

96. WENDLANDIA Bartling ex Candolle, Prodr. 4: 411. 1830, nom. cons.,
not Willdenow (1799).

水锦树属 shui jin shu shu

Chen Tao (陈涛); Charlotte M. Taylor

Shrubs or trees, unarmed; branches sometimes flattened. Raphides absent. Leaves opposite or occasionally in whorls of 3, without or rarely with domatia, with margins rarely denticulate (apparently where scabrous projections form triangular thickenings), infrequently with venation not visible abaxially; stipules persistent or caducous as a whole or by fragmentation, interpetiolar, triangular to pandurate or leaflike (i.e., generally ovate and narrowed to a stipitate base), entire or rarely bilobed, erect and flat to longitudinally folded and/or spreading to reflexed. Inflorescences terminal, cymose, thyrsoid, or paniculiform, many flowered, sessile to pedunculate, bracteate. Flowers sessile or pedicellate, bisexual, monomorphic, often fragrant. Calyx limb 5-lobed. Corolla white, purple, or red, tubular, salverform, or funnelform, glabrous or pubescent inside, with top portion of tube often reflexed at anthesis; lobes (4 or)5, imbricate in bud, strongly reflexed to revolute at anthesis. Stamens (4 or)5, inserted in corolla tube near throat, partially to fully exerted; filaments short to developed; anthers dorsifixed, sometimes with connective prolonged in short apical and/or basal appendages. Ovary 2(or 3)-celled, ovules numerous in each cell on peltate axile placentas; stigma bifid or rarely clavate and shortly emarginate at apex (*Wendlandia pendula*), exerted. Fruit capsular, subglobose, loculicidally dehiscent across apical portion into 2 valves with valves later sometimes splitting septically, papery to woody, with calyx limb persistent; seeds numerous, small, compressed, sometimes narrowly winged; testa membranous, reticulate-striate; endosperm fleshy.

At least 90 species: mainly in tropical and subtropical Asia and a few in the Pacific region; 31 species (21 endemic) in China.

The flowers seem to open generally all at once on an individual plant and perhaps in the population. They are reported in several species to be strongly fragrant. W. C. Chen (in FRPS 71(1): 191. 1999) described the fruit as rarely septical, but this has not been reported by other authors and has not been seen on the specimens studied.

Wendlandia has been studied by several authors, notably in a comprehensive monograph by Cowan (Notes Roy. Bot. Gard. Edinburgh 16: 233–313, t. 232–235. 1932, with supplemental notes shortly afterward; Notes Roy. Bot. Gard. Edinburgh 18: 183–188. 1934) and then in treatments of the Chinese species by F. C. How (Sunyatsenia 7(1–2): 32–62. 1948) and later W. C. Chen (Acta Phytotax. Sin. 21: 277–284, 386–403. 1983).

Many *Wendlandia* species seem to be morphologically variable with much of the variation difficult to partition into distinct clusters, as discussed by Cowan (loc. cit. 1932). Cowan also evaluated characters used by various authors to distinguish species and concluded that many were variable and/or incorrectly interpreted, although he used several of these to distinguish infraspecific taxa. With more species known now, there also seems to be variation within species in some of the characters that Cowan considered reliable to distinguish species. W. C. Chen (loc. cit. 1983) used Cowan's characters to delimit some of his new species, but circumscribed other species to include a relatively wide range of variation in some of the same features (e.g., *W. pingpiensis*).

Cowan recognized four series and four subseries, distinguished by stigmas, anther, and stipule morphology as well as habit. These taxa were accepted by W. C. Chen in FRPS (loc. cit. 1999: 195, 196, 200, 202, 208, 218, 221); however, the classification following Cowan's treatment of several Chinese *Wendlandia* species described by recent authors is problematic because flowers are needed but are unknown for these. The key published by W. C. Chen (loc. cit. 1999: 192–195) closely follows that of Cowan except some leads were numbered incorrectly while others appear to be missing, and the updated information on morphological variation and geographic distribution was not added to the key so could be problematic to use. The key to *Wendlandia* species here follows that of W. C. Chen, to outline for reference the species distinctions in that treatment; however, it has been augmented with the new morphological and distributional information.

In addition to the species treated here, F. C. How (loc. cit.: 43) reported *Wendlandia ternifolia* Cowan provisionally from China based on *Tsang 21937*, *Liang 67941*, and *Zoo 69290*. However, W. C. Chen in FRPS (loc. cit. 1999: 192) commented that study of *Tsang 21937* showed the calyx to have stiff pubescence, which is inconsistent with the protologue description of *W. ternifolia*, while the other two specimens cited have no flowers in adequate condition for identification. Therefore, *W. ternifolia* was excluded from the Chinese flora; no new or alternative identification was given by Chen for these specimens.

- 1a. Most or all flowers with well-developed pedicels 2–6 mm; stipules triangular to broadly triangular, acute, cuspidate, or narrowly spatulate.
- 2a. Shrubs or trees; petioles 0.5–1.5 cm; corolla lobes 1–2.5 mm; anthers 0.8–2 mm, subsessile or with filaments less than 1 mm.
- 3a. Corolla with lobes ca. 1 mm, less than half as long as tube; anthers ca. 1 mm 12. *W. laxa*
- 3b. Corolla with lobes 1.5–2.5 mm, half as long as tube to ± equal to tube; anthers 1.2–2 mm.
- 4a. Leaves abaxially with secondary and higher order venation well marked; corolla white to yellow, with tube 1.5–4 mm 8. *W. formosana*
- 4b. Leaves abaxially with secondary and higher order venation hardly visible; corolla purplish red, with tube 2.3–3 mm 16. *W. longipedicellata*
- 2b. Low shrubs or sometimes trees up to 12 m tall; petioles 0.1–0.6 cm; corolla lobes 3.5–8 mm; anthers 2–3.5 mm, exerted on filaments 4–6 mm (*W. ser. Montigenae* Cowan).

- 5a. Shrubs or trees 1–12 m tall; leaves elliptic-oblong, oblong-lanceolate, oblanceolate, or elliptic, 3–14.5 cm, glabrous on both surfaces; stipules spatulate to lanceolate or leaflike (i.e., ovate and stipitate); Hainan 18. *W. merrilliana*
- 5b. Leaves elliptic-lanceolate, lanceolate, narrowly lanceolate, ovate, or suborbicular, 0.8–3 cm, pubescent on one or both surfaces; stipules triangular, lanceolate-triangular, or ovate; mainland.
- 6a. Leaves acute, shortly acuminate, or obtuse at apex, with secondary veins ca. 3 pairs, visible abaxially; calyx lobes linear-oblong, spatulate, or oblanceolate 15. *W. longidens*
- 6b. Leaves obtuse at apex, veins not visible abaxially; calyx lobes triangular or lanceolate 28. *W. subalpina*
- 1b. Flowers sessile to shortly pedicellate, with pedicels up to 2 mm; stipules variously shaped, generally triangular, spatulate, ovate, suborbicular, leaflike, or pandurate.
- 7a. Stipules triangular, ovate, broadly triangular, or leaflike, at apex acute, cuspidate, ligulate, or aristate, erect or slightly spreading with age.
- 8a. Leaves subsessile or shortly petiolate, petioles up to 3 mm.
- 9a. Leaves opposite or ternate, ovate to ovate-lanceolate, 1.8–4 cm wide, drying papery, margins not thickened nor edged with a vein; stigma clavate 22. *W. pendula*
- 9b. Leaves opposite, narrowly elliptic to narrowly lanceolate, 0.4–1.2 cm wide, drying thinly leathery, marginally edged with a thickened vein; stigma deeply bilobed 25. *W. salicifolia*
- 8b. Leaves petiolate, petioles 3–25 mm.
- 10a. Stipule apex prolonged, ligulate, 5–7 mm 9. *W. grandis*
- 10b. Stipule apex acute, cuspidate, or shortly acicular, 0.5–2 mm.
- 11a. Calyx lobes narrowly triangular to linear, 1–1.2 mm, equal or unequal on an individual flower with at least one of lobes longer than 1 mm.
- 12a. Petioles 0.8–1.2 cm; stipules ca. 5 mm; corolla lobes ca. 1 mm 6. *W. cavaleriei*
- 12b. Petioles 0.8–1.5 cm; stipules 2–3 mm; corolla lobes 1.5–2.2 mm 13. *W. ligustrina*
- 11b. Calyx lobes lanceolate, triangular, or spatulate, 0.3–1.2 mm, equal or subequal.
- 13a. Leaves strigillose to puberulent on both surfaces; corolla tube 8.5–11 mm 1. *W. aberrans*
- 13b. Leaves strigillose, puberulent, tomentulose, villous, or glabrescent on both surfaces; corolla tube 1.5–4 mm.
- 14a. Calyx lobes 0.3–0.5 mm 8. *W. formosana*
- 14b. Calyx lobes 0.8–1 mm.
- 15a. Inflorescences smaller, 5–6 × 3–6 cm; calyx glabrous or sparsely villosulous; leaves sparsely pubescent to glabrous abaxially 4. *W. brevipaniculata*
- 15b. Inflorescences larger, 9–17 × 6–22 cm; calyx glabrous to densely pilosulous, hirtellous, or villosulous; leaves glabrous to strigillose, tomentose, or villous abaxially.
- 16a. Inflorescences 9–17 × 9–22 cm; corolla outside with tubes and lobes variously glabrous, strigillose, and/or villosulous (including glabrous on tube and densely villosulous on lobes in subsp. *affinis*) 29. *W. tinctoria*
- 16b. Inflorescences 9–12 × 6–11 cm; corolla outside glabrous on tube and densely villosulous or hirtellous on lobes 31. *W. villosa*
- 7b. Stipules triangular, ovate, suborbicular, leaflike, or pandurate, with apex obtuse, rounded, shortly acuminate, 2-lobed, or ligulate and usually spreading to reflexed.
- 17a. Anthers linear-lanceolate, 1.3–2 mm, exserted from corolla on developed filaments; corolla 7–9.4 mm; capsule 2.5–3 mm in diam. (*W. ser. Euexsertae* Cowan p.p., *W. subser. Orbiculares* Cowan) 27. *W. speciosa*
- 17b. Anthers lanceolate or elliptic, 0.5–1.7 mm, partially included, sessile or with filaments less than 1 mm; corolla 2–13.5 mm; capsule 1–2.5 mm in diam. (fruit unknown in *W. augustinii*, *W. erythroxyton*, *W. myriantha*, *W. parviflora*, *W. pubigera*) (*W. ser. Wendlandia* p.p., *W. subser. Paniculatae* Cowan).
- 18a. Leaves abaxially densely strigose or sericeous along midrib; inflorescences smaller, 4–10.5 × 3–10 cm; corolla 11.5–13.5 mm, red or purple; capsule 2–2.5 mm in diam. 3. *W. bouvardioides*
- 18b. Leaves abaxially glabrous, glabrescent, or sparsely to densely strigillose, puberulent, pilosulous, tomentose, hispidulous, or hirtellous; inflorescences often larger, 4–30 × 4–25 cm; corolla 2–6 mm, white, pale green, pale yellow, or yellowish green; capsule 1–2 mm in diam. (unknown in *W. augustinii*, *W. erythroxyton*, *W. myriantha*, *W. parviflora*, *W. pubigera*).
- 19a. Corolla tube 1–1.5 mm, with lobes equal to, longer than, or sometimes slightly shorter than tube; leaves 5–17 × 2–8.5 cm.
- 20a. Leaves glabrescent or sparsely strigillose to pilosulous abaxially; Guangdong, Guangxi 5. *W. brevituba*
- 20b. Leaves densely ferruginous pubescent abaxially; Yunnan 21. *W. parviflora*
- 19b. Corolla tube 2–5 mm, with lobes clearly shorter than tube; leaves 3–26 × 1.5–14 cm.

