

12. BOEHMERIA Jacquin, Enum. Syst. Pl. 9: 31. 1760.

苧麻属 zhu ma shu

Chen Jiarui (陈家瑞 Chen Chia-jui); Ib Friis, C. Melanie Wilmot-Dear

Trees small, shrubs, subshrubs, or perennial herbs, without stinging hairs. Leaves alternate or opposite; stipules deciduous, intrapetiolar, free or rarely connate at base; leaf blade 3-veined, margin dentate, rarely 2- or 3-lobed; cystoliths punctiform. Inflorescence an axillary glomerule, on normal leafy stems or on specialized, slender, mostly axillary, occasionally terminal, shoots, these unbranched and spikelike to branched and panicle-like, mostly unisexual, less often bisexual. Flowers unisexual (plants monoecious or dioecious); bracts and bracteoles small, scarious. Male flowers: perianth (3 or)4 or 5-lobed or parted, segments valvate; stamens (3 or)4 or 5; filaments inflexed in bud; rudimentary ovary clavate or subglobose. Female flowers: perianth tubular, usually compressed, apex 2-4-toothed, in fruit sometimes enlarged and dilated into 2 acute angles or wings; staminodes absent. Ovary included; stigma filiform, on a style, pilose on 1 side, usually persistent for some time; ovule orthotropous. Achene not lustrous, enclosed by marcescent perianth, Seed with endosperm; cotyledons elliptic or ovate.

About 65 species: tropical, subtropical, and rarely temperate regions; 25 species (six endemic) in China.

- 1a. Glomerules all axillary on normal leaf branches; male flowers 4-merous; leaves alternate 1. *B. glomerulifera*
- 1b. Glomerules all or partly arranged on specialized slender flowering branches; male flowers (3-)4-5-merous; leaves alternate or opposite.
 - 2a. Male glomerules in axils of foliage leaves, female glomerules on specialized long spikelike shoots in terminal and subterminal axils; male flowers 4-5-merous, pedicel 2-5 mm 3. *B. zollingeriana*
 - 2b. Glomerules all arranged on specialized slender flowering shoots, rarely simply axillary; male flowers 4-merous, pedicel very short to absent.
 - 3a. Flowering shoots with tuft of foliage leaves at apex.
 - 4a. Leaves not lobed, apex acuminate or caudate 4. *B. clidemioides*
 - 4b. Leaves lobed, apex cuspidate 5. *B. umbrosa*
 - 3b. Flowering shoots without tuft of leaves at apex (except rarely in *B. silvestrii*).
 - 5a. Flowering shoots branched; leaves alternate or opposite.
 - 6a. Flowering shoots in pairs; leaves alternate, abaxially often white tomentose (or strigose in var. *tenacissima*); achene long stipitate at base 2. *B. nivea*
 - 6b. Flowering shoots solitary; leaves opposite, glabrous or sparsely strigillose abaxially; achene base obtuse or cuneate.
 - 7a. Leaf blade elliptic ovate, apex acuminate; flowering shoots with irregular second order branching; achene base narrowly cuneate 20. *B. polystachya*
 - 7b. Leaf blade ovate-orbicular to suborbicular, apex abruptly caudate; flowering shoots with simple, spikelike branches only; achene base rounded 21. *B. conica*
 - 5b. Flowering shoots usually unbranched, sometimes loosely branched at base; leaves opposite, seldom alternate in distal part of stem (only in *B. allophylla* and *B. tricuspis*).
 - 8a. Leaf blade often 3-cusped or 3-lobed, rarely 5-lobed at apex.
 - 9a. Leaf blade often papery, 7-15(-22) cm wide, teeth 10-20 mm.
 - 10a. Leaf blade ovate or broadly ovate, apex sometimes inconspicuously tricuspidate, base often broadly cuneate; spikes or rarely few branched at base 15. *B. japonica*
 - 10b. Leaf blade oblate to 5-angled or oblate to orbicular-ovate, apex often 3-lobed, base often truncate or subcordate; spikes well branched into subpanicle 16. *B. tricuspis*
 - 9b. Leaf blade herbaceous, 1-8(-13) cm wide, teeth less than 10 mm.
 - 11a. Leaves all opposite, apex 3- or 5-cuspidate, base broadly cuneate to subtruncate, teeth 2-10 mm, sparsely strigose or subglabrous on both surfaces 17. *B. silvestrii*
 - 11b. Leaves alternate on upper stems, opposite on lower stems, apex tricuspidate, base broadly cuneate, teeth 1-2.5 mm, long appressed hirsute adaxially, pubescent abaxially 19. *B. allophylla*
 - 8b. Leaf blade not divided at apex.
 - 12a. Leaf blade lanceolate or linear-lanceolate.
 - 13a. Leaf blade herbaceous, lanceolate, smooth adaxially, apex caudate or acuminate; female spikes of usually distant glomerules, often branched at base, straight; achene stipitate or very shortly so.
 - 14a. Leaf blade apex entire, margin dentate; flowering shoots unbranched or with a few short irregular branches near base; achene almost without stipe 10. *B. formosana*
 - 14b. Leaf blade apex serrulate, margin finely serrulate; female flowering shoot dichotomously forked at lowermost glomerule; achene stipitate 23. *B. ingjiangensis*
 - 13b. Leaf blade thickly papery, linear-lanceolate, often strongly rugose adaxially, apex tapering to

- acuminate; female spikes of congested glomerules, simple, nodding; achene long stipitate.
- 15a. Leaf blade 14–29 × 2.2–5.5 cm, glabrous or glabrescent adaxially, teeth revolute; female spikes 6–32 cm; perianth tube of female flower 1.6–2.2 mm, apex rounded 24. *B. penduliflora*
- 15b. Leaf blade 5–24 × 2–6.4 cm, densely appressed strigillose adaxially, teeth flattened; female spikes 4–18 cm; perianth tube of female flower 1–1.5 mm, apex attenuate 25. *B. densiflora*
- 12b. Leaf blade ovate or suborbicular, rarely sublanceolate (in *B. hamiltoniana*).
- 16a. Flowering shoots branched at base.
- 17a. Shrubs.
- 18a. Leaf blade elliptic ovate; flowering shoots with irregular second order branching 20. *B. polystachya*
- 18b. Leaf blade oblong, narrowly ovate or oblanceolate; flowering shoots with simple, spikelike branches only.
- 19a. Branches glabrous; spikes very slender, to 26 cm 11. *B. hamiltoniana*
- 19b. Branches strigose; spikes straight, 4–10 cm.
- 20a. Branches dark purplish brown; leaf blade oblong or oblong-lanceolate, apex acuminate, tip denticulate; inflorescence unbranched 8. *B. lanceolata*
- 20b. Branches light brown; leaf blade elliptic, apex acuminate, tip entire; inflorescence with shorter branches from base 9. *B. lohuiensis*
- 17b. Herbs perennial or subshrubs.
- 21a. Leaf margin coarsely 7–14-dentate, teeth gradually larger distally 15. *B. japonica*
- 21b. Leaf margin dentate, denticulate, or serrulate, all regular.
- 22a. Leaf blade herbaceous or rarely membranous, suborbicular or orbicular-ovate.
- 23a. Leaf base rounded, patent pubescent abaxially 6. *B. macrophylla*
- 23b. Leaf base truncate or cordate, appressed strigose abaxially.
- 24a. Leaf blade 6.5–19 × 6–17.5 cm; spikes of distant glomerules to 40 cm 13. *B. dolichostachya*
- 24b. Leaf blade 5–9.4 × 5–8 cm; spikes of congested glomerules to 5.5 cm 14. *B. densiglomerata*
- 22b. Leaf blade usually herbaceous or papery, ovate or oblong.
- 25a. Leaf blade papery, oblong, apex denticulate 8. *B. lanceolata*
- 25b. Leaf blade usually herbaceous, ovate or narrowly ovate, apex entire.
- 26a. Leaf margin dentate; achene verrucose 10. *B. formosana*
- 26b. Leaf margin denticulate or serrulate; achene smooth 6. *B. macrophylla*
- 16b. Flowering shoots unbranched.
- 27a. Leaf blade ovate-rhombic or rhombic, margin coarsely 3–9-dentate 18. *B. spicata*
- 27b. Leaf blade ovate or suborbicular, margin serrulate, crenulate, or denticulate.
- 28a. Leaf blade suborbicular.
- 29a. Leaf margin coarsely 9–14-dentate, teeth gradually larger distally 15. *B. japonica*
- 29b. Leaf margin subregularly dentate, denticulate, or serrulate.
- 30a. Branchlets densely yellowish tomentose; leaf blade tomentose to densely pubescent on both surfaces 12. *B. tomentosa*
- 30b. Branchlets strigose; leaf blade strigose adaxially.
- 31a. Leaf blade patent pubescent abaxially.
- 32a. Leaf blade sparsely puberulent abaxially 6. *B. macrophylla*
- 32b. Leaf blade densely pubescent abaxially 13. *B. dolichostachya*
- 31b. Leaf blade strigillose abaxially.
- 33a. Herbs perennial to 0.5 m tall; leaf blade 5–9.4 × 5–8 cm; female or bisexual spikes of congested glomerules 2–5 cm 14. *B. densiglomerata*
- 33b. Subshrubs or shrubs to 3 m tall; leaf blade 6.5–19 × 6–17.5 cm; female spikes of distant glomerules 9–40 cm 13. *B. dolichostachya*
- 28b. Leaf blade ovate, rarely also lanceolate (in *B. hamiltoniana*).
- 34a. Branches glabrous; leaf blade narrowly ovate to lanceolate, margin finely crenulate throughout; spikes very slender, to 26 cm 11. *B. hamiltoniana*
- 34b. Branches strigose; leaf blade ovate or narrowly ovate, margin dentate, denticulate, or serrulate, with entire tip; spikes usually less than 26 cm.
- 35a. Female spikes 0.8–2 cm; plants 0.4–0.6 m tall 7. *B. pilosiuscula*
- 35b. Female spikes 4–20 cm; plants 0.7–3.5 m tall.
- 36a. Shrubs or small trees; petiole to 1.2 cm; female inflorescences often in groups of 2–4; female perianth tube patent-puberulent all over 22. *B. siamensis*
- 36b. Herbs perennial or subshrubs; petiole to 6 or 13 cm; female inflorescences solitary; female perianth tube strigillose on shoulder.

