

43. LASIANTHUS Jack, Trans. Linn. Soc. London 14: 125. 1823, nom. cons.,
not Adanson (1763).

粗叶木属 *cu ye mu shu*

Zhu Hua (朱华); Charlotte M. Taylor

Dasus Loureiro; *Litosanthes* Blume; *Mephitidia* Reinwardt ex Blume.

Erect subshrubs, shrubs, or rarely small trees, unarmed, with tissues sometimes fetid. Branches and branchlets terete, sometimes compressed, rarely fistulous; lenticels inconspicuous or conspicuous. Raphides present. Leaves opposite, distichous, usually thinly leathery or papery, base acute to rounded or cordate, apex acuminate, acute or cuspidate; midrib plane, depressed or slightly prominent adaxially, usually prominent abaxially; veins generally prominent abaxially, ascending at an angle of more than 45°, curved to margin or joining nerves above at margin; tertiary nervules parallel or reticulate; stipules caducous or usually persistent at least near stem apex, interpetiolar, well developed or reduced, triangular, lanceolate, ovate, or oblong, acute or obtuse. Inflorescence axillary, several flowered and glomerulate, capitate, cymose, or with flowers solitary, sessile or pedunculate, ebracteate or bracteate with bracts persistent or not, well developed, sometimes fused. Flowers bisexual, small, sessile or pedicellate. Calyx with hypanthium portion obovoid, ovoid, or campanulate; limb 3–6-dentate or lobed or rarely truncate. Corolla white, funnellform or salverform to urceolate (*Lasianthus biflorus*), from several millimeters long up to 2.5 cm, glabrous or hairy outside, inside glabrous or usually villous in throat; lobes 4–6, valvate or imbricate in bud. Stamens 4–6, inserted in corolla throat; filaments short; anthers linear or oblong, dorsifixed, included or exerted. Style linear; stigma lobes 3–9, linear or lanceolate, included or exerted. Ovary 3–9-celled, ovules 1 in each cell, basal, erect. Fruit blue or rarely white, black, or red, drupaceous, small, pulpy or fleshy, usually globose, smooth or warty, rounded or ridged, with calyx limb persistent; pyrenes 3–9 (sometimes fewer than that developing), thick walled, smooth, warty or sulcate on abaxial face, usually triangular in transverse section, with preformed germination slits; seed black, with abundant endosperm; embryo straight; cotyledon short, flattened; radicle long clavate.

About 184 species: 160 species in tropical Asia, ca. 20 in Africa, three in tropical America, and one in Australia; 33 species (seven endemic) in China.

Lasianthus is commonly collected in China. This genus has been studied in detail by H. Zhu for both China (Acta Phytotax. Sin. 32: 49–81. 1994; Syst. & Geogr. Pl. 72: 63–110. 2002; Acta Bot. Yunnan. 30: 308–314. 2008) and Thailand (Acta Phytotax. Sin. 39: 116–150. 2001: 53 species included). As Zhu detailed (loc. cit. 2002: 63), the characters that distinguish species of *Lasianthus* are mostly small and/or subtle, frequently ephemeral, and often difficult to see; and, consequently, the taxonomy of this genus is complicated. *Lasianthus* can be confused with some species of *Damnacanthus*, *Diplospora*, *Prismatomeris*, *Saprosma*, and *Urophyllum*, especially when collected only with young flower buds. *Lasianthus* (Chinese species) is rather distinctive vegetatively in its combination of leaf blades that are completely glabrous adaxially, petioles that are usually densely pubescent even when other parts of the plant are glabrescent or only sparsely pubescent, and small stipules that are usually persistent and also densely pubescent.

The leaf venation of *Lasianthus* frequently has a characteristic regular pattern, comprising subparallel or exceptionally regularly oriented tertiary veins (“nervules”). This is different, however, from the lineolate quaternary venation found in *Antirhea*, *Timonius*, and some other genera. A similar arrangement is found in some species of *Urophyllum*. Cai et al. (Acta Bot. Yunnan. 29: 497–512. 2007) studied leaf details of *Lasianthus* and [broadly] related genera, and Cai et al. (J. Syst. Evol. 46(1): 62–72. 2008) studied the pollen of a similar group.

The genus *Litosanthes* has been variously treated as a genus with one to several species, or included in *Lasianthus*. H. S. Lo (in FRPS 71(2): 106–108. 1999) treated *Litosanthes* as a separate genus of one or two species, as did Puff et al. (Rubiaceae of Thailand, 102. 2005). However, H. Zhu (loc. cit. 2002: 69) included it as a synonym of *Lasianthus*, as done here, based on morphological and molecular evidence.

Lasianthus verrucosus H. S. Lo (Bot. J. S. China 2: 2. 1993; type specimen: China. Hainan: Ledong, *Q. Huang 820468*, SCBI) was not seen. From H. S. Lo’s description and figure of this species, it has leaves with a looped venation, glabrous and fuscous when drying; inflorescence sessile or subsessile; calyx limb with 4 small, broadly triangular lobes; and pyrenes 4, verrucose on the abaxial face. Many *Lasianthus* specimens from Hainan were examined, but none was found matching the description of *L. verrucosus*. Consequently, this species is excluded from this account. From the original description it appears to be most similar to *Saprosma merrillii* and thus would likely key out as that species.

The phylogenetic relationships among species of *Lasianthus* and related genera were studied based on molecular data by Xiao and Zhu (Bot. Stud. (Taipei) 48: 227–232. 2007). Their results supported the inclusion of *Litosanthes biflora* and *Saprosma crassipes* within *Lasianthus*. *Litosanthes* is accordingly included here. However, *S. crassipes* has a 2-locular ovary and 2-pyrene drupes, which do not match the current circumscription of *Lasianthus*. *Saprosma merrillii* seems similar to *S. crassipes*, and their systematic position needs further study.

Lasianthus cyanocarpus Jack was reported from China by the *Flora of Japan*. However, true *L. cyanocarpus* has a restricted distribution in S Thailand and Malesia. This name is therefore misapplied in China and Japan, where the correct name for the species is *L. hirsutus*.

The following species was recorded from China but could not be treated here because no material was seen by the present authors: *Lasianthus areolatus* Dunn (J. Bot. 47: 376. 1909), recorded from Guangdong by Merrill and Chun (Sunyatsenia 1(1): 49. 1930).

1a. Flowers in pedunculate congested cymes or subcapitate groups (though shortly pedunculate in *L. chunii* and

sometimes subsessile in *L. japonicus*).

- 2a. Peduncles slender, 0.5–3 cm.
 - 3a. Leaves more than 3 cm; flowers 5-merous; pyrenes 5 12. *L. filipes*
 - 3b. Leaves less than 3 cm; flowers 4-merous; pyrenes 2 or 4 5. *L. biflorus*
- 2b. Peduncles short, 0.1–0.4 cm, or if more than 0.6 cm then robust.
 - 4a. Peduncles very short, 1–2 mm.
 - 5a. Branches and leaves abaxially appressed pubescent; leaves usually elliptic, acute or acuminate at apex, with nervules conspicuously elevated abaxially; fruit with 5 or 6 longitudinally elevated angles or ribs, strigillose 10. *L. chunii*
 - 5b. Branches and leaves glabrous, or branches sparsely strigose when young and leaves abaxially strigose or hirtellous; leaves usually lanceolate, long caudate at apex, with nervules slightly prominent abaxially; fruit smooth, glabrous 20. *L. japonicus*
 - 4b. Peduncles conspicuous, 1.5–20 mm.
 - 6a. Bracts numerous, linear, 6–12 mm 26. *L. rhinoceros*
 - 6b. Bracts 2 and less than 1 cm, or reduced and apparently absent.
 - 7a. Branches depressed pubescent or subglabrous; peduncles relatively robust, 5–20 mm; bracts linear, 3–10 mm; calyx more than 5 mm with ovate-lanceolate lobes; corolla more than 1.5 cm 4. *L. biermannii*
 - 7b. Branches sparsely puberulent to glabrous; peduncles slender, 1.5–5 mm; bracts 2 mm or shorter, usually inconspicuous; calyx less than 2.5 mm with triangular or subulate lobes; corolla 8.5 mm or shorter 24. *L. micranthus*
- 1b. Flowers solitary or in sessile fascicles or glomerules (though sometimes pedunculate in *L. henryi*).
 - 8a. Bracts conspicuous.
 - 9a. Leaves slightly cordate to rounded and often oblique at base.
 - 10a. Branches and leaves tomentose or setose; leaves 5–12 cm; stipules inconspicuous or to ca. 3 mm 1. *L. attenuatus*
 - 10b. Branches and leaves glabrous, except very young branches subglabrous and leaves sparsely hairy on nerves abaxially; leaves 11–18 cm; stipules 5–6 mm 27. *L. rigidus*
 - 9b. Leaves cuneate or subrounded and not oblique at base.
 - 11a. Branches and leaves hirsute; bracts large, leaflike 16. *L. hirsutus*
 - 11b. Branches and leaves glabrous or villous or appressed pubescent; bracts not leaflike.
 - 12a. Branches glabrous or thinly puberulent, leaves glabrous; bracts orbicular, leathery 19. *L. inodorus*
 - 12b. Branches and leaves abaxially tomentose, villous, or densely appressed pubescent; bracts not orbicular, papery.
 - 13a. Leaves usually no more than 10 cm; bracts small, subulate; fruit with 4 pyrenes 28. *L. schmidtii*
 - 13b. Leaves more than 12 cm; bracts ovate, lanceolate or linear; fruit with 5 or 6 pyrenes.
 - 14a. Stipules not conspicuous; bracts linear to lanceolate, up to 2 cm; fruit glabrous 30. *L. sikkimensis*
 - 14b. Stipules triangular, up to 8 mm; outer bracts ovate and inner ones lanceolate, none more than 5 mm; fruit hairy.
 - 15a. Pubescence appressed on branches, leaves abaxially, stipules, bracts, and calyx, drupes subglabrous 9. *L. chrysoneurus*
 - 15b. Tomentum dense and spreading on branches, leaves abaxially, stipules, bracts, calyx, and drupes 25. *L. obscurus*
 - 8b. Bracts inconspicuous or absent.
 - 16a. Calyx lobes linear, longer than 5 mm.
 - 17a. Leaves 11–16 × 3.5–5.5 cm; lateral veins more than 10 pairs; branches and nerves abaxially densely yellow villous; calyx lobes equal in length and 9–14 mm 7. *L. chevalieri*
 - 17b. Leaves 7–11 × 2.5–3 cm; lateral veins 5 or 6 pairs; branches and nerves abaxially hirsute; calyx lobes unequal in length, with longer ones up to 8 mm 22. *L. linearisepalus*
 - 16b. Calyx lobes not linear, no more than 5 mm.
 - 18a. Calyx lobes longer than calyx tube or as long as tube.
 - 19a. Leaves more than 12 cm.
 - 20a. Branches, leaf nerves abaxially, calyx, corolla, and fruit strigillose to glabrescent; calyx lobes linear-lanceolate 6. *L. calycinus*
 - 20b. Branches, leaf nerves abaxially, and fruit tomentose with relatively long brown or fuscous hairs, calyx and corolla densely brown tomentose; calyx lobes oblong 33. *L. wardii*
 - 19b. Leaves less than 12 cm.

