

21. DEBREGEASIA Gaudichaud-Beaupré, Voy. Bonite, Bot., Atlas, t. 90. 1844.

水麻属 shui ma shu

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

Leucocnides Miquel; Missiessya Weddell; Morocarpus Siebold & Zuccarini (1846), not Boehmer (1760).

Shrubs or small trees, without stinging hairs. Leaves alternate, petiolate; stipules deciduous, intrapetiolar, connate, membranous, 2-cleft; leaf blade thinly papery or papery, 3-veined, often snow white or silvery tomentose abaxially, margin serrulate; cystoliths punctiform. Inflorescences axillary, densely capitate clusters of unisexual flowers (plants monoecious or dioecious); glomerules solitary or pairs of dichotomously branched cymes. Male flowers: perianth lobes (3 or)4(or 5), slightly connate, valvate, often depressed-globose in bud, stamens (3 or)4(or 5); filaments inflexed in bud; rudimentary ovary obovoid, woolly at base. Female flowers: perianth tube obovoid or jug-shaped, mouth contracted, very minutely 3- or 4-toothed, in fruit often enlarged, fleshy, and adnate to ovary, rarely membranous and free; staminodes absent; style short; stigma penicillate, with tuft of long hairs; ovule orthotropous. Achenes somewhat drupaceous, obovoid, slightly compressed, closely enclosed by often fleshy, adnate perianth. Seeds with endosperm; cotyledons small, broad.

About six species: mainly in tropics and subtropics of E Asia, one species in N Africa and one in E Australia; all six species in China.

The stem fibers are used to make ropes and fishing nets, and the fruits are edible and used to make wine.

- 1a. Leaves broadly ovate, elliptic, or cordate; fruit enclosed by membranous perianth.
- 2a. Leaves usually elliptic; branches without leaf scars, spreading hirtellous 1. *D. elliptica*
- 2b. Leaves broadly ovate or cordate; branches with leaf scars, appressed pubescent.
 - 3a. Branches with fleshy, scale-like protuberances or warts; inflorescences to 3 cm; leaf margin denticulate, secondary veins in 3–5 pairs 2. *D. squamata*
 - 3b. Branches without protuberances or warts; inflorescences often more than 5 cm; leaf margin sinuate-dentate, secondary veins in 5–8 pairs 3. *D. wallichiana*
- 1b. Leaves lanceolate, sometimes narrowly ovate or oblong; fruit enclosed by succulent perianth.
 - 4a. Branches spreading pubescent; at least some inflorescences on current year's branches; flowering August to December 4. *D. longifolia*
 - 4b. Branches usually appressed pubescent; all inflorescences on branches of previous seasons; flowering February to April.
 - 5a. Leaves densely snow white tomentose abaxially, faintly fine veined; inflorescences often sessile 6. *D. saeneb*
 - 5b. Leaves gray tomentose abaxially, distinctly fine veined; inflorescences usually pedunculate 5. *D. orientalis*

1. *Debregeasia elliptica* C. J. Chen, Acta Phytotax. Sin. 21: 477. 1983.

Mixed forests in limestone mountains; 100–1900 m. SW Guangxi, SE Yunnan [N Vietnam].

椭圆叶水麻 tuo yuan ye shui ma

2. *Debregeasia squamata* King ex J. D. Hooker, Fl. Brit. India 5: 591. 1888.

鳞片水麻 lin pian shui ma

Debregeasia spiculifera Merrill.

Shrubs or small trees, 2–4 m tall; trunk to 12 cm d.b.h. Branchlets gray-green, turning brown, without leaf scars; branchlets and petioles densely, spreading hirtellous. Stipules narrowly ovate, 7–8 mm, 2-cleft to middle; petiole 4–7(–13.5) cm; leaf blade adaxially dark green, elliptic, 7–17 × 4.5–8 cm, thinly papery, 3-veined, lateral ones arcuate, reaching to distal 1/4, anastomosing with secondary veins 3 or 4 on each side distally, abaxial surface snow white tomentose, sparsely appressed strigose on veins, adaxial surface sparsely appressed strigose or subglabrous, sometimes rugose, base broadly cuneate or rounded, margin finely denticulate, apex acuminate or shortly acuminate. Female cymes borne on current and previous years' branches, 2–4-dichotomously branched, 1.5–3 × 1.5–3.5 cm; peduncle 1–2.5 cm, spreading hirtellous; glomerules globose, 2.5–3 mm in diam.; bracts narrowly ovate to lanceolate, 0.5–0.7 mm, membranous, densely pubescent abaxially. Female flowers sessile, obovoid, ca. 0.7 mm; perianth tube membranous, 3-ribbed, 3-denticulate at apex. Achene ca. 1 mm, enclosed by membranous perianth but not adnate to it. Fl. Aug–Sep, fr. Oct–Dec.