- 37a. Leaf teeth 6–20 mm, gradually larger distally 15. *B. japonica*
 37b. Leaf teeth 2–5 mm, regular.
 38a. Leaf narrowly ovate or oblong-ovate, glabrous or subglabrous adaxially; achene
 verrucose 10. *B. formosana*
 38b. Leaf ovate, often rugose, strigose adaxially; achene smooth 6. *B. macrophylla*

1. *Boehmeria glomerulifera* Miquel in Zollinger, Syst. Verz. 2: 101, 104. 1854.

腋球苧麻 ye qiu zhu ma

Boehmeria depauperata Weddell; *B. glomerulifera* var. *leioclada* W. T. Wang; *B. leiophylla* W. T. Wang; *B. malabarica* Weddell, nom. illeg. superfl.; *B. malabarica* var. *leioclada* (W. T. Wang) W. T. Wang; *B. oblongifolia* W. T. Wang.

Shrubs or small trees 1–5 m tall; branchlets pubescent or glabrous. Dioecious or monoecious. Leaves alternate; stipules lanceolate, 4–8 mm; petiole 2–11(–13) cm, pubescent or glabrous; leaf blade ovate, elliptic, oblong or subelliptic, (5–)9–21 × 2.5–10 cm, papery, slightly rough, secondary veins 3 or 4 pairs along midvein, abaxial surface strigillose or pubescent on veins, rarely glabrous, adaxial surface sparsely appressed strigillose or glabrous, base broadly cuneate, rounded, or obtuse, margin denticulate, apex acuminate or caudate-acuminate. Glomerules usually unisexual, sometimes bisexual, in the axils of current and fallen leaves along normal leafy stems, 4–10 mm in diam.; male ones on proximal part of flower-bearing branches; female ones on distal part. Male flowers 4-merous, sessile or very shortly pedicellate, ca. 1 mm, pubescent; rudimentary ovule ellipsoid, ca. 0.7 mm. Female flowers broadly obovoid or obovoid, ca. 1 mm, pubescent, with short neck, 2-toothed; stigma ca. 1.2 mm. Fruiting perianth brown, obovoid, ca. 1.2 mm, sessile. Fl. Nov–Jan, fr. Feb–Apr.

Subtropical forests; 100–1400 m. SW Guangxi, SE Xizang, S Yunnan [Bhutan, India, Indonesia, Laos, Myanmar, Sikkim, Sri Lanka, Thailand, Vietnam].

This species is variable in the shape, size, and indumentum of the leaves and in the length of the neck of the female perianth tube. These features show some correlation with geography, with leaves mostly ovate, more pubescent abaxially, and with inconspicuous fruiting perianth necks in the northern and western part of the range, and leaves more elliptic, less pubescent (even glabrous), and with conspicuous fruiting perianth necks in the southern and eastern parts of the range. However, there are frequent intermediates, not only in the middle part of the range, but also within populations, such that it is not possible to maintain any infraspecific taxa.

2. *Boehmeria nivea* (Linnaeus) Gaudichaud-Beaupré, Voy. Uranie, Bot. 12: 499. 1830.

苧麻 zhu ma

Subshrubs or shrubs simple or few branched, 0.5–1.5 m tall; upper stems, branchlets, and petioles densely patent hirsute, appressed strigose or only strigose. Monoecious. Leaves alternate; stipules lanceolate, free or connate and 2-cleft, 7–11 mm; petiole 2.5–10 cm; leaf blade often orbicular or broadly ovate, sometimes ovate or elliptic-ovate, 5–15 × 3.5–13 cm, herbaceous, secondary veins ca. 3 each side of midvein, abaxial surface snowy tomentose, sometimes light green with strigose hairs on veins, or thinly white tomentose, adaxial surface slight-

ly rough and sparsely hispid, base subtruncate, rounded, cordate, or cuneate, margin dentate from base, apex cuspidate or acuminate. Glomerules unisexual, on specialized, unisexual flowering branches in the axils of current or recently fallen leaves, these paired and much branched, usually shorter than petioles and often congested in fruit, male branches proximal or sometimes absent, female distal. Male glomerules few-flowered, 2–4 mm in diam.; female glomerules many-flowered, 2–3 mm in diam. Male flowers 4-merous, sessile; perianth lobes connate to middle, ca. 1.5 mm, pubescent. Female flowers rhomboid-ellipsoidal, 0.6–0.8 mm; stigma ca. 1 mm. Fruiting perianth rhomboid-obovoid, compressed, ca. 1 mm, strigose on shoulder, base constricted and stalklike, apex almost without neck, 2–3-toothed; achenes subovoid, ca. 0.6 mm, base stipitate. Fl. May–Aug, fr. Sep–Nov.

Forest margins, thickets, moist places along streams, roadsides, often cultivated; 200–1700 m. S Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, S Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Korea, Laos, Nepal, Sikkim, Thailand, Vietnam].

This species is extremely variable, but can be distinguished easily by its alternate leaves, cymose inflorescences, and stipitate achenes. Two varieties are recognized: var. *nivea* is known only from cultivation or from naturalized populations; it is a stout plant with dense, long, spreading hairs, free stipules, and broadly ovate to suborbicular leaf blades with the abaxial surface densely, rarely more thinly, white or gray tomentose. Naturalized plants are often smaller with smaller, relatively narrower leaves and shorter inflorescences. Truly wild populations are very variable in stature and indumentum, but can be consistently distinguished by the appressed to assurgent hairs on the stems and leaves and the connate stipules, and are here distinguished as var. *tenacissima*. The plants are sometimes cultivated. Such plants with concolorous leaves have been variously named as var. *concolor*, var. *tenacissima*, var. *viridula*, and *Boehmeria thailandica*, but the diagnostic characters seem inconsistent, with many intermediate forms, even within local populations, and so all have been included here within var. *tenacissima*. More field work and molecular studies are needed to understand more fully this complex species.

Boehmeria nivea is cultivated widely in China, mainly in Jiangxi, but also in S Gansu, S Henan, Hubei, Hunan, S Shaanxi, and Sichuan. The history of the cultivation of this species in China can be traced back at least 3000 years. Ramie, which provides high-quality fiber, is used to make ropes, cloth, and some industrial materials. Ramie was introduced to Europe and North and South America in the early 18th century. Ramie plants are used medicinally to relieve internal fevers and treat infections of the urethra. In addition, young leaves are used as fodder for silkworms.

- 1a. Stems densely patent hirsute; stipules free; leaf blade abaxial surface densely white or gray tomentose 2a. var. *nivea*
 1b. Stems not patent hirsute, assurgent or appressed strigose; stipules partly connate; leaf blade abaxial surface white tomentose, green and sparsely strigose or pubescent, sometimes thinly canescent tomentose 2b. var. *tenacissima*

2a. Boehmeria nivea var. **nivea**

苧麻(原变种) zhu ma (yuan bian zhong)

Urtica nivea Linnaeus, Sp. Pl. 2: 985. 1753.

Shrubs to 2.5 m, most parts densely patent hirsute. Stipules free, linear, 9–11 mm; leaf blade suborbicular or broadly ovate, 7–15 × 4–13 cm, abaxial surface densely white tomentose, base subtruncate or broadly cuneate, apex cuspidate. Fl. Jul–Aug, fr. Sep–Oct.

Margins of secondary forests, thickets, roadsides, often cultivated; 200–1700 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Laos, Nepal, Sikkim, Vietnam].

This variety is cultivated in S Gansu, S Henan, Hubei, Hunan, Jiangxi, S Shaanxi, and Sichuan. The fibers are used to make 夏布 (xia bu, literally “summer cloth”).

2b. Boehmeria nivea var. **tenacissima** (Gaudichaud-Beaupré) Miquel, Fl. Ind. Bot. 1(2): 253. 1859.