- 21a. Branches and leaf nerves abaxially glabrous or sparsely strigose; fruit glabrous 23. *L. lucidus*
 21b. Branches and leaves abaxially very hairy; fruit pubescent.
 22a. Calyx limb divided nearly to base, lobes lanceolate or oblong and much longer than tube.
 23a. Young branches and leaves abaxially appressed pubescent; calyx lobes oblong to elliptic or oblanceolate, obtuse at apex 2. *L. austrosinensis*
 23b. Branches and leaves abaxially densely spreading villous; calyx lobes lanceolate, acuminate at apex 11. *L. curtisii*
 22b. Calyx limb not divided to base, lobes linear-lanceolate, slightly longer than or almost as long as tube.
 24a. Branches and leaves abaxially densely spreading villous 14. *L. formosensis*
 24b. Branches and leaves abaxially densely appressed pubescent 15. *L. henryi*
 18b. Calyx lobes clearly shorter than tube.
 25a. Calyx lobes or teeth small, ovate and reflexed; leaves usually with more than 10 pairs of nerves, veinlets conspicuously reticulate 8. *L. chinensis*
 25b. Calyx lobes or teeth not ovate and not reflexed; leaves usually with less than 10 pairs of nerves, veinlets parallel or subparallel or subreticulate.
 26a. Calyx cupulate, with limb truncate or minutely dentate; fruit crowned by enlarged calyx limb 32. *L. verticillatus*
 26b. Calyx with conspicuous lobes; fruit crowned by persistent calyx lobes but these not enlarged.
 27a. Stipules triangular-lanceolate to linear-lanceolate, equal to or more than 3 mm, strigillose or hirsute; young branches strigillose or hirsute.
 28a. Stipules 3–5 mm; flowers 5-merous; fruit smooth, pyrenes 5 29. *L. simizui*
 28b. Stipules usually more than 5 mm; flowers 4-merous; fruit verrucose, pyrenes 4 31. *L. trichophlebus*
 27b. Stipules triangular, less than 3 mm, puberulent; young branches puberulent or pubescent.
 29a. Leaves more than 12 cm, lanceolate or oblong, lateral veins 6–9 pairs.
 30a. Leaves oblong, lateral veins 6–8 pairs, veinlets subparallel, conspicuously elevated abaxially; branches densely appressed pubescent, leaves abaxially at nerves and margins puberulent or ciliate 18. *L. hookeri*
 30b. Leaves lanceolate to elliptic-lanceolate, lateral veins ca. 9 pairs, veinlets subreticulate with forks very slender; branches and leaf nerves abaxially sparsely appressed puberulent 21. *L. lancifolius*
 29b. Leaves less than 11 cm, ovate or ovate-oblong, lateral veins 4–6 pairs.
 31a. Leaves 4–6 cm, less than 3 cm wide; branches and leaf nerves abaxially densely appressed hirsute 3. *L. austroyunnanensis*
 31b. Leaves 6–10 cm, as narrow as 2 cm but usually more than 3 cm wide; branches and leaf nerves abaxially glabrous or pubescent or villous.
 32a. Branches and leaf nerves abaxially glabrous or sparsely appressed pubescent; calyx sparsely pubescent, with 5 triangular teeth; fruit glabrous 13. *L. fordii*
 32b. Branches and leaves abaxially densely villous; calyx densely strigillose, with 5 minute and broadly triangular teeth; fruit strigillose 17. *L. hispidulus*

1. *Lasianthus attenuatus* Jack, Trans. Linn. Soc. London 14: 126. 1823.

斜基粗叶木 xie ji cu ye mu

Lasianthus densifolius Miquel; *L. setosus* Craib; *L. wallichii* Wight; *L. wallichii* var. *hispidocostatus* H. Zhu.

Shrubs, 1–2 m tall; branches and branchlets densely tomentose to hirsute or sometimes setose. Petiole 1–3 mm, tomentose to hirsute; leaf blade leathery or subleathery, oblong,

elliptic-lanceolate, or oblong-ovate, 5–12 × 2.5–5 cm, glabrous abaxially, strigillose to hirtellous or tomentose abaxially, base slightly cordate or rarely rounded, slightly to markedly oblique, apex acute to cuspidate-acuminate; lateral veins 6–8 pairs; nerves subparallel, conspicuous abaxially; stipules triangular or ovate-lanceolate, 2–3 mm, tomentose to hirsute, apparently persistent. Inflorescence cymose or glomerulate, sessile, densely hirsute to hirtellous; bracts subulate to lanceolate, 6–15 mm, persistent. Flowers sessile. Calyx densely hirsute; hypanthium portion campanulate, ca. 1 mm; limb 1–2 mm, with 5 triangular

teeth. Corolla sparsely hirtellous, puberulent to glabrescent outside, villous inside; tube 8–10 mm; lobes 5, spatulate, 4–5 mm. Fruit globose or ovoid, 5–10 mm in diam., densely hirsute, smooth; pyrenes 5 or 6. Fl. Apr, fr. Aug–Sep.

Forests, shaded and wet places; 200–1800 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Bhutan, Cambodia, NE India, Indonesia, S Japan, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Thailand, Vietnam].

2. *Lasianthus austrosinensis* H. S. Lo, Bot. J. S. China 2: 4. 1993.

华南粗叶木 *hua nan cu ye mu*

Shrubs, 1–2 m tall; branches and branchlets densely appressed strigillose. Petiole 3–8 mm, densely strigillose; leaf blade papery, ovate, 5–8 × 2.5–3 cm, glabrous adaxially, appressed strigillose on midrib and nerves abaxially, base obtuse or subrounded, apex shortly cuspidate; lateral veins ca. 5 pairs; nervules subparallel; nerves and nervules elevated abaxially; stipules generally persistent, triangular to broadly triangular, 1–1.5 mm, densely strigillose. Inflorescences glomerulate to subcapitate, sessile; bracts absent. Flowers sessile or subsessile. Calyx densely strigillose; hypanthium portion obconic, ca. 1 mm; limb deeply lobed; lobes 5, oblong to elliptic or oblanceolate, 3–3.5 mm, nerved, obtuse. Corolla ca. 5 mm, densely hirsute outside, villous in upper half inside; lobes 5, triangular. Fruit subglobose, 4–5 mm in diam., strigillose; pyrenes 5.

• Forests, shaded and wet places; 300–500 m. Guangdong, Guangxi, Hainan.

H. Zhu (Syst. & Geogr. Pl. 72: 85. 2002) noted that the relatively well-developed calyx lobes with evident venation are distinctive for this species; the calyx lobes are also distinctive in being widest near the middle rather than at the base as in most other *Lasianthus* species.

3. *Lasianthus austroyunnanensis* H. Zhu, Syst. & Geogr. Pl. 72: 96. 2002.

滇南粗叶木 *dian nan cu ye mu*

Shrubs, to 1 m tall; branchlets densely appressed hirsute. Petiole 5–8 mm, hirsute; leaf blade papery to membranous, ovate-elliptic, 4–6 × 2–3 cm, glabrous adaxially, appressed hirsute on midrib and nerves abaxially, base acute or obtuse, apex cuspidate-acuminate or acuminate; lateral veins 4 or 5 pairs; nervules subparallel; nerves and nervules elevated conspicuously abaxially; stipules ?persistent, triangular, minute, hirsute. Inflorescences glomerulate, sessile; bracts minute, hirsute. Flowers sessile. Calyx hirsute; hypanthium portion campanulate, ca. 1 mm; limb 1–1.5 mm, toothed; teeth 5. Corolla 8–10 mm, pubescent outside, villous inside. Fruit globose, 4–5 mm in diam., subglabrous; pyrenes 5.

• Forests, shaded and wet places; 1000–1300 m. Taiwan, Yunnan.

This species has been often misidentified as *Lasianthus microphyllus* Elmer. After examining type specimens of *L. microphyllus* from the Philippines (*Elmer 13790*, isotypes in A, CAS, E, K, L, MO), it is clear that the Chinese populations differ from *L. microphyllus* by having appressed-hirsute hairs on the branches, leaf midrib and nerves abaxially, and the outside of the calyx and corolla. The leaves are ovate-elliptic with a cuspidate-acuminate or acuminate apex. In contrast, *L. microphyllus* has subglabrous or glabrous branches, leaves, and flowers, and the leaves are ovate with a caudate apex. Therefore, the Chinese taxon

represents a separate species. The name *L. microphyllus* has also been sometimes misapplied in Taiwan to plants of *L. micranthus*.

4. *Lasianthus biermannii* King ex J. D. Hooker, Fl. Brit. India 3: 190. 1880.

梗花粗叶木 *geng hua cu ye mu*

Shrubs, 2–5 m tall; branchlets sparsely pubescent to densely appressed pubescent to strigose, or subglabrous. Petiole 7–14 mm, pubescent to strigose; leaf blade membranous or papery, elliptic, elliptic-ovate, or elliptic-lanceolate, 8–20 × 3–5 cm, glabrous adaxially, sparsely pubescent to densely appressed pubescent on midrib, lateral veins, and nervules abaxially, base acute to obtuse or rounded, apex cuspidate-acuminate; lateral veins 5–7 pairs; nervules reticulate, slender and inconspicuous to parallel and conspicuously elevated abaxially; stipules triangular or lanceolate, 3–5 mm, pubescent to strigillose, apparently caducous. Inflorescences congested-cymose to subcapitate, densely strigillose, pedunculate; peduncles slender to robust, 5–15 mm; bracts linear, 2–10 mm. Flowers sessile or subsessile. Calyx purple when fresh, strigillose; hypanthium portion turbinate, 1–1.5 mm; limb 4–5 mm; lobes 4–6, narrowly lanceolate to oblanceolate, 2–4 mm. Corolla light purple when fresh, 7–8 mm, villous inside; tube 3–5 mm, glabrous outside; lobes 4–6, oblong-ovate, 3–4 mm, pilosulous outside. Fruit globose, 0.3–1.5 cm in diam., smooth or with ca. 5 ridges; pyrenes 5. Fl. Apr, Oct–Nov, fr. Jul.

