M. repandus* var. *megaphyllus* Croizat, p.p.; *R. cordifolia* Benth.

Climbing shrubs. Branchlets densely dull yellow stellate-

tomentulose when young, becoming glabrous. Leaf blade ovate, orbicular-ovate, or lanceolate-ovate, 7–15 × 4–11 cm, sub-papery, adaxially glabrous, abaxially glabrescent, vein axils puberulent, sometimes along veins puberulent, scattered yellowish glandular-scaly, base cordate or subtruncate, apex acuminate. Inflorescences unbranched, 2–10 cm, dull yellow tomentulose. Male flowers: calyx lobes 4 or 5, ca. 3 mm; stamens 40–55. Female flowers: ovary 3-locular, yellow-brownish tomentose; styles 3, ca. 5 mm, connate for ca. 1.5 mm, plumose. Capsule 3-locular, yellowish tomentulose; pedicel 5–7 mm. Fl. Apr–May, fr. Jun–Jul.

• Hill or mountain valleys, thickets, forests; below 100–600 m. S Fujian, Guangdong, Guangxi, Hunan, S Jiangxi, S Yunnan, Zhejiang.

13c. *Mallotus repandus* var. *chrysocarpus* (Pampanini) S. M. Hwang, *Acta Phytotax. Sin.* 23: 297. 1985.

杠香藤 gang xiang teng

Mallotus chrysocarpus Pampanini, *Nuovo Giorn. Bot. Ital.*, n.s., 17: 413. 1910; *M. contubernalis* var. *chrysocarpus* (Pampanini) Handel-Mazzetti; *M. illudens* Croizat.

Climbing shrubs, 2–5 m tall. Branchlets brownish tomentose. Leaf blade ovate or elliptic-lanceolate, 6–10 × 1.5–4.5 cm, papery, abaxially pubescent and scattered yellowish glandular-scaly, or glabrescent, base cuneate or obtuse, apex shortly acuminate. Inflorescences unbranched, 5–7 cm, yellowish brown tomentulose. Male flowers: calyx lobes 3, ca. 2.5 mm; stamens 35–45. Female flowers: ovary 3-locular, yellow-brown tomentose; styles 3, ca. 3.5 mm, connate for ca. 1 mm, plumose. Fruiting pedicel 3–5 mm; capsule 3-locular, brownish tomentulose. Fl. May–Jun, fr. Aug–Sep.

• Mountain valleys, thickets; 500–1000 m. Anhui, S Gansu, E Guizhou, Henan, Hubei, Hunan, S Shanxi, Sichuan.

14. *Mallotus dunnii* F. P. Metcalf, *J. Arnold Arbor.* 22: 205. 1941.

南平野桐 nan ping ye tong

Mallotus roxburghianus Müller Argoviensis var. *glabrus* Dunn, *J. Linn. Soc., Bot.* 38: 365. 1908.

Shrubs 1–4 m tall. Branchlets slender, sparsely stellate-pubescent and villous when young, becoming glabrous, brown. Leaves alternate, sometimes subopposite; stipules oblong, 6–7 mm, deciduous; petiole 10–17 cm; leaf blade triangular-ovate to broadly ovate, 10–25 × 8–21 cm, membranous, both surfaces sparsely villous and yellow glandular-scaly, brownish when dry, base rounded, rarely cordate, narrowly or broadly peltate, with 2–4 basal glands, margin denticulate, undivided or 1–3-lobate, apex long acuminate; basal veins 5–9, lateral veins 4 or 5 pairs. Inflorescences terminal, not or few branched, 10–32 cm, sparsely villous or glabrescent; bracts lanceolate, 3–10 mm. Male flowers 3–11-fascicled; pedicel 5–10 mm; calyx lobes 4 or 5, ovate, ca. 2 mm, glabrous; stamens 40–50. Female flowers: pedicel 1.5–3.5 cm, slender; sepals 4 or 5, lanceolate, 2–3 mm, glabrous; ovary softly spiny and glandular-scaly; styles 3, ca. 4 mm, base connate, plumose. Capsule 3-locular, ca. 10 mm in diam., densely yellowish glandular-scaly and sparsely shortly softly spiny, 2–3 mm. Seeds ovoid, 4–5 mm,

dull brown. Fl. Jun–Jul, fr. Jul–Sep.

• Mountain valleys, thickets, forests; 300–500 m. Fujian, Guangdong, Guangxi, S Hunan.

15. *Mallotus metcalfianus* Croizat, *J. Arnold Arbor.* 21: 501. 1940.

褐毛野桐 he mao ye tong

Small trees 5–10 m tall. Branchlets densely ferruginous stellate-tomentose with candelabra-like hair. Stipules triangular, 3–5 mm; petiole 5–10 cm; leaf blade ovate or triangular-ovate, 10–25 × 9–20 cm, papery, adaxially glabrescent, abaxially ferruginous tomentulose, base broadly cuneate or obtuse, slightly peltate, with 2–4 basal glands, margin repand-denticulate or coarsely serrate, apex acute or acuminate; basal veins 5–7. Male inflorescences branched, 10–25 cm, tomentulose; bracts subulate, ca. 3 mm. Male flowers 2–5-fascicled; pedicel 5–7 mm; calyx lobes 4 or 5, long ovate, ca. 3 mm, tomentulose; stamens 50–60. Female inflorescences with few or no branches; infructescence 15–25 cm, cylindric, brown tomentose. Female flowers: pedicel 2–3 mm; calyx lobes 4, triangular, ca. 3 mm, tomentulose; ovary 3-locular, stellate-pubescent; style 3–5 mm, plumose. Capsule subglobose, ca. 1.7 cm in diam., pubescent and densely stellate-pubescent and softly spiny, 6–8 mm. Seeds ovoid, ca. 5 mm, brown. Fl. Jul–Aug, fr. Sep–Dec.