青叶苧麻 qing ye zhu ma

Boehmeria tenacissima Gaudichaud-Beaupré, Voy. Uranie, Bot. 500. 1830; *B. frutescens* var. *concolor* (Makino) Nakai; *B. nipononivea* Koidzumi; *B. nivea* var. *candicans* Weddell; *B. nivea* var. *concolor* Makino; *B. nivea* var. *nipononivea* (Koidzumi) W. T. Wang; *B. nivea* var. *viridula* Yamamoto; *B. thailandica* Yahara.

Plants 0.5–2.5 m tall; stems and petioles sparsely appressed strigose, occasionally hairs dense and assurgent. Stipules connate at base or rarely to middle; leaf blade usually ovate or elliptic-ovate, 5–13 × 3.5–12 cm, abaxial surface greenish, sparsely appressed strigillose or patent pubescent, sometimes thinly canescent-tomentose on veinlets, base rounded, broadly cuneate or abruptly narrowly cuneate.

Forest margins, thickets, moist places along streams, occasionally cultivated; 200–1200 m. S Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, SE Yunnan, Zhejiang [Indonesia, Japan, Korea, Laos, Thailand, Vietnam].

This variety is cultivated in Anhui, Guangdong, Jiangxi, Taiwan, and Zhejiang. It is perhaps the original wild form of the species.

3. Boehmeria zollingeriana Weddell, Ann. Sci. Nat., Bot., sér. 4, 1: 201. 1854.

帚序苧麻 zhou xu zhu ma

Shrubs or small trees, 1.5–3 m tall; branchlets glabrous. Leaves opposite or alternate on distal branches; stipules lanceolate, ca. 1 cm; petiole 2–12 cm, glabrous; leaf blade ovate, broadly ovate to subcordate, or in upper branches narrowly ovate or narrowly elliptic, 8–17(–20) × 4.5–12 cm, secondary veins 3–5 pairs along midvein, anastomosing near margin, abaxial surface sparsely strigillose on veins, adaxial surface glabrous or subglabrous, base rounded or subcordate, margin crenulate from base, apex acuminate or caudate. Glomerules unisexual; male glomerules in the axils of current or fallen leaves on normal branches; female glomerules on long slender terminal or subterminal branches, drooping, usually rebranching,

30–50 cm, all leaves reduced and scale-like. Male glomerules axillary, 1–1.5 cm in diam. Male flowers 5-merous; pedicel 4–5 mm; perianth lobes boat-shaped to elliptic, ca. 1 mm, glabrous or subglabrous, connate at base, often corniculate near apex; rudimentary ovule ellipsoid, ca. 0.5 mm. Fruiting perianth brown, obovoid or ellipsoid with a cuneate to ± stipitate base, compressed, 0.8–1 mm, smooth, sparsely pubescent, sessile, apex with prolonged neck, ca. 0.2 mm, 2(or 3)-toothed. Fl. May–Sep, fr. Sep–Nov.

Forests, thickets, along streams; 100–1200 m. NW Guangxi, S Guizhou, Taiwan, S Yunnan [E India, Indonesia, Laos, Myanmar, Thailand, Vietnam].

- 1a. Leaf blade broadly ovate to subcordate; stipules ca. 1.5 times as long as wide; male flowers glabrous or subglabrous; female spikes or panicles often more than 30 cm 3a. var. *zollingeriana*
- 1b. Leaf blade narrowly ovate to lanceolate; stipules (2–)3–4 times as long as wide; male flowers pubescent; female spikes or panicles less than 30 cm.
 - 1a. Achene sessile; branchlets and petiole glabrous 3b. var. *blinii*
 - 1b. Achene stipitate; branchlets and petiole pubescent 3c. var. *podocarpa*

3a. Boehmeria zollingeriana var. **zollingeriana**

帚序苧麻(原变种) zhou xu zhu ma (yuan bian zhong)

Boehmeria heteroidea Blume; *B. heteroidea* var. *latifolia* Gagnepain.

Branchlets and petioles glabrous. Leaf blade ovate, broadly ovate to subcordate, or in upper branches narrowly ovate or narrowly elliptic, 8–17(–20) × 4.5–12 cm, base rounded or subcordate. Male perianth glabrous or subglabrous. Fruiting perianth tube sessile, brown, obovoid or ellipsoid with a cuneate to ± stipitate base, compressed, 0.8–1 mm, smooth, sparsely pubescent, apex with prolonged neck, ca. 0.2 mm, 2(or 3)-toothed. Fl. Jul–Sep, fr. Sep–Nov.

Forests, thickets, along streams; 400–1200 m. S Yunnan [E India, Indonesia, Laos, Myanmar, Thailand, Vietnam].

3b. Boehmeria zollingeriana var. **blinii** (H. Lévillé) C. J. Chen, **comb. et stat. nov.**

黔桂苧麻 qian gui zhu ma

Basionym: *Boehmeria blinii* H. Lévillé, Repert. Spec. Nov. Regni Veg. 11: 551. 1913.

Branchlets and petioles glabrous or appressed strigillose. Distal leaves sometimes alternate. Leaf blade narrowly ovate to lanceolate, 8–24 × 2–9 cm, base broadly cuneate, rounded or cordate. Male perianth densely puberulent. Fruiting perianth brown, obovoid, ca. 0.8 mm, base ± rounded, sometimes cuneate. Fl. May–Jul, fr. Aug–Nov.

Forests; 100–1000 m. NW Guangxi, S Guizhou [N Thailand, N Vietnam].

3c. *Boehmeria zollingeriana* var. *podocarpa* (W. T. Wang) W. T. Wang & C. J. Chen, **comb. nov.**

柄果苧麻 bing guo zhu ma

Basionym: *Boehmeria blinii* var. *podocarpa* W. T. Wang, Acta Bot. Yunnan. 3: 323. 1981; *Pilea wattersii* Hance.

Branchlets and petioles pubescent. Leaves all opposite. Fruiting perianth rhomboid or ± rounded, ca. 1.2 mm, base stipitate. Fl. Mar–Aug, fr. Jul–Oct.

- Forests; 300–1000 m. Taiwan.

4. *Boehmeria clidemioides* Miquel, Pl. Jungh. 1: 34. 1851.

白面苧麻 bai mian zhu ma

Herbs perennial or subshrubs, few branched or well branched, erect or diffuse, 0.7–3 m tall; branchlets strigose. Usually dioecious. Leaves opposite or nearly so on distal branches and unequal in size; stipules lanceolate, 6–8 mm; petiole 2–9.5 cm, pubescent; leaf blade ovate, narrowly ovate, or sublanceolate, 4–14 × 2–7 cm, papery or herbaceous, secondary veins 2 or 3 pairs along midvein, abaxial surface spreading-pilose but appressed pubescent along midvein and lateral veins, adaxial surface strigose and often rough, base rounded or broadly cuneate, margin serrulate or coarsely serrate from basal 1/3, apex acuminate or caudate. Glomerules unisexual, on specialized axillary branches, these usually unbranched but occasionally with a few lateral branches at their base, and always with a tuft of 2–4 small foliage leaves at the apex. Glomerules 2–4 mm in diam. Male flowers 4-merous, sessile; perianth lobes ca. 1.5 mm, sparsely puberulent, connate at base; rudimentary ovule ellipsoid, ca. 0.5 mm. Fruiting perianth tube obovoid, compressed, ca. 1.5 mm, strigose on shoulder, apex 2-toothed. Fl. May–Aug, fr. Aug–Oct. $2n = 28$.

Moist places in forests, forest margins, along streams, often somewhat dry places in disturbed areas, roadsides; 200–2500 m. S Anhui, Fujian, S Gansu, N Guangdong, N Guangxi, Guizhou, Hubei, Hunan, Jiangxi, S Shaanxi, Sichuan, SE Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Sikkim, Vietnam].

- 1a. Stem erect; leaves opposite 4a. var. *clidemioides*
1b. Stem often diffuse; leaves alternate or
sometimes opposite in lower part of
stems 4b. var. *diffusa*

4a. *Boehmeria clidemioides* var. *clidemioides*

白面苧麻(原变种) bai mian zhu ma (yuan bian zhong)

Boehmeria clidemioides var. *cinerascens* H. Hara; *B. clidemioides* var. *platyphyloides* Yahara; *B. sidifolia* Weddell.

Subshrubs, few branched, 0.7–3 m tall. Leaves opposite or rarely alternate in upper part of branches, base often obtuse or rounded, margin 23–29-serrulate. Fruiting perianth base stipitate or cuneate. Fl. May–Aug, fr. Aug–Oct. $2n = 28$.

Moist places in forests, along streams; 1000–2500 m. NW Guangxi, SE Xizang, Yunnan [Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Sikkim, Vietnam].

4b. *Boehmeria clidemioides* var. *diffusa* (Weddell) Handel-Mazzetti, Symb. Sin. 7: 152. 1929.

序叶苧麻 xu ye zhu ma

Boehmeria diffusa Weddell, Arch. Mus. Hist. Nat. 9: 356. 1856; *B. diffusa* var. *strigosa* Weddell.