Montane forests, shaded and wet places; 1000–2500 m. Guizhou, Hainan, Xizang, Yunnan [Bhutan, NE India, Myanmar].

The well-developed calyx lobes that are usually broadest near the apex are distinctive.

- 1a. Branches usually sparsely pubescent or subglabrous and leaf nerves abaxially sparsely pubescent; nervules reticulate, slender and inconspicuous; calyx lobes relatively narrow and short; peduncles slender, longer or shorter than petioles 4a. subsp. *biermannii*
- 1b. Branches and leaf nerves abaxially densely appressed strigose; leaf nervules parallel and conspicuously elevated abaxially; calyx lobes relatively wide and long; peduncles robust and usually longer than petioles 4b. subsp. *crassipedunculatus*

4a. *Lasianthus biermannii* subsp. *biermannii*

梗花粗叶木(原亚种) *geng hua cu ye mu (yuan ya zhong)*

Branches sparsely pubescent or subglabrous. Leaf blade with nerves abaxially sparsely pubescent; nervules reticulate, slender and inconspicuous. Peduncles slender, longer or shorter than petioles. Calyx lobes relatively narrow and short.

Montane forests, shaded and wet places; 1200–2500 m. Yunnan [Bhutan, NE India, Myanmar].

4b. *Lasianthus biermannii* subsp. *crassipedunculatus* C. Y. Wu & H. Zhu, Acta Phytotax. Sin. 32: 75. 1994.

粗梗粗叶木 *cu geng cu ye mu*

Lasianthus esquirolii H. Léveillé.

Branches densely appressed strigose. Leaf blade with nerves densely appressed strigose abaxially; nervules parallel and conspicuously elevated abaxially. Peduncles robust and usually longer than petioles. Calyx lobes relatively wide and long.

• Forests, shaded and wet places; 1000–1700 m. Guizhou, Hainan, Yunnan.

Rehder (J. Arnold Arbor. 16: 323. 1935) considered that *Henry 11148* from Yunnan province of China, cited by Hutchinson as *Lasianthus biermannii*, matched the type specimen of *L. esquirolii* (J. Esquirol 648) from Guizhou province of China, so he reduced *L. esquirolii* to a synonym of *L. biermannii*. However, Ferguson (Notes Roy. Bot. Gard. Edinburgh 32(1): 109. 1972) contended that the type of *L. esquirolii* did not sufficiently match the type of *L. biermannii* and again recognized *L. esquirolii* as a separate species. Many specimens from SE Yunnan and Hainan are closely related to *L. biermannii* but clearly differ from it and have been treated as a geographic subspecies of *L. biermannii*. When the type of *L. esquirolii* was checked, it was concluded that *L. esquirolii* is the same as *L. biermannii* subsp. *crassipedunculatus*.

5. *Lasianthus biflorus* (Blume) M. Gangopadhyay & Chakrabarty, J. Econ. Taxon. Bot. 16: 338. 1992.

石核木 *shi he mu*

Litosanthes biflora Blume, Catalogus, 22. 1823; *Lasianthus gracilis* King & Gamble.

Shrubs, 1–2.5 m tall; branchlets terete, densely hirsute to pilosulous. Petiole 0.5–2 mm, hirsute to pilosulous; leaf blade thinly to thickly papery, subrhombic or elliptic-obovate, elliptic, or subovate, 1.5–3 cm × 7–15 mm, glabrous adaxially, hirtellous to pilosulous abaxially, base cuneate, margin flat, often undulate, apex acute, often mucronulate; midrib depressed adaxially, prominent abaxially, hirsute or pilosulous abaxially; lateral veins plane adaxially, prominent abaxially, 6–9 pairs, hirsute or pilosulous abaxially, extending to unite with margin; nervules obscure on both surfaces; stipules ± inconspicuous, narrowly triangular, 0.5–2 mm, densely pilosulous to hirtellous, at apex acute sometimes with 2–4 very small lateral projections or lobes. Inflorescence congested-cymose or with solitary flowers, pedunculate; peduncles 0.5–1.7 cm, sparsely hirsute to pilosulous; bracts inconspicuous, lanceolate to linear, 0.3–1.2 mm. Flowers pedicellate; pedicels 0.2–1 mm. Calyx glabrous to sparsely hirtellous; hypanthium portion campanulate, 1.2–1.5 mm; limb deeply 5-toothed; teeth triangular, ca. 0.5 mm. Corolla 2–4 mm, glabrous outside, villous in throat and on inside of lobes; lobes ovate, shorter than tube, rostriform-incurved at apex. Fruit ovoid or depressed globose, 3–5 mm in diam., glabrous, verrucose, 4-grooved; pyrenes 4.

Forests, shaded and wet places; 600–700 m. Hainan, Taiwan, S Yunnan [Indonesia, Malaysia, Philippines, Thailand, Vietnam].

6. *Lasianthus calycinus* Dunn, Bull. Misc. Inform. Kew 1912: 367. 1912.

黄果粗叶木 *huang guo cu ye mu*

Shrubs, 1.5–3 m tall; branchlets appressed pubescent or strigillose to glabrescent. Petiole 8–10 mm, appressed pubescent or strigillose to glabrescent; leaf blade thickly papery, oblong-elliptic, 13–15 × 4–6 cm, glabrous adaxially, sparsely appressed pubescent to strigillose on nerves abaxially, base broadly cuneate or subrounded, apex acute to shortly acuminate; lateral veins 7–9 pairs, extending to unite with margin; nervules parallel; nerves and nervules conspicuous abaxially; stipules generally persistent, broadly triangular, ca. 2 mm, strigillose, acute. Inflorescences glomerulate to subcapitate, sessile, 4–6-flowered; bracts absent. Flowers subsessile. Calyx strigillose; hypanthium portion 1.5–2 mm; limb deeply lobed; lobes 5, linear-lanceolate to narrowly triangular, 2.5–5 mm, acute. Corolla 7–9 mm, strigillose outside; lobes 5, ovate. Fruit orange or red-orange, subglobose, 6–7 mm in diam., sparsely strigillose to glabrescent, with longitudinal elevated angles. Fl. Apr–May, fr. Sep–Oct, Dec.

• Forests, shaded and wet places; 600–700 m. Hainan.

H. Zhu (Syst. & Geogr. Pl. 72: 83. 2002) noted that this species is similar to and may even be conspecific with the poorly known species *Lasianthus latifolius* (Blume) Miquel of Borneo, Java, and Sumatra.

7. *Lasianthus chevalieri* Pitard in Lecomte, Fl. Indo-Chine 3: 384. 1924.

长萼粗叶木 *chang e cu ye mu*

Lasianthus longisepalus Geddes; *L. longisepalus* var. *jianfengensis* H. S. Lo.

Shrubs, to 2 m tall; branches and branchlets densely yellow villous. Petiole 1–1.5 cm, long, yellow villous; leaf blade subleathery, elliptic-oblong, 11–16 × 3.5–5.5 cm, glabrous adaxially, yellow villous abaxially, base cuneate, apex acuminate; lateral veins ca. 11 pairs, prominent abaxially; nervules parallel, prominent abaxially; stipules generally persistent, narrowly triangular, ca. 3 mm, spreading yellow villous. Inflorescences glomerulate, sessile; bracts inconspicuous. Flowers sessile. Calyx densely pilose; hypanthium portion obconic, 1.5–3 mm; limb with tubular portion 1.5–3 mm; lobes 5–7, linear, 9–14 mm. Corolla tube 12–13 mm; lobes 5–7, lanceolate, 7–8 mm, densely pilose. Fruit subglobose, 6–7 mm in diam., pilose; pyrenes 5–7.

Forests, shaded and wet places; 800–1500 m. Hainan [Thailand, Vietnam].

The sessile flowers with relatively long calyx lobes are quite distinctive.

8. *Lasianthus chinensis* (Champion ex Benth) Benth, Fl. Hongk. 160. 1861.

粗叶木 *cu ye mu*

Mephitidia chinensis Champion ex Benth, Hooker's J. Bot. Kew Gard. Misc. 4: 196. 1852; *Lasianthus dinhensis* Pierre ex Pitard; *M. odajimae* Masamune.

Shrubs, 1–4 m tall; branches and branchlets terete, densely pubescent or puberulent to strigillose. Petiole 0.5–1.5 cm, densely pubescent or puberulent to strigillose; leaf blade sub-

leathery, oblong to elliptic, 11–25 × 2.5–7 cm, glabrous adaxially, thinly to densely pubescent or puberulent to strigillose abaxially, base acute or obtuse, margin plane or usually reflexed, apex acute or acuminate; lateral veins 9–15 pairs; nervules reticulate, slightly elevated abaxially; stipules generally persistent, triangular to narrowly triangular, 1.5–3 mm, densely pubescent or puberulent to strigillose. Inflorescences subcapitate to congested-cymose, sessile to subsessile; bracts reduced. Flowers sessile or subsessile. Calyx puberulent to strigillose; hypanthium portion globose to ellipsoid, 1.5–3 mm; limb 1.5–2.5 mm, lobed for 1/2–2/3; lobes 4–6, triangular, ovate, or orbicular, becoming reflexed. Corolla 10–15 mm, densely strigillose to sericeous outside; lobes 5 or 6, lanceolate. Fruit globose to depressed globose, 5–8 mm in diam., pubescent to strigillose, with 5 or 6 conspicuous longitudinal angles; pyrenes 5 or 6. Fl. May–Jun, fr. Sep–Oct.

Forests, shaded and wet places; below 100–900 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan [Cambodia, Laos, Malaysia, Philippines, Thailand, Vietnam].

The relatively large flowers with the large globose to ellipsoid hypanthium (i.e., ovary) portion is distinctive; *Lasianthus verticillatus* is similar in these characters but can be distinguished by its truncate to denticulate calyx limb and smooth fruit. The calyx limb often enlarges as the fruit develops.

9. *Lasianthus chryoneurus* (Korthals) Miquel, Fl. Ned. Ind. 2: 322. 1857.

库兹粗叶木 ku zi cu ye mu

Mephitidia chryoneura Korthals, Ned. Kruidk. Arch. 2(2): 222. 1851; *Lasianthus hoensis* Pierre ex Pitard; *L. kurzii* J. D. Hooker; *L. kurzii* var. *howii* H. S. Lo.