Mountain valleys, forests; 100–1900 m. S Guangxi, S Yunnan [Vietnam].

16. *Mallotus conspurcatus* Croizat, *J. Arnold Arbor.* 21: 501. 1940.

桂野桐 gui ye tong

Shrubs 2–3 m tall. Branchlets densely brown stellate pulveraceous tomentose when young. Stipules even obsolete; petiole 5–10 cm, tomentose; leaf blade broadly ovate, undivided, 11–25 × 9–17 cm, papery, adaxially glabrescent, abaxially brown tomentose, sparsely reddish granular-glandular, base obtuse, peltate, with 8 or 9 small basal glands, margin subentire or denticulate, apex acute or acuminate; basal veins 5–7. Flowers not known. Infructescence 15–17 cm, tomentose; bracts subtriangular, 2–3 mm. Fruiting pedicel 3–6 mm; capsule 3-locular, ca. 15 mm in diam., densely stellate-pubescent and softly spiny, forming a continuous uniform layer, spines short, subulate, ca. 3 mm. Seeds ovoid, ca. 5 mm, brown, verruculose. Fr. Aug–Sep.

• Limestone hills, forests; 400–500 m. W Guangxi (Jingxi).

17. *Mallotus barbatus* Müller Argoviensis, *Linnaea* 34: 184. 1865.

毛桐 mao tong

Shrubs or small trees, 1.5–6 m tall. Branchlets, petioles, and inflorescences densely brownish floccose-tomentose or brownish or yellowish pulveraceous tomentose. Stipules subulate, 5–15 mm; petiole 5–20 cm; leaf blade suborbicular or broadly ovate, often tricuspidate or shortly and acutely 1- or 2-lobed, 8–35 × 6–28 cm, papery, adaxially stellate-villous along nerves, abaxially stellate-tomentose, scattered yellow glandular-

scaly, base rounded, broadly peltate, with up to 4 basal glands, margin repand-denticulate, apex acuminate; basal veins 5–7. Male inflorescences terminal, branched or unbranched, 15–34 cm; bracts subulate, 5–7 mm. Male flowers 3–5-fascicled; pedicel 3–4 mm; calyx lobes 4 or 5, oblong, 3–3.5 mm, stellate-pubescent; stamens 75–85. Female inflorescences branched or unbranched; peduncle stout; infructescence erect, 10–20 cm; bracts subulate, 4–5 mm. Female flowers: pedicel 2–3 mm; calyx 4- or 5-lobed, 4–5 mm, tomentose; ovary 3–5-locular, densely setose, tomentose; style 3–4 mm, plumose. Fruiting pedicel 5–30 mm; capsule subglobose, 12–20 mm in diam., densely stellate-tomentose and softly spiny, forming a continuous uniform layer, spines linear, 6–7 mm. Seeds ovoid, ca. 5 mm, black, verruculose. Fl. Apr–May, fr. Sep–Oct.

Mountain slopes or valleys, forests, thickets, limestone hills, roadsides, often in clearings; 200–1300 m. Guangdong, Guangxi, Guizhou, W Hubei, Hunan, Sichuan, Yunnan [India, Malaysia, Myanmar, Thailand, Vietnam].

The concept of *Mallotus barbatus* is sometimes extended to include *M. lotingensis* (see Govaerts et al., World Checkl. Euphorbiaceae: <http://www.kew.org/wcps/home.do>). *Mallotus luchenensis* is also closely related. This complex needs more detailed study.

- 1a. Branchlets and petiole densely brownish or yellowish pulveraceous-tomentose when young, female inflorescence unbranched 17c. var. *croizatianus*
- 1b. Branchlets and petiole densely brownish floccose-tomentose; female inflorescence branched or unbranched.
 - 2a. Female inflorescence branched, 10–20 cm; fruiting pedicel 5–10 mm 17a. var. *barbatus*
 - 2b. Female inflorescence unbranched, 15–32 cm; fruiting pedicel 15–30 mm, often with 1 or 2 subulate bracteoles, ca. 1.5 mm 17b. var. *pedicellaris*

17a. *Mallotus barbatus* var. *barbatus*

毛桐(原变种) mao tong (yuan bian zhong)

Small trees or shrubs, 2–6 m tall. Branchlets, petiole, and inflorescences densely brownish floccose-tomentose. Female inflorescences branched, 10–20 cm; infructescence erect. Fruiting pedicel 5–10 mm; capsule 15–20 mm in diam. Fl. Apr–May, fr. Sep–Nov.

Mountain slopes, roadsides, thickets, often in clearings; 300–1300 m. W Guangdong, Guangxi, Guizhou, Yunnan [India, Malaysia, Myanmar, Thailand, Vietnam].

17b. *Mallotus barbatus* var. *pedicellaris* Croizat, J. Arnold Arbor. 19: 135. 1938.

长梗毛桐 chang geng mao tong

Mallotus barbatus var. *hubeiensis* S. M. Hwang.