Herbs perennial or subshrubs, well branched, diffuse or erect, to 1.5 m tall. Leaves alternate or sometimes opposite in lower stems, base often cuneate, margin coarsely 7–13-dentate. Fruiting perianth base often obtuse. Fl. Jun–Aug, fr. Aug–Sep. $2n = 28$.

Forest margins, roadsides, often somewhat dry places in disturbed areas; 200–2400 m. S Anhui, Fujian, S Gansu, N Guangdong, N Guangxi, Guizhou, Hubei, Hunan, Jiangxi, S Shaanxi, Sichuan, N Yunnan, Zhejiang [Bhutan, India, Laos, Myanmar, Nepal, Sikkim, Vietnam].

This variety is very common in China, and it is variable in leaf shape and size.

The plants are used in traditional medicine and as pig feed.

5. *Boehmeria umbrosa* (Handell-Mazzetti) W. T. Wang, Acta Bot. Yunnan. 3: 324. 1981.

阴地苧麻 yin di zhu ma

Boehmeria clidemioides Miquel var. *umbrosa* Handel-Mazzetti, Symb. Sin. 7: 152. 1929; *B. bicuspis* C. J. Chen; *B. pseudotricuspis* W. T. Wang.

Herbs perennial, simple or few branched, 0.4–1.2 m tall; upper stems and branchlets appressed strigose. Dioecious or monoecious. Leaves alternate or sometimes opposite; stipules lanceolate, 6–8 mm; petiole 1.5–8 cm, appressed strigose; leaf blade broadly elliptic or broadly rhombic, 5.2–15 × 4.6–11 cm, herbaceous, secondary veins 2 each side of midvein, both surfaces sparsely appressed strigose, base broadly cuneate or subtruncate, margin coarsely 5–9-dentate from basal 1/3, teeth larger distally, apex tricuspidate, terminal tooth as long as leaf blade proper, lateral teeth 1/2–2/3 as long. Glomerules unisexual and on different plants, on specialized axillary branches, these usually unbranched, 3–11 cm, occasionally with a few lateral branches at their base, and always with a tuft of 2–4 small foliage leaves at the apex. Glomerules 1.5–3 mm in diam. Male flowers 4-merous, sessile; perianth lobes ca. 1.5 mm, sparsely puberulent, connate at base, 2 lobes corniculate near apex; rudimentary ovule ellipsoid, ca. 0.6 mm. Fruiting perianth obovoid, compressed, ca. 1 mm, strigose on shoulder, base obtuse, 2-toothed. Fl. Aug–Sep, fr. Sep–Oct.

• Forests, along streams, shady and wet places; 1100–2600 m. NW Guangxi, NW Guizhou, W Sichuan, SE Xizang, N Yunnan.

6. *Boehmeria macrophylla* Hornemann, Hort. Bot. Hafn. 2: 890. 1815.

水苧麻 shui zhu ma

Subshrubs or herbs perennial, 1–2(–3.5) m tall; upper stems strigose. Dioecious or monoecious. Leaves opposite, unequal in size; stipules lanceolate, 8–10 mm; petiole 0.8–8 cm, pubescent; leaf blade ovate, suborbicular, elliptic-ovate, or sublanceolate, 6–18 × 3–12 cm, membranous, herbaceous, or rarely

papery, secondary veins 2 or 3 pairs along midvein, abaxial surface rugulose, sparsely strigose or patent pubescent along veins, adaxial surface strigose, base rounded or subcordate, sometimes oblique, margin serrulate or denticulate, teeth 2–5 mm, apex acuminate or abruptly cuspidate. Glomerules unisexual, on long spikelike branches, these erect or pendent, usually unbranched, but sometimes with short or long lateral branches from base, glomerules separated or sometimes densely congested; female ones in distal axils, 7–20 cm. Male flowers 4-merous, sessile; perianth lobes ca. 1.5 mm, sparsely puberulent, connate at base; rudimentary ovule ellipsoid, ca. 0.4 mm. Fruiting perianth tube ellipsoid, compressed, ca. 1 mm, smooth, strigose on shoulder, apex 2-toothed. Fl. Jun–Sep, fr. Sep–Jan.

Forests, forest margins, thickets, along streams, roadsides; 100–3000 m. N Guangdong, N and W Guangxi, Guizhou, S Xizang, Yunnan, SE Zhejiang [Bhutan, India, Indonesia, Laos, Myanmar, Nepal, Sikkim, Sri Lanka, Thailand, Vietnam].

The species as a whole is characterized by the opposite leaves, spikelike inflorescences, and fruiting perianth with a rounded base. The varieties are very distinctive and their status needs more detailed assessment.

The fibers are used to make ropes.

- 1a. Leaf blade suborbicular, base cordate, abaxial surface with patent hairs along veins 6c. var. *rotundifolia*
- 1b. Leaf blade not orbicular, base usually not cordate, abaxial surface sparsely strigose or densely canescent.
 - 2a. Leaf blade papery, 4.5–7(–10) × 2–4(–6) cm, rugose, adaxial surface stiffly hispid, reticulate veins strongly raised abaxially 6d. var. *scabrella*
 - 2b. Leaf blade often herbaceous or membranous, 7–20 × 4–12 cm, slightly rugose, adaxial surface sparsely strigose, reticulate veins slightly raised.
 - 3a. Stems and petioles sparsely strigose; leaf blade often membranous, apex long-cuspidate, 1.5–2 cm, abaxial surface sparsely strigose 6a. var. *macrophylla*
 - 3b. Stems and petioles densely strigose; leaf blade herbaceous, apex cuspidate, 0.5–1.2 cm, abaxial surface densely canescent 6b. var. *canescens*

6a. *Boehmeria macrophylla* var. *macrophylla*

水苧麻(原变种) shui zhu ma (yuan bian zhong)

Boehmeria erythropoda Miquel; *B. macrophylla* var. *dongtousensis* W. T. Wang; *B. platyphylla* D. Don; *B. platyphylla* var. *macrostachya* (Wight) Weddell; *Splitgerbera macrostachya* Wight.

Stems and petioles sparsely strigose. Leaf blade 6.5–18 × 3.2–12 cm, often membranous, abaxial surface appressed strigose, reticulate veins slightly raised, adaxial surface sparsely

strigose, apex long-cuspidate, 1.5–2 cm. Female spikes ± branched, nodding at apex. Fl. Jun–Aug, fr. Sep–Jan.

Forest margins, along streams, roadsides; 100–500 m in S China, 1800–3000 m in SW China. N Guangdong, N Guangxi, Guizhou, S Xizang, Yunnan, SE Zhejiang (Dongtou) [Bhutan, India, Indonesia, Laos, Myanmar, Nepal, Sikkim, Sri Lanka, Thailand, Vietnam].

6b. *Boehmeria macrophylla* var. *canescens* (Weddell) D. G. Long, Notes Roy. Bot. Gard. Edinburgh 40: 129. 1982.

灰绿水苧麻 hui lü shui zhu ma

Boehmeria canescens Weddell, Ann. Sci. Nat., Bot., sér. 4, 1: 28. 1854; *B. platyphylla* var. *canescens* (Weddell) Weddell.

Stems and petioles densely strigose. Leaf blade herbaceous, abaxial surface densely canescent, apex cuspidate, 0.5–1.2 cm. Female spikes thick, with congested glomerules in fruit. Fl. Jul–Aug, fr. Sep–Nov.

Forests, along streams; 400–1000 m. W Guangxi, NW and S Yunnan [Bhutan, N India, Nepal, Sikkim].

6c. *Boehmeria macrophylla* var. *rotundifolia* (D. Don) W. T. Wang in W. T. Wang & C. J. Chen, Fl. Reipubl. Popularis Sin. 23(2): 337. 1995.

圆叶苧麻 yuan ye zhu ma

Boehmeria rotundifolia D. Don, Prodr. Fl. Nepal. 60. 1825; *B. platyphylla* var. *rotundifolia* (D. Don) Weddell.

Leaf blade suborbicular, abaxial surface with patent hairs along veins, base rounded or cordate. Female spikes thin, with distant glomerules. Fl. May–Jun, fr. Jul–Sep.

Forests, along streams; 1700–2100 m. S Xizang, NW Yunnan [India, Nepal].

6d. *Boehmeria macrophylla* var. *scabrella* (Roxburgh) D. G. Long, Notes Roy. Bot. Gard. Edinburgh 40: 129. 1982.

糙叶苧麻 cao ye zhu ma

Urtica scabrella Roxburgh, Fl. Ind., ed. 1832, 3: 581. 1832; *Boehmeria platyphylla* var. *scabrella* (Roxburgh) Weddell.

Leaf blade 4.5–7(–10) × 2–4(–6) cm, papery, abaxial surface with reticulate veins strongly raised, adaxial surface rugose, stiffly hispid, apex gradually acuminate. Fl. Jun–Aug, fr. Sep–Nov.

Thickets, disturbed places in secondary forests, roadsides; 200–1300 m. N Guangdong, N Guangxi, Guizhou, S Xizang, Yunnan [Bhutan, India, Indonesia, Laos, Nepal, Sikkim, Sri Lanka, Thailand, Vietnam].