Shrubs, to 3 m tall; branchlets appressed pubescent to densely velutinous. Petiole 5–10 mm, appressed pubescent to densely velutinous; leaf blade membranous, elliptic-oblong to elliptic-lanceolate, 12–20 × 3–5 cm, glabrous adaxially, appressed pubescent to puberulent abaxially, base cuneate to acute, apex acuminate; lateral veins 7–10 pairs; nervules parallel, ± inconspicuous; stipules deciduous, triangular or oblong-lanceolate, 3–8 mm, pubescent to densely velutinous, strigillose on margin. Inflorescences glomerulate to subcapitate, sessile; bracts persistent, outer bracts ovate, inner bracts lanceolate, all 1–5 mm, pubescent to densely strigillose, especially on margin. Flowers sessile or subsessile. Calyx densely strigillose; hypanthium portion campanulate, 1–1.5 mm; limb deeply lobed; lobes 4–6, triangular, 1.5–2 mm. Corolla 5–6 mm, puberulent outside on upper part, pubescent inside in throat. Fruit blue-black, subglobose, 4–6 mm in diam., pubescent to strigillose or puberulent; pyrenes 5 or 6.

Forests, shaded and wet places; 500–1200 m. S Yunnan [Cambodia, India, Indonesia (Java), Laos, Myanmar, Papua New Guinea, Thailand, Vietnam].

H. Zhu (Syst. & Geogr. Pl. 72: 80. 2002) noted that this species is very similar to *Lasianthus obscurus*.

10. *Lasianthus chunii* H. S. Lo, Bot. J. S. China 2: 10. 1993.

焕镛粗叶木 huan yong cu ye mu

Shrubs, 1–3 m tall; branchlets dark brown, densely hirsute or strigose. Petiole 0.5–1 cm, densely hirsute to strigillose; leaf blade subleathery or thickly papery, lanceolate or oblong-lanceolate, 8–15 × 2–5.5 cm, glabrous adaxially, hirsute or strigillose on midrib, nerves, and nervules abaxially, base cuneate or obtuse to rounded, apex acuminate; lateral veins 7 or 8 pairs; nervules subparallel; veins and nervules conspicuously elevated abaxially; stipules 1–1.5 mm, densely hirsute to strigillose, apparently caducous. Inflorescence congested-cymose, shortly pedunculate, 2–4-flowered, densely strigillose; peduncle 1–2 mm; bracts narrowly triangular, 1–2 mm. Flowers subsessile to pedicellate; pedicels to 1 mm. Calyx strigillose; hypanthium portion campanulate, 1–1.5 mm; limb ca. 2 mm; lobes 6, subtriangular, ca. 1 mm. Corolla ca. 1 cm, hirsute or strigillose outside, villous in upper half inside; lobes 6, lanceolate. Fruit depressed globose, ca. 5 mm in diam., hirsute or strigillose, with 5 or 6 longitudinal elevated angles or ridges; pyrenes 5 or 6. Fl. Apr, fr. Jun–Jul, Sep.

• Forests, shaded and wet places. SE Fujian, Guangdong, SE Guangxi, S Jiangxi.

11. *Lasianthus curtisii* King & Gamble, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 73: 128. 1904.

广东粗叶木 guang dong cu ye mu

Lasianthus condorensis Pierre ex Pitard; *L. formosensis* Matsumura var. *hirsutus* Matsumura; *L. kwangtungensis* Merrill.

Shrubs, 1–2 m tall; branches and branchlets densely spreading villous. Petiole 4–8 mm, densely villous; leaf blade papery or subleathery, ovate-lanceolate or elliptic-lanceolate, 5–9 × 2–3 cm, glabrous adaxially, densely soft villous abaxially, base cuneate or obtuse, apex cuspidate-acuminate; lateral veins 4–6 pairs; nervules subparallel; stipules generally persistent, narrowly triangular, 1–1.5 mm, densely strigose. Inflorescences glomerulate to subcapitate, sessile; bracts absent. Flowers sessile to subsessile. Calyx densely villous to hirsute; hypanthium portion obconic, 1–1.5 mm; limb divided nearly to base; lobes 5, lanceolate to narrowly triangular, 2–5 mm, acuminate. Corolla 7–8 mm, outside hispid, inside villous; lobes 5. Fruit ovoid-globose, 4–5 mm in diam., hirsute to villous; pyrenes 5. Fl. Aug–Sep, fr. Jun–Dec.

Forests, shaded and wet places; 300–900 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan [Indonesia (Sumatra), Japan (Kyushu, Ryukyu Islands), Malaysia, Thailand, Vietnam].

12. *Lasianthus filipes* Chun ex H. S. Lo, Bot. J. S. China 2: 8. 1993.

长梗粗叶木 chang geng cu ye mu

Shrubs, 1–2 m tall; branchlets slender, densely strigose. Petiole 1–5 mm, densely hirsute or strigillose; leaf blade papery, ovate or ovate-oblong, 5–8 × 2–3 cm, glabrous adaxially, appressed pubescent to strigillose on midrib, veins, and nervules abaxially, base obtuse, rounded, or rarely subcordate, apex shortly acuminate or cuspidate-acuminate; lateral veins 4 or 5 pairs; nervules subparallel, conspicuous abaxially; stipules minute, densely appressed hirsute or strigose, apparently caducous. Inflorescence congested-cymose or subcapitate, peduncu-

late, few flowered; peduncles slender, 1–3 cm, densely hirsute or strigose; bracts subulate, 1–2.5 mm, hirsute or strigose. Flowers subsessile to shortly pedicellate. Calyx hirsute or strigillose; hypanthium portion campanulate, ca. 1 mm; limb 1.5–2 mm; lobes 5, subulate, 1–1.5 mm. Corolla ca. 5 mm; tube puberulent outside, densely villous in upper half inside; lobes 5, ovate, ca. 1.5 mm, villous inside. Fruit globose, 7–8 mm in diam., subglabrous; pyrenes 5. Fl. Apr.

Forests, shaded and wet places; 500–1500 m. Fujian, Guangdong, Guangxi, Hainan, Yunnan [N Vietnam].

13. *Lasianthus fordii* Hance, J. Bot. 23: 324. 1885.

罗浮粗叶木 *luo fu cu ye mu*

Lasianthus kumptensis Pierre ex Pitard; *L. tashiroi* Matsumura; *L. zambalensis* Elmer.

Shrubs, 1–2 m tall; branches and branchlets glabrous to thinly appressed pubescent or strigose. Petiole 0.4–1 cm, subglabrous to hirsute or strigillose; leaf blade subleathery or papery, ovate-oblong, 6–10 × 2–5 cm, glabrous adaxially, thinly appressed strigillose or subglabrous abaxially, base acute or obtuse, apex acuminate or cuspidate-acuminate; lateral veins 4–6 pairs; nervules subparallel, elevated abaxially; stipules generally persistent, triangular to narrowly triangular, 0.5–1.2 mm, strigillose. Inflorescences glomerulate, sessile; bracts absent. Flowers sessile. Calyx sparsely to densely strigillose; hypanthium portion campanulate to obconic, ca. 1 mm; limb 1–1.5 mm, shallowly toothed; teeth 5, triangular. Corolla 6–10 mm, glabrous to puberulent outside, villous inside; lobes 5. Fruit globose or subglobose, 5–6 mm in diam., glabrous to strigillose; pyrenes 5 or 6.

Forests, shaded and wet places; 200–1000 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Cambodia, Indonesia (Java), Japan (Kyushu, Ryukyu Islands, Yakushima), Papua New Guinea, Philippines, Thailand, Vietnam].

Lasianthus fordii var. *trichocladus* H. S. Lo (Bot. J. S. China 2: 7. 1993) was described from SE China (Guangdong, Guangxi, and Hainan) but could not be treated here because no material was seen by the present authors.

14. *Lasianthus formosensis* Matsumura, Bot. Mag. (Tokyo) 15: 17. 1901.

台湾粗叶木 *tai wan cu ye mu*

Lasianthus kwangsiensis Merrill ex H. L. Li; *L. tashiroi* Matsumura var. *pubescens* Matsumura; *L. tenuicaudatus* Merrill.

Shrubs, 1–2 m tall; branches and branchlets densely villous or villosulous. Petiole 5–8 mm, villous to villosulous; leaf blade papery or subleathery, oblong or ovate-elliptic, 7–12 × 2.5–5 cm, glabrous adaxially, villous or villosulous at least on veins abaxially, base acute or obtuse, apex acuminate or cuspidate-acuminate; lateral veins 6 or 7 pairs; nervules subparallel, slightly elevated abaxially; stipules generally persistent, triangular, ca. 2 mm, villous to villosulous. Inflorescences glomerulate to congested-cymose, sessile to shortly pedunculate; bracts absent. Flowers sessile. Calyx pilosulous to villosulous; hypanthium obconic to campanulate, ca. 1 mm; limb 3–4 mm, deeply

lobed; lobes 5, linear-lanceolate. Corolla 6–8 mm, villous outside, tomentose inside; lobes 5, oblong-lanceolate. Fruit ovoid-globose, ca. 5 mm in diam., subglabrous; pyrenes 5. Fl. Oct–Dec, fr. Apr.

Forests, shaded and wet places; 500–1000 m. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Japan (Kyushu, Ryukyu Islands, Yakushima), Thailand, Vietnam].

15. *Lasianthus henryi* Hutchinson in Sargent, Pl. Wilson. 3: 401. 1916.

西南粗叶木 *xi nan cu ye mu*

Lasianthus appressihirtus Simizu; *L. appressihirtus* var. *maximus* Simizu ex T. S. Liu & J. M. Chao; *L. inconspicuus* J. D. Hooker var. *hirtus* Hutchinson.

Shrubs, 1–1.5 m tall; branches and branchlets densely appressed pubescent or strigillose. Petiole 3–8 mm, appressed strigillose; leaf blade subleathery or papery, oblong-lanceolate, 6–12 × 1.5–3.5 cm, glabrous adaxially, appressed pubescent abaxially on nerves or strigillose on veins, base acute or cuneate, apex cuspidate-acuminate; lateral veins 7 or 8 pairs; nervules subparallel; nerves and nervules conspicuously elevated abaxially; stipules generally persistent, triangular, 0.5–1.2 mm, densely strigillose. Inflorescences glomerulate to subcapitate, sessile or subsessile or very shortly pedunculate; bracts minute, strigillose. Flowers sessile. Calyx densely strigillose; hypanthium portion campanulate to obconic, ca. 1 mm; limb 1–1.5 mm, lobed for 1/3–3/4; lobes 5, linear-lanceolate. Corolla ca. 8 mm, glabrous or strigillose on lobes outside, villous inside; lobes 5. Fruit globose, ca. 5 mm in diam., strigillose; pyrenes 5. Fl. Jun, fr. Jul–Oct.