Small trees 3–6 m tall. Branchlets, petiole, and inflorescences densely brownish floccose-tomentose. Female inflores-

cences unbranched, 15–32 cm; infructescence erect. Fruiting pedicel often 15–30 mm, sometimes with 1 or 2 bracteoles, subulate, ca. 1.5 mm, deciduous; capsule ca. 20 mm in diam. Fl. May–Jul, fr. Aug–Nov.

Mountain valleys, forests; 200–700 m. N Guangdong, Guangxi, Guizhou, W Hubei, Hunan, Sichuan, Yunnan [N Thailand].

17c. *Mallotus barbatus* var. *croizatianus* (F. P. Metcalf) S. M. Hwang, Acta Phytotax. Sin. 23: 295. 1985.

石山毛桐 shi shan mao tong

Mallotus croizatianus F. P. Metcalf, J. Arnold Arbor. 22: 204. 1941; *M. esquirolii* H. Léveillé (15 Aug 1911), not H. Léveillé (10 May 1911); *M. leveilleanus* Fedde.

Shrubs 1.5–3 m tall. Branchlets and petiole densely brownish or yellowish pulveraceous-tomentose. Leaf blade 8–24 × 6–20 cm, abaxially yellowish or whitish stellate-tomentose and slightly yellowish glandular-scaly, base with 1 or 2 basal glands. Female inflorescences unbranched, 8–15 cm. Female flowers: pedicel 5–6 mm; styles 3 or 4, long papillate or plumose. Fruiting pedicel 5–8 mm; capsule 12–18 mm in diam. Fl. Jun–Sep, fr. Jul–Oct.

• Limestone hills or mountain slopes and valleys; 300–1200 m. Guangxi, S Guizhou.

18. *Mallotus luchenensis* F. P. Metcalf, J. Arnold Arbor. 22: 206. 1941.

罗城野桐 luo cheng ye tong

Small trees or shrubs, 3–7 m tall. Branchlets densely ferruginous stellate-tomentose. Stipules filiform, 6–8 mm, stellate pubescent; petiole 5–15 cm, brown tomentose; leaf blade subovate-rotund or long ovate, 15–23 × 10–18 cm, often tricuspidate or shortly 1- or 2-lobed, papery, adaxially along nerves stellate-pubescent, abaxially densely white stellate-pubescent, scattered orange glandular-scaly, base rounded or obtuse, broadly peltate, with 4 basal glands, margin sparsely denticulate, apex acuminate or caudate; basal veins 7–9. Inflorescences terminal, branches few or absent, (10–)18–28 cm, brownish tomentose; bracts filiform, 8–10 mm. Male flowers 2- or 3-fascicled; pedicel 6–7 mm; calyx lobes 4 or 5, ovate, ca. 3 mm, pubescent; stamens 60–80. Female flowers: pedicel 4–6 mm; sepals 3–5, 4–5 mm, tomentulose; ovary tomentose; style 4, ca. 6 mm, plumose. Infructescence elongated, 10–27 cm. Fruiting pedicel 6–12 mm; capsule subglobose, ca. 20 mm in diam., densely white stellate-pubescent and softly spiny, forming a continuous uniform layer, spines linear, 7–8 mm. Seeds ellipsoid, ca. 6 mm, black. Fl. May–Sep, fr. Jun–Oct.

Mountain valleys or slopes, limestone hills, forests, thickets; 200–1300 m. Guangxi, Guizhou [N Vietnam].

Mallotus luchenensis was treated as part of *M. barbatus* by S. M. Hwang (Acta Phytotax. Sin. 23: 295. 1985).

19. *Mallotus lotingensis* F. P. Metcalf, J. Arnold Arbor. 22: 206. 1941.

罗定野桐 *luo ding ye tong*

Mallotus barbatus Müller Argoviensis var. *congestus* F. P. Metcalf, Lingnan Sci. J. 10: 487. 1931.

Shrubs 1–2 m tall. Branchlets, petiole, and inflorescences densely yellowish-brownish stellate-tomentose. Stipules narrowly lanceolate, 3–4 mm, tomentose; petiole 10–14 cm; leaf blade ovate-rounded, often tricuspidate or shortly 1-lobed, 15–18 × 13–15 cm, papery, abaxially stellate-tomentose, base obtuse, broadly peltate, with 4 basal glands, margin repand-denticulate, apex acute or acuminate; basal veins 5–7. Inflorescences terminal or axillary, branched or unbranched, 15–30 cm; peduncle 7–8 cm, stout; bracts linear, 3–5 mm. Male flowers 2- or 3-fascicled; pedicel 3–4 mm; calyx lobes 3–5, ovate, 3.5–4 mm, pubescent; stamens 35–40. Female flowers: pedicel 1–2 mm; sepals 5, triangular, ca. 2 mm, tomentose; ovary tomentose; styles 3, ca. 4 mm, plumose. Inflorescence elongated, 28–45 cm. Fruiting pedicel 1–3 mm; capsule subglobose, 12–15 mm in diam., stellate-pubescent and softly spiny, forming a continuous uniform layer, spines subulate, 3–5 mm, with white stellate-pubescent. Seeds ovoid, ca. 6 mm, black, smooth. Fl. May–Nov, fr. Jun–Dec.

• Mountain valleys or slopes, hills, forests, thickets; 200–500 m. NW Guangdong, SE Guangxi.

20. *Mallotus tetracoccus* (Roxburgh) Kurz, Forest Fl. Burma 2: 382. 1877.

四果野桐 *si guo ye tong*

Rottlera tetracocca Roxburgh, Fl. Ind., ed. 1832, 3: 826. 1832.