7. *Boehmeria pilosiuscula* (Blume) Hasskarl in Teijsmann & Binnendijk, Cat. Hort. Bot. Bogor. 79. 1844.

疏毛苧麻 shu mao zhu ma

Urtica pilosiuscula Blume, Bijdr. Fl. Ned. Ind. 491. 1826; *Boehmeria platyphylla* D. Don var. *pilosiuscula* (Blume) Handel-Mazzetti.

Subshrubs or herbs perennial, prostrate at base, 0.4–0.6 m tall; upper stems densely strigose or velutinous. Monoecious. Leaves opposite, unequal in size; stipules subulate-lanceolate, 5–10 mm; petiole 0.3–6.5 cm, velutinous; leaf blade obliquely ovate or obovate-elliptic, 3–11 × 1.5–6.2 cm, herbaceous, slightly rugulose, secondary veins 3 pairs along midvein, abaxial surface pubescent or velutinous along veins, adaxial surface strigose, base obliquely rounded or obtuse, margin serrulate, apex acuminate or shortly acuminate, serrulate. Glomerules unisexual, in short congested, often unbranched bisexual spike-like shoots, 0.8–2 cm; male glomerules distal. Male flowers 4-merous, sessile or subsessile; perianth lobes ca. 1 mm, sparsely puberulent, connate at base; rudimentary ovule ellipsoid, ca. 0.6 mm. Fruiting perianth narrowly obovoid, compressed, ca. 1 mm, smooth, strigose on shoulder, smooth, apex 2-toothed. Fl. Sep–Oct, fr. Oct–Nov.

Secondary forest margins, along streams, rocks; 700–1500 m. Hainan, Taiwan, Yunnan [Indonesia, Thailand].

8. *Boehmeria lanceolata* Ridley, J. Straits Branch Roy. Asiat. Soc. 57: 94. 1910.

北越苕麻 bei yue zhu ma

Boehmeria tonkinensis Gagnepain.

Small shrubs 1–3 m tall; branches dark purplish brown, strigose. Monoecious. Leaves opposite, slightly unequal in size; stipules lanceolate, 5–8 mm; petiole 0.3–2.5 cm, strigose; leaf blade oblong-obovate or oblong-oblancoate, 5–12 × 2–3.2 cm, thinly papery, secondary veins 3 or 4 each side of midvein, reticulate veins prominent abaxially, abaxial surface pubescent with strigose veins, adaxial surface slightly rugulose, sparsely strigose, base obtuse or broadly cuneate, margin denticulate, apex acuminate, tip denticulate. Glomerules on axillary spike-like branches, with a few branches from near base, 4–11 cm, often paired at each axil, often bisexual with proximal female glomerules and distal male glomerules; glomerules 2.5–3 mm in diam., 1–3 mm apart. Male flowers 4-merous, subsessile; perianth lobes elliptic, ca. 1 mm, sparsely puberulent, connate at base, corniculate near apex; rudimentary ovule obovoid, ca. 0.3 mm. Fruiting perianth broadly obovoid, compressed, ca. 1 mm, smooth, strigose on shoulder, base rounded, apex 2-toothed. Fl. Mar–May, fr. Jun–Aug.

Moist open places, secondary forests, near streams; 200–1300 m. Hainan, SE Yunnan [Malaysia, Vietnam].

This species is here newly recorded for China. Hainan and N Vietnam have very similar floras with many species in common, often localized around the Beibu (Tonkin) gulf.

9. *Boehmeria lohuiensis* S. S. Chien, Acta Phytotax. Sin. 8: 355. 1963.

琼海苕麻 qiong hai zhu ma

Small shrubs 1–1.5 m tall; branches light brown, strigose. Dioecious. Leaves opposite, unequal in size; stipules subulate-lanceolate, 8–10 mm; petiole 1–6 cm, strigose; leaf blade elliptic, 8–14 × 3–5.5 cm, secondary veins 2 pairs along midvein, abaxial surface sparsely strigose along veins, adaxial surface glabrous, base cuneate, margin denticulate, apex acuminate.

Glomerules on axillary spike-like branches, often with less straight branches from base, ca. 10 cm. Fruiting perianth broadly ovoid, compressed, ca. 1 mm, strigose on shoulder, 2-toothed. Fl. and fr. Sep.

• Moist places, along streams; ca. 200 m. Hainan (Ledong).

10. *Boehmeria formosana* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 281. 1911.

海島苕麻 hai dao zhu ma

Subshrubs or herbs perennial, 0.8–1.5 m tall; stems often simple, 4-angled, upper ones appressed strigose, then glabrescent. Dioecious or sometimes monoecious. Leaves opposite; stipules lanceolate, 4–7 mm; petiole 1.5–13 cm, strigose or glabrescent; leaf blade ovate, oblong-ovate, lanceolate, or linear-lanceolate, 8–15(–23) × 2.5–6.5(–13) cm, herbaceous, secondary veins 3 or 4 each side of midvein, both surfaces sparsely strigose or glabrous, adaxial surface smooth, base obtuse or rounded, margin dentate, apex long acuminate or caudate. Glomerules distant on axillary spike-like flowering shoots, sometimes branched at base, 3.5–9(–16) cm. Male flowers 4-merous, sessile; perianth lobes elliptic, ca. 1 mm, sparsely puberulent, connate at base; rudimentary ovule obovoid, ca. 0.5 mm. Fruiting perianth tube almost without stipe, broadly rhomboid or obovoid, slightly compressed, ca. 1 mm, verrucose, strigose on shoulder, base obtuse or broadly cuneate, almost without stipe, apex 2(–4)-toothed. Fl. Jun–Aug, fr. Aug–Oct.

Secondary forests, thickets, along streams, roadsides; below 100 to 1400 m. S Anhui, Fujian, Guangdong, Guangxi, SE Guizhou, W Hunan, Jiangxi, Taiwan, Zhejiang [Japan].

- 1a. Leaf blade ovate to lanceolate, base obtuse or rounded; petiole 1.5–13 cm; fruiting perianth rhomboid, often with cuneate base 10a. var. *formosana*
- 1b. Leaf blade linear-lanceolate, base cuneate; petiole 1–1.5 cm; fruiting perianth subglobose with obtuse base 10b. var. *stricta*

10a. *Boehmeria formosana* var. *formosana*

海島苕麻(原变种) hai dao zhu ma (yuan bian zhong)

Petiole 1.5–13 cm; leaf blade ovate to lanceolate, 8–23 × 2.5–13 cm, base obtuse or rounded. Achene and surrounding perianth rhomboid, tuberculate, base cuneate, apex 2–4 toothed. Fl. Jun–Aug, fr. Aug–Oct.

Secondary forests, thickets, along streams, roadsides; below 100 to 1400 m. S Anhui, Fujian, Guangdong, Guangxi, SE Guizhou, W Hunan, Jiangxi, Taiwan, Zhejiang [Japan].

10b. *Boehmeria formosana* var. *stricta* (C. H. Wright) C. J. Chen, **comb. nov.**

福州苕麻 fu zhou zhu ma

Basionym: *Boehmeria platyphylla* D. Don var. *stricta* C. H. Wright, J. Linn. Soc., Bot. 26: 487. 1899; *B. formosana* var. *fuzhouensis* W. T. Wang.

Petiole 1–1.5 cm, strigose; leaf blade linear-lanceolate, 9–

17 × 2–3.5 cm, base cuneate. Achene and surrounding perianth subglobose, finely reticulate, base obtuse, apex often 4-toothed. Fr. Aug.

- Thickets; ca. 100 m. Fujian, Guangdong, Taiwan, Zhejiang.

11. *Boehmeria hamiltoniana* Weddell, Ann. Sci. Nat., Bot., sér. 4, 1: 199. 1854.

细序苧麻 xi xu zhu ma

Boehmeria platyphylla D. Don var. *hamiltoniana* (Weddell) Weddell.

Shrubs to 2 m tall; branches glabrous. Leaves opposite, unequal in size; stipules subulate-lanceolate, ca. 7 mm; petiole 1.2–7 cm, strigose, glabrous; leaf blade obliquely ovate, oblong, or rarely lanceolate, 8–21 × 3.5–8 cm, herbaceous, secondary veins 2 pairs along midvein, abaxial surface pubescent along veins, adaxial surface sparsely strigose, base broadly cuneate or obliquely subrounded, margin inconspicuously crenulate, apex acuminate. Glomerules unisexual, on long spikelike inflorescences, usually with a few long basal branches, widely separated; male spikes to ca. 6 cm; bisexual or female spikes very slender, to 26 cm. Male flowers 4-merous, subsessile; perianth lobes elliptic, ca. 1.5 mm, sparsely puberulent, connate at base; rudimentary ovule ellipsoid, ca. 0.5 mm. Fruiting perianth ellipsoid, compressed, ca. 1 mm, strigose on shoulder, base sharply cuneate, ± stipitate, apex 2-toothed. Fl. May–Aug, fr. Oct–Dec.