• Forests, shaded and wet places; 200–1900 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, E Xizang, Yunnan.

16. *Lasianthus hirsutus* (Roxburgh) Merrill, J. Arnold Arbor. 33: 229. 1952.

鸡屎树 *ji shi shu*

Triosteum hirsutum Roxburgh, Fl. Ind. 2: 180. 1824.

Shrubs, 1–2 m tall; branchlets stiffly spreading rusty hirsute to glabrescent. Petiole 10–15 mm, hirsute; leaf blade subleathery or leathery, oblong or oblanceolate-oblong, 13–25 × 5–7.5 cm, glabrous adaxially, densely hirtellous or hirsute to strigose abaxially, base acute to obtuse, apex shortly acuminate; lateral veins 7–10 pairs; nervules subparallel, elevated abaxially; stipules lanceolate to deltoid, 8–10 mm, hirsute, generally persistent at least on apical nodes. Inflorescences glomerulate, sessile, hirsute; bracts leaflike, numerous, persistent, outer ones ovate-lanceolate, 2–3 cm, with distinct nerves, inner ones linear, much smaller. Flowers sessile. Calyx densely hirsute; hypanthium portion obconical, ca. 1 mm; limb 5-lobed; lobes linear-lanceolate, ca. 2.5 mm. Corolla 11–15 mm; tube 8–12 mm, outside glabrous in lower half and hirsute in upper half, glabrous inside; lobes 5, ovate, ca. 3 mm. Fruit ovoid-globose, 4–5 mm in diam., hirsute to glabrescent, with ca. 5 rounded ridges; pyrenes 5. Fr. Nov.

Forests, shaded and wet places; 100–1500 m. Guangdong, Guang-

xi, Hainan, Taiwan [Bangladesh, India (including Andaman and Nicobar Islands), Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam].

Lasianthus hirsutus is a widely distributed species. It was mistakenly called "*L. cyanocarpus*" by most authors until Merrill (loc. cit.) showed the correct application of the name. *Lasianthus cyanocarpus* has relatively smaller leaves with cordate and slightly oblique bases and usually fewer and relatively smaller bracts; *L. hirsutus* differs from it in relatively larger leaves with cuneate, slightly unequal bases, relatively longer petioles, conspicuous triangular stipules, more numerous bracts with the outer ones ovate-oblong and leaflike and the inner ones gradually narrower and smaller, as well as usually long rusty hirsute hairs on most parts of the plants.

17. *Lasianthus hispidulus* (Drake) Pitard in Lecomte, Fl. Indo-Chine 3: 393. 1924.

文山粗叶木 wen shan cu ye mu

Mephitidia hispidula Drake, J. Bot. (Morot) 9: 239. 1895; *Lasianthus brevidens* Craib; *L. bunzanensis* Simizu.

Shrubs, 1–1.5 m tall; branches and branchlets densely villous or strigose. Petiole 4–7 mm, densely hirsute or strigose to strigillose; leaf blade thinly leathery to papery, elliptic or ovate-oblong, 7–10 × 3–5 cm, glabrous adaxially, densely villous abaxially, base acute or obtuse, apex cuspidate-acuminate or acuminate; lateral veins 4–6 pairs; nervules subparallel; midrib and veins elevated abaxially, nervules slightly elevated abaxially, strigose to strigillose; stipules generally persistent, 0.5–1 mm, densely hirsute or strigillose. Inflorescences glomerulate, sessile; bracts absent. Flowers sessile. Calyx strigillose; hypanthium campanulate, 1–1.5 mm; limb 1–1.5 mm, shortly toothed; teeth 5, broadly triangular. Corolla 6–7 mm, pilose outside, villous inside; lobes 5. Fruit globose, 3–6 mm in diam., strigillose; pyrenes 5.

Forests, shaded and wet places; 300–600 m. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Indonesia (Sumatra), Japan (Ryukyu Islands), Malaysia (Borneo), Thailand, Vietnam].

18. *Lasianthus hookeri* C. B. Clarke ex J. D. Hooker, Fl. Brit. India 3: 184. 1880.

虎克粗叶木 hu ke cu ye mu

Shrubs, up to 5 m tall; branches and branchlets densely appressed pubescent to sericeous. Petiole 5–10 mm, appressed puberulent to strigose or sericeous; leaf blade papery or subleathery, oblong, 12–24 × 3–6 cm, glabrous adaxially, puberulent or ciliate on nerves and margins abaxially, base obtuse or cuneate, apex caudate-acuminate; lateral veins 6–8 pairs, outermost pair extending to tip of leaf; nervules subparallel, conspicuously elevated abaxially; stipules generally persistent, triangular to broadly triangular, 2–3 mm, appressed puberulent to strigose or sericeous. Inflorescences glomerulate, sessile; bracts absent or few, linear, 3–4 mm. Flowers sessile. Calyx subglabrous to puberulent; hypanthium campanulate, 1.5–2 mm; limb lobed for 1/2–3/4; lobes 4–6, lanceolate to narrowly triangular, 1–2 mm. Corolla 6–7 mm, puberulent outside; tube 4–5 mm; lobes 4–6, ovate-lanceolate, ca. 2 mm. Fruit subglobose, 4–5 mm in diam., glabrous or puberulent, smooth; pyrenes 5.

Forests, shaded and wet places; 300–1500 m. Guangxi, Guizhou,

Xizang, Yunnan [NE India, Myanmar, Thailand, Vietnam].

- 1a. Leaf margins densely ciliate; bracts subulate; calyx limb plus hypanthium ca. 2 mm, with minute subulate teeth 18a. var. *dunnianus*
- 1b. Leaf margins sparsely ciliate; bracts absent; calyx limb plus hypanthium ca. 3 mm, with lanceolate, ca. 1 mm lobes 18b. var. *hookeri*

18a. *Lasianthus hookeri* var. *dunnianus* (H. Léveillé) H. Zhu, Acta Phytotax. Sin. 32: 71. 1994 ["*dunniana*"].

睫毛虎克粗叶木 jie mao hu ke cu ye mu

Lasianthus dunnianus H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 64. 1912 ["*dunniana*"].

Leaf blade with margin densely ciliate. Bracts subulate. Calyx limb plus hypanthium ca. 2 mm, with minute subulate teeth.

Forests, shaded and wet places; 300–1500 m. Guangxi, Guizhou, Yunnan [N Myanmar].

18b. *Lasianthus hookeri* var. *hookeri*

虎克粗叶木(原变种) hu ke cu ye mu (yuan bian zhong)

Leaf blade with margin sparsely ciliate. Bracts absent. Calyx limb plus hypanthium ca. 3 mm; lobes lanceolate, ca. 1 mm.

Forests, shaded and wet places; 600–1500 m. Xizang, Yunnan [NE India, Myanmar, Thailand, Vietnam].

19. *Lasianthus inodorus* Blume, Bijdr. 998. 1826–1827.

革叶粗叶木 ge ye cu ye mu

Lasianthus poilanei Pitard; *L. tubiferus* J. D. Hooker.

Shrubs, 2–3 m tall; branches and branchlets glabrous or thinly puberulent. Petiole 6–10 mm, glabrous or sparsely puberulent; leaf blade leathery, elliptic to elliptic-lanceolate, 10–20 × 2.5–6 cm, glabrous adaxially, glabrous or sparsely puberulent abaxially, base acuminate, apex acuminate; lateral veins 6 or 7 pairs; nervules parallel; nerves and nervules conspicuous abaxially; stipules persistent, triangular or ovate-lanceolate, 3–5 mm, glabrous, leathery. Inflorescences sessile, glomerulate; bracts persistent, orbicular or ovate-orbicular, 3–6 mm, thickly leathery, glabrous or pubescent. Flowers sessile. Calyx puberulent; hypanthium portion ca. 1 mm; limb 5-lobed; lobes ovate-lanceolate. Corolla ca. 10 mm, puberulent outside, villous inside. Fruit red, ovoid, ca. 10 mm, glabrous; pyrenes 5.

Montane forests, shaded and wet places; 1000–1800 m. S Yunnan [E Bangladesh, Cambodia, NE India, Indonesia (Java, Sumatra), Thailand, Vietnam].

20. *Lasianthus japonicus* Miquel, Ann. Mus. Bot. Lugduno-Batavi 3: 110. 1867.

日本粗叶木 ri ben cu ye mu

Shrubs, 1–2 m tall; branches and branchlets glabrous or subglabrous to sparsely strigose on young branches. Petiole 3–

10 mm, sparsely strigillose to strigose or subglabrous; leaf blade leathery or papery, lanceolate, lanceolate-oblong, or oblong, 9–15 × 2–3.5 cm, glabrous adaxially, glabrous to strigose or hirtellous abaxially, especially on lateral veins and nervules, base acute to obtuse, apex cuspidate or cuspidate-acuminate to long caudate; lateral veins 5–7 pairs or numerous; nervules reticulate; stipules generally persistent, triangular, 1–3 mm, glabrous to minutely hirsute to strigillose. Inflorescences congested-cymose, pedunculate to subsessile, densely strigillose; peduncle 1–2 mm; bracts 0.2–1 mm. Flowers sessile or subsessile. Calyx strigillose to glabrescent; hypanthium portion campanulate, 1–1.5 mm; limb 1–2 mm, 4- or 5-dentate; teeth short to well developed, linear. Corolla 13–14 mm at anthesis, glabrous outside or sometimes puberulent on lobes, villous inside; tube 9–10 mm; lobes 4 or 5, spatulate, 4–4.5 mm. Fruit globose, 5–6 mm in diam., glabrous; pyrenes 4 or 5. Fl. Apr–May, fr. Jun–Oct.

Forests, shaded and wet places; 200–2300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [NE India, S Japan (Kyushu, Ryukyu Islands, Shikoku), Laos, N Vietnam].

This species is commonly collected in China. The leaf margin is often finely irregular, not crisped but actually undulate parallel to the looping tertiary venation that is near it. The leaves generally flush in a characteristic fashion, elongating but remaining rolled up and narrow, and are covered with notable sericeous pubescence on the exposed lower surfaces of the midrib and principal veins. This pubescence is often deciduous, leaving the mature lower leaf surface glabrous.