- 21a. Leaves drying leathery, abaxially with secondary veins plane and tertiary venation hardly or not visible.
- 22a. Calyx densely hirtellous 14. *W. litseifolia*
- 22b. Calyx glabrous to sparsely strigillose 20. *W. oligantha*
- 21b. Leaves drying papery to leathery, abaxially with secondary veins raised and tertiary venation easily visible and usually also raised (i.e., most common condition).
- 23a. Calyx glabrous to sparsely puberulent, with lobes 1.2–2 mm, entire to ciliate.
- 24a. Calyx lobes 1.2–2 mm; corolla tube 2–3.5 mm; Guangdong, Hainan 10. *W. guangdongensis*
- 24b. Calyx lobes 1.2–1.5 mm; corolla tube 2.5–4 mm; Guangxi, Taiwan.
- 25a. Leaves entire or scabrous to denticulate marginally; stipules entire; Taiwan 7. *W. erythroxyton*
- 25b. Leaves entire, smooth or ciliate marginally; stipules entire or 2-lobed; Guangxi 19. *W. myriantha*
- 23b. Calyx with hypanthium portion and limb glabrous, glabrescent, or pilosulous, puberulent, tomentose, hirtellous, pilose, strigose, or strigillose, with lobes 0.3–1 mm.
- 26a. Leaves abaxially moderately to densely hirtellous, strigillose, pilosulous, pilose, or strigose with pubescence on lamina spreading and/or partly obscuring its surface.
- 27a. Leaves scaberulous on lamina adaxially; stipules usually equal to or only slightly wider than stem; corolla inside with short trichomes confined to lower to upper part of tube; Yunnan 26. *W. scabra*
- 27b. Leaves sparsely hirtellous, hispidulous or scaberulous adaxially; stipules usually twice or more as wide as stem; corolla hirsute inside upper part of tube and throat 30. *W. uvariifolia*
- 26b. Leaves abaxially glabrous to sparsely strigillose or hispidulous on lamina and strigillose to moderately hispidulous or hirtellous on principal veins.
- 28a. Leaves abaxially glabrous on lamina and sparsely strigillose and/or hirtellous on principal veins; Taiwan 17. *W. luzoniensis*
- 28b. Leaves abaxially glabrous to hispidulous or strigillose; mainland.
- 29a. Stipules with apex ligulate, obtuse, often longitudinally folded 9. *W. grandis*
- 29b. Stipules with apex oblanceolate to suborbicular, folded to usually flat.
- 30a. Corolla tube 4–5 mm; Yunnan.
- 31a. Stipules with apical portion 3–4 mm wide; leaves with secondary veins 7–9 pairs 2. *W. augustinii*
- 31b. Stipules with apical part broad, ca. 10 mm wide; leaves with secondary veins 7–13 pairs 23. *W. pingpienensis*
- 30b. Corolla tube 2–3 mm.
- 32a. Leaves smaller, 7–10.5 × 2–4 cm, abaxially glabrous on lamina and sparsely pubescent only on veins; secondary veins 7 or 8 pairs; Yunnan 11. *W. jingdongensis*
- 32b. Leaves larger, 14.5–18 × 6–7 cm, abaxially glabrous to sparsely pubescent on lamina with pubescence denser along veins; secondary veins 10 or 11 pairs; Guangxi 24. *W. pubigera*

1. *Wendlandia aberrans* F. C. How, Sunyatsenia 7(1–2): 44. 1948.

广西水锦树 *guang xi shui jin shu*

Shrubs, 1–3 m tall; branches terete, yellowish brown, densely adpressed ferruginous hirsute. Leaves opposite; petiole 3–10 mm, appressed yellowish brown pubescent; blade drying papery and reddish yellow, oblong-elliptic or ovate-elliptic, 5–16 × 2–5.8 cm, adaxially adpressed puberulent with pubescence denser along midrib, abaxially sparsely puberulent with pubescence denser along principal veins, base cuneate or acute, apex shortly caudate-acuminate or acute; secondary veins 6–12 pairs; stipules late deciduous to persistent, triangular, 3–5 mm, yellowish brown pubescent becoming glabrescent, cuspidate. Inflorescences congested-paniculate, narrowly pyramidal in outline, 5–10 × 3–8 cm, appressed ferruginous pubescent, tripartite and sessile or pedunculate; bracts leaflike or filiform. Flowers subsessile to shortly pedicellate. Calyx grayish white pilosulous or hirtellous; hypanthium portion subglobose, 0.8–1.2 mm; limb lobed nearly to base; lobes lanceolate to triangular, 0.7–1.2 mm. Corolla reddish white, slenderly funnelform, glabrous outside; tube 8.5–11 mm, sparsely white villous at middle inside;

lobes oblong-ovate, 1.5–2 mm. Anthers linear-oblong, 1–1.7 mm, subsessile, partially exerted. Stigma 2-lobed, ca. 0.8 mm. Capsules not seen. Fl. Apr–Dec.

- Forests on hill slopes; 900–1200 m. Guangxi (Napo).

W. C. Chen's key (in FRPS 71(1): 192. 1999) described the leaves of this species as hispidulous on both surfaces, but this conflicts with the protologue and Chen's species description.

2. *Wendlandia augustinii* Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 298. 1932.

思茅水锦树 *si mao shui jin shu*

Shrubs, 2–3 m tall; branches terete, densely tomentulose to hirtellous becoming glabrescent. Leaves opposite; petiole 5–15 mm, densely tomentulose; blade drying papery, elliptic or elliptic-ovate, 9–15.5 × 2–6 cm, adaxially sparsely hispidulous to glabrous on lamina and sparsely to densely puberulent on principal veins, abaxially sparsely strigillose to hispidulous, base cuneate to acute, apex acute to acuminate; secondary veins 7–9 pairs; stipules generally persistent, pandurate, 5–7 × 3–4 mm, densely hirtellous, pilosulous, or strigillose, apically spreading,

obtuse to rounded. Inflorescences paniculate, pyramidal in outline, 11–12 × 11–14 cm, branched to 2 or 3 orders, densely pilosulous to strigillose, pedunculate; peduncle 0.8–1.5 cm; bracts linear to narrowly lanceolate, 1–1.5 mm. Flowers sessile or subsessile. Calyx densely pilosulous to puberulent; hypanthium portion ellipsoid to turbinate, 0.8–1.2 mm; limb deeply lobed; lobes triangular, ca. 0.3 mm. Corolla white, funnelform, outside glabrous; tube 4–5 mm, inside glabrous or puberulent in throat; lobes ovate, 0.6–1 mm. Anthers elliptic, subsessile, ca. 0.8 mm, partially exserted. Stigma bilobed, ca. 0.4 mm. Capsules not seen.

- Forests on mountains; ca. 1300 m. Yunnan (Simao).

3. *Wendlandia bouvardioides* Hutchinson in Sargent, Pl. Wilson. 3: 393. 1916.

薄叶水锦树 bao ye shui jin shu

Shrubs or small trees, 1–5 m tall; branches terete, densely strigose to hirsute. Leaves opposite; petiole 0.4–1.2 cm, strigose to strigillose; blade drying thinly papery, elliptic, narrowly elliptic, or lanceolate, 5–20 × 1.2–5.5 cm, adaxially strigillose on principal veins and glabrescent on lamina, abaxially glabrescent on lamina, strigose to sericeous on principal veins, and strigillose on higher order veins, base acute to attenuate, apex long acuminate; secondary veins 5–8 pairs; stipules deciduous, suborbicular, ovate, or leaflike, 3–5 × 3.5–5 mm, strigose to glabrescent, base shortly stipitate, apex spreading to reflexed, obtuse to shortly acuminate. Inflorescences congested-cymose or thyrsoid, cylindrical in outline, branched to 1 or 2 orders, 4–10.5 × 3–10 cm, densely strigose, hirsute, or strigillose, subsessile to pedunculate; peduncle to 1 cm; bracts subulate, linear, narrowly triangular, or lanceolate, 1–5 mm; pedicels to 1 mm. Flowers subsessile to pedicellate. Calyx densely strigillose; hypanthium portion turbinate, ca. 1 mm; limb deeply lobed; lobes lanceolate to narrowly triangular, 0.3–1.5 mm, unequal on an individual flower (this entire size range found on one flower). Corolla red or purple, salverform or tubular, outside glabrous; tube 10–11 mm; lobes oblong to lanceolate, 1.5–2.5 mm, obtuse to rounded. Anthers lanceolate, 1–1.7 mm, partially exserted, subsessile. Stigma 2-lobed, 0.3–0.5 mm. Capsules globose, 2–2.5 mm in diam., strigillose. Fl. Feb–Dec, fr. May–Dec.

- Thickets or forests in valleys, on mountain slopes, or at stream-sides; 1200–1800 m. Yunnan.

This species seems to have been grouped together with *Wendlandia* species with relatively long, fully exserted anthers by W. C. Chen (in FRPS 71(1): 192–193. 1999), but it actually has relatively short fat anthers that are not exserted, as noted in the protologue.

4. *Wendlandia brevipaniculata* W. C. Chen, Acta Phytotax. Sin. 21: 386. 1983.