Margins of secondary forests, moist places along streams; ca. 700 m. S Yunnan [Bhutan, Indonesia, NE India, Myanmar, Nepal, Thailand].

12. *Boehmeria tomentosa* Weddell, Ann. Sci. Nat., Bot., sér. 4, 1: 200. 1854.

密毛苧麻 mi mao zhu ma

Boehmeria platyphylla D. Don var. *tomentosa* (Weddell) Weddell.

Shrubs 2–8 m tall; branchlets densely yellowish tomentose. Leaves opposite, unequal in size; stipules lanceolate, ca. 10 mm; petiole 1–8 cm, tomentose; leaf blade suborbicular or orbicular-ovate, 6.5–18.5 × 4.5–15 cm, papery, secondary veins 2 each side of midvein, abaxial surface densely and ferruginous tomentose to densely pubescent, adaxial surface densely strigose, base cordate or subtruncate, margin denticulate, apex shortly acuminate or acuminate. Glomerules unisexual, on long spikelike branches, nodding; male spikes in pairs, in axils of fallen leaves, 5–12 cm; female spikes simple, in axils of current leaves, 8–16 cm. Male flowers 4-merous, sessile; perianth lobes elliptic, ca. 1.5 mm, sparsely puberulent, connate at base; rudimentary ovule subcolumnar, ca. 0.6 mm. Fruiting perianth obovoid, compressed, 1.5–2 mm, densely strigose on shoulder, base obtuse, apex 2-toothed. Fl. Apr–Jul, fr. Aug–Oct.

Forest margins, along streams; 1500–2400 m. SW Sichuan, NW and S Yunnan [Bhutan, NE India, Nepal, Sikkim].

- The fibers are used to make ropes.

13. *Boehmeria dolichostachya* W. T. Wang, Acta Bot. Yunnan. 3: 405. 1981.

长序苧麻 chang xu zhu ma

Subshrubs or small shrubs 0.6–3 m tall; upper stems strigose. Leaves opposite, slightly unequal in size; stipules subulate-triangular, ca. 5 mm; petiole 2–19 cm, strigose or pubescent; leaf blade suborbicular or orbicular-ovate, 6.5–19 × 6–17.5 cm, herbaceous, secondary veins 2 pairs along midvein, abaxial surface densely appressed strigillose or patent pubescent, adaxial surface often sparsely appressed strigose, base cordate or subtruncate, margin coarsely dentate, apex cuspidate or caudate. Glomerules unisexual, distant along long spikelike flowering branches, male branches sometimes branched at base, 5–10 cm; female spikes often unbranched, 10–40 cm. Male flowers 4-merous, sessile; perianth lobes obovate, ca. 1 mm, sparsely puberulent, connate at base; rudimentary ovule obovoid, 0.3–0.5 mm. Fruiting perianth rhomboid-obovoid, compressed, ca. 1.2 mm, strigose on shoulder, base obtuse, apex with very short neck, 2-toothed. Fl. Jul–Sep, fr. Sep–Nov.

- Thickets in hills, moist or disturbed places; 100–1300 m. Guangdong, Guangxi, Guizhou.

The fibers are used to make ropes.

- 1a. Stems and petioles appressed strigose; leaf blade appressed strigillose abaxially 13a. var. *dolichostachya*
- 1b. Stems and petioles patently pubescent; leaf blade patently pubescent abaxially 13b. var. *mollis*

13a. *Boehmeria dolichostachya* var. *dolichostachya*

长序苧麻(原变种) chang xu zhu ma (yuan bian zhong)

Boehmeria holosericea Blume var. *strigosa* W. T. Wang; *B. strigosifolia* W. T. Wang.

Stems and petioles appressed strigose. Leaf blade abaxial surface appressed strigillose. Fl. Aug–Sep, fr. Sep–Oct.

- Partly shaded thickets in limestone hills, disturbed places; 100–1300 m. N Guangdong, Guangxi, Guizhou.

13b. *Boehmeria dolichostachya* var. *mollis* (W. T. Wang) W. T. Wang & C. J. Chen, **comb. nov.**

柔毛苧麻 rou mao zhu ma

Basionym: *Boehmeria strigosifolia* W. T. Wang var. *mollis* W. T. Wang, Guihaia 3: 78. 1983.

Stems and petioles patently pubescent. Leaf blade abaxial surface patently pubescent. Fl. Jul–Sep, fr. Oct–Nov.

- Often moist places, thickets in hills; 500–700 m. Guangdong, Guangxi, Guizhou.

14. *Boehmeria densiglomerata* W. T. Wang, Acta Bot. Yunnan. 3: 408. 1981.

密球苧麻 mi qiu zhu ma

Herbs perennial or subshrubs 0.3–0.5 m tall; stems simple or branched, strigillose along distal 1/2. Leaves opposite, subequal in size; stipules linear, 7–9 mm; petiole dark reddish, 2.5–8 cm, sparsely strigillose; leaf blade suborbicular or orbicular-ovate, 5–9.4 × 5–8 cm, herbaceous, secondary veins 2 or 3

pairs along midvein, abaxial surface purplish and densely appressed strigillose, adaxial surface often sparsely appressed strigose, base cordate or subcordate, margin coarsely dentate, apex cuspidate or caudate and entire. Glomerules unisexual, densely congested along thick, columnar spikelike branches; bisexual and male branches often branched at base, 2.5–5.5 cm; female branches unbranched. Male flowers 4-merous, sessile; perianth lobes elliptic, ca. 1 mm, sparsely puberulent, connate at base; rudimentary ovule obovoid, 0.06 mm. Fruiting perianth rhomboid-obovoid, compressed, 1–1.3 mm, reticulate, strigose on shoulder, base obtuse, apex with very short neck, 2-toothed. Fl. Jun–Aug, fr. Sep–Oct.

• Forests, thickets, along streams; 200–700(–1200) m. S Fujian, N Guangdong, N Guangxi, Guizhou, SW Hubei, W Hunan, Jiangxi, S Sichuan, SE Yunnan.

15. *Boehmeria japonica* (Linnaeus f.) Miquel, Ann. Mus. Bot. Lugduno-Batavi 3: 131. 1867.

野线麻 *ye xian ma*

Urtica japonica Linnaeus f., Suppl. Pl. 481. 1782; *Boehmeria grandifolia* Weddell; *B. holosericea* Blume; *B. japonica* var. *appendiculata* (Blume) Yahara; *B. japonica* var. *longispica* (Steudel) Yahara; *B. longispica* Steudel; *B. pilushanensis* Liu & Lu; *B. platyphylla* D. Don var. *macrophylla* Weddell; *B. spicata* var. *duploserrata* C. H. Wright; *B. taiwaniana* Nakai & Satake.

Subshrubs or herbs perennial, simple or few branched, 0.7–1.5 m tall; upper stems and branchlets densely appressed or patent strigose. Dioecious. Leaves opposite, subequal in size; stipules lanceolate, 8–1.2 mm; petiole 6–8 cm, appressed or patent strigose; leaf blade dark green or black when dry, suborbicular, orbicular-ovate, or ovate, 7–17(–26) × 5.5–13(–20) cm, papery, secondary veins 1–3 pairs along midvein, abaxial surface pubescent or sericeous along veins and veinlets, adaxial surface roughish, strigillose, base broadly cuneate, subrounded, or truncate, margin coarsely 7–14-dentate, teeth 6–20 mm, gradually larger distally, distal ones often biserrate, apex sometimes inconspicuously tricuspidate, lateral cusps shorter than terminal one. Glomerules on axillary unbranched, or sometimes few-branched, spikelike branches; male spikes 3–15 cm; female spikes 7–20(–30) cm. Male flowers 4-merous, sessile; perianth lobes elliptic, ca. 1 mm, strigose, connate at base. Fruiting perianth rhomboid-obovoid, compressed, ca. 1.8 mm, smooth, strigose on shoulder, base stipitate or cuneate, apex with short neck, 2-toothed. Fl. Jun–Aug, fr. Sep–Nov.

Forest margins, thickets, along streams in hills and mountains; 300–600 m in N and SE China, 1000–1300 m in SW China. Anhui, Fujian, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, SE Yunnan, Zhejiang [Japan].

The fibers are used to make ropes and cloth. The leaves are used agriculturally as fodder and medicinally to relieve internal fever.

The earliest reference to this species is an excellent plate published by Houttuyn (Nat. Hist. 11: 291, pl. 72, f. 2. 1779), but that author did not ascribe any binomial to the plant in question. *Boehmeria japonica* and the following four species in this account, *B. tricuspis*, *B. silvestrii*, *B. spicata* and *B. allophylla*, make up a complex containing

intermediate forms, because of which the status of the species remains uncertain.

16. *Boehmeria tricuspis* (Hance) Makino, Bot. Mag. (Tokyo) 26: 387. 1912.

八角麻 *ba jiao ma*

Boehmeria platyphylla D. Don var. *tricuspis* Hance, J. Bot. 12: 261. 1874; *B. japonica* Miquel var. *platanifolia* Maximowicz; *B. maximowiczii* Nakai & Satake; *B. platanifolia* Franchet & Savatier.