Shrubs, 1–2 m tall, monoecious. Branches stout, leaf scars conspicuous; branchlets greenish, aging brown, branchlets and branches with fleshy, spreading scale-like protuberances or warts and mixed appressed hairs; protuberances fleshy, ± recurved, 2–5 mm, hairs of branchlets and stipules reddish brown, appressed. Stipules lanceolate, 7–8 mm, 2-cleft in distal 1/3; petiole 2.5–7(–14) cm; leaf blade abaxially greenish gray, adaxially dark green, ovate or cordate, 6–16(–22) × 4–12(–18) cm, thinly papery, 3-veined, lateral ones arcuate, reaching to distal 1/4, anastomosing with lowest of secondary veins 3–5 on each side distally, abaxial surface thinly tomentose, adaxial surface sparsely appressed strigose, sometimes rugose, sparsely appressed pubescent on veins, base rounded or cordate, margin denticulate, apex shortly acuminate. Inflorescences borne on current and previous years' branches, 2–3-dichotomously branched, 1–3 cm; peduncle ca. 0.5 cm, spreading hirtellous; glomerules globose, 3–4 mm in diam.; bracts triangular-lanceo-

late, 0.6–1 mm, membranous, densely pubescent abaxially. Male flowers shortly pedicellate, globose in bud, ca. 1.2 mm in diam.; perianth lobes 3(or 4), broadly ovate, puberulent abaxially, connate at middle, acute; rudimentary ovary stipitate, obovoid, ca. 0.6 mm. Female flowers sessile, obovoid, ca. 0.6 mm; perianth tube membranous, 4-ribbed, 4-denticulate at apex. Achene ca. 1 mm, enclosed by membranous perianth but not adnate to it. Fl. Aug–Oct, fr. Oct–Dec(–Jan).

Thickets, valleys, shady, wet places; 100–1500 m. SW Fujian, Guangxi, Guangdong, S Guizhou, Hainan, S Yunnan [Malaysia, Thailand, Vietnam; N Borneo].

3. *Debregeasia wallichiana* (Weddell) Weddell, Monogr. Urtic. 464. 1857.

长序水麻 chang xu shui ma

Missiessya wallichiana Weddell, Ann. Sci. Nat., Bot., sér. 4: 195. 1854; *Debregeasia ceylanica* J. D. Hooker; *D. leucophylla* Weddell; *Morocarpus ceylanicus* (J. D. Hooker) Kuntze; *M. wallichianus* (Weddell) Blume.

Shrubs or small trees to 6 m tall, monoecious; trunk to 8 cm d.b.h.; bark brown. Branchlets stout, leaf scars conspicuous, 3–4 mm, smooth; branchlets and petioles appressed pubescent. Leaves crowded at apex of branchlets; stipules large, oblong-lanceolate, 12–20 × 2.5–5 mm, 2-cleft at apex; petiole 3–15 cm; leaf blade adaxially dark green, broadly ovate to orbicular, 7–18 × 6–16 cm, thinly papery, 3-veined, lateral ones straight, reaching to middle, anastomosing with lowest of secondary veins 5–8 on each side from middle of leaf, abaxial surface thinly white tomentose, sparsely appressed pubescent on veins, adaxial surface subglabrous or sparsely appressed strigose, sometimes rugose, base broadly cuneate, rounded or cordate, margin sinuate-dentate, apex shortly caudate or shortly acuminate. Inflorescences borne on current and previous years' branches, 3–7-dichotomously branched, 3.5–7.5 × 3–6.5 cm; peduncle 2.5–6.5 cm, spreading hirtellous; glomerules globose, 3–5 mm in diam.; bracts membranous, of male ones narrowly obovate to oblong-lanceolate, 0.5–0.8 mm, of female ones subcordate, 1–1.3 mm, densely pubescent abaxially. Male flowers shortly pedicellate, obovoid in bud 1 mm in diam.; perianth lobes 5, broadly ovate, glabrous abaxially, connate at the middle, apex acute; rudimentary ovary stipitate, obovoid, ca. 0.6 mm. Female flowers sessile, obovoid, ca. 0.7–0.8 mm; perianth tube membranous, 4-ribbed, 4-denticulate at apex. Achene ca. 1.3–1.5 mm, enclosed by membranous perianth but not adnate to it. Fl. May–Aug, fr. Jul–Sep.