吹树 chui shu

Trees; branches subterete, yellowish brown velutinous or mealy pubescent. Leaves opposite; petiole 0.8–1.2 cm, puberulent; blade drying leathery, elliptic or ovate-elliptic, 4.5–10.5 × 2.5–4.5 cm, sparsely pubescent to glabrescent on both surfaces with pubescence denser along principal veins, base cuneate to obtuse, apex abruptly shortly acuminate or acute; secondary

veins 8–10 pairs; stipules generally persistent, triangular to ovate, ca. 4 mm, puberulent to strigillose, apex cuspidate, erect. Inflorescence paniculate, subglobose, 5–6 × 3–6 cm, densely tomentose or strigillose to glabrescent, sessile and tripartite or pedunculate; peduncle 0.8–1.8 cm; bracts lanceolate to linear, 1–5 mm. Flowers subsessile. Calyx glabrous or sparsely villosulous; hypanthium subglobose, ca. 0.8 mm; limb lobed nearly to base; lobes lanceolate, ca. 0.8 mm. Corolla tubular-salverform, outside glabrous or villosulous on lobes; tube 2–3 mm, white hirsute inside; lobes elliptic, ca. 1 mm. Filaments ca. 0.8 mm; anthers elliptic, ca. 0.8 mm, partially exserted. Stigma 2-lobed, ca. 0.2 mm. Capsules globose, ca. 2 mm in diam., puberulent, villosulous, or subglabrous. Fl. and fr. Sep.

- Forests; 200–300 m. Yunnan (Jingdong).

5. *Wendlandia brevituba* Chun & F. C. How ex W. C. Chen, Acta Phytotax. Sin. 21: 397. 1983.

短筒水锦树 duan tong shui jin shu

Shrubs, 0.5–3 m tall; branches flattened to terete, densely hirtellous, pilosulous, or strigillose. Leaves opposite; petiole 0.3–1.5 cm, densely hirtellous or pilosulous; blade drying papery, elliptic-oblong, elliptic-ovate, or elliptic, 5–15 × 2–6.3 cm, adaxially glabrous or sparsely strigillose on lamina and densely strigillose on principal veins, abaxially sparsely strigillose to glabrous on lamina and densely strigillose to pilosulous on principal veins, base cuneate, apex acuminate to shortly acuminate; secondary veins 4–8 pairs; stipules deciduous, suborbicular, elliptic, or pandurate, 2–6 × 1.5–4 mm, moderately to densely strigillose, spreading at apex to fully reflexed, apex obtuse to rounded. Inflorescences rather laxly paniculate, pyramidal in outline, branched to 1 or 2 orders, 4–7 × 4–11 cm, densely pilosulous to hirtellous, sessile and tripartite or pedunculate; peduncle 0.3–3.5 cm; bracts linear to triangular, 0.3–1 mm. Flowers subsessile. Calyx densely strigillose to pilosulous; hypanthium portion subglobose, ca. 0.8 mm; limb deeply lobed; lobes lanceolate to triangular, 0.5–1 mm. Corolla white, tubular or salverform, sparsely pilosulous or glabrous outside; tube 1–1.5 mm, sparsely pubescent or glabrescent inside; lobes oblong-ovate or subovate, 1–1.5 mm, rounded to obtuse. Anthers elliptic, ca. 0.8 mm, subsessile, partially exserted. Stigma bifid, ca. 1 mm. Capsules subglobose, 1–1.5 mm in diam., pilosulous. Fl. Apr–May, fr. Jun–Dec.

- Forests in valleys; 100–900 m. Guangdong, Guangxi.

6. *Wendlandia cavaleriei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 10: 434. 1912.

贵州水锦树 gui zhou shui jin shu

Wendlandia feddei H. Léveillé.

Shrubs or small trees, 1.5–3 m tall; branches brown, subterete, strigillose to glabrescent. Leaves opposite; petiole 0.8–1.2 cm, strigillose; blade drying subleathery, ovate, elliptic, or oblanceolate-elliptic, 4.5–13.5 × 2–6 cm, adaxially glabrous to sparsely strigillose on lamina and sparsely pubescent along midrib, abaxially sparsely hirsute with pubescence denser along veins, base obtuse to acute, apex acute or acuminate; secondary

veins 7–10 pairs; stipules generally persistent, broadly triangular, ca. 5 mm, strigillose, apex erect, cuspidate. Inflorescence paniculate, pyramidal to ovate in outline, 7–21 × 6–15 cm, densely many flowered, branched to 2 or 3 orders, densely yellowish brown pilosulous, sessile and tripartite or pedunculate; peduncle 1–6 cm; bracts triangular, 1–3 mm. Flowers sessile. Calyx densely hirtellous to pilosulous; hypanthium portion subglobose, ca. 1 mm; limb deeply lobed; lobes narrowly triangular, 1–1.2 mm. Corolla white or purple, tubular-funnelform, glabrous to pilosulous; tube ca. 3.5 mm, inside white villosulous; lobes ovate to elliptic, ca. 1 mm. Anthers elliptic, ca. 0.8 mm, subsessile, partially exerted. Stigma 2-lobed, ca. 0.7 mm. Capsules globose, ca. 1.5 mm in diam., pilosulous. Fl. Mar–Apr, fr. Apr.

• Forests or thickets on hill slopes; 200–700 m. Guangxi (Tianyang), Guizhou.

W. C. Chen (in FRPS 71(1): 203. 1999) described the corollas as glabrous outside, but Cowan (Notes Roy. Bot. Gard. Edinburgh 16: 263–264. 1932) specifically noted that the corollas of *Wendlandia cavaleriei* vary from glabrous to pubescent in China, as described here.

7. *Wendlandia erythroxylo* Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 299. 1932.

红木水锦树 hong mu shui jin shu

Trees, ca. 7 m tall; wood firm, red; branches quadrate, brownish gray, moderately to densely mixed pubescent, hirsute and pilosulous, sometimes becoming glabrescent. Leaves opposite; petiole 0.5–1 cm, moderately to densely strigillose to hirtellous; blade drying leathery or papery, elliptic-ovate, obovate, or ovate, 5–12 × 3–5.5 cm, adaxially sparsely strigillose or hirtellous to glabrescent, abaxially sparsely to moderately hirtellous with pubescence denser along principal veins, base obtuse to acute, margins scaberulous to denticulate, apex acute to acuminate; secondary veins 6 or 7 pairs; stipules generally persistent, suborbicular to pandurate, 5–8 × 4–5.5 mm, sparsely to densely strigillose or strigose basally and glabrescent above, apex usually spreading to reflexed, obtuse to rounded. Inflorescence rather laxly paniculate, 5–13 × 3–12.5 cm, sparsely to densely hirtellous to hirsute, tripartite and sessile or pedunculate; peduncle 1–6 cm; bracts ligulate to lanceolate or narrowly elliptic, 1.2–5 mm, often glabrescent. Flowers sessile or subsessile. Calyx glabrous or sparsely pilose; hypanthium portion subglobose to ellipsoid, ca. 0.8 mm; limb lobed nearly to base; lobes ovate-oblong to ligulate, ca. 1.2 mm, ciliate. Corolla tubular to salverform, glabrous outside; tube 2.5–3 mm, in throat white hirsute; lobes ovate, 1–1.2 mm. Anthers elliptic, ca. 0.8 mm, subsessile, partially exerted. Stigma ca. 0.5 mm, 2-lobed. Capsules unknown. Fl. Apr–Oct.

• Forests on hills of low elevations. Taiwan.

The leaf margins of the specimens seen are denticulate, with the teeth apparently scabrosities rather than dentate mesophyll tissue.

8. *Wendlandia formosana* Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 247. 1932.

水金京 shui jin jing

Shrubs or trees, 2–8 m tall; branches flattened to terete,

densely puberulent to glabrescent, reddish brown to gray. Leaves opposite; petiole 0.7–2.5 cm, thinly puberulent or glabrous; blade drying papery, elliptic or elliptic-lanceolate, 6–14 × 2–6.5 cm, both surfaces glabrescent or sparsely to densely puberulent or strigillose at least on principal veins, base acute to obtuse, apex acute to acuminate; secondary veins 5–10 pairs; stipules generally persistent, broadly triangular, 2–3.5 mm, densely strigillose to puberulent, apex erect, acute, cuspidate, or sometimes narrowly spatulate. Inflorescences paniculate, pyramidal in outline, 12–20 × 10–20 cm, branched to 2 or 3 orders, densely puberulent to strigillose, sessile and tripartite or pedunculate; peduncle 2–4 cm; bracts linear, spatulate, or narrowly elliptic, 1–6 mm; pedicels 0.5–4 mm. Flowers subsessile to pedicellate. Calyx glabrous; hypanthium portion subglobose, ca. 0.8 mm; limb lobed nearly to base; lobes triangular, 0.3–0.5 mm, sometimes ciliolate. Corolla white to yellow, funnelform, glabrous outside; tube 1.5–4 mm, villosulous in throat; lobes spatulate, 1.5–2.5 mm. Filaments ca. 0.8 mm; anthers linear-lanceolate, ca. 2 mm, partially exerted. Stigma 2-lobed, ca. 0.8 mm. Capsules globose, 1.8–2 × 2–2.2 mm, glabrous. Fl. Apr–Jun, fr. May–Dec.

Thickets or forests at low elevations or on hills or mountains; 200–1600 m. Guangdong, Guangxi, Taiwan, Yunnan [Japan (Ryukyu Islands), Vietnam].

- 1a. Leaf secondary veins 7–10 pairs, closely set, usually prominent abaxially; corolla 3–5 mm, with tube slightly longer than lobes 8a. subsp. *breviflora*
- 1b. Leaf secondary veins 5–9 pairs, rather well spaced, prominulous abaxially; corolla 5–6.5 mm, with tube markedly longer than lobes 8b. subsp. *formosana*

8a. *Wendlandia formosana* subsp. *breviflora* F. C. How, Sunyatsenia 7(1–2): 38. 1948.

短花水金京 duan hua shui jin jing

Leaf secondary veins 7–10 pairs, closely set, usually prominent abaxially. Corolla tube 1.5–3 mm, lobes 1.5–2 mm. Fl. Apr–Jun, fr. May–Dec.

Thickets or forests on hills or mountains; 200–1600 m. Guangdong, Guangxi, Yunnan [Vietnam].

8b. *Wendlandia formosana* subsp. *formosana*

水金京(原亚种) shui jin jing (yuan ya zhong)

Secondary veins 5–7 pairs in leaves of flowering branches, 5–9 pairs in leaves of vegetative branches (*Isang 23991*, MO), rather well spaced, prominulous abaxially. Corolla tube 3–4 mm; lobes 2–2.5 mm. Fl. Apr–Jun, fr. Jun–Aug.

Forests on hills at low elevations; 200–500 m. Taiwan [Japan (Ryukyu Islands)].

