

3. PAULOWNIA Siebold & Zuccarini, Fl. Jap. 1: 25. 1835.

泡桐属 pao tong shu

Trees, deciduous, evergreen in tropics. Bark smooth with conspicuous lenticels when young, longitudinally splitting with age. Branches opposite, without terminal buds. Leaves opposite, occasionally 3 in a whorl; petiole long; leaf blade entire or shallowly 3–5-lobed, margin undulate and often serrate when young. Inflorescences a large pyramidal to cylindrical thyrses. Cymes (1–)3–5(–8)-flowered, pedunculate or not. Calyx campanulate or obconical, hairy; lobes 5, subequal, upper 1 enlarged. Corolla purple or white, funnelform-campanulate to tubular-funnelform; tube base constricted and slightly curved; limb 2-lipped; lower lip elongated and 3-lobed; upper lip yellow, 2-lobed. Stamens 4, didynamous; filaments included, twisted near base; anthers divergent. Ovary 2-loculed. Style nearly as long as stamens. Capsule loculicidal, 2-valved or incompletely 4-valved; pericarp thin or thick and woody. Seeds small, numerous, membranous winged; endosperm sparse.

Seven species: mostly in China with one species extending to Laos and Vietnam; six species in China.

Because of the extensive cultivation of most species, it is often difficult to determine the precise wild distribution.

- 1a. Cymes without a peduncle or peduncle much shorter than pedicels; inflorescences broadly conical, to 1 m; lateral branches of inflorescences more than 1/2 of rachis length.
 - 2a. Cymes peduncle to 6–7 mm, terminal cyme with inconspicuous peduncle; calyx lobed to 1/3–2/5 of its length 7. *P. ×taiwaniana*
 - 2b. Cymes, except for ones borne on lower branches, without peduncle; calyx lobed to 1/2 or more of its length.
 - 3a. Calyx lobes strongly reflexed in fruit; corolla pale violet to blue-purple, 3–5 cm; young leaves viscid-glandular; capsule ovoid 5. *P. kawakamii*
 - 3b. Calyx lobes adnate to base of fruit; corolla white with purple striae to purple, 5.5–7.5 cm; young leaves stellate tomentose; capsule ellipsoid, or ovoid-ellipsoid 6. *P. fargesii*
- 1b. Cymes with a conspicuous peduncle or peduncle nearly as long as pedicels; inflorescences pyramidal, narrowly conical, or cylindrical, to 0.5 m; lateral branches of inflorescences to 1/2 of rachis length.
 - 4a. Capsule oblong to oblong-ellipsoid, 6–10 cm; pericarp woody, 3–6 mm; inflorescences subcylindrical; corolla ventral plaits inconspicuous; calyx 2–2.5 cm 4. *P. fortunei*
 - 4b. Capsule ovoid, ovoid-ellipsoid, or ellipsoid, 3–5.5 cm; pericarp not woody, to 3 mm; inflorescences pyramidal or narrowly conical; corolla ventral plaits conspicuous; calyx to 2 cm.
 - 5a. Capsule viscid-glandular hairy; calyx lobes as long as or longer than tube, not glabrescent 1. *P. tomentosa*
 - 5b. Capsule pubescent when young; calyx lobes shorter than tube, partly glabrescent.
 - 6a. Corolla funnelform-campanulate, apically 4–5 cm in diam.; leaves as long as wide, or slightly longer than wide; capsule ovoid, rarely ovoid-ellipsoid 2. *P. elongata*
 - 6b. Corolla narrowly tubular-funnelform, apically less than 3.5 cm; leaves length ca. 2 × width; capsule ellipsoid 3. *P. catalpifolia*

1. Paulownia tomentosa (Thunberg) Steudel, Nomencl. Bot. 2: 278. 1841.
毛泡桐 mao pao tong

Trees, to 20 m tall; crown broad, umbelliform. Bark brown-gray. Twigs conspicuously lenticellate, viscid glandular when young. Leaf blade cordate, ca. 40 cm, abaxially densely to sparsely hairy, adaxially sparsely hairy, apex acute. Thyrses pyramidal to narrowly conical, to 50 cm; cymes 3- or 4-flowered; peduncle 1–2 cm, nearly as long as pedicels. Calyx shallowly campanulate, ca. 1.5 cm, outside tomentose; lobes to 1/2 or more calyx length, ovate-oblong. Corolla purple, funnelform-campanulate, 5–7.5 cm, ridged ventrally, outside glandular, inside glabrous; limb ca. 4.5 cm in

diam. Stamens to 2.5 cm. Ovary ovoid, glandular. Style shorter than stamens. Capsule ovoid, 3–4.5 cm, densely viscid-glandular hairy; pericarp ca. 1 mm; persistent calyx lobes flat. Seeds 2.5–4 mm including wing. Fl. Apr–May, fr. Aug–Sep.