Lasianthus japonicus is a widely distributed species from E Asia to the Himalaya. *Lasianthus japonicus* subsp. *japonicus* occurs in SE China to Japan, below 1800 m, and basically in the Sino-Japanese floristic region delineated by C. Y. Wu (Bull. Univ. Mus. Univ. Tokyo 37: 1–9. 1998). *Lasianthus japonicus* subsp. *longicaudus* occurs in SW China and NE India in the Himalaya, at 1000–2300 m, i.e., in the Sino-Himalayan floristic region of Wu. They are a typical vicariant pair of subspecies. It may be surprising that *L. lucidus* var. *caudisepalus* from Assam, NE India, is found to be conspecific with *L. japonicus* subsp. *japonicus*. However, the geological history of E Asia gives an explanation. The formation of the vicarious distribution patterns of the Sino-Himalayan and Sino-Japanese regions is supposed to be related to the uplift of Himalaya in the Tertiary. *Lasianthus japonicus* subsp. *longicaudus* could have differentiated with the uplift of Himalaya becoming an altitudinal vicariant taxon of *L. japonicus*.

- 1a. Leaves usually long caudate at apex, lateral veins numerous, slender, very similar to nervules or subparallel secondary nerves; calyx and corolla 4-merous; calyx teeth reduced, limb almost truncate at apex 20b. subsp. *longicaudus*
- 1b. Leaves cuspidate or cuspidate-acuminate at apex, lateral veins 5–7 pairs, ascending at an oblique angle, conspicuously different from reticulate nervules; calyx and corolla 4-merous or usually 5-merous; calyx with well-developed triangular or lanceolate teeth 20a. subsp. *japonicus*

20a. *Lasianthus japonicus* subsp. *japonicus*

日本粗叶木(原亚种) ri ben cu ye mu (yuan ya zhong)

Lasianthus caudatifolius Merrill; *L. hartii* Franchet; *L. japonicus* var. *satsumensis* (Matsumura) Makino; *L. lancilimbus* Merrill; *L. lucidus* Blume var. *caudisepalus* Deb & M. Gangopadhyay; *L. satsumensis* Matsumura.

Leaf blade cuspidate or cuspidate-acuminate at apex; lateral veins 5–7 pairs, ascending at an oblique angle, conspicuously different from reticulate nervules. Calyx 4- or usually 5-lobed, with triangular or lanceolate teeth. Corolla 4- or usually 5-lobed.

Forests, shaded and wet places; 200–1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [NE India, S Japan (Kyushu, Ryukyu Islands, Shikoku)].

Two varieties are recognized within *Lasianthus japonicus* subsp. *japonicus*; their morphological characters and geographic distribution are presented below.

Lasianthus japonicus var. *japonicus*: Leaf blade lanceolate, less than 3.5 cm wide. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang [NE India, S Japan (Kyushu, Ryukyu Islands, Shikoku)].

Lasianthus japonicus var. *latifolius* H. Zhu (Acta Phytotax. Sin. 32: 79. 1994; 宽叶日本粗叶木 kuan ye ri ben cu ye mu): Leaf blade oblong-lanceolate, more than 3.5 cm wide. Guangxi, Guizhou, Sichuan, Yunnan.

20b. *Lasianthus japonicus* subsp. *longicaudus* (J. D. Hooker)

C. Y. Wu & H. Zhu, Acta Phytotax. Sin. 32: 80. 1994.

云广粗叶木 yun guang cu ye mu

Lasianthus longicaudus J. D. Hooker, Fl. Brit. India 3: 190. 1880 [“*longicauda*”]; *L. pseudojaponicus* Masamune.

Leaf blade usually long caudate at apex; lateral veins numerous, slender, very similar to nervules or subparallel secondary nerves. Calyx 4-lobed, almost truncate at apex. Corolla 4-lobed.

Montane forests, shaded and wet places; 1000–2300 m. Guangxi, Guizhou, Sichuan, Xizang, Yunnan [NE India, Laos, N Vietnam].

21. *Lasianthus lancifolius* J. D. Hooker, Fl. Brit. India 3: 187. 1880.

美脉粗叶木 mei mai cu ye mu

Shrubs, 1.5–3 m tall; branches and branchlets puberulent. Petiole 5–10 mm, appressed pubescent; leaf blade papery, lanceolate to elliptic-lanceolate, 13–20 × 2.5–4 cm, glabrous adaxially, puberulent on nerves and nervules as well as margin abaxially, base acute to obtuse, apex long acuminate; lateral veins ca. 9 pairs, faint adaxially; nervules subreticulate, forked, very slender; stipules generally persistent, triangular, 2–3 mm, pubescent. Inflorescences glomerulate, sessile; bracts absent. Flowers sessile. Calyx puberulent; hypanthium portion campanulate, 1–1.5 mm; limb 1–1.5 mm; teeth subulate. Corolla 12–13 mm, puberulent outside, pubescent inside at upper half; lobes 5, ovate, ca. 2 mm. Fruit globose, 4–5 mm in diam., gla-

brous or sparsely puberulent, smooth; pyrenes 5.

Forests, shaded and wet places; 500–1700 m. Guangdong, Guangxi, Hainan, Yunnan [Bangladesh, Bhutan, NE India, NE Thailand, N Vietnam].

22. *Lasianthus linearisepalus* C. Y. Wu & H. Zhu, Acta Phytotax. Sin. 32: 61. 1994.

线薯粗叶木 xian e cu ye mu

Shrubs, ca. 1 m tall; branchlets hirsute to subglabrous. Petiole ca. 5 mm, sparsely hirsute; leaf blade papery, oblong, 7–11 × 2.5–3 cm, glabrous adaxially, hirsute on nerves abaxially, base unequally cuneate, apex caudate; lateral veins 5 or 6 pairs; nervules subparallel; nerves and nervules elevated conspicuously abaxially; stipules ca. 1 mm, hirsute. Inflorescences glomerulate, sessile, 1–3-flowered; bracts subulate, 2–3 mm, hirsute. Flowers sessile. Calyx hirsute; lobes 5 or 6, linear, unequal, longest to 8 mm. Corolla strigose-villous outside. Fruit globose, sparsely hirsute; pyrenes 5.

• Montane forests, shaded and wet places; 1800–2100 m. SW Yunnan.

23. *Lasianthus lucidus* Blume, Bijdr. 997. 1826–1827.

无苞粗叶木 wu bao cu ye mu

Shrubs, 1–1.5 m tall; branches and branchlets glabrous or sparsely strigose on very young parts. Petiole 2.5–8 mm, strigillose or usually strigose; leaf blade membranous or subleathery, ovate, elliptic, or ovate-elliptic, 4–9 × 1.5–3 cm, glabrous adaxially, sparsely strigose or hirsute on nerves and nervules abaxially, base cuneate to obtuse, apex acuminate or cuspidate-acuminate; lateral veins 3–6 pairs, elevated abaxially; nervules parallel, conspicuous abaxially; stipules generally persistent, triangular, 1–1.5 mm, strigose. Inflorescences glomerulate to subcapitate, sessile; bracts absent. Flowers sessile or subsessile. Calyx with hypanthium portion obconic to widely campanulate, 1–1.5 mm, glabrescent; limb deeply lobed; lobes 5, narrowly triangular, 2–3 mm, usually somewhat unequal on an individual flower, strigose. Corolla 8–12 mm, glabrous or strigillose outside, villous at throat and on lobes inside; lobes 5, triangular, 2–2.5 mm. Fruit globose or ovoid, 4–5 mm in diam., glabrous; pyrenes 5.

Montane forests, shaded and wet places; 900–2400 m. Hainan, Yunnan [Bangladesh, NE India, Indonesia, Myanmar, Philippines, Thailand, Vietnam].

- 1a. Leaves elliptic, with lateral veins
5 or 6 pairs 23a. var. *inconspicuus*
- 1b. Leaves ovate or ovate-elliptic, with
lateral veins 3 or 4 pairs 23b. var. *lucidus*

23a. *Lasianthus lucidus* var. *inconspicuus* (J. D. Hooker) H. Zhu, Acta Bot. Yunnan. 20: 154. 1998.

椭圆叶无苞粗叶木 tuo yuan ye wu bao cu ye mu

Lasianthus inconspicuus J. D. Hooker, Fl. Brit. India 3: 187. 1880.

Leaves elliptic; lateral veins 5 or 6 pairs.

Montane forests, shaded and wet places; 900–1800 m. Yunnan [Bangladesh, NE India, N Thailand].

23b. *Lasianthus lucidus* var. *lucidus*

无苞粗叶木(原变种) wu bao cu ye mu (yuan bian zhong)

Leaves ovate or ovate-elliptic; lateral veins 3 or 4 pairs.

Montane forests, shaded and wet places; 1200–2400 m. Hainan, Yunnan [NE India, Indonesia, Myanmar, Philippines, Thailand, Vietnam].

24. *Lasianthus micranthus* J. D. Hooker, Fl. Brit. India 3: 190. 1880.

小花粗叶木 xiao hua cu ye mu

Lasianthus balansae (Drake) Pitard; *L. microstachys* Hayata; *Mephitidia balansae* Drake.

Shrubs, 1–2 m tall; branches and branchlets slender, sparsely puberulent to glabrous, smooth. Petiole 4–9 mm, hirsute or strigillose; leaf blade papery or subleathery, ovate, ovate-oblong, or oblong-lanceolate, 5–10 × 2.5–3.5 cm, glabrous adaxially, sparsely to densely hirsute or strigillose to strigose on midrib and nerves abaxially, base obtuse or rounded to subacute, apex acute or acuminate; lateral veins 5 or 6 pairs; nervules parallel or subparallel; stipules triangular or lanceolate, 1–1.5 mm, densely strigillose. Inflorescences congested-cymose to capitate, pedunculate, densely strigillose; peduncles 1.5–5 mm, slender; bract reduced or linear and up to 2 mm; bracteoles minute. Flowers sessile. Calyx densely strigillose or villous to glabrescent; hypanthium portion campanulate, ca. 1 mm; limb 1–1.5 mm; teeth 5, subulate or triangular. Corolla 5–6.5 mm, glabrous to puberulent outside, villous inside; tube 3–6 mm; lobes 5, spatulate, 2–2.5 mm. Fruit globose to depressed globose, ca. 5 mm in diam., glabrous, smooth or with ca. 5 low ridges; pyrenes 5. Fl. Aug–Nov, fr. Sep–Oct.

Forests, shaded and wet places; 100–1800 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Xizang, Yunnan, Zhejiang [NE India, Thailand, N Vietnam].

The glabrous stems with strigillose rings at the nodes and the narrowly triangular, rather well-developed calyx lobes are distinctive.

25. *Lasianthus obscurus* (Blume ex Candolle) Miquel, Fl. Ned. Ind. 2: 317. 1857.

林生粗叶木 lin sheng cu ye mu

Mephitidia obscura Blume ex Candolle, Prodr. 4: 453. 1830; *Lasianthus kurzii* J. D. Hooker var. *fulvus* C. Y. Wu & H. Zhu; *L. kurzii* var. *sylicola* H. S. Lo.