Trees 5–15 m tall. Branchlets brownish stellate-tomentose. Stipules ovate-triangular, 1.5–3 mm, pubescent; petiole 6–15 cm, tomentose; leaf blade triangular-ovate or ovate, sometimes 1- or 2-lobate, 10–25 × 9–20 cm, leathery, abaxially brownish tomentose, adaxially glabrous, base obtuse or truncate, sometimes slightly peltate, with 2–4 basal glands, margin repand or entire, apex acute or acuminate; basal veins 3, lateral veins 4–6 pairs. Male inflorescences terminal, branched, 12–20 cm, tomentose; peduncle stout; bracts triangular, 1–1.5 mm. Male flowers 3–9-fascicled; pedicel ca. 4 mm; calyx lobes 3 or 4, oblong, 2.5–3 mm; stamens 60–80. Female inflorescences paniculate, 9–14 cm, tomentose; bracts lanceolate, 3–5 mm. Female flowers: sepals 4 or 5, unequal, ovate, 3–4 mm; ovary tomentose, often 4-loculed; style often 4, ca. 3 mm, plumose. Fruiting pedicel ca. 5 mm; capsule depressed globose, ca. 1 cm in diam., gray tomentose and densely shortly softly spiny, spines stellate-pubescent. Seeds subovoid, ca. 6 mm, verruculose. Fl. Jun–Aug, fr. Aug–Dec.

Mountain slopes, forests; 800–1300 m. SE Xizang, SW Yunnan [Bhutan, India, Myanmar, Nepal, Sri Lanka].

21. *Mallotus apelta* (Loureiro) Müller Argoviensis, Linnaea 34: 189. 1865.

白背叶 *bai bei ye*

Shrubs or small trees 1–6 m tall. Branchlets whitish and

brownish stellate-tomentose when young. Stipules subulate, 2.5–4 mm, deciduous; petiole 5–15 cm, whitish tomentose; leaf blade broadly ovate, 5–60 × 4–20 cm, papery, abaxially whitish tomentose and scattered orange glandular-scaly, adaxially glabrescent or sparsely stellate-pilosulose, base truncate or contracted cuneate, rarely slightly cordate, with 2 basal glands, margin repand-denticulate, apex acute or acuminate; basal veins 3. Male inflorescences terminal, branched or unbranched, 15–50 cm, whitish tomentose; bracts triangular, ca. 2.5 mm. Male flowers 1–5-fascicled; pedicel ca. 3 mm; calyx lobes 4, ovate, ca. 3 mm, tomentose; stamens 50–75. Female inflorescences unbranched; peduncle 5–10 cm; bracts linear ca. 3 mm; infructescence 15–60 cm, densely cylindric, whitish tomentose. Female flowers: pedicel 1.5–2 mm; calyx lobes 3–5, ovate to triangular, 2.5–3 mm, tomentose; ovary 3(or 4)-locular, with stellate-tomentose hairs; style ca. 3 mm, plumose. Capsule subglobose, densely softly spiny, spines filiform, 3–8 mm, whitish stellate-pubescent. Seeds ovoid, ca. 4 mm, often black, verruculose. Fl. May–Sep, fr. Aug–Nov.

Hill slopes, mountain valleys, thickets, forests; below 100–1000 m. SW Fujian, Guangdong, Guangxi, Hainan, S Hunan, S Jiangxi, S Yunnan [Vietnam].

- 1a. Branchlets whitish and brownish tomentose; leaf blade 5–20 cm; male inflorescence racemose or paniculate, 15–30 cm; infructescence 15–30 cm; capsule spines 3–5 mm 21a. var. *apelta*
- 1b. Branchlets white tomentose; leaf blade 35–60 cm; male inflorescence branched, 30–50 cm; infructescence 35–60 cm; capsule spines 6–8 mm 21b. var. *kwangsiensis*

21a. *Mallotus apelta* var. *apelta*

白背叶(原变种) *bai bei ye* (yuan bian zhong)

Ricinus apelta Loureiro, Fl. Cochinch. 2: 585. 1790; *Croton chinensis* Geiseler; *Mallotus apelta* var. *chinensis* (Geiseler) Pax; *Rottlera cantoniensis* Sprengel; *R. chinensis* A. Jussieu.

Shrubs 1–4 m tall. Branchlets whitish and brownish stellate-tomentose when young. Leaf blade 5–20 × 4–20 cm. Male inflorescence branched or unbranched, 15–30 cm. Infructescence drooping, 15–30 cm, whitish tomentose. Capsule spines 3–5 mm. Fl. May–Sep, fr. Aug–Nov.

Hill slopes, mountain valleys, thickets; below 100–1000 m. SW Fujian, Guangdong, Guangxi, Hainan, S Hunan, S Jiangxi, SE Yunnan [Vietnam].

21b. *Mallotus apelta* var. *kwangsiensis* F. P. Metcalf, J. Arnold Arbor. 22: 204. 1941.

广西白背叶 *guang xi bai bei ye*

Small trees 5–6 m tall. Branchlets white stellate-tomentose. Leaf blade 35–60 × 30–58 cm, abaxially white tomentose. Male inflorescence laxly branched, 30–50 cm. Infructescence 35–60 cm, white tomentose. Capsule spines 6–8 mm. Fl. and fr. Jul–Oct.

• Thickets or forests on limestone; 200–1000 m. N Guangdong, Guangxi, S Yunnan.