Subtropical forests, slopes of limestone mountains; ca. 800 m. S Yunnan (Mengla) [E Bangladesh, Bhutan, Cambodia, India, N Myanmar, Nepal, Sikkim, Sri Lanka, Thailand].

4. *Debregeasia longifolia* (N. L. Burman) Weddell in Candolle, Prodr. 16(1): 235. 1869.

长叶水麻 chang ye shui ma

Urtica longifolia N. L. Burman, Fl. Indica, 197 [“297”]. 1768; *Conocephalus niveus* Wight; *Debregeasia dichotoma* (Blume) Weddell; *D. libera* Chien & C. J. Chen; *D. velutina* Gaudichaud-Beaupré; *Morocarpus dichotomus* (Blume) Blume;

M. longifolius (N. L. Burman) Blume; *M. velutinus* Blume; *Urtica angustata* Blume; *U. dichotoma* Blume.

Shrubs or small trees 3–6 m tall, dioecious or monoecious. Branchlets slender, reddish or purplish brown; branchlets and petiole densely spreading hirtellous. Stipules oblong-lanceolate, 6–10 mm, 2-cleft in distal 1/3; petiole 1–4 cm; leaf blade adaxially dark green, oblong- or obovate-lanceolate, sometimes linear or narrowly ovate, 7–18(–23) × 1.5–5(–6.5) cm, papery, sometimes thinly so, 3-veined, lateral ones straight, reaching to middle, secondary veins 5–8(–10) on each side from basal 1/3, anastomosing at margin, abaxial surface thinly greenish gray or gray-white tomentose, densely hirtellous on veins, adaxial surface sparsely appressed strigose, sometimes rugose, base rounded or subcordate, rarely broadly cuneate, margin finely serrulate or denticulate throughout, apex acuminate. Inflorescences borne on current and previous years' branches, 2–4-dichotomously branched, 1–2.5 cm; peduncle 0.3–3 cm, spreading hirtellous; glomerules globose, 3–4 mm in diam.; bracts triangular-ovate, ca. 1 mm, membranous. Male flowers shortly pedicellate, obovoid in bud, 1.2–1.5 mm in diam.; perianth lobes 4, broadly ovate, puberulent abaxially, connate at middle, apex acute; rudimentary ovary sessile, obovoid, ca. 0.5 mm. Female flowers sessile, obovoid, ca. 0.8 mm; perianth tube membranous, 4-denticulate at apex. Achene reddish or orange, ca. 1–1.5 mm, enclosed by fleshy perianth and adnate to it. Fl. Aug–Dec, fr. Sep–Feb.

Shady, moist places by streams, forests in mountain valleys; 500–3200 m. W Hubei, SE Gansu, W Guangdong, Guangxi, Guizhou, S Shaanxi, Sichuan, S Xizang, Yunnan [E Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, N Myanmar, Nepal, Philippines, Sikkim, Sri Lanka, Thailand, Vietnam].

This species is very common in SW China; its morphology is variable, especially in leaf shape and petiole length. The plant fibers are of high quality.

5. *Debregeasia orientalis* C. J. Chen, Novon 1: 56. 1991.