Shrubs, to 3 m tall; branchlets spreading tomentose or densely pilosulous. Petiole 5–10 mm, spreading tomentose or pilosulous to villous; leaf blade membranous, elliptic-oblong to oblong, 12–20 × 3–5 cm, glabrous adaxially, spreading tomentose or villous abaxially, base cuneate to acute, apex acuminate; lateral veins 7–10 pairs; nervules parallel, distinct on both surfaces; stipules generally persistent, triangular or oblong-lanceolate, 4–8 mm, tomentose or pilosulous to strigillose. Inflorescences glomerulate or subcapitate, sessile; bracts persistent, outer bracts ovate, inner bracts lanceolate, all 1–5 mm, tomen-

tose or pilosulous to villous. Flowers sessile or subsessile. Calyx densely tomentose or strigose; hypanthium portion campanulate, 1–1.5 mm; limb deeply lobed; lobes 4–6, triangular, ca. 2 mm. Corolla 5–6 mm, puberulent outside on upper part, pubescent inside at throat. Fruit subglobose, 4–6 mm in diam., tomentose; pyrenes 5 or 6.

Forests, shaded and wet places; 300–1200 m. Hainan, Yunnan [India (S Andaman Islands), Indonesia (Java, Sumatra), Myanmar, Thailand, Vietnam].

H. Zhu (Syst. & Geogr. Pl. 72: 80. 2002) noted that this species is very similar to *Lasianthus chrysonerurus*.

26. *Lasianthus rhinocerotis* Blume, Bijdr. 996. 1826–1827 [*“rhinozerotis”*].

黄毛粗叶木 huang mao cu ye mu

Shrubs, 1–3 m tall; branches and branchlets densely villous. Petiole 5–10 mm, densely brown villous; leaf blade leathery, oblong-lanceolate or lanceolate, 15–21 × 4–7 cm, glabrous adaxially, densely villous abaxially, base broadly cuneate to truncate, subrounded, rounded, or slightly cordate, apex caudate-acuminate; lateral veins 7–12 pairs; nervules parallel to subreticulate; veins and nervules elevated conspicuously abaxially; stipules generally persistent, triangular, 2.5–4 mm. Inflorescences congested-cymose to subcapitate, shortly pedunculate, densely villous to strigose or pilose; peduncles 3–10[–25] mm; bracts numerous, narrowly triangular, linear, or filiform, 6–12 mm, densely brown villous. Flowers sessile. Calyx densely strigose to pilose; hypanthium portion 1.5–2 mm; limb ca. 4 mm, usually 6-lobed; lobes linear-lanceolate, 1.5–3 mm. Corolla ca. 7 mm, densely strigose to pilose outside; tube ca. 4 mm; lobes 5, oblong, ca. 3 mm. Fruit subglobose or obovoid, ca. 4 mm in diam., strigillose or subglabrous, slightly longitudinally angled, crowned with calyx lobes; pyrenes 4 or 5. Fl. Apr, May.

Forests, shaded and wet places; 300–1600 m. Guangxi, Hainan, Yunnan [Indonesia (Java, Sumatra), Malaysia, Thailand, N Vietnam].

Lasianthus rhinocerotis subsp. *rhinocerotis* occurs in Indonesia (Java, Sumatra), Malaysia, and Thailand. The description is as follows: young branches and leaf abaxially densely hairy; leaf blade leathery, base rounded or slightly cordate, lateral veins 9–12 pairs, nervules densely anastomosing, parallel, stipules triangular, ca. 3 mm; bracts slender, filiform.

- 1a. Leaf bases broadly cuneate to truncate or subrounded; stipules ± inconspicuous; bracts relatively thick, linear to narrowly triangular; young branches and leaf abaxially densely hairy; leaf blade papery to leathery with 8–12 pairs of lateral veins and with densely anastomosing, parallel nervules 26a. subsp. *pedunculatus*
- 1b. Leaf bases rounded or slightly cordate; stipules triangular, ca. 3 mm; bracts slender, filiform; young branches and leaf abaxially sparsely hairy; leaf blade papery with 7 or 8 pairs of lateral veins and with loosely anastomosing,

subreticulate nervules 26b. subsp. *xishuangbannaensis*

26a. *Lasianthus rhinocerotis* subsp. ***pedunculatus*** (Pitard) H. Zhu, Acta Bot. Yunnan. 20: 154. 1998.

有梗粗叶木 you geng cu ye mu

Lasianthus rhinocerotis var. *pedunculatus* Pitard in Lecomte, Fl. Indo-Chine 3: 395. 1924; *L. koi* Merrill & Chun.

Young branches and leaf abaxially densely hairy. Leaf blade papery to leathery, base broadly cuneate to truncate or subrounded; lateral veins 8–12 pairs; nervules densely anastomosing, parallel; stipules ± inconspicuous. Bracts relatively thick, linear to narrowly triangular.

Forests, shaded and wet places; 300–1000 m. Guangxi, Hainan, Yunnan [N Vietnam].

26b. *Lasianthus rhinocerotis* subsp. ***xishuangbannaensis*** H. Zhu & H. Wang, Acta Phytotax. Sin. 38: 282. 2000.

版纳粗叶木 ban na cu ye mu

Young branches and leaf abaxially sparsely hairy. Leaf blade papery, base rounded or slightly cordate; lateral veins 7 or 8 pairs; nervules loosely anastomosing, subreticulate; stipules triangular, ca. 3 mm. Bracts slender, filiform.

Montane forests, shaded and wet places; 1500–1600 m. S Yunnan [Thailand].

27. *Lasianthus rigidus* Miquel, Fl. Ned. Ind. 2: 321. 1857.

大叶粗叶木 da ye cu ye mu

Lasianthus humilis Elmer; *L. tentaculatus* J. D. Hooker.

Shrubs, height unknown; branchlets glabrous or subglabrous. Petiole 4–7 mm, sparsely hirsute; leaf blade papery or leathery, obovate-oblong, obovate, or oblong, 12–18 × 5–7 cm, glabrous adaxially, hirsute on midrib, lateral veins, and nervules abaxially, base ± oblique, obtuse, slightly cordate, or rounded, margin thinly recurved, apex shortly cuspidate-acuminate; lateral veins 8 or 9 pairs, elevated abaxially; nervules parallel, conspicuous abaxially; stipules persistent, triangular or subulate, 5–6 mm, hirsute. Inflorescences glomerulate, sessile, hirsute to hirtellous; bracts numerous, linear or linear-lanceolate to lanceolate, 9–12 mm, hirsute. Flowers sessile. Calyx sparsely hirsute; hypanthium portion campanulate, ca. 2 mm; limb ca. 2 mm; teeth 5, triangular, ca. 1 mm. Corolla ca. 1 cm, puberulent outside, pubescent inside in upper part; lobes 5. Fruit globose, 4–5 mm in diam., glabrous; pyrenes 5.

Forests, shaded and wet places; 500–700 m. Hainan, S Yunnan [NE India, Indonesia (Java, Sumatra), Philippines].

28. *Lasianthus schmidtii* K. Schumann, Bot. Tidsskr. 24: 340. 1902.

臺北粗叶木 tai bei cu ye mu

Lasianthus kerrii Craib.

Shrubs, 1–1.5 m tall; branches and branchlets densely tomentose to strigose. Petiole 4–9 mm, tomentose or strigose; leaf blade papery or rigid-papery, oblanceolate, elliptic-oblanceo-

late, or oblong, 5–10 × 2–4 cm, glabrous adaxially, tomentose or strigillose on midrib, nerves, and nervules abaxially, base cuneate, obtuse, or rounded, apex shortly acuminate or acute; lateral veins 5–7 pairs; nervules subtreticulate; nerves and nervules elevated conspicuously abaxially; stipules subulate-triangular, 2–3 mm, tomentose or strigose. Inflorescence glomerulate, sessile; bracts subulate, 4–6 mm, tomentose or strigose. Flowers sessile. Calyx tomentose or strigose; hypanthium portion obconic, 1–1.5 mm; limb deeply lobed; lobes 4, triangular-subulate to lanceolate, 1.5–2 mm. Corolla ca. 9 mm; tube ca. 7 mm, sparsely strigillose outside; lobes 4, ca. 2 mm. Fruit blue, subglobose, 4–5 mm in diam., tomentose or strigillose; pyrenes 4.

Montane forests, shaded and wet places; 1000–1200 m. S Yunnan [N Thailand].

H. Zhu (Syst. & Geogr. Pl. 72: 79. 2002) noted that this species is rare and very similar to *Lasianthus sikkimensis*.

29. *Lasianthus simizui* (T. S. Liu & J. M. Chao) H. Zhu, Syst. & Geogr. Pl. 72: 92. 2002 [“*shimizui*”].

清水氏鸡屎树 qing shui shi ji shi shu

Lasianthus obliquinervis Merrill var. *simizui* T. S. Liu & J. M. Chao, Taiwania 10: 143. 1964; *L. trichophlebus* Hemsley var. *simizui* (T. S. Liu & J. M. Chao) H. Zhu.

Shrubs; branches and branchlets densely hirsute. Petiole 3–5 mm, hirsute; leaf blade leathery or subleathery, oblong or elliptic-oblong, 6–10 × 2.5–4 cm, glabrous adaxially, hirsute on midrib, nerves, and nervules abaxially, base acute, apex cuspidate or acute; lateral veins 6–8 pairs; nervules parallel; nerves and nervules elevated abaxially; stipules triangular-lanceolate, 3–5 mm, hirsute. Inflorescences sessile; bracts subulate, reduced. Flowers sessile. Calyx hirsute; hypanthium portion campanulate; limb ca. 2 mm, toothed for ca. 1/2; teeth 5, ca. 1 mm. Corolla not seen. Fruit subglobose, 5–6 mm in diam., subglabrous; pyrenes 5.

- Forests, shaded and wet places. Taiwan.

This species is similar to *Lasianthus trichophlebus* and *L. verticillatus*. It has stipules longer than in *L. verticillatus* and shorter than in *L. trichophlebus*, indumentum and a dentate calyx similar to *L. trichophlebus*, but 5-merous flowers and smooth fruit like *L. verticillatus*.

30. *Lasianthus sikkimensis* J. D. Hooker, Fl. Brit. India 3: 180. 1880.

锡金粗叶木 xi jin cu ye mu

Lasianthus langkokensis Drake ex Pitard; *L. sikkimensis* subsp. *langkokensis* (Drake ex Pitard) H. Zhu; *L. tsangii* Merrill ex H. L. Li.