22. *Mallotus tenuifolius* Pax, Bot. Jahrb. Syst. 29: 429. 1900.

野桐 ye tong

Shrubs or small trees, 3–6 m tall. Branchlets and inflorescences densely stellate-pilosulose or grayish-yellowish stellate-tomentose. Stipules subulate, 3–5 mm, caducous; petiole 6–14 cm, glabrescent; leaf blade triangular-ovate or broadly ovate, undivided or shortly 1- or 2-lobed, 12–17 × 14–19 cm, membranous or papery, greenish, abaxially sparingly stellate-pilosulose or subglabrescent and scattered yellowish or orange glandular-scaly, or gray or white tomentulose and sparsely reddish glandular scaly, adaxially glabrescent, base subtruncate, broadly cuneate, sometimes slightly cordate, with 2 basal glands, margin entire, apex abruptly acuminate; basal veins 3. Male inflorescences unbranched, 5–15 cm; bracts subulate, ca. 4 mm. Male flowers 2–9-fascicled; pedicels 2–4 mm; calyx lobes 3 or 5, ovate, 3–4 mm, pubescent; stamens 50–60. Female inflorescences unbranched, 5–15 cm; peduncle ca. 5 mm thick; bracts lanceolate-subulate, ca. 2.5 mm. Female flowers: pedicel 2–4 mm; sepals 5, triangular, 2.5–3 mm, pubescent; ovary densely pubescent and softly spiny; styles 3, 3–4 mm, almost free, long papillose. Fruiting pedicel 3–5 mm; capsule subglobose, ca. 10 mm in diam., tomentose and densely softly spiny, spines linear, 5–15 mm, stellate-pilosulose when young, glabrescent. Seeds subglobose or ovoid, 4–5 mm in diam., blackish, verruculose or smooth. Fl. Jun–Jul, fr. Jul–Aug.

• Mountain valleys or slopes, forests, thickets, rocky hills, roadsides; 200–1700 m. Anhui, Fujian, S Gansu, N Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, E Sichuan, Zhejiang.

Mallotus tenuifolius and its varieties are included within the preceding species, *M. apelta*, by some authors (see Govaerts et al., World Checkl. Euphorbiaceae: <http://www.kew.org/wcsp/home.do>).

- 1a. Leaf blade drying greenish or yellowish green, abaxially subglabrescent or sparingly stellate-pilosulose, gland-scales yellowish or orange; male calyx lobes 3 or 5; capsule tomentose.
- 2a. Leaves membranous, abaxially greenish, gland-scales yellowish; male calyx lobes 3, ca. 3 mm 22a. var. *tenuifolius*
- 2b. Leaves papery, abaxially yellowish green, gland-scales orange; male calyx lobes 5, ca. 4 mm 22b. var. *subjaponicus*
- 1b. Leaf blade drying dull brown or reddish brown, abaxially gray or white tomentulose with sparse red gland-scales; male calyx lobes 4; capsule stellate-pilose or tomentulose.
- 3a. Leaves abaxially gray tomentulose, gland-scales scattered; styles ca. 4 mm; capsule stellate-pilose, spines 5–8 mm 22c. var. *paxii*
- 3b. Leaves abaxially densely white tomentulose, gland-scales obscure;

styles ca. 3 mm; capsule white tomentulose, spines 10–15 mm

..... 22d. var. *castanopsis*

22a. *Mallotus tenuifolius* var. *tenuifolius*

野桐(原变种) ye tong (yuan bian zhong)

Mallotus apelta (Loureiro) Müller Argoviensis var. *tenuifolius* (Pax) Pax.

Branchlets and inflorescences densely stellate-pilosulose. Leaf blade triangular-ovate or broadly ovate, membranous, greenish when dry, abaxially sparingly stellate-pilosulose or subglabrescent, sparsely yellowish glandular-scaly. Male inflorescences 8–12 cm. Male flowers 2–5-fascicled; calyx lobes 3, ca. 3 mm. Female inflorescences or infructescences 8–15 cm. Female flowers: styles 3, ca. 4 mm, almost free. Capsule tomentose, spines 5–7 mm. Seeds subglobose, ca. 5 mm in diam., blackish, verruculose. Fl. Jun–Jul, fr. Jul–Aug.

• Mountain valleys or slopes, forests, thickets; 700–1700 m. Anhui, Fujian, S Gansu, E Guizhou, Henan, Hubei, Hunan, Jiangxi, E Sichuan.

22b. *Mallotus tenuifolius* var. *subjaponicus* Croizat, J. Arnold Arbor. 19: 138. 1938.

黄背野桐 huang bei ye tong

Mallotus nepalensis Müller Argoviensis var. *kwangtungensis* Croizat; *M. subjaponicus* (Croizat) Croizat.

Branchlets and inflorescences grayish-yellowish stellate-tomentose. Leaf blade ovate or broadly ovate, papery, yellowish green when dry, abaxially yellowish, scattered stellate-pilose and orange glandular-scaly. Male inflorescences 5–10 cm. Male flowers 2- or 3-fascicled; calyx lobes 5, unequal, ca. 4 mm. Female inflorescences or infructescences 8–12 cm. Female flowers: styles 3, ca. 6 mm, base connate for ca. 1 mm. Capsule stellate-pilose, spines 5–7 mm. Seeds ovoid, 4–5 mm, black. Fl. May–Jun, fr. Jun–Aug.

• Mountain valleys, forests, thickets; 500–1500 m. Anhui, Fujian, N Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang.