9. *Wendlandia grandis* (J. D. Hooker) Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 261. 1932.

西藏水锦树 xi zang shui jin shu

Wendlandia tinctoria (Roxburgh) Candolle var. *grandis* J.

D. Hooker, Fl. Brit. India 3: 38. 1880.

Trees, 3–4 m tall; branches brown, fissured, strigillose to glabrescent. Leaves opposite; petiole 0.5–1.5 cm, strigillose; blade drying leathery or thickly papery, elliptic, elliptic-oblong, or obovate-oblong, 5–17 × 2.5–7 cm, adaxially glabrous or sparsely strigillose, abaxially glabrous or sparsely pubescent on lamina, sparsely hispidulous along veins, and with pubescence denser along midrib, base cuneate or acute, apex acute or shortly acuminate; secondary veins 8–12 pairs; stipules generally persistent, triangular to ovate, 9–12 mm, strigillose, apex erect to spreading, ligulate, 5–7 mm, often longitudinally folded. Inflorescences paniculate, ovoid, 9–17 × 5–15 cm, densely brown hirsute; bracts lanceolate, ca. 5 mm. Flowers sessile. Calyx densely brown hirtellous; hypanthium portion ca. 1 mm; limb deeply lobed; lobes lanceolate, 0.5–1 mm. Corolla white, funnelform, glabrous outside; tube ca. 4 mm, white hirsute inside; lobes triangular, 1–1.2 mm. Anthers elliptic, ca. 0.8 mm, subsessile, partially exerted. Stigma 2-lobed. Capsules subglobose, ca. 2 mm in diam., pubescent. Fl. and fr. Aug.

Evergreen forests, secondary forests; 700–1300 m. Xizang (Mé-dog) [Bangladesh, Bhutan, India, Myanmar, Nepal].

Springate et al. (Fl. Bhutan 2(2): 754. 1999) described the leaf size of plants from Bhutan as 10–24 × 5–11 cm and the corolla tubes there as 2.5–5 mm; these measurements might be found in Chinese plants.

10. *Wendlandia guangdongensis* W. C. Chen, Acta Phytotax. Sin. 21: 393. 1983.

广东水锦树 *guang dong shui jin shu*

Shrubs or trees, 4–6 m tall; branches terete, moderately to densely hirsute. Leaves opposite; petiole 0.3–1.2 cm, moderately to densely hirtellous; blade drying thickly papery, lanceolate-oblong or ovate-elliptic, 7–16 × 3–8.5 cm, adaxially sparsely strigillose or puberulent to glabrescent on lamina and moderately to densely strigillose or hirtellous on principal veins, abaxially sparsely to moderately hirtellous throughout, base rounded to obtuse, apex obtuse, shortly acuminate, or acute; secondary veins 7–11 pairs; stipules generally persistent, pandurate, 5–6 × 4–6 mm, glabrescent, with upper part spreading to reflexed, apex rounded to obtuse. Inflorescences paniculate, branched to 2 or 3 orders, 13–17 × 10–20 cm, densely hirtellous to hirsute, pedunculate; peduncle 1–2 cm; bracts narrowly elliptic to oblanceolate, 1.5–3 mm. Flowers sessile in glomerules. Calyx glabrous; hypanthium portion subglobose, ca. 0.8 mm; limb divided nearly to base; lobes lanceolate or narrowly oblong, 1.2–2 mm, sparsely to densely ciliate. Corolla white or greenish yellow, tubular to salverform, glabrous outside; tube 2–3.5 mm, in throat white hirsute; lobes suborbicular, ca. 1 mm. Anthers elliptic, ca. 0.7 mm, subsessile, partially exerted. Stigma 2-lobed, ca. 0.3 mm. Capsules subglobose, ca. 1.5 mm in diam., glabrous. Fl. Mar–Apr, fr. May.

• Thickets or forests in ravines or on hill slopes; 100–800 m. Guangdong, Hainan.

The ciliate filaments on the margins of the calyx lobes give the appearance of pilose pubescence on all of the calyx at first glance, but when teased apart the individual hypanthia on the material seen are completely glabrous.

11. *Wendlandia jingdongensis* W. C. Chen, Acta Phytotax. Sin. 21: 396. 1983.

景东水锦树 *jing dong shui jin shu*

Shrubs, ca. 3 m tall; branches pubescent. Petiole 0.7–1 cm, pubescent; leaf blade drying leathery, lanceolate-elliptic, 7–10.5 × 2–4 cm, adaxially glabrous or sparsely puberulent along veins, abaxially sparsely pubescent along veins and glabrous on lamina, base cuneate or acute, apex acuminate; secondary veins 7 or 8 pairs; stipules pandurate, as wide as or wider than branchlets, apex erect, rounded. Inflorescences 9–15 × 10–15 cm, densely brown hirsute. Flowers sessile. Calyx pubescent; lobes lanceolate. Corolla pale yellow, glabrous outside; tube 2.5–3 mm, white hirsute inside; lobes ca. 0.5 mm. Anthers elliptic, ca. 0.6 mm, subsessile, partially exerted. Stigma bifid. Capsules subglobose, ca. 1.5 mm in diam., densely pubescent. Fl. and fr. May.

• Forests on mountains; ca. 1700 m. Yunnan (Jingdong).

12. *Wendlandia laxa* S. K. Wu ex W. C. Chen, Acta Phytotax. Sin. 21: 390. 1983.

疏花水锦树 *shu hua shui jin shu*

Small trees, 5–8 m tall; branches mealy puberulent. Petiole 0.7–1.5 cm, glabrescent; leaf blade drying papery to thinly leathery, lanceolate-elliptic to elliptic, 4.5–13 × 2–5 cm, both surfaces glabrous throughout or puberulent on principal veins, base acute to obtuse, apex acute to shortly acuminate; secondary veins 6 or 7 pairs; stipules persistent, broadly triangular, 2.4–4.5 mm, glabrescent, apex erect, cuspidate. Inflorescences paniculate, pyramidal, 13–22 × 12–18 cm, densely puberulent; pedicels 2–4.5 mm. Flowers pedicellate. Calyx puberulent to glabrous; hypanthium portion turbinate; limb lobed nearly to base; lobes ovate. Corolla white, tubular-salverform, outside puberulent to glabrous; tube 3.5–4 mm, sparsely puberulent inside; lobes subrounded, ca. 1 mm. Anthers elliptic, ca. 0.8 mm, partially exerted. Stigma 2-lobed. Capsules subglobose, glabrescent. Fl. Nov, fr. Jul, Dec.

• Mixed forests; 500–1000 m. Yunnan (Jingdong).

13. *Wendlandia ligustrina* Wallich ex G. Don, Gen. Hist. 3: 518. 1834.

小叶水锦树 *xiao ye shui jin shu*

Shrubs, 1.5–3 m tall; branches flattened to quadrangular, strigillose to glabrescent. Leaves opposite; petiole 0.8–1.5 cm, strigillose to glabrescent; blade drying leathery, dark brown adaxially, reddish brown abaxially, elliptic or elliptic-ovate, 3–12 × 1.5–6 cm, adaxially glabrous, abaxially glabrescent to sparsely strigillose or puberulent at least along principal veins, base cuneate and sometimes shortly decurrent, apex acute or obtuse; secondary veins 6–8 pairs; stipules generally persistent, broadly triangular, 2–3 mm, strigillose to glabrescent, apex erect, cuspidate. Inflorescences paniculate, pyramidal, 15–17 × 12–20 cm, branched to 2 or 3 orders, densely hirtellous to strigillose, sessile and tripartite or pedunculate; peduncle 2–3 cm; bracts 1.5–6 mm; pedicels to 1 mm. Flowers sessile to shortly pedicellate. Calyx moderately to sparsely strigillose; hypanthi-

um portion ellipsoid, ca. 1 mm; limb lobed nearly to base; lobes narrowly triangular to linear, 1–1.5 mm, generally unequal on an individual flower. Corolla yellow or pale yellowish green, salverform to tubular-funnelform, glabrous outside; tube 3.5–5 mm, pilose in throat; lobes narrowly oblong to spatulate, 1.5–2.2 mm. Filaments ca. 1 mm; anthers linear-lanceolate, 1.2–1.5 mm, partially exerted. Stigma 2-lobed, ca. 1 mm. Capsules subglobose, ca. 2 mm, strigillose. Fl. Jun–Feb of following year.

Forests in valleys; 1500–1600 m. Guizhou (Qinglong), Yunnan [Myanmar].

14. *Wendlandia litseifolia* F. C. How, *Sunyatsenia* 7(1–2): 46. 1948.

木姜子叶水锦树 mu jiang zi ye shui jin shu

Trees, ca. 10 m tall; branches terete to subquadrangular, densely brown hirtellous to glabrescent. Leaves opposite; petiole 0.5–1.2 cm, densely hirtellous to strigillose; blade drying subleathery, obovate, obovate-elliptic, or rarely elliptic, 6.4–11.5 × 3–6.5 cm, adaxially sparsely hispidulous to puberulent with pubescence denser along midrib, abaxially sparsely to moderately strigillose or hirtellous with pubescence denser along veins, base obtuse, apex acute to abruptly and shortly acuminate; secondary veins 6–8 pairs, plane to hardly visible abaxially; stipules generally persistent, pandurate, 3–5 × 1.5–2 mm, densely strigillose, apex suberect to spreading, subrounded. Inflorescences paniculate, 7–10 × 4–5 cm, branched to 2 or 3 orders, dark yellow- to reddish brown tomentose to -hirtellous, pedunculate; peduncle 0.5–0.8 cm; bracts linear to narrowly elliptic, 1–3 mm. Flowers sessile, densely grouped. Calyx densely hirtellous; hypanthium portion subglobose, ca. 0.8 mm; limb lobed nearly to base; lobes triangular to ovate, ca. 0.5 mm. Corolla pale yellow, tubular-funnelform, glabrous outside; tube 2.5–3 mm, sparsely pilose in throat; lobes ovate, ca. 1 mm. Anthers elliptic, ca. 0.7 mm, subsessile, partially exerted. Stigma 2-lobed, ca. 0.2 mm. Capsules subglobose to ovoid, ca. 2 × 2 mm, hirtellous. Fl. and fr. Jun.

- Forests on mountains or hills; ca. 800 m. Guangxi (Tianlin).

This species was included by How (loc. cit.) and W. C. Chen (*Acta Phytotax. Sin.* 21: 391. 1983) in the group of *Wendlandia* species with erect, triangular, acute stipules; but examination of an isotype (MO!) and careful study of the protologue (including the figure) shows that the stipules are oblanceolate to pandurate, with the apex narrow but mostly not spreading from the stem on most nodes.

15. *Wendlandia longidens* (Hance) Hutchinson in Sargent, *Pl. Wilson.* 3: 392. 1916.

水晶榧子 shui jing ke zi

Hedyotis longidens Hance, *J. Bot.* 20: 289. 1882; *Wendlandia henryi* Oliver.

Subshrubs, much branched, 0.2–1.5 m tall; branches terete, densely strigillose, hirtellous, or hispidulous. Leaves opposite; petiole 0.5–2 mm, strigillose to hirtellous; blade drying papery, elliptic-lanceolate, lanceolate, narrowly lanceolate, or ovate, 0.8–3 × 0.3–1 cm, adaxially densely hispidulous to glabrous, abaxially densely to sparsely hispidulous or strigillose or glabrous, base acute and usually decurrent, apex acute to shortly

acuminate or rarely obtuse; secondary veins ca. 3 pairs, occasionally with foveolate pilosulous domatia; stipules lanceolate, triangular, or ovate-triangular, 2.5–4.5 mm, densely strigillose to hispidulous, apex erect to spreading, acute to cuspidate. Inflorescence paniculate to cymose, corymbiform to subglobose, 2–4 × 2–4 cm, densely strigillose, hirtellous, or strigose, sessile and tripartite or pedunculate; peduncle 3–6 mm; bracts linear to narrowly triangular, 0.5–5 mm; pedicels 2–3 mm. Flowers pedicellate. Calyx densely strigillose to glabrescent; hypanthium portion turbinate to ellipsoid, 1–2 mm; limb lobed nearly to base; lobes linear-oblong to spatulate or oblanceolate, 2–3 mm. Corolla white, tubular-salverform, glabrous outside; tube 7–8 mm; lobes linear-oblong, 7–8 mm. Filaments 5–6 mm; anthers linear-lanceolate, 3–3.2 mm, exerted. Stigma 2-lobed, ca. 2 mm. Capsule subglobose, 2–2.5 mm in diam., densely strigillose to glabrescent, with calyx lobes elongating, up to 4 mm. Fl. May–Jul, fr. Jul–Nov.

- Thickets at riversides or on mountain slopes; near sea level to 1800 m. Guizhou (Chishui), Hubei (Yichang), Sichuan, Yunnan.

16. *Wendlandia longipedicellata* F. C. How, *Sunyatsenia* 7(1–2): 39. 1948.

长梗水锦树 chang geng shui jin shu

Shrubs, ca. 1.5 m tall; branchlets ferruginous pubescent. Leaves opposite; petiole 0.5–1 cm, glabrous or sparsely pubescent; blade drying leathery, elliptic or lanceolate-elliptic, 4–8 × 0.8–2 cm, adaxially glabrous, abaxially sparsely pubescent along midrib, base acute and usually decurrent, apex acute; secondary veins not easily visible; stipules generally persistent, broadly triangular, 1.5–3 mm, apex erect, acute. Inflorescence paniculate, lax, pyramidal, 6–10.5 × 4.5–10.5 cm, ferruginous pilosulous, sessile and tripartite or pedunculate; peduncle 1.8–3.6 cm; pedicels 3–6 mm. Flowers pedicellate. Calyx sparsely pilosulous or glabrous; hypanthium portion subglobose, ca. 1.75 mm; limb lobed nearly to base; lobes triangular, ca. 0.75 mm. Corolla purplish red, tubular-salverform, glabrous outside; tube 2.3–3 mm, sparsely strigillose inside; lobes narrowly oblong to spatulate, 1.7–2 mm. Anthers linear-lanceolate, ca. 1.2 mm, subsessile, partially exerted. Stigma 2-lobed, ca. 0.5 mm. Capsules not seen. Fl. Feb.

- Forests on mountains; ca. 1600 m. Yunnan (Luxi).

17. *Wendlandia luzoniensis* Candolle, *Prodr.* 4: 412. 1830.

吕宋水锦树 lü song shui jin shu

Wendlandia luzoniensis var. *membranifolia* (Elmer) Cowan; *W. membranifolia* Elmer.

Shrubs or small trees; branches flattened-quadrate, glabrous to sparsely strigillose. Leaves opposite; petiole 0.8–1.2 cm, glabrous to sparsely strigillose; blade drying papery, ovate-oblong or elliptic, 10–20 × 4.5–7 cm, glabrous on both surfaces or sparsely strigillose on principal veins abaxially, base cuneate to acute, apex acute to shortly acuminate; secondary veins 6–9 pairs; stipules generally persistent, suborbicular, obovate, oblanceolate, or pandurate, 4–6 × 1–3 mm, glabrous or sparsely strigillose, apex erect to spreading, obtuse to rounded. Inflores-

cences paniculate, pyramidal to broadly obconic in outline, branched to 3 or 4 orders, 10–12 × 12–15 cm, densely strigillose to hirtellous, pedunculate; peduncle 0.8–1 cm; bracts linear to narrowly lanceolate, 0.5–2 mm. Flowers sessile or subsessile. Calyx with hypanthium portion subglobose, 1–1.5 mm, densely puberulent to strigillose; limb deeply lobed; lobes triangular to lanceolate, 0.5–1 mm, glabrous. Corolla white, tubular or tubular-funnelform, glabrous outside; tube 3–4 mm, villosulous in throat; lobes ovate, 0.8–1.5 mm. Anthers elliptic, ca. 1 mm, subsessile, partially exerted. Stigma 2-lobed, ca. 0.3 mm. Capsules subglobose, 1.5–2 mm in diam., moderately to sparsely strigillose. Fl. and fr. Jul–Aug.

Forests. Taiwan (Taidong) [?India, Philippines, ?Vietnam].

Wendlandia membranifolia was cited by W. C. Chen (in FRPS 71(1): 214. 1999) as a synonym of *W. luzoniensis*, apparently based on Cowan's 1932 treatment (Notes Roy. Bot. Gard. Edinburgh 16: 294. 1932). However, Cowan subsequently (Notes Roy. Bot. Gard. Edinburgh 18: 187. 1934) separated these plants as *W. luzoniensis* var. *membranifolia*; because of the inclusion of the name *W. membranifolia*, this other name is here added too.

18. *Wendlandia merrilliana* Cowan, Notes Roy. Bot. Gard. Edinburgh 18: 303. 1935.

海南水锦树 hai nan shui jin shu

Shrubs or rarely trees, 1–3(–12) m tall; branches terete to somewhat flattened or quadrangular, sparsely strigillose or pilosulous to usually glabrous. Leaves opposite; petiole 1–6 mm, glabrous; blade drying leathery or subleathery, adaxially pale green to dark gray-green, abaxially rather pale or reddish brown to dark purple-gray or purple-black, elliptic-oblong, oblong-lanceolate, oblanceolate, or elliptic, 3–14.5 × 0.8–5 cm, glabrous on both surfaces, base cuneate to rounded, truncate, or cordulate, apex acute to acuminate; secondary veins 5–9 pairs; stipules caducous or persistent, spatulate, lanceolate, or leaflike, 1–10 mm, glabrous, apex erect to spreading, acute. Inflorescence cymose to paniculate, narrowly pyramidal, 1.5–10 × 1.5–6.6 cm, branched to 2 orders, puberulent to glabrescent, pedunculate; peduncle 0.3–3 cm; bracts linear, lanceolate, or spatulate, 0.3–3 mm; pedicels 2–3.5 mm. Flowers pedicellate. Calyx glabrous; hypanthium portion subglobose to ellipsoid, 1.5–2 mm; limb deeply lobed; lobes triangular, 0.5–1 mm. Corolla white, salverform, glabrous outside; tube 5–8 mm, pilose in throat; lobes narrowly oblong, 5–6 mm. Filaments 4–4.5 mm; anthers linear-lanceolate, 3–3.3 mm, exerted. Stigma 2-lobed, 1.5–2 mm. Capsules red or purplish black, subglobose to ovoid, 2–3 × 2.5–3.5 mm, glabrous. Fl. and fr. Apr to Jan of following year.

• Open spaces or streamsides and rocks in forests on mountains; 400–1400 m. Hainan.

This species was included by Cowan in a group of generally similar species that are all reduced shrubs, but it apparently becomes rather large compared to the other species; also its stipules are anomalous in the group, as the other species otherwise have very narrow triangular stipules.

1a. Branch internodes 0.5–7 cm; leaves larger, 4.5–14.5 × 1.5–5 cm; stipules

4–10 mm, spatulate, lanceolate, or leaflike 18a. var. *merrilliana*

1b. Branch internodes 0.4–2.2 cm; leaves smaller, 3–5 × 0.8–1.5 cm; stipules 1–4 mm, spatulate to lanceolate 18b. var. *parvifolia*

18a. *Wendlandia merrilliana* var. *merrilliana*

海南水锦树(原变种) hai nan shui jin shu (yuan bian zhong)

Branch internodes 0.5–7 cm. Leaves 4.5–14.5 × 1.5–5 cm; stipules spatulate, lanceolate, or leaflike, 4–10 mm. Fl. and fr. Apr to Jan of following year.

• Open spaces or streamsides and rocks in forests on mountains; 400–1400 m. Hainan.

18b. *Wendlandia merrilliana* var. *parvifolia* F. C. How, Sunyatsenia 7(1–2): 61. 1948.

细叶海南水锦树 xi ye hai nan shui jin shu

Branch internodes 0.4–2.2 cm. Leaves 3–5 × 0.8–1.5 cm; stipules spatulate to lanceolate, 1–4 mm. Fr. Oct.

• On rocks, infrequent. Hainan (Dongfang).

19. *Wendlandia myriantha* F. C. How, Sunyatsenia 7(1–2): 57. 1948.

密花水锦树 mi hua shui jin shu

Shrubs, ca. 3 m tall; branches terete to subquadrangular, brown strigillose. Leaves opposite; petiole 0.7–1.2 cm, puberulent; blade drying subleathery, elliptic, 7–12 × 2.5–6 cm, adaxially glabrescent or sparsely puberulent along midrib, abaxially puberulent, base cuneate, margin sparsely ciliolate, apex shortly acuminate; secondary veins 8–10 pairs; stipules generally persistent, ovate to pandurate, ca. 7 mm, sparsely puberulent, apex spreading to reflexed, rounded to 2-lobed. Inflorescences paniculate, branched to 2–4 orders, 18–20 × 18–20 cm, puberulent, sessile and tripartite or pedunculate; peduncle 3–4 cm; lower bracts leaflike, upper bracts linear-lanceolate, oblong, oblong-lanceolate, or oblanceolate, 2–6 mm, strigillose. Flowers sessile in fasciculate groups. Calyx glabrous or sparsely puberulent; hypanthium portion subglobose, ca. 2 mm; limb lobed nearly to base; lobes ovate or ovate-triangular, ca. 1.5 mm. Corolla white, tubular-funnelform, glabrous outside; tube ca. 4 mm, in throat white hirsute; lobes ovate, ca. 1 mm. Anthers elliptic, ca. 1 mm, subsessile, partially exerted. Stigma 2-lobed. Capsules not seen. Fl. Mar.

• Forests in ravines; ca. 300 m. Guangxi (Shangsi).

20. *Wendlandia oligantha* W. C. Chen, Acta Phytotax. Sin. 21: 399. 1983.

龙州水锦树 long zhou shui jin shu

Shrubs or trees, 3–10 m tall; branches flattened to quadrangular, grayish brown, glabrous or sparsely or densely puberulent to pilosulous becoming glabrescent. Leaves opposite; petiole 3–15 mm, glabrous or mealy puberulent; blade drying leathery, adaxially dark brown and often shiny, elliptic, ovate, or ovate-oblong, 3–10.5 × 1.5–5 cm, adaxially glabrous, abaxially glabrous or sparsely to densely strigillose or puberulent

along principal veins, base cuneate or acute, apex acute or shortly acuminate; secondary veins 5–7 pairs, hardly visible abaxially; stipules deciduous, spatulate to pandurate, 1.5–2.5 mm, pilosulous or puberulent, apex spreading to reflexed, rounded to obtuse. Inflorescences laxly paniculate, branched to 2 or 3 orders, 7–20 × 4–18 cm, moderately to densely pilosulous, sessile and tripartite or pedunculate; peduncle 0.5–1.5 cm; bracts linear, narrowly oblanceolate, or triangular, 1–5 mm. Flowers sessile to subsessile. Calyx glabrous to sparsely strigillose; hypanthium portion subglobose, ca. 0.5 mm; limb lobed nearly to base; lobes triangular to lanceolate, 0.3–0.5 mm. Corolla white, salverform to funnelliform, outside glabrous; tube ca. 2.5 mm, rather abruptly narrowed at base, sparsely villous in throat; lobes triangular, ca. 1 mm. Anthers elliptic, ca. 0.7 mm, subsessile, partially exerted. Stigma 2-lobed, ca. 0.2 mm. Capsules subglobose, ca. 1.5 mm in diam., glabrous. Fl. Jul–Aug, fr. Aug–Dec.

- Rocks in forests or thickets in valleys; 300–1000 m. Guangxi.

21. *Wendlandia parviflora* W. C. Chen, Acta Phytotax. Sin. 21: 394. 1983.

小花水锦树 xiao hua shui jin shu

Small trees, 4–5 m tall; branches ferruginous pubescent. Leaves opposite; petiole 0.8–1.5 cm, densely ferruginous pubescent; blade drying leathery, elliptic-oblong or ovate-elliptic, 8.5–17 × 4.5–8.5 cm, adaxially sparsely strigose except densely ferruginous pubescent along veins, abaxially densely ferruginous pubescent, base cuneate, acute, or sometimes obtuse, apex acuminate; secondary veins 8–13 pairs; stipules pandurate, 4–5 mm wide, pilosulous, apex spreading to reflexed. Inflorescences paniculate, ca. 19 × 15 cm, ferruginous pubescent; bracts ovate, ca. 1 mm. Flowers sessile. Calyx glabrous or pilose; hypanthium portion ca. 0.8 mm; limb deeply lobed; lobes semi-ovate, ca. 0.5 mm. Corolla pale green, outside glabrous; tube 1–1.5 mm, white hirsute in throat; lobes ca. 1 mm. Anthers elliptic, ca. 0.5 mm, subsessile, partially exerted. Stigma 2-lobed. Capsules not seen. Fl. Dec.

- Forests on flat land. Yunnan (Mengla).

22. *Wendlandia pendula* (Wallich) Candolle, Prodr. 4: 412. 1830.

垂枝水锦树 chui zhi shui jin shu

Rondeletia pendula Wallich in Roxburgh, Fl. Ind. 2: 140. 1824.

Shrubs, often straggly, 1–3 m tall; branches pendulous, terete, hispidulous or puberulent to glabrescent. Leaves opposite or ternate, subsessile; blade drying papery, ovate-lanceolate or ovate, 3.5–10 × 1.8–4 cm, adaxially glabrous to sparsely hispidulous, abaxially sparsely to moderately scaberulous or hispidulous with pubescence denser on principal veins, base rounded to cuneate, apex acute to weakly acuminate; secondary veins 4–7 pairs; stipules caducous to persistent, triangular, 1.5–2 mm, glabrescent, apex erect, cuspidate. Inflorescences paniculate, pyramidal in outline, 10–15 × 4–9 cm, branched to 2 or 3 orders, densely hispidulous to puberulent, sessile and tripartite or pedunculate; peduncle 2–4.5 cm; bracts triangular to ovate,

0.5–1 mm; pedicels 0.5–1.2 mm. Flowers shortly pedicellate. Calyx puberulent to glabrous; hypanthium ellipsoid to subglobose, 1–1.5 mm; limb lobed nearly to base; lobes lanceolate or triangular, 0.5–0.8 mm. Corolla red, tubular-funnelform, outside glabrous; tube 4–5 mm, inside pubescent in upper part; lobes oblong to elliptic, ca. 2 mm. Anthers linear-oblong, 1.3–1.5 mm, partially exerted. Stigmas clavate, ca. 1.3 mm. Capsules subglobose, 1.5–2 mm in diam., glabrous or pilose. Fl. and fr. Dec–Feb of following year.

Forests or thickets in ravines; 600–1300 m. Yunnan [Bhutan, India, Myanmar, Nepal].

W. C. Chen (in FRPS 71(1): 221. 1999) described the stipules as caducous, but these are persistent on all the specimens studied.

23. *Wendlandia pingpienensis* F. C. How, Sunyatsenia 7(1–2): 51. 1948.

屏边水锦树 ping bian shui jin shu

Shrubs or trees, 3–15 m tall. Petiole 1–3 cm, sparsely strigillose; leaf blade drying papery, elliptic-oblong or oblanceolate-oblong, 7.5–23 × 4–8 cm, adaxially glabrous or sometimes sparsely hispidulous along midrib, abaxially glabrous or sparsely hispidulous along principal veins, base cuneate or attenuate, apex acute or shortly caudate; secondary veins 7–13 pairs; stipules ca. 2 × as wide as branchlets, apex reflexed, subrounded. Inflorescences laxly paniculate, to 30 × 24 cm, ferruginous strigillose. Flowers sessile. Calyx pilosulous to strigillose; hypanthium portion subglobose, 1–1.5 mm; limb deeply lobed; lobes triangular. Corolla white, funnelliform, glabrous outside; tube 4–5 mm, white hirsute inside upper part; lobes triangular, ca. 1 mm. Anthers elliptic, ca. 1 mm, subsessile, partially exerted. Stigma 2-lobed. Capsules subglobose, 1.5–2 mm in diam., pubescent or subglabrous. Fl. Apr–Oct, fr. Jun–Nov.

- Forests or thickets in valleys; 200–1500 m. Yunnan.

24. *Wendlandia pubigera* W. C. Chen, Acta Phytotax. Sin. 21: 395. 1983.

大叶木莲红 da ye mu lian hong

Shrubs, to 2 m tall; branches pubescent. Leaves opposite or ternate; petiole 0.8–1.8 cm, pubescent; blade drying thinly leathery, obovate-oblong or elliptic, 14.5–18 × 6–7 cm, adaxially glabrous or sparsely puberulent along principal veins, abaxially sparsely pubescent with pubescence denser along principal veins, base cuneate, apex shortly acuminate; secondary veins 10 or 11 pairs; stipules generally persistent, pandurate, 7.5–9 × 2.5–3 mm, nearly as wide as to slightly wider than branches, apex spreading, rounded. Inflorescence paniculate, pyramidal in outline, ca. 12 × 12–15 cm, branched to 2 or 3 orders, yellowish brown pubescent, sessile and tripartite or pedunculate; peduncle 1.8–3 cm. Flowers sessile. Calyx pubescent; hypanthium portion ca. 1.8 mm; limb lobed nearly to base; lobes ovate to deltoid, ca. 1 mm. Corolla white, tubular-salverform, outside glabrous; tube 2–3 mm, white villous inside upper part; lobes rounded to spatulate, ca. 1 mm. Anthers elliptic, ca. 0.7 mm, subsessile, partially exerted. Stigma 2-lobed. Capsules not seen. Fl. Mar.

- Dense forests. Guangxi (Shangsi).

Some of the characters in the description here are augmented with details from the protologue figure.

25. *Wendlandia salicifolia* Franchet ex Drake, *J. Bot.* (Morot) 9: 208. 1895.

柳叶水锦树 liu ye shui jin shu

Ligustrum thea H. Léveillé & Dunn.

Shrubs, to ca. 1 m tall; branches flattened to terete, hirtellous or strigillose to glabrescent. Leaves opposite; petiole 0.5–3 mm; blade drying thinly leathery, narrowly lanceolate to narrowly elliptic, 2–6.5 × 0.4–1.2 cm, glabrous on both surfaces or sparsely pubescent along midrib abaxially, base acute, margin usually edged with thickened vein, apex acute to weakly acuminate; secondary veins 5–7 pairs; stipules generally persistent, triangular, 1.5–4 mm, densely strigillose to hirtellous, apex erect, acute to aristate. Inflorescences paniculate, pyramidal in outline, 2–5 × 1–3 cm, branched to 2 or 3 orders, densely hirtellous to strigillose, sessile and tripartite or pedunculate; peduncle 0.4–0.7 cm; bracts linear, 1–5 mm; pedicels 0.3–1 mm. Flowers subsessile to pedicellate. Calyx moderately to sparsely strigillose; hypanthium portion ellipsoid to subglobose, ca. 0.8 mm; limb lobed nearly to base; lobes triangular, 0.3–0.5 mm. Corolla pale reddish white, funnellform, glabrous outside; tube 2–5 mm, apparently pubescent inside upper part; lobes linear-oblong, 2–2.5 mm. Filaments ca. 1 mm; anthers linear-lanceolate, ca. 1.4 mm, partially exerted. Stigma 2-lobed, 0.8–1 mm. Capsules subglobose to ovoid, ca. 1.5 × 2 mm, moderately to sparsely strigillose. Fl. Nov, fr. Jan of following year.

Streamsides in ravines and forests on hill slopes; 100–200 m. Guangxi (Donglan), Guizhou (Guanling), Yunnan [Laos, Vietnam].

26. *Wendlandia scabra* Kurz, *J. Asiat. Soc. Bengal*, Pt. 2, Nat. Hist. 41: 310. 1872.

粗叶水锦树 cu ye shui jin shu

Shrubs or trees, 1–12 m tall; branches terete to quadrangular, densely brown hirtellous to -tomentose. Leaves opposite; petiole 0.5–2.7 cm, densely brown tomentulose to -hirtellous; blade drying papery or leathery, elliptic-obovate, elliptic, or ovate, 6.5–18 × 2.8–9 cm, adaxially sparsely to moderately scaberulous on lamina and densely strigillose to tomentulose on principal veins, abaxially sparsely to densely strigillose, pilosulous, hirtellous, strigose, or pilose, base obtuse, acute, or rounded, apex acute or acuminate; secondary veins 6–10 pairs; stipules generally persistent, spatulate to pandurate, 5–6 mm, strigillose or tomentulose to glabrescent, apex spreading, obtuse. Inflorescences paniculate, pyramidal, 20–30 × 20–25 cm, branched to 2 or 3 orders, erect and congested (var. *scabra*, var. *pilifera*) or pendulous and lax (var. *dependens*), densely hirtellous to tomentose, pedunculate; peduncle ca. 4 cm; bracts linear, 1–2.5 mm. Flowers sessile or subsessile. Calyx densely hirtellous; hypanthium portion turbinate to ellipsoid, ca. 0.5 mm; limb deeply lobed; lobes triangular, 0.5–0.8 mm. Corolla white, tubular-funnelform, glabrous outside or pubescent on lobes (var. *pilifera*); tubes 2.5–3 mm, inside glabrous or sparsely pubescent in lower part (var. *scabra*, var. *dependens*) or white villous or hispid in upper part (var. *pilifera*); lobes oblong, 1–1.25 mm. Anthers elliptic, 0.75–1 mm, subsessile, partially ex-

serted. Stigma 2-lobed, ca. 0.7 mm. Capsules subglobose, ca. 2 mm in diam., hirsute. Fl. Mar–May, fr. May–Jul.

Forests or thickets on mountains; 100–1800 m. Guangxi, Guizhou, Yunnan [Bangladesh, India, Myanmar, Nepal, Thailand, Vietnam].

The application of this name and the report of this species seem to be based on Cowan's incorporation of Kurz's report into his treatment and may deserve re-evaluation.

- 1a. Leaves densely strigillose or scaberulous adaxially, densely tomentulose abaxially 26c. var. *scabra*
- 1b. Leaves glabrescent adaxially, sparsely strigose or pilose abaxially.
 - 2a. Leaves sparsely strigose abaxially; inflorescences lax, pendulous; corolla tubes inside glabrous or pubescent near middle 26a. var. *dependens*
 - 2b. Leaves pilose abaxially; inflorescences compact, erect; corolla tubes inside white villous or hispid in upper part 26b. var. *pilifera*

26a. *Wendlandia scabra* var. *dependens* Cowan, *Notes Roy. Bot. Gard. Edinburgh* 16: 292. 1932.

悬花水锦树 xuan hua shui jin shu

Leaves glabrescent adaxially, sparsely strigose abaxially. Inflorescence lax, pendulous. Corolla tube inside glabrous or pubescent near middle; lobes glabrous outside. Fl. Mar–Apr.

- Forests or thickets on mountains; 500–1800 m. W Yunnan.

26b. *Wendlandia scabra* var. *pilifera* F. C. How ex W. C. Chen, *Acta Phytotax. Sin.* 21: 395. 1983.

毛粗叶水锦树 mao cu ye shui jin shu

Leaves glabrescent adaxially, pilose abaxially. Inflorescence compact, erect. Corolla tube white villous in upper part inside; lobes pubescent outside. Fl. Apr.

- Thickets on mountains. Guangxi (Shangsi).

26c. *Wendlandia scabra* var. *scabra*

粗叶水锦树(原变种) cu ye shui jin shu (yuan bian zhong)

Wendlandia paniculata (Roxburgh) Candolle subsp. *scabra* (Kurz) Cowan; *W. zoi* F. C. How.

Leaves strigillose and/or scaberulous adaxially, tomentulose abaxially. Inflorescence erect, compact. Corolla tube inside sparsely pubescent in lower part or glabrous; lobes glabrous outside. Fl. Apr–May, fr. May–Jul.

Forests or thickets on mountains; 100–1600 m. Guangxi, Guizhou, Yunnan [Bangladesh, India, Myanmar, Nepal, Thailand, Vietnam].

27. *Wendlandia speciosa* Cowan, *Notes Roy. Bot. Gard. Edinburgh* 16: 254. 1932.

美丽水锦树 mei li shui jin shu

Wendlandia speciosa var. *forrestii* Cowan.

Shrubs or trees, 1–12 m tall; branches flattened, strigillose to glabrescent. Leaves opposite; petiole 0.5–3 cm, strigillose to glabrescent; blade drying papery or subleathery, ovate, obovate, ovate-lanceolate, or elliptic, 6–19 × 2.5–11 cm, on both sides sparsely to moderately strigillose or hirtellous to glabrescent with pubescence often denser on principal veins, base acute or cuneate, apex acute or acuminate; secondary veins 5–12 pairs; stipules generally persistent, spatulate to pandurate, 4–7 mm, strigillose to glabrescent, apex spreading, rounded. Inflorescence paniculate, pyramidal, 20–30 × 20–30 cm, branched to 2 or 3 orders, densely strigillose, pedunculate; peduncle ca. 4.5 cm; bracts linear, spatulate, or lanceolate, 1–3 mm, acute. Flowers subsessile. Calyx strigillose; hypanthium portion turbinate, ca. 1 mm; limb lobed nearly to base; lobes lanceolate to triangular, 1–1.5 mm. Corolla white to cream, yellowish white, salverform or tubular, glabrous outside; tube 5–7 mm, white villous inside; lobes narrowly oblong to oblanceolate, 2–2.5 mm, obtuse to rounded. Anthers linear-lanceolate, exerted, 1.3–2 mm, at base 2-lobed; filaments ca. 1.5 mm. Stigma 2-lobed, 1–1.2 mm. Capsule subglobose, 2.5–3 mm in diam., pubescent. Fl. and fr. Mar–Nov.

Forests in ravines, forest margins; 1500–2800 m. Xizang (Mé-dog), Yunnan [Bhutan, India].

28. *Wendlandia subalpina* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 142. 1916.

高山水锦树 gao shan shui jin shu

Shrubs, tufted to prostrate, 0.3–1 m tall; branches subterete, puberulent. Leaves opposite, subsessile; petiole to ca. 1 mm, glabrescent; blade drying leathery, ovate or suborbicular, 0.4–1 × 0.3–0.6 mm, glabrescent on both surfaces, base obtuse to cuneate, apex obtuse, subacute, or shortly acuminate; secondary veins indistinct; stipules deciduous, triangular, ca. 1 mm, glabrescent, apex erect, apparently acute. Inflorescences paniculate to cymose, 6–12-flowered, 0.6–1 × 0.6–1 cm, branched to 2 orders, puberulent, pedunculate; peduncle ca. 0.2 cm; bracts ca. 1 mm; pedicels 2–3 mm. Flowers pedicellate. Calyx puberulent; hypanthium portion ellipsoid, ca. 1.5 mm; limb deeply lobed; lobes triangular or lanceolate, 1.5–2 mm. Corolla white or pale yellow, tubular, outside glabrous; tube ca. 2.5 mm; lobes linear-oblong, ca. 3.5 mm. Filaments ca. 3 mm; anthers linear-lanceolate, ca. 2 mm, exerted. Stigma 2-lobed, ca. 1.2 mm. Capsules subglobose, 2–2.5 mm in diam., pubescent. Fl. May–Jul, fr. Sep–Oct.

• Open spaces or thickets on mountain slopes; 1800–3100 m. Yunnan.

29. *Wendlandia tinctoria* (Roxburgh) Candolle, Prodr. 4: 411. 1830.

染色水锦树 ran se shui jin shu

Rondeletia tinctoria Roxburgh, Fl. Ind. 2: 134. 1824.

Shrubs or trees, to 6 m tall; branches somewhat flattened to terete or quadrangular, densely puberulent, velutinous, or hirtellous usually becoming glabrescent. Leaves opposite; petiole 0.5–2 cm, densely puberulent or strigillose to glabrous; blade

drying papery to leathery, oblong-lanceolate, elliptic-ovate, or obovate, 5.5–20 × 2.5–10 cm, adaxially sparsely strigillose at least on principal veins to glabrous throughout, abaxially sparsely to moderately strigillose or tomentose to glabrescent, base acute to obtuse, apex acute to acuminate; secondary veins 10–12 pairs, occasionally with pubescent and/or foveolate domatia; stipules generally persistent, triangular to ovate, 3–5.5 mm, densely strigillose or puberulent to glabrescent, apex cuspidate, erect or slightly spreading with age. Inflorescences paniculate, pyramidal in outline, 9–17 × 9–22 cm, branched to 2–4 orders, densely strigillose, pilosulous, velutinous, tomentose, hirtellous, or villosulous, sessile and tripartite or pedunculate; peduncle 0.8–4 cm; bracts linear to narrowly elliptic, 1–5 mm; pedicels to 0.8 mm. Flowers sessile to shortly pedicellate. Calyx densely hirtellous or pilosulous to glabrous; hypanthium portion subglobose to ellipsoid or turbinate, 0.8–1 mm; limb lobed nearly to base; lobes spatulate, triangular, or lanceolate, 0.8–1 mm. Corolla white, tubular-funnelform, outside glabrous and/or variously densely villosulous or strigillose; tube 3–4 mm, pilose in throat; lobes elliptic to ovate, 0.8–1 mm. Anthers oblong, ca. 0.5 mm, subsessile, partially exerted. Stigma 2-lobed, 0.5–0.8 mm. Capsules ovoid, ca. 1.5 × 2–2.5 mm, hirtellous to glabrous. Fl. and fr. Jan–Dec.

Dry sparse forests, dense forests, or thickets in valleys, in ravines, or on mountain slopes; 200–2800 m. Guangxi, Guizhou, Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, Thailand, Vietnam].

Cowan recognized seven infraspecific taxa of this species, with five found in China; two additional infraspecific taxa from China were described by F. C. How. In Cowan's circumscription, *Wendlandia tinctoria* subsp. *tinctoria* was widespread in India and also found in Bhutan, Myanmar, Nepal, and Thailand but not known from China.

- 1a. Inflorescences glabrous or puberulent; calyx glabrous or sparsely pubescent.
 - 2a. Corolla lobes strigose outside 29d. subsp. *floribunda*
 - 2b. Corolla lobes glabrous outside 29g. subsp. *orientalis*
- 1b. Inflorescences densely pilosulous or tomentose.
 - 3a. Calyx with hypanthium portion glabrous, glabrescent, or puberulent, lobes glabrous, glabrescent, or pilosulous.
 - 4a. Corolla lobes pilosulous outside 29b. subsp. *barbata*
 - 4b. Corolla lobes glabrous outside 29f. subsp. *intermedia*
 - 3b. Calyx hirtellous or pilosulous.
 - 5a. Corolla lobes villosulous outside 29a. subsp. *affinis*
 - 5b. Corolla lobes glabrous outside.
 - 6a. Calyx densely hirtellous 29c. subsp. *callitricha*
 - 6b. Calyx pilosulous or sparsely hirtellous 29e. subsp. *handellii*

29a. *Wendlandia tinctoria* subsp. *affinis* F. C. How ex W. C. Chen, Acta Phytotax. Sin. 21: 389. 1983.

毛冠水锦树 *mao guan shui jin shu*

Inflorescence densely tomentose. Calyx hirtellous or pilosulous. Corolla lobes villosulous outside. Fl. and fr. Feb–Jun.

• Forests or thickets in valleys or on mountain slopes; 700–1400 m. Guangxi (Longzhou), Yunnan.

In the protologue, this taxon is treated as “subsp.” in the text (both key and description) but its figure is labeled “var.”

29b. *Wendlandia tinctoria* subsp. *barbata* Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 268. 1932.

粗毛水锦树 *cu mao shui jin shu*

Inflorescence densely tomentose. Calyx with hypanthium portion glabrous or glabrescent, lobes glabrous or pilosulous. Corolla lobes pilosulous outside. Fl. and fr. Feb–Nov.

Thickets or forests in valleys; 1000–1800 m. Guangxi, Yunnan [Vietnam].

29c. *Wendlandia tinctoria* subsp. *callitricha* (Cowan) W. C. Chen, Acta Phytotax. Sin. 21: 389. 1983.

厚毛水锦树 *hou mao shui jin shu*

Wendlandia tinctoria var. *callitricha* Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 265. 1932.

Inflorescence densely tomentose. Calyx densely hirtellous. Corolla lobes glabrous outside. Fl. and fr. year-round.

Forests or thickets on mountain slopes or in ravines; 400–2800 m. Guangxi, Yunnan [Myanmar].

29d. *Wendlandia tinctoria* subsp. *floribunda* (Craib) Cowan in Craib, Fl. Siam. 2: 23. 1932.

多花水锦树 *duo hua shui jin shu*

Wendlandia glabrata Candolle var. *floribunda* Craib, Bull. Misc. Inform. Kew 1911: 386. 1911; *W. floribunda* (Craib) Craib.

Inflorescence glabrous or puberulent. Calyx glabrous or sparsely puberulent. Corolla lobes strigillose outside. Fl. Jul.

Dry sparse forests on mountain slopes; ca. 1100 m. Yunnan (Menglian) [Myanmar, Thailand].

29e. *Wendlandia tinctoria* subsp. *handelii* Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 267. 1932.

麻栗水锦树 *ma li shui jin shu*

Inflorescences densely pilosulous. Calyx pilosulous or sparsely hirtellous. Corolla lobes glabrous outside. Fl. and fr. Mar–Dec.

• Forests or thickets on mountain slopes or in ravines; 200–1900 m. Guangxi (Wuming), Guizhou (Wangmo), Yunnan.

29f. *Wendlandia tinctoria* subsp. *intermedia* (F. C. How) W. C. Chen, Acta Phytotax. Sin. 21: 390. 1983.

红皮水锦树 *hong pi shui jin shu*

Wendlandia tinctoria var. *intermedia* F. C. How, Sun-

yatsenia 7(1–2): 43. 1948.

Inflorescence densely tomentose. Calyx with hypanthium portion glabrous or puberulent, lobes pilosulous. Corolla lobes glabrous outside. Fl. and fr. Mar–May.

• Forests or thickets in valleys; 1400–1600 m. Yunnan.

29g. *Wendlandia tinctoria* subsp. *orientalis* Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 268. 1932.

东方水锦树 *dong fang shui jin shu*

Inflorescence glabrous or puberulent. Calyx glabrous or rarely sparsely puberulent. Corolla lobes glabrous outside. Fl. Mar–May, fr. Apr–Oct.

Thickets or forests on mountains; 200–2100 m. Guangxi, Yunnan [India, Myanmar, Thailand].

30. *Wendlandia uvariifolia* Hance, J. Bot. 8: 73. 1870.

水锦树 *shui jin shu*

Shrubs or trees, 2–15 m tall; branches terete to subquad-rangular, tomentulose, pilosulous, or hirsute, often with pubescence of two or more types. Leaves opposite; petiole 0.5–3.5 cm, densely ferruginous hirtellous or -pilosulous; blade drying papery, broadly elliptic, elliptic-oblong, ovate, or oblong-lanceolate, 7–26 × 4–14 cm, adaxially sparsely hirtellous, hispidulous, or scaberulous on lamina and moderately to densely tomentulose to strigillose along principal veins, abaxially moderately to densely hirtellous to pilosulous, base acute to obtuse, apex shortly to abruptly acuminate; secondary veins 8–12 pairs; stipules persistent or sometimes deciduous, obovate to pandurate, 5–12 × 5–12 mm, hispid, apex spreading to reflexed, rounded. Inflorescences paniculate, pyramidal in outline, 10–20 × 10–20 cm, branched to 2–4 orders, densely tomentulose, pilosulous, and/or hirtellous, sessile and tripartite or pedunculate; peduncle 1–4 cm; bracts linear-lanceolate to spatulate, 1–4 mm. Flowers sessile or subsessile. Calyx densely grayish pilose, -strigose, -hirtellous, -tomentose, or subglabrous (subsp. *pilosa*); hypanthium obconic, ca. 0.8 mm; limb lobed nearly to base; lobes triangular to lanceolate, ca. 1 mm. Corolla white, tubular-funnelform, glabrous outside; tube 2.5–3 mm, inside upper part and throat white hirsute; lobes oblong to elliptic, ca. 1 mm. Anthers elliptic, ca. 0.8 mm, subsessile, partially exerted. Stigma 2-lobed, ca. 0.3 mm. Capsules subglobose, 1–2 mm in diam., densely strigillose to strigose. Fl. Jan–May, fr. Apr–Oct.

Thickets, forests, or forest margins on mountains or hill slopes, in ravines, or at streamsides; below 100–1200 m. Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Vietnam].

Cowan discussed in detail the wide morphological variability in this species, in both vegetative and flower characters.

- 1a. Calyx pilose or subglabrous 30b. subsp. *pilosa*
- 1b. Calyx densely grayish white hirsute, -strigose, -tomentulose, or -strigillose.
 - 2a. Leaves rather narrow, elliptic-oblong or oblong-lanceolate, pilosulous abaxially 30a. subsp. *chinensis*
 - 2b. Leaves wider, broadly elliptic or ovate, densely grayish brown

pilosulous abaxially 30c. subsp. *uvariifolia*

Fl. Apr.

30a. *Wendlandia uvariifolia* subsp. *chinensis* (Merrill) Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 288. 1932.

• Forests. Yunnan.

中华水锦树 *zhong hua shui jin shu*

Wendlandia chinensis Merrill, Philipp. J. Sci. 15: 257. 1919.

Leaves rather narrow, elliptic-oblong or oblong-lanceolate, pilosulous abaxially. Calyx densely grayish white hirsute, -strigose, -tomentulose, or -strigillose. Fl. Mar–Apr, fr. Apr–Jul.

• Forests or thickets in ravines or on hill slopes; below 100–600 m. Guangdong, Guangxi, Hainan.

30b. *Wendlandia uvariifolia* subsp. *pilosa* W. C. Chen, Acta Phytotax. Sin. 21: 393. 1983.

疏毛水锦树 *shu mao shui jin shu*

Leaves densely pilosulous abaxially. Calyx pilose or subglabrous. Fl. Nov.

• Forests; ca. 900 m. Yunnan (Mengla).

30c. *Wendlandia uvariifolia* subsp. *uvariifolia*

水锦树(原亚种) *shui jin shu (yuan ya zhong)*

Wendlandia dunniana H. Léveillé; *W. rotundifolia* Handel-Mazzetti; *W. uvariifolia* subsp. *dunniana* (H. Léveillé) Cowan; *W. uvariifolia* subsp. *rotundifolia* (Handel-Mazzetti) Cowan; *W. uvariifolia* subsp. *rufula* Cowan; *W. uvariifolia* subsp. *yunnanensis* Cowan.

Leaves broadly elliptic or ovate, densely grayish brown pilosulous abaxially. Calyx densely grayish white hirsute, -strigose, -tomentulose, or -strigillose. Fl. Jan–May, fr. Apr–Oct.

Thickets, forests, or forest margins on mountains or at stream-sides; below 100–1200 m. Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Vietnam].

31. *Wendlandia villosa* W. C. Chen, Acta Phytotax. Sin. 21: 388. 1983.

毛叶水锦树 *mao ye shui jin shu*

Shrubs or trees; branches densely villous becoming glabrescent. Leaves opposite; petiole 8–10 mm, villous becoming glabrescent; blade drying leathery, elliptic or elliptic-oblong, 4.5–13 × 2.5–6 cm, adaxially sparsely strigose or glabrous, abaxially densely yellowish brown villous, base cuneate, apex broad then shortly acuminate; secondary veins 7–9 pairs; stipules generally persistent, triangular to ovate, ca. 6 mm, villous, apex erect, cuspidate. Inflorescence paniculate, pyramidal in outline, 9–12 × 6–11 cm, branched to 2 or 3 orders, densely yellowish brown villosulous to -hirtellous, sessile and tripartite or pedunculate; peduncle ca. 3 cm; bracts lanceolate, ca. 1.5 mm. Flowers sessile or subsessile. Calyx densely hirtellous or villosulous; hypanthium portion ellipsoid, ca. 0.8 mm; limb lobed nearly to base; lobes lanceolate, 0.8–1 mm, ciliate. Corolla tubular-salverform; tube 3–4 mm, outside and inside glabrous; lobes elliptic to ovate, ca. 1 mm, densely villosulous or hirtellous outside. Anthers elliptic, ca. 0.7 mm, subsessile, partially exserted. Stigma 2-lobed, ca. 0.2 mm. Capsules not seen.