Subshrubs or herbs perennial, simple or few branched, 0.5–1.5 m tall; upper stems and branchlets densely pubescent. Dioecious or monoecious. Leaves opposite or rarely alternate, subequal in size; stipules lanceolate, 7–10 mm; petiole 1.5–6(–10) cm, densely pubescent; leaf blade dark green or black when dry, oblate to 5-angled or oblate to orbicular-ovate, often ovate in upper stems, 8–12(–18) × 7–14(–22) cm, papery, secondary veins 2 pairs along midvein, abaxial surface densely pubescent along veins and veinlets, adaxial surface roughish, densely strigose, base truncate, subcordate, or broadly cuneate, margin coarsely 8–12-dentate, teeth gradually larger distally, often biserrate apically, apex 3-cusped or lobed, tip serrulate. Glomerules on axillary spikelike flowering branches, male branches often branched, 8–17 cm; female spikes distal, unbranched or branched, 5.5–24 cm. Male flowers 4-merous, sessile; perianth lobes elliptic, ca. 1 mm, strigillose, connate at base. Fruiting perianth rhomboid-obovoid, compressed, ca. 1.2 mm, smooth, strigillose on shoulder, base cuneate or stipitate, apex with short neck, 2-toothed. Fl. Jul–Aug, fr. Sep–Oct.

Forest margins, thickets, along streams in hills and mountains; 500–1400 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, W Hebei, W Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, SE Yunnan, Zhejiang [Japan, Korea].

The high-quality fibers are used to make cloth, paper, and ropes. The leaves are used as fodder and as traditional medicines to relieve internal fever.

17. *Boehmeria silvestrii* (Pampanini) W. T. Wang, Acta Phytotax. Sin. 20: 204. 1982.

赤麻 *chi ma*

Boehmeria platanifolia Franchet & Savatier var. *silvestrii* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 22: 278. 1915.

Herbs perennial or subshrubs, simple or few branched, 0.6–1 m tall; upper stems and branchlets sparsely strigillose. Dioecious or monoecious. Leaves opposite, unequal or subequal in size; stipules lanceolate, 5–7 mm; petiole 1.5–4(–8) cm, sparsely strigillose; middle leaf blade 5-angled or orbicular-ovate, 5–8(–13) × 4.8–7.5(–13) cm, thinly herbaceous, secondary veins 1–3 each side of midvein, both surfaces sparsely strigillose or abaxial surface sometimes glabrous, base broadly cuneate or subtruncate, apex often 3- or 5-cuspidate, sometimes caudate; upper leaf blade gradually smaller, base broadly cuneate or subrounded, margin 8–10-dentate, denticles gradually larger distally, apex caudate or inconspicuously tricuspidate. Glomerules on axillary, lax, unbranched spikelike flowering branches; male or bisexual ones in proximal axils; female ones

in distal axils, 4–11(–20) cm. Male flowers 4-merous, subsessile; perianth lobes boat-shaped to elliptic, ca. 1.5 mm, sparsely strigillose, connate to middle; rudimentary ovule ellipsoid, ca. 0.8 mm. Fruiting perianth rhomboid-obovoid, compressed, ca. 1.5 mm, smooth, strigillose on shoulder, base cuneate or stipitate, apex with short neck, 2-toothed. Fl. Jun–Aug, fr. Sep–Nov.

Forest margins, thickets, along streams in hills and mountains; 100–1400 m in C and N China, 2100–2600 m in SW China. N and W Hebei, W Henan, W Hubei, S Gansu, SE Jilin, S Liaoning, S Shaanxi, E Shandong, Sichuan [Japan, Korea].

The fibers are used to make ropes and cloth.

18. *Boehmeria spicata* (Thunberg) Thunberg, Trans. Linn. Soc. London 2: 330. 1794.

小赤麻 xiao chi ma

Urtica spicata Thunberg in Murray, Syst. Veg., ed. 14, 850. 1784; *Boehmeria gracilis* C. H. Wright; *B. paraspicata* Nakai; *B. tricuspis* var. *unicuspis* Makino.

Herbs perennial or subshrubs, simple or few branched, 0.4–1 m tall; upper stems, branchlets, and petioles sparsely strigillose. Dioecious or monoecious. Leaves opposite, subequal in size; stipules lanceolate, 4–7 mm; petiole 1–7(–10) cm; leaf blade ovate-rhombic or rhombic, 2.5–8(–15) × 2–6(–10) cm, thinly herbaceous, secondary veins 1 or 2 each side of midvein, both surfaces sparsely strigillose or subglabrous, base broadly cuneate, sometimes subrounded, margin coarsely 3–9(–13)-dentate, teeth gradually larger distally. Glomerules on axillary, lax, unbranched spikelike branches; male or bisexual ones in proximal axils, 2–10(–18) cm; female ones in distal axils. Male flowers 4-merous, sessile; perianth lobes boat-shaped to elliptic, ca. 1.2 mm, sparsely strigillose, connate to middle; rudimentary ovule ellipsoid, 0.6–0.8 mm. Fruiting perianth tube rhomboid-obovoid, compressed, 1.2–1.5 mm, strigillose on shoulder, base cuneate or stipitate, apex with short neck, 2-toothed. Fl. May–Aug, fr. Aug–Sep.

Forest margins, thickets, grasslands, by ditches in hills and mountains; 100–1600 m. Anhui, Fujian, S Gansu, Guizhou, N and W Hebei, W Henan, Hubei, NW Hunan, Jiangsu, Jiangxi, SE Jilin, S Liaoning, Nei Mongol, S Shaanxi, E Shandong, Shanxi, Sichuan, Zhejiang [Japan, Korea].

The fibers are used to make ropes, cloth, and paper.

19. *Boehmeria allophylla* W. T. Wang, Acta Bot. Yunnan. 3: 412. 1981.

异叶苧麻 yi ye zhu ma

Herbs perennial, ca. 0.7 m tall, sparsely strigillose. Monoecious. Leaves alternate on upper stems or opposite on lower stems. Alternate leaves: stipules lanceolate, 4–6 mm; petiole 0.4–2 cm, sparsely strigillose; leaf blade elliptic, 2.7–7.5 × 1–3 cm, thinly herbaceous, abaxial surface pubescent, adaxial surface long appressed hirsute, apex acuminate. Opposite leaves unequal in size; petiole 2.4–3.8 cm, sparsely strigillose; leaf blade elliptic or broadly rhombic, 8–11 × 4–5.5 cm, secondary veins 2 each side of midvein, base broadly cuneate, margin minutely serrulate, teeth 1–2.5 mm, apex tricuspidate. Glomerules

on axillary, lax, unbranched spikelike flowering branches; male or bisexual ones in proximal axils, 3–8 cm; female ones in distal axils. Male flowers 4-merous, subsessile; perianth lobes boat-shaped to elliptic, ca. 1 mm, sparsely strigillose, connate to middle; rudimentary ovule ellipsoid, ca. 0.8 mm. Female flowers: perianth tube narrowly ellipsoid, compressed, ca. 0.5 mm, strigillose on shoulder, 2-toothed at apex. Fl. Aug.

• Along streams; ca. 200 m. Guangxi (Lingyun).

20. *Boehmeria polystachya* Weddell, Ann. Sci. Nat., Bot., sér. 4, 1: 200. 1854.

歧序苧麻 qi xu zhu ma

Boehmeria tibetica C. J. Chen.

Herb or shrubs 1–1.5 m tall. Often monoecious, sometimes dioecious. Stems simple or branched distally; upper stems, branches and petioles densely puberulent. Leaves opposite, slightly unequal in size; stipules narrowly lanceolate, 8–12 mm, free; petiole 3–8 cm; leaf blade light green when dry, elliptic-ovate or ovate, 7–20 × 4–12 cm, herbaceous, secondary veins 3 or 4 pairs each side of midvein, tertiary veins many, transversely parallel, abaxial surface strigillose, adaxial surface often densely pubescent, base cordate or rounded, margin serrate, apex acuminate. Glomerules many flowered, 4–5 mm in diam., on axillary, irregularly spreading, much rebranched specialized flowering shoots, bisexual shoots lax, to 8 cm; female shoots in distal axils, congested, to 13 cm. Male flowers 4-merous, sessile; perianth lobes elliptic, ca. 1.2 mm, densely puberulent, connate at base; rudimentary ovule ellipsoid, ca. 0.5 mm. Fruiting perianth tube rhomboid-obovoid, compressed, 1–1.2 mm, strigillose on shoulder, base cuneate, apex long necked, 4-toothed. Fl. Jul–Aug, fr. Sep–Oct.

Forests, along streams; 2100–2700 m. SE Xizang [Bhutan, N India, Nepal, Sikkim].

21. *Boehmeria conica* C. J. Chen, Wilmot-Dear & Friis, **sp. nov.**

锥序苧麻 zhui xu zhu ma

Type: China. Yunnan: “Szemao” [Simao], A. Henry 12070 (holotype, K).