22c. *Mallotus tenuifolius* var. *paxii* (Pampanini) H. S. Kiu, comb. et stat. nov.

红叶野桐 hong ye ye tong

Basionym: *Mallotus paxii* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 414. 1910; *M. stewardii* Merrill ex F. P. Metcalf.

Branchlets and inflorescences gray stellate-tomentulose and scattered stellate-pilose. Leaf blade triangular-ovate, sometimes ovate, papery, abaxially gray stellate-tomentulose, scattered reddish glandular-scaly, adaxially dull brown or reddish-brownish when dry, scattered stellate-pilose. Male inflorescences 5–15 cm. Male flowers 3–9-fascicled; calyx lobes 4, ca. 3 mm. Female inflorescences or infructescences 5–14 cm. Female flowers: styles 3(or 4), ca. 4 mm. Capsule stellate-pilose, spines 5–8 mm. Seeds subglobose, ca. 4 mm in diam., black, verruculose. Fl. May–Jul, fr. Jul–Sep.

• Mountain valleys or slopes, thickets, secondary forests, roadsides; 300–1200 m. Anhui, Fujian, NE Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, E Sichuan, Zhejiang.

This taxon is based on material misidentified as *Mallotus albus* Müller Argoviensis by Pax (Bot. Jahrb. Syst. 29: 429. 1900).

22d. *Mallotus tenuifolius* var. *castanopsis* (F. P. Metcalf) H. S. Kiu, **comb. et stat. nov.**

乐昌野桐 le chang ye tong

Basionym: *Mallotus castanopsis* F. P. Metcalf, Lingnan Sci. J. 10: 487. 1931; *M. paxii* Pampanini var. *castanopsis* (F. P. Metcalf) S. M. Hwang.

Branchlets and inflorescences white stellate-tomentulose. Leaf blade ovate or broadly ovate, papery, abaxially densely white tomentulose, obscurely reddish glandular-scaly, adaxially dull brown when dry, scattered stellate-pilosulose. Male inflorescences 8–13 cm. Male flowers 2–7-fascicled; calyx lobes 4, ca. 3 mm. Female inflorescences or infructescences 5–12 cm. Female flowers: styles 3, ca. 3 mm. Capsule white tomentulose, softly spiny, spines 10–15 mm. Seeds ovoid, ca. 4 mm in diam., black, smooth. Fl. May–Aug, fr. Oct–Nov.

• Rocky hills, thickets; 200–300 m. N Guangdong, E Guangxi, S Hunan, E Jiangxi.

23. *Mallotus nepalensis* Müller Argoviensis, Linnaea 34: 188. 1865.

尼泊尔野桐 ni bo er ye tong

Mallotus japonicus (Linnaeus f.) Müller Argoviensis var. *floccosus* (Müller Argoviensis) S. M. Hwang; *M. oreophilus* Müller Argoviensis var. *floccosus* Müller Argoviensis; *M. tenuifolius* Pax var. *floccosus* (Müller Argoviensis) Croizat.

Shrubs or small trees, 3–6 m tall. Branchlets and inflorescences brownish-yellowish stellate-tomentose. Petiole 5–15 cm, tomentulose; leaf blade orbiculate-ovate or triangular-ovate, 10–23 × 8–24 cm, papery, abaxially brownish or gray stellate-pilose, sparsely orange glandular-scaly, adaxially glabrescent, base truncate or slightly cordate, sometimes slightly peltate, with 2 maculate glands, margin entire, sometimes shortly 3-lobed, apex acuminate; basal veins 3. Male inflorescences unbranched, 10–15 cm; bracts lanceolate-subulate, ca. 1 mm. Male flowers 2- or 3-fascicled; pedicel 1–1.5 mm; sepals 4, oblong, ca. 3 mm, tomentulose; stamens ca. 100. Female inflorescences unbranched, 10–20 cm; peduncle 2–5 cm, ca. 3 mm thick; bracts sublanceolate, ca. 1.5 mm. Female flowers: pedicel ca. 1.5 mm; sepals 5 or 6, lanceolate, 2.5–3 mm, tomentose; ovary densely softly spiny, stellate-pilose; styles 3, free, ca. 3 mm, plumose. Infructescence erect. Fruiting pedicel ca. 1.5 mm; capsule ca. 1.5 cm in diam., densely softly spiny, brownish, ca. 5 mm, stellate-pilose. Seeds subglobose, blackish, ca. 5 mm in diam., verruculose. Fl. and fr. Jun–Jul.

Mountain valleys or slopes, thickets; 1700–2500 m. Xizang, Yunnan [Bhutan, NE India, Myanmar, Nepal].

24. *Mallotus microcarpus* Pax & K. Hoffmann in Engler,

Pflanzenr. 63(IV. 147. VII): 172. 1914.