Shrubs, 1–3 m tall; branches and branchlets densely brown tomentose or -villous. Petiole 6–14 mm, densely tomentose to villous; leaf blade subleathery or thinly leathery, elliptic-lanceolate or elliptic, 12–20 × 2.5–5 cm, glabrous adaxially, densely to moderately brown tomentose or villous to hirtellous abaxially, base acute or obtuse, margin usually thinly recurved, apex cuspidate-acuminate; lateral veins 8–10 pairs; midrib and nerves elevated conspicuously abaxially; nervules subparallel, conspicuous abaxially; stipules generally persistent, triangular,

2–3 mm, densely tomentose to villous. Inflorescences glomerulate, sessile, 1–3-flowered, densely strigose to villous; bracts persistent, linear to lanceolate, 0.3–2 cm. Flowers sessile or subsessile. Calyx with hypanthium portion obconic, 1–2 mm, glabrous; limb 1–2 mm, hirtellous to strigillose, 5-lobed; lobes triangular. Corolla ca. 1 cm, puberulent outside. Fruit ellipsoid, 6–8 mm, glabrous, smooth or with ca. 5 low ridges; pyrenes 5. Fr. Jun, Oct.

Forests, shaded and wet places; 300–1600 m. Fujian, Guangdong, Guangxi, Taiwan, Yunnan, Zhejiang [Bangladesh, NE India, Philippines, Thailand, N Vietnam].

The combination of the glabrous fruit body and densely pubescent persisting calyx limb and the well-developed bracts on the sessile glomerulate inflorescences are distinctive for this species. H. Zhu (Syst. & Geogr. Pl. 72: 80. 2002) noted that the two subspecies of *Lasianthus sikkimensis* that were previously recognized have become difficult or impossible to separate now that more collections are available. Zhu (loc. cit.: 79) also noted that this species is very similar to *L. schmidtii*.

31. *Lasianthus trichophlebus* Hemsley, J. Linn. Soc., Bot. 23: 388. 1888.

钟萼粗叶木 zhong e cu ye mu

Shrubs, 1–2 m tall; branchlets strigillose to hirtellous. Petiole 5–8 mm, strigillose to hirsute; leaf blade leathery, oblong or elliptic-oblong, 8–15 × 3–5 cm, glabrous adaxially, strigillose or hirsute on midrib and nerves abaxially, base cuneate, apex cuspidate or acute; lateral veins 7–9 pairs; nervules parallel; nerves and nervules elevated abaxially; stipules triangular-lanceolate to narrowly triangular, 5–8 mm, densely strigillose. Inflorescences glomerulate, sessile; bracts absent. Flowers subsessile. Calyx strigillose to hirsute; hypanthium obconic to campanulate, ca. 2 mm; limb 1–1.5 mm, deeply 4-lobed; lobes narrowly triangular, ca. 1 mm. Corolla 6–8 mm, densely strigillose in upper half outside; lobes 4. Fruit subglobose, 5–6 mm in diam., verrucose, strigillose; pyrenes 4. Fl. Apr–May, fr. Sep–Oct.

Forests, shaded and wet places; ca. 100 m. Guangdong, Hainan, Taiwan [Indonesia, Malaysia (Peninsular), Philippines, Singapore, Thailand, Vietnam].

Lasianthus trichophlebus was often confused with both *L. chinensis* and *L. verticillatus*. However, it differs from *L. chinensis* by having leathery leaves with 7–9 pairs of lateral veins and parallel veinlets; stipules triangular-lanceolate, strigillose, 5–8 mm; flowers 4-merous; and pyrenes 4. It differs from *L. verticillatus* by having strigillose hairs on young branches and leaf nerves abaxially; stipules triangular-lanceolate, strigillose, 5–8 mm; flowers 4-merous; calyx with strigillose triangular lobes; and drupes with 4 pyrenes and verrucose on external surface.

- 1a. Branches densely hirsute, leaves pubescent abaxially 31a. var. *latifolius*
- 1b. Branches sparsely strigillose; leaves abaxially glabrous except strigillose or hirsute on midrib and nerves 31b. var. *trichophlebus*

31a. *Lasianthus trichophlebus* var. *latifolius* (Miquel) H. Zhu, Syst. & Geogr. Pl. 72: 93. 2002.

栖兰钟萼粗叶木 qi lan zhong e cu ye mu

Lasianthus sylvestris Blume f. *latifolius* Miquel, Ann. Mus. Bot. Lugduno-Batavi 4: 248. 1869 [*latifolia*]; *L. hiiransensis* Hayata; *L. lei* Merrill & F. P. Metcalf ex H. S. Lo.

Branches densely hirsute. Leaves pubescent abaxially.

Forests, shaded and wet places. Hainan, Taiwan [Indonesia (Java, Sumatra), Malaysia (Peninsular), Philippines, Singapore, Thailand, Vietnam].

This taxon was treated as *Lasianthus tomentosus* Blume by King and Gamble (J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 73: 130. 1904), Ridley (Fl. Malay Penin. 2: 161. 1923), Craib (Fl. Siam. 2(2): 219. 1934), and H. Zhu (Acta Bot. Yunnan. 20: 155. 1998), which may be due to the authors following two misidentified sheets in K. These two specimens, which are labeled as *Horsfield s.n.* [Rub. 50] from Java, are indicated as "*L. tomentosus* Blume" with Miquel's handwriting and also were cited as such in print (Miquel, Fl. Ned. Ind. 2: 318. 1857). Miquel (loc. cit. 1869) later changed his mind and considered that they were not the same as *L. tomentosus*. The type materials of *L. tomentosus* are only in Leiden and there are no overseas duplicates. After examining Malaysian specimens and carefully comparing with the type of *L. tomentosus*, it is recognized that the taxon that was mistaken for *L. tomentosus* has conspicuous, strigose, linear-lanceolate stipules, 4-merous flowers, hirsute and verrucose drupes with 4 pyrenes, and is more closely related to *L. trichophlebus* than *L. tomentosus*. The taxon differs from *L. trichophlebus* by having only dense hirsute hairs on the branches and pubescent hairs on the abaxial leaf surface. It is better, therefore, to treat this taxon as a variety of *L. trichophlebus*.

31b. *Lasianthus trichophlebus* var. *trichophlebus*

钟萼粗叶木(原变种) zhong e cu ye mu (yuan bian zhong)

Lasianthus barbellatus Ridley; *L. cupreus* Pierre ex Pitard.

Branches sparsely strigillose. Leaves glabrous except strigillose or hirsute on midrib and nerves abaxially.

Forests, shaded and wet places. Guangdong [Indonesia, Malaysia (Peninsular), Philippines, Thailand, Vietnam].

32. *Lasianthus verticillatus* (Loureiro) Merrill, Trans. Amer. Philos. Soc., n.s., 24: 372. 1935.

斜脉粗叶木 xie mai cu ye mu

Dasus verticillatus Loureiro, Fl. Cochinch. 1: 142. 1790; *Lasianthus andamanicus* J. D. Hooker; *L. taitoensis* Simizu; *L. tamirensis* Pierre ex Pitard.

Shrubs, 1.5–3 m tall; branches and branchlets appressed pubescent or strigillose to glabrescent. Petiole 7–10 mm, densely pubescent or strigillose to strigose; leaf blade leathery, oblong to elliptic-oblong, 8.5–18 × 3.5–7 cm, glabrous adaxially, thinly pubescent or strigillose abaxially, base acute to broadly obtuse, margins usually undulate, often thinly revolute, apex acute or acuminate; lateral veins 7–9 pairs; nervules parallel; nerves and nervules elevated conspicuously abaxially; stipules generally persistent, triangular to narrowly triangular, 3–5 mm, densely puberulent to strigillose. Inflorescences subcapitate to congested-cymose, sessile; bracts absent or reduced. Flowers sessile to subsessile. Calyx subglabrous or puberulent; hypanthium portion campanulate to subglobose, 2.5–3 mm; limb 2–2.5 mm, truncate or minutely dentate. Corolla 10–12 mm, hirtellous to villous outside, villous inside; lobes 5, ovate.

Fruit blue, ellipsoid, up to 10 mm in diam., strigillose to glabrescent, smooth; pyrenes 4 or 5. Fl. Apr–May, fr. Oct–Nov.

Forests, shaded and wet places; 100–1000 m. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Cambodia, India (Andaman and Nicobar Islands), Indonesia, Japan (Ryukyu Islands), Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

The relatively large flowers with the large globose to ellipsoid hypanthium (i.e., ovary) portion are distinctive; *Lasianthus chinensis* is similar in these characters but can be distinguished by its deeply lobed calyx limb and angled to ridged fruit.

Specimens from mainland SE China, Taiwan, and Ryukyu Islands that have been treated as "*Lasianthus obliquinervis* Merrill" are clearly conspecific with *L. verticillatus*. In Merrill's description (Philipp. J. Sci. 1(Suppl. 1): 136. 1906), *L. obliquinervis* is described as having oblong-ovate stipules ca. 5 mm and fruit with 6 triquetrous pyrenes, which does not match *L. verticillatus*. *Lasianthus obliquinervis* represents a different species with distribution in the Philippines and Papua New Guinea. The so-called "*L. obliquinervis*" from China, Taiwan, and the Ryukyus in Chinese and Japanese literature is a misidentification of the species *L. verticillatus*.

33. *Lasianthus wardii* C. E. C. Fischer & Kaul, Bull. Misc. Inform. Kew 1940: 292. 1941.

滇西粗叶木 dian xi cu ye mu

Shrubs, height unknown; branchlets fuscous tomentose. Petiole 5–10 mm, tomentose; leaf blade papery, dark olivaceous adaxially, elliptic-oblong to oblanceolate-oblong, 12–17 × 3.5–6 cm, glabrous adaxially, brown- or fuscous tomentose abaxially especially on nerves, base cuneate, apex caudate-acuminate; lateral veins ca. 7 pairs, elevated abaxially; nervules subreticulate; stipules broadly ovate, cuspidate. Inflorescences glomerulate, sessile; bracts absent. Flowers sessile. Calyx brown tomentose; hypanthium portion campanulate, very short; limb deeply lobed; lobes 5, oblong, ca. 3 mm, obtuse. Corolla shortly brown tomentose outside; tube up to 1.6 cm, whitish- or brownish pilose in upper half inside; lobes 5, triangular-ovate, ca. 4.5 mm. Fruit not seen.

Forests, shaded and wet places. Yunnan [Myanmar].

H. Zhu (Syst. & Geogr. Pl. 72: 83–84. 2002) cited only three specimens in total of this species, which suggests that it is rare.