Boehmeriae poystachyae similis sed foliis latissime ovatis ut maximum sequi (nec circa duplo) longioribus quam latioribus, ad basin semper rotundato-truncatis (nec cuneatis), ad apicem abrupte (nec sensim) acuminatis, ramulis lateralibus inflorescentiae non ramosis, glomerulis femineis parvis paucifloris et fructu late ovoideo ut maximum 1.3-plo (nec circa duplo) longiore quam latiore ad basin semper rotundato (nec protracto) differt.

Shrubs large, to 3 m tall, dioecious; branches 4-angled; branches and petioles sparsely appressed strigillose, glabrescent. Leaves opposite, subequal in size; stipules narrowly triangular, 3–4 × 1.5–5 mm, connate at base; petiole 4–12 cm; leaf blade light green abaxially, dark green adaxially when dried, ovate-orbicular to suborbicular, rarely broadly ovate, sometimes obliquely ovate, 8–17 × 6.5–14 cm, herbaceous,

basal veins extending into apical 1/5 of leaf blade, secondary veins 3 or 4 each side of midvein, reticulate veins slightly raised abaxially, abaxial surface subglabrous, adaxial surface sparsely appressed strigose, glabrescent; base cordate, rounded truncate or broadly cuneate, margin crenate, apex cuspidate to shortly acuminate, rarely acuminate, tip entire. Glomerules 5–10-flowered, on axillary, regularly spreading branches along specialized flowering shoots 5–8 cm; branches simple, spikelike, progressively and regularly shorter toward apex of shoot. Male flowers 4-merous, sessile; perianth lobes elliptic, ca. 1.2 mm, sparsely puberulent, connate to middle. Fruiting perianth tube broadly ovoid, compressed, ca. 0.8 mm, sparsely strigillose on shoulder, base \pm rounded, apex with very short neck. Fl. Oct–Mar, fr. Apr–Jun.

Forests, shady wet places in ravines; 1200–2000 m. SE Xizang, Yunnan [NE India (Bengal)].

This new species is named for its small inflorescences, with unbranched lateral branches which become progressively shorter toward the inflorescence apex, thereby giving a conic appearance. Chinese material has hitherto been confused with *Boehmeria polystachya*, which can be distinguished from *B. conica* by its narrower leaves with serrate margins and many transversely parallel secondary veins, much more irregular and rebranched inflorescences, and narrowly rhomboid-obovoid fruiting perianth tube with a cuneate base.

22. *Boehmeria siamensis* Craib, Bull. Misc. Inform. Kew 1916: 269. 1916.

八棱麻 ba leng ma

Boehmeria Chiangmaiensis Yahara; *B. spirei* Gagnepain.

Shrubs or small trees, simple or branched distally, 1–3 m tall, to 1.5 cm in diam.; upper stems, branches, and petioles sparsely or densely strigose. Dioecious or monoecious. Buds ovoid, 2–5 mm; scales triangular-ovate. Leaves opposite, subequal in size; stipules lanceolate, 7–10 mm; petiole 0.3–1.2 cm; leaf blade light green when dry, narrowly ovate, elliptic, or rarely oblong, 5–15 \times 2–8 cm, thickly papery, secondary veins 3 or 4 each side of midvein, abaxial surface with reticulate vein prominent, both surfaces sparsely appressed strigose, base subcordate or rounded, slightly oblique, margin serrulate, apex acuminate or shortly acuminate. Glomerules on axillary, densely congested, spikelike shoots, simple in distal part of twigs or in groups of 2 or more in axils of fallen leaves; male ones in lower axils, 4–6 cm; female ones in distal axils; bracts scarious, ovate, ca. 3 mm. Male flowers 4-merous, sessile; perianth lobes elliptic, 1.8–2 mm, densely puberulent, connate to middle; rudimentary ovule obovoid, ca. 0.4 mm. Fruiting perianth tube fusiform or narrowly rhomboid-obovoid, compressed, 1.8–2 mm, patent puberulent all over, base cuneate, apex long necked, 2- or 3-toothed. Fl. Mar–Apr, fr. Sep–Oct.

Secondary forests, sunny thickets; 400–1800 m. W Guangxi, S Guizhou, S Yunnan [Laos, Myanmar, Thailand, Vietnam].

The fibers are used to make ropes.

23. *Boehmeria ingjiangensis* W. T. Wang, Acta Bot. Yunnan. 3: 414. 1981.

盈江苕麻 ying jiang zhu ma

Shrubs ca. 3 m tall; branches inconspicuously 4-angled, glabrous but strigillose at nodes. Leaves opposite, subequal in size; stipules triangular-lanceolate, 7–10 mm; petiole 1.5–3 cm, strigillose or glabrescent; leaf blade lanceolate, 15–19 \times 4–5 cm, herbaceous, secondary veins 3 pairs along midvein, both surfaces glabrous, but sparsely appressed strigillose on veins, adaxial surface smooth, base rounded, slightly oblique, margin finely serrulate, apex long acuminate, tip serrulate. Glomerules on axillary, lax, spikelike shoots, each dichotomously forked at lowermost glomerule; male not known, female ones 10–16 cm. Fruiting perianth narrowly rhomboid-obovoid, compressed, ca. 1.2 mm, sparsely appressed puberulent on shoulder, base cuneate, stipitate, apex 2-toothed. Fl. Oct.

• Secondary forests; ca. 300 m. SW Yunnan.

24. *Boehmeria penduliflora* Weddell ex D. G. Long, Notes Roy. Bot. Gard. Edinburgh 40: 130. 1982.

长叶苕麻 chang ye zhu ma

Boehmeria macrophylla D. Don, Prodr. Fl. Nepal. 60. 1825, not Hornemann (1815), nor (Thunberg) Siebold & Zuccarini (1846).

Shrubs erect, sometimes with trailing branches, 1.5–4.5 m tall; branchlets 4-angled, 4-grooved, often densely strigillose. Dioecious or monoecious. Leaves opposite, slightly unequal in size; stipules narrowly triangular-lanceolate, 1.3–1.8 cm; petiole 0.6–3 cm, often strigillose; leaf blade lanceolate or linear-lanceolate, 5–29 \times 1.5–6.4 cm, thickly papery, secondary veins 3 or 4 pairs along midvein, abaxial surface sparsely or densely pubescent along veins, adaxial surface often strongly rugose, glabrous or sparsely strigillose, but roughened, base obtuse, rounded, or subcordate, margin minutely serrulate, teeth revolute, apex long acuminate or caudate. Glomerules on spikelike flowering shoots; female glomerules congested, 4–8 mm in diam.; male spikes often in pairs, in proximal axils, shorter than female spikes; female spikes unbranched, in distal axils, nodding, 4–32 cm. Male flowers 4-merous, sessile; perianth lobes elliptic, ca. 1.2 mm, sparsely puberulent, connate at base; rudimentary ovule ellipsoid, ca. 0.5 mm. Fruiting perianth tube narrowly cuneate, oblanceolate or fusiform, compressed, 1–2.2 mm, sparsely strigillose on shoulder, base with stipe ca. 1.2 mm, 2-toothed at apex of very short neck; achenes oblong-ovoid, ca. 0.5 mm, base long stipitate. Fl. Apr–Jun, fr. Jul–Oct.

Forest margins, along streams, thickets, valleys; 500–2000 m. SW Guangxi, SW Guizhou, SW Sichuan, SE Xizang, Yunnan [Bhutan, N India, Laos, Nepal, Myanmar, Sikkim, Thailand, Vietnam].

25. *Boehmeria densiflora* W. J. Hooker & Arnott, Bot. Beechey Voy. 271. 1838.

密花苕麻 mi hua zhu ma

Boehmeria hwaliensis Liu & Lu; *B. penduliflora* Weddell ex D. G. Long var. *loochooensis* (Weddell) W. T. Wang; *B. platyphylla* D. Don var. *loochooensis* Weddell.

Shrubs 1–2 m tall, dioecious or monoecious; branches often densely strigose. Dioecious or monoecious. Leaves opposite, subequal in size; stipules lanceolate, 5–8 mm, free or

sometimes connate at base; petiole 0.5–2.5 cm, often strigillose; leaf blade ovate to ovate-lanceolate, 5–19(–24) × 2–4(–6.4) cm, thinly papery, secondary veins 2 or 3 each side of midvein, abaxial surface pubescent along veins, adaxial surface sometimes slightly rugose, densely appressed strigillose, base ob-

tuse or broadly cuneate, margin flattened serrulate, apex acuminate. Glomerules on specialized axillary spikelike shoots; male shoots often paired, in proximal axils in monoecious plants, 3–10 cm; female spikes solitary, nodding, 4–18 cm. Male flowers 4-merous, sessile; perianth lobes elliptic, ca. 1.3 mm, sparsely puberulent, connate at base. Fruiting perianth fusiform or oblanceolate, compressed, 1–1.5 mm, sparsely strigillose on shoulder, base with stipe ca. 0.8 mm, apex with very short neck, attenuate, 2-toothed, stigma 0.7–1 mm. Fl. Apr–May; fr. Jun–Sep.

River banks, exposed rocky slopes, roadsides; 100–1200 m. Guangdong, Taiwan [Japan, Philippines].