小果野桐 xiao guo ye tong

Shrubs 1–3.5 m tall. Branchlets slender, densely whitish pubescent, becoming glabrescent. Stipules triangular, ca. 2 mm; petiole 3–20 cm; leaf blade broadly to narrowly ovate, sometimes 1–3-lobed, 5–22 × 3.5–18 cm, papery, abaxially pubescent, sparsely yellowish glandular-scaly, adaxially pilosulose and sparsely stellate-pilosulose, base obtuse or truncate, rarely shallowly peltate and cordate, with 2–4 basal glands, margin denticulate, apex acuminate or acute; basal veins 3–5. Male inflorescences terminal, unbranched, 7–20 cm, puberulent; bracts ovate. Male flowers 3–9-fascicled; pedicel ca. 3 mm; calyx lobes 3 or 4, ovate, pilosulose; stamens 50–60. Female inflorescences unbranched, 12–14 cm, puberulent; bracts subulate, 1–2 mm. Female flowers: sepals 4 or 5, triangular, ca. 1.5 mm, puberulent; ovary puberulent and scabrous; styles 3, ca. 3 mm, basally connate, plumose. Fruiting pedicel 2.5–3 mm; capsule 3-locular, ca. 6 mm in diam., sparsely shortly softly spiny, puberulent and glandular-scaly. Seeds ovoid, ca. 2.5 mm, dull brownish. Fl. Aug–Oct.

Mountain slopes or roadsides, thickets, sometimes on limestone hills; 200–1000 m. Guangdong, Guangxi, S Guizhou, S Hunan, S Jiangxi [N Vietnam].

25. *Mallotus oreophilus* Müller Argoviensis, Linnaea 34: 188. 1865.

山地野桐 shan di ye tong

Shrubs or small trees, 1.5–13 m tall. Branchlets and inflorescences yellowish-brownish stellate-tomentulose. Stipules ± obsolete; petiole 6–15 cm, gray-yellowish tomentulose; leaf blade ovate, broadly ovate, rhombic-ovate, subreniform, or oblong, sometimes shortly 1- or 2-lobed, 6–15 × 6.5–20 cm, papery, abaxially densely gray-yellowish tomentulose and sparsely yellowish glandular-scaly, adaxially glabrescent, base truncate or obtuse, sometimes broadly cuneate, with 2 basal glands, margin entire, apex abruptly acute or acuminate, or rounded to subtruncate; basal veins 3. Male inflorescences unbranched, 14–30 cm; bracts subulate to lanceolate, 4–5 mm. Male flowers 3–5-fascicled; pedicel 4–7 mm; sepals 5, oblong, ca. 5 mm, tomentulose; stamens 75–85. Female inflorescences unbranched, 12–18 cm; peduncle 1.5–3 cm, strong; bracts sublanceolate, 3–5 mm. Female flowers: pedicel 1.5–4 mm; sepals 6, lanceolate, 3.5–4 mm, tomentose; ovary tomentose and sparsely spiny, stellate-pilose; styles 3, 4–5 mm, almost free, long papillose. Fruiting pedicel 2–3 mm; capsule subglobose, 1–1.2 cm in diam., tomentose and sparsely softly spiny, spines subulate, ca. 5 mm, stellate-pilose. Seeds subglobose, ca. 5 mm in diam., black, verruculose. Fl. and fr. Jun–Aug, or fl. May–Jun.

Mountain valleys or slopes, forests, roadsides; 600–2000 m. Sichuan, Xizang, Yunnan [Bhutan, India (W Bengal, Sikkim)].

- 1a. Leaves ovate, broadly ovate, or rhombic-ovate, longer than wide, apex abruptly acute to acuminate; pedicel of female flower less than 2 mm 25a. var. *oreophilus*
- 1b. Leaves subreniform or oblong, wider

than long, apex rounded or subtruncate, abruptly shortly acuminate; pedicel of female flower 2.5–4 mm 25b. var. *latifolius*

25a. *Mallotus oreophilus* var. *oreophilus*

山地野桐(原变种) shan di ye tong (yuan bian zhong)

Mallotus japonicus (Linnaeus f.) Müller Argoviensis var. *ochraceoalbidus* (Müller Argoviensis) S. M. Hwang; *M. japonicus* var. *oreophilus* (Müller Argoviensis) S. M. Hwang; *M. nepalensis* Müller Argoviensis var. *ochraceoalbidus* (Müller Argoviensis) Pax & K. Hoffmann; *M. oreophilus* var. *ochraceoalbidus* Müller Argoviensis.

Shrubs or small trees, 3–8 m tall. Leaf blade ovate, broadly ovate, or rhombic-ovate, 10–15 × 8–14 cm, apex abruptly acute or acuminate. Male pedicels 4–5 mm; females ca. 1.5 mm. Fl. and fr. Jun–Aug.

Mountain valleys or slopes, forests; 1400–2000 m. SW Sichuan, S Xizang, Yunnan [Bhutan, India (W Bengal, Sikkim)].

25b. *Mallotus oreophilus* var. *latifolius* (Boufford & T. S. Ying) H. S. Kiu, *stat. nov.*

肾叶野桐 shen ye ye tong

Basionym: *Mallotus oreophilus* Müller Argoviensis subsp. *latifolius* Boufford & T. S. Ying, *J. Arnold Arbor.* 71: 575. 1990.

Shrubs or small trees, 1.5–13 m tall. Leaf blade subreniform to transversely oblong, 6–14 × 6.5–20 cm, apex rounded to subtruncate, abruptly shortly acuminate. Male pedicels 6–7 mm; females 2.5–4 mm. Fl. May–Jun, fr. Jun–Aug.

• Mountain valleys, roadsides, forests; 600–2000 m. W Sichuan, NE Yunnan.

26. *Mallotus japonicus* (Linnaeus f.) Müller Argoviensis, *Linnaea* 34: 189. 1865.

野梧桐 ye wu tong

Croton japonicus Linnaeus f., *Suppl. Pl.* 422. 1782 [“*ia-ponicum*”].