- Cultivated or wild; below 1800 m. Anhui, Gansu, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Liaoning, Shaanxi, Shandong, Shanxi, N Sichuan [cultivated in North America, Europe, Japan, and Korea].
- 1a. Leaves abaxially densely hairy . 1a. var. *tomentosa*
- 1b. Leaves abaxially sparsely hairy when young 1b. var. *tsinlingensis*

1a. Paulownia tomentosa var. *tomentosa*
毛泡桐(原变种) mao pao tong (yuan bian zhong)

Bignonia tomentosa Thunberg in Murray, Syst. Veg. ed. 14, 563. 1784; *Incarvillea tomentosa* (Thunberg) Sprengel; *Paulownia grandifolia* Hort. ex Wettstein; *P. imperialis* Siebold & Zuccarini; *P. imperialis* var. *lanata* Dode; *P. recurva* Rehder; *P. lilacina* Sprague; *P. tomentosa* var. *japonica* Elwes; *P. tomentosa* var. *lanata* (Dode) C. K. Schneider.

Leaf blade base cordate, abaxial surface densely hairy when mature. Fl. Apr–May, fr. Aug–Sep.

• Usually cultivated; below 1800 m. Anhui, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Liaoning, Shaanxi, Shandong, Shanxi [cultivated in North America, Europe, Japan, and Korea].

1b. *Paulownia tomentosa* var. *tsinlingensis* (Pai) Gong Tong, Acta Phytotax. Sin. 14(2): 43. 1976.

光泡桐 guang pao tong

Paulownia fortunei (Seemann) Hemsley var.

tsinlingensis Pai, Contr. Inst. Bot. Natl. Acad. Peiping 3: 59. 1935; *P. glabrata* Rehder; *P. shensiensis* Pai.

Leaf blade base rounded to shallowly cordate, abaxial surface glabrous or sparsely hairy when mature. Fr. Aug–Sep.

• Cultivated or wild; below 1700 m. Gansu, Henan, Hubei, Shaanxi, Shandong, Shanxi, N Sichuan.

2. *Paulownia elongata* S. Y. Hu, Quart. J. Taiwan Mus. 12: 41. 1959.

兰考泡桐 lan kao pao tong

Trees, to more than 10 m tall; crown broadly conical; many parts stellate tomentose. Young branches brown, with convex lenticels. Leaf blade often ovate-cordate, to 34 cm, abaxially densely sessile dendroid hairy, adaxially glabrescent, base cordate to subrounded, margin usually entire, sometimes irregularly angled or lobed, apex gradually attenuate and acute. Thyrses pyramidal to narrowly conical, ca. 30 cm; cymes 3–5-flowered; peduncle 0.8–2 cm, almost as long as pedicels. Calyx obconical 1.6–2 cm; tube glabrescent; lobes 5, to 1/3 of calyx length. Corolla purple to pinkish white, funnelform-campanulate, 7–9.5 × 4–5 cm, slightly curved, ridged ventrally, outside glandular and stellate hairy, inside glabrous and purple spotted; limb 4–5 cm in diam. Stamens to 2.5 cm. Ovary and style glandular; style 3–3.5 cm. Capsule ovoid, rarely ovoid-ellipsoid, 3.5–5 cm, stellate tomentose; persistent calyx disc-shaped; beak 4–5 mm; pericarp 1–2.5 mm. Seeds 4–5 mm including wing. Fl. Apr–May, fr. autumn.

• Wild or cultivated; low elevations. Anhui, Hebei, Henan, Hubei, Jiangsu, Shaanxi, Shandong, Shanxi.

3. *Paulownia catalpifolia* T. Gong ex D. Y. Hong, Novon 7: 366. 1998.

楸叶泡桐 qiu ye pao tong

Trees; crown large and high. Trunk straight. Leaves often narrowly ovate-cordate, ca. 2 × as long as wide, abaxially densely stellate tomentose, adaxially glabrous, margin entire or undulate and angled, apex acuminate. Thyrses pyramidal or narrowly conical, usually less than 35 cm; cyme peduncle nearly as long as pedicels.

Calyx shallowly campanulate, less than 2 cm, glabrescent after flowering; lobes 1/3–2/5 of calyx length, triangular to ovate. Corolla light purple, narrowly tubular-funnelform, 7–8 cm, less than 3.5 cm wide, ridged ventrally, inside with dense purple small spots, base curved forward; throat ca. 1.5 cm, apically less than 3.5 cm in diam. Capsule ellipsoid, 4.5–5.5 cm, stellate hairy when young; pericarp to 3 mm. Fl. Apr, fr. Jul–Aug.

• Low elevations. Shandong (Zou Xian).