水麻 shui ma

Shrubs 1–4 m tall, often dioecious, rarely monoecious. Branchlets slender, branchlets and petioles dark reddish, often appressed pubescent or subglabrous. Stipules oblong-lanceolate, 6–8 mm, 2-cleft at apex; petiole 0.3–1 cm; leaf blade adaxially dark green, oblong- to linear-lanceolate, sometimes linear, 5–18(–25) × 1–2.5(–3.5) cm, papery or thinly so, 3-veined, lateral ones straight, reaching to middle, secondary veins 3–5 on each side from middle of leaf, anastomosing at margin, abaxial surface thinly greenish gray or gray-white tomentose, sparsely appressed pubescent on distinct veins, adaxial surface sparsely appressed strigose, often rugose, base rounded or broadly cuneate, margin finely serrulate or denticulate, apex acuminate. Inflorescences borne always on previous years' branches, often flowering before leaf flush, 1–2-dichotomously branched or solitary, 0.5–1.5 cm; peduncle 0–1.5 cm, appressed pubescent; glomerules globose, 3–5 mm in diam.; bracts obovate, ca. 2 mm, membranous. Male flowers shortly pedicellate, obovate in bud, 1.2–1.5 mm in diam.; perianth lobes (3 or 4), triangular-ovate, sparsely puberulent abaxially, connate at

base, apex acute; rudimentary ovary sessile, obovoid, ca. 0.5 mm. Female flowers sessile, obovoid, ca. 0.7 mm; perianth tube membranous, glabrous, 4-denticulate at apex. Achene orange, ca. 1 mm, enclosed by fleshy perianth and adnate to it. Fl. Feb–Apr, fr. May–Sep.

Shady, moist places by streams, in mountain valleys; 300–2800 m. Hubei, Hunan, S Gansu, Guangxi, Guizhou, S Shaanxi, Sichuan, Taiwan, SE Xizang, Yunnan [Bhutan, India, Japan, Nepal].

This species is very common in eastern China; it is a source of high-quality fiber.

6. *Debregeasia saeneb* (Forsskål) Hepper & Wood, *Kew Bull.* 38: 86. 1983.

柳叶水麻 liu ye shui ma

Rhus saeneb Forsskål, *Fl. Aegypt.-Arab.* 206. 1775; *Boehmeria salicifolia* D. Don; *Debregeasia bicolor* (Roxb.) Weddell; *D. salicifolia* (D. Don) Rendle; *Urtica bicolor* Roxburgh.

Shrubs or small trees 2–5 m tall, often dioecious. Branches dark purplish, young branchlets and petioles sparsely spreading hirtellous and mixed snow white tomentose. Stipules oblong-lanceolate, 6–10 mm, 2-cleft at apex, tomentose along veins abaxially; petiole 0.5–3 cm; leaf blade adaxially green, oblong to linear-lanceolate, sometimes linear, 5–15 × 1.5–4 cm, thinly papery or papery, 3-veined, lateral ones straight, reaching to middle, secondary veins 4–6 on each side from middle of leaf, anastomosing at margin, abaxial surface thickly snow-white tomentose, fine veins invisible, sometimes sparsely appressed pubescent on main and secondary veins, adaxial surface sparsely appressed strigose, sometimes rugose, base rounded, margin finely serrulate, apex acuminate. Inflorescences borne always on previous years' branches, often flowering before leaf flush, 1–2-dichotomously branched or solitary, 0.5–1 cm; peduncle 0–0.5 cm, appressed pubescent; glomerules globose, 4–6 mm in diam.; bracts obovate, ca. 2.5 mm, membranous. Male flowers shortly pedicellate, flattened in bud, 1.2–1.5 mm in diam.; perianth lobes (3 or)4, triangular-ovate, densely white tomentose abaxially, connate at base, apex acute; rudimentary ovary sessile, obovoid, ca. 0.5 mm. Female flowers sessile, obovoid, ca. 0.7 mm; perianth tube membranous, glabrous, 4-denticulate at apex. Achene orange, ca. 1 mm, stipitate at base, enclosed by fleshy perianth and adnate to it. Fl. Mar–Apr, fr. May–Jul.

Shady, moist places by streams, forests in mountain valleys; 1700–2300 m. SW Xinjiang, S Xizang [Afghanistan, Kashmir, Nepal; Iran, Yemen, Ethiopia].