Shrubs 2–4 m tall. Branchlets dull brownish stellate-tomentulose when young. Petiole 3–17 cm; leaf blade suborbicular-ovate or rhombic-ovate, sometimes repand-tricuspidate, 8–20 × 5–15 cm, papery, abaxially sparsely stellate-pilosulose, sparsely yellowish glandular-scaly, adaxially glabrous, base cuneate, obtuse, or slightly cordate, sometimes slightly peltate, with 2(or 4) glands, margin entire, apex acuminate; basal veins 3–5. Male inflorescences branched or unbranched, 7–18 cm, gray or brownish tomentulose; bracts sublanceolate, ca. 1 mm. Male flowers 2- or 3-fascicled; pedicels 2–3 mm; calyx lobes 3 or 4, ovate, ca. 3 mm, densely stellate-pilosulose; stamens 70–100. Female inflorescences branched or unbranched, 5–15 cm; bracts lanceolate, 2–3 mm. Female flowers: pedicel ca. 3 mm; sepals 4 or 5, triangular, 2–3 mm, tomentulose; ovary densely glandular-scaly, softly spiny and stellate-pilosulose; styles 3 or 4, ca. 4 mm, base connate for ca. 1 mm, long papillate. Fruiting

pedicel ca. 3 mm; capsule ca. 8 mm in diam., reddish orange glandular-scaly and sparsely softly spiny, spines subulate, ca. 4 mm, sparsely stellate-pilosulose and glandular-scaly. Seeds subglobose, ca. 4 mm in diam., brown or black, verrucate. Fl. Apr–Jun, fr. Jul–Aug.

Valleys, forests, forest margins; 100–600 m. Jiangsu (cultivated), Taiwan, S Zhejiang [Japan, Korea].

27. *Mallotus paniculatus* (Lamarck) Müller Argoviensis, *Linnaea* 34: 189. 1865.

白楸 bai qiu

Croton paniculatus Lamarck, *Encycl.* 2: 207. 1786; *Echinus trisulcus* Loureiro; *Mallotus chinensis* Müller Argoviensis; *M. cochinchinensis* Loureiro; *M. formosanus* Hayata; *M. paniculatus* var. *formosanus* (Hayata) Hurusawa; *Rottlera paniculata* (Lamarck) A. Jussieu.

Shrubs or trees, 3–15 m tall. Branchlets reddish stellate-tomentulose. Stipules small; petiole 2–15 cm; leaf blade rhombic, ovate, or triangular-ovate, often 1–3-lobed or 3-cuspidate, 5–15 × 3–12 cm, thickly papery, adaxially glabrescent, abaxially grayish tomentulose, base cuneate, sometimes slightly peltate, with 2 large basal glands, apex acuminate; basal veins 3–5. Male and female inflorescences often branched, 10–25 cm, tomentulose; bracts ovate, 1–2 mm. Male flowers 2–7-fascicled; pedicel 2–3 mm; calyx lobes 3 or 4, ovate, 2–2.5 mm, stellate-puberulent; stamens 50–60. Female flowers: sepals 4 or 5, oblong, 2–3 mm, tomentulose; ovary tomentulose; styles 3, ca. 3 mm, plumose. Fruiting pedicel ca. 2.5 mm; capsule 3-locular, ca. 10 mm in diam., tomentulose, sparsely softly spiny, spines subulate, 4–5 mm. Seeds subglobose, ca. 4 mm in diam., blackish, verruculose or smooth. Fl. Jul–Oct, fr. Oct–Dec.

Mountain slopes, thickets, secondary forests; below 100–1300 m. S Fujian, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam; NE Australia].

28. *Mallotus lianus* Croizat, *J. Arnold Arbor.* 19: 140. 1938.

东南野桐 dong nan ye tong

Mallotus japonicus (Linnaeus f.) Müller Argoviensis var. *astrochinensis* Hurusawa.

Shrubs or small trees, 2–15 m tall. Branchlets and petioles dull ferruginous stellate-tomentose. Stipules subtriangular, ca. 1 mm, deciduous; petiole 5–14 cm; leaf blade broadly ovate or orbicular-ovate, 9–18 × 7–15 cm, papery, abaxially reddish stellate-pubescent, sparsely orange or reddish glandular-scaly, adaxially glabrescent, base obtuse or subtruncate, sometimes slightly cordate, narrowly peltate or not peltate, with 2–4 glands, margin entire, apex acute or acuminate; basal veins 3–5. Male inflorescences often branched, 10–30 cm, reddish tomentulose; bracts ovate, ca. 1.5 mm. Male flowers 3–9-fascicled; pedicel

4–5 mm; calyx lobes 3 or 4, subovate, 2.5–3 mm, tomentulose; stamens 50–80. Female inflorescences branched or unbranched, (10–)15–32 cm, tomentulose; bracts subovate, 1.5–2 mm. Female flowers: pedicel 2–3 mm; sepals 4 or 5, triangular, 1.5–2 mm, tomentulose; ovary subglobose, densely stellate-pubescent and softly spiny; styles 3, 6–7(–10) mm, basally connate, plumose. Capsule globose, 1–1.2 cm in diam., tomentose and softly spiny, spines subulate, 5–7 mm, stellate-pubescent. Seeds ovoid or subglobose, ca. 5 mm, black, sparsely verrucose or verruculose. Fl. Aug–Sep, fr. Nov–Dec.

• Mountain valleys, forests; 200–1000 m. Fujian, Guangdong, Guangxi, S Hunan, S Jiangxi, S Zhejiang.