Paulownia catalpifolia has been described from Shandong and is also cultivated in Hebei, Henan, Shandong, and Shanxi (Gong Tong, Acta Phytotax. Sin. 14(2): 41. 1976). A natural hybrid between *P.*

catalpifolia and *P. tomentosa*, *Paulownia* × *henanensis* C. Y. Zhang & Y. H. Zhao, has been reported from Henan (Acta Phytotax. Sin. 33: 503. 1995).

4. *Paulownia fortunei* (Seemann) Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 180. 1890.

白花泡桐 bai hua pao tong

Campsis fortunei Seemann, J. Bot. 5: 373. 1867; *Paulownia duclouxii* Dode; *P. meridionalis* Dode; *P. mikado* T. Itô.

Trees, to 30 m tall; crown conical; young shoots, inflorescences, and fruit yellowish brown stellate tomentose. Trunk straight, ca. 2 m d.b.h.; bark gray-brown. Petiole ca. 12 cm, glabrous; leaf blade narrowly ovate-cordate, occasionally ovate-cordate, to 20 cm, 2-parted on new shoots, abaxially stellate hairy or glandular, tomentose when mature, and rarely sparsely hairy or glabrous, adaxially glabrous. Thyrses narrow and long, subcylindric, ca. 25 cm; cymes 3–8-flowered; peduncle ± as long as pedicels. Pedicel glabrous. Calyx obconical, 2–2.5 cm; lobes 1/4–1/3 of calyx length, ovate to triangular-ovate, narrowly triangular in fruit. Corolla white, purple, or light purple, tubular-funnelform, 8–12 cm; tube enlarged gradually, slightly bent forward, ventrally weakly ridged, outside stellate pilose. Stamens 3–3.5 cm, sparsely glandular hairy. Ovary glandular, occasionally stellate hairy. Capsule oblong to oblong-ellipsoid, 6–10 cm; beak to 6 cm; pericarp woody, 3–6 mm thick; persistent calyx 3–6 mm, woody. Seeds 6–10 mm including wing. Fl. Mar–Apr, fr. Jul–Aug.

Wild or cultivated. Mountain slopes, forests, mountain valleys, wastelands; below 2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Laos, Vietnam].

Paulownia fortunei has been recently introduced to Hebei, Henan, Shaanxi, and Shandong.

5. *Paulownia kawakamii* T. Itô, Icon. Pl. Japon. 1(4): 1. 1912.

台湾泡桐 tai wan pao tong

Paulownia rehderiana Handel-Mazzetti; *P. thyrsoides* Rehder; *P. viscosa* Handel-Mazzetti.

Trees, 6–12 m tall; crown umbellate. Trunk short. Young shoot brown-gray, conspicuously lenticellate. Leaf blade cordate, to 8 cm, viscid-glandular hairy, margin entire or 3–5-lobed or angled, apex acute.

Thyrse broadly conical, to 1 m; cymes often 3-flowered, yellow-brown tomentose; peduncle absent or less than 1.2 cm. Pedicel to 1.2 cm. Calyx conspicuously ridged, tomentose; lobes longer than 1/2 of calyx length, narrowly ovate, conspicuously green margined, apex acute. Corolla pale violet to blue-purple, subcampanulate, 3–5 × 3–4 cm, outside glandular hairy. Stamens 1–1.5 cm. Ovary glandular. Style ca. 1.4 cm. Capsule ovoid, 2.5–4 cm, apex short beaked; pericarp less than 1 mm; persistent calyx radiate, lobes often strongly reflexed. Seeds oblong, 3–4 mm including wing. Fl. Apr–May, fr. Aug–Sep.

• Scrub, forests, wastelands; 200–1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Taiwan, Zhejiang.
6. *Paulownia fargesii* Franchet, Bull. Mus. Hist. Nat. (Paris) 2: 280. 1896.

川泡桐 chuan pao tong

Trees, to 20 m tall; crown conical. Trunk conspicuous. Twigs purple-brown to brown-gray, with round convex lenticels, stellate tomentose, glabrescent. Petiole to 11 cm; leaf blade ovate to ovate-cordate, to 20 cm or longer, abaxially moderately to densely tomentose or subglabrous, adaxially sparsely pubescent, hairs short branched and stalked, margin entire or undulate, apex narrowly acuminate and apiculate. Thyrse broadly conical, to 1 m; cymes sessile or subsessile, 3–5-flowered. Pedicel less than 1 cm. Calyx obconical, to 2 cm, stellate tomentose; lobes to 1/2 of calyx length. Corolla white with purple striations to wholly purple, subcampanulate, 5.5–7.5 cm, glandular pubescent. Stamens 2–2.5 cm. Ovary glandular. Style ca. 3 cm. Capsule ellipsoid to ovoid-ellipsