

37. HYMENODICTYON Wallich in Roxburgh, Fl. Ind. 2: 148. 1824, nom. cons.

土连翘属 tu lian qiao shu

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Shrubs or trees [or sometimes epiphytic or lianescent], usually deciduous, unarmed; bark notably bitter. Raphides absent. Leaves opposite, usually with domatia; margins rarely irregularly lobed and/or serrate; stipules deciduous, interpetiolar, triangular to ligulate, entire or glandular-serrate, usually strongly reflexed. Inflorescence terminal and/or axillary, spiciform to racemiform or sometimes paniculate with axes racemiform or spiciform, many flowered, erect to pendulous, pedunculate, bracteate with 1–4 leaf-like to petaloid, stipitate, veined basal bracts and other bracts usually reduced [or sometimes well developed]. Flowers sessile to shortly pedicellate, bisexual, monomorphic. Calyx limb deeply 5(or 6)-lobed. Corolla white, green, yellow, or red, funnelform or narrowly campanulate, inside glabrous; lobes 5, valvate in bud, apparently often ascending or remaining partially closed at anthesis. Stamens 5, inserted in corolla tube below throat, included; filaments short, flattened; anthers basifixed, sagittate at base. Ovary 2-celled, ovules several to numerous in each cell on axile placentas; stigma fusiform or capitate, well exerted. Infructescences with pedicels and sometimes peduncles often elongating and/or becoming reflexed. Fruit capsular, ellipsoid-oblong to obovoid or ellipsoid, loculicidally dehiscent into 2 valves, woody to cartilaginous, with calyx limb deciduous; seeds numerous, medium-sized, flattened, with broad, membranous, shortly erose, basally 2-lobed wing; endosperm fleshy; embryo small; cotyledon oblong or orbicular.

Twenty-two species: Africa, tropical Asia, and Madagascar; two species in China.

The flowers apparently all open nearly simultaneously on a plant, probably within a very few days at most. The corolla lobes appear to remain partly closed when the flower is mature and the stigma well exerted; Razafimandimbison and Bremer (Bot. J. Linn. Soc. 152: 335. 2006) reported that the flowers are protandrous, so this may be a secondary position after the anthers have released their pollen and while the stigma is receptive. Occasional irregularly lobed leaves, similar to those of plants of *Hymenodictyon*, are found in a few other Rubiaceae genera (e.g., *Simira* Aublet of the Neotropics).

W. C. Chen (in FRPS 71(1): 227. 1999) described the corolla lobes as imbricate in bud and the anthers as dorsifixed, but Bridson and Verdcourt (Fl. Trop. E. Africa, Rub. (Pt. 2), 452. 1988) and Razafimandimbison and Bremer (loc. cit.) described them as valvate and basifixed, respectively, which corresponds to observations of Chinese specimens (*Henry 12150*, MO!).

- 1a. Inflorescences axillary, at each leaf axil simple, with 1 racemiform or spiciform axis; leaf blade glabrous to glabrescent on both surfaces or sometimes pilosulous abaxially 1. *H. flaccidum*
1b. Inflorescences axillary and sometimes also terminal, simple or at least part branched and paniculate with several spiciform to racemiform axes; leaf blade pilosulous on both surfaces 2. *H. orixense*

1. *Hymenodictyon flaccidum* Wallich in Roxburgh, Fl. Ind. 2: 152. 1824.

土连翘 tu lian qiao

Trees, deciduous, 6–20 m tall; bark gray, smooth; branches rather stout, weakly flattened to terete, glabrous to puberulent. Leaves often crowded at ends of branches; petiole 2.5–9 cm, puberulent or pilosulous to glabrescent; blade drying papery or thinly leathery, ovate, obovate, elliptic, or elliptic-oblong, 10–26 × 7–15 cm, glabrous to glabrescent on both surfaces or sometimes pilosulous abaxially, base acute to obtuse, margins entire or rarely serrate or lobed in distal part, apex acute to acuminate or rarely rounded; secondary veins 7–11 pairs, usually with pilosulous domatia; stipules ovate-oblong or triangular, 5–20 mm, densely pilosulous to glabrescent, acute to obtuse or bilobed for up to 1/2. Inflorescences axillary, simple, densely racemiform to spiciform, 10–30 cm, pilosulous to hirtellous, often pendulous; peduncle 3–5 cm; basal bracts 1 or 2, with blade leathery, ovate to elliptic-oblong or narrowly elliptic, 4–8.5 × 2–3 cm, pilosulous to glabrescent, on stipes 3–5.5 cm; pedicels 0.5–2 mm. Calyx densely puberulent; ovary portion ellipsoid, 1.2–1.5 mm; limb lobed essentially to base; lobes triangular to elliptic, 1–1.5 mm, ciliolate, acute. Corolla yellow to red, densely puberulent to glabrescent outside; tube ca. 2 mm, slender and cylindrical in basal portion then abruptly in-

flated just below lobes; lobes ligulate to lanceolate or ovate, 2–3.5 mm, obtuse to acute. Style exerted for 2–5 mm. Fruiting pedicels to 8 mm, reflexed. Capsules dark brown, 1.2–1.5 × 0.5–0.8 cm, woody, with several prominent whitened, ellipsoid lenticles; seeds (including wing) ca. 10 × 5 mm. Fl. May–Jul, fr. Aug–Dec.

Forests or thickets at streamsides or in valleys; 300–3000 m. Guangxi, Sichuan, Yunnan [Bhutan, N India, Nepal, N Vietnam].

The name "*Hymenodictyon yunnanense*" was written by Pitard on a specimen of this species from Yunnan, China (*Ducloux 6767*, P!) but never validly published (Razafimandimbison & Bremer, Bot. J. Linn. Soc. 152: 370. 2006).

2. *Hymenodictyon orixense* (Roxburgh) Mabberley, Taxon 31: 66. 1982.

毛土连翘 mao tu lian qiao

Cinchona orixensis Roxburgh, Bot. Descr. Swietenia, 21. 1793; *C. excelsa* Roxburgh; *Hymenodictyon excelsum* (Roxburgh) Wallich.

Trees, deciduous, to 25 m tall; bark smooth, gray; branches rather stout, weakly flattened to terete, puberulent to densely pilosulous or glabrescent. Leaves often grouped near ends of branches; petiole 2–17 cm, pilosulous; blade drying pa-

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perly or membranous, ovate-elliptic, elliptic, or broadly elliptic, 9–22 × 6–14 cm, both surfaces pilosulous with pubescence sometimes denser abaxially, base acute to obtuse, margins entire, apex shortly acuminate or acute; secondary veins 7–10 pairs, sometimes with pilosulous domatia; stipules ovate to triangular or lanceolate, 5–20 mm, densely pilosulous, obtuse to acute or bilobed for up to 1/2. Inflorescences terminal and in axils of uppermost leaves, 15–20 cm, simple or branched at least in part, with axes densely spiciform to racemiform, pilosulous, usually pendulous; peduncles ca. 6 cm; basal bracts 2–4, with blade papery to leathery, ovate to elliptic or elliptic-oblong, 9–17 × 2–5.5 cm, pilosulous, with stipe 3–8 cm. Flowers subsessile or with pedicels to 2 mm. Calyx densely puberulent to pilosulous; ovary portion subglobose to ellipsoid, 1–1.5 mm; limb lobed essentially to base; lobes triangular to elliptic, 1–1.5 mm. Corolla white or brown, outside densely puberulent to pilosulous; tube 2.5–3.5 mm, slenderly cylindrical then abruptly inflated at lobes; lobes ligulate to lanceolate, 2–2.5 mm, acute. Style exerted for 2–5 mm. Fruiting pedicels to 10 mm, reflexed. Capsules brown, 1.2–3 × 0.5–1.1 cm, woody, with prominent whitened, elliptic lenticels; seeds (including wing) 7–8 mm. Fl. May–Jul, fr. May–Dec.

Thickets or forests at riversides, at field edges, and in valleys; 100–1700 m. Sichuan, Yunnan [Cambodia, India, Indonesia (Java), Kashmir, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam].

Mabberley (loc. cit.) noted that Roxburgh studied this species in India as one of several plants (in several families) for which the bitter bark was used medicinally. In India this species is used for good quality wood for furniture and small items, and its bark as a febrifuge and a source of dye (color not noted; Razafimandimbison & Bremer, Bot. J. Linn. Soc. 152: 375–377. 2006).

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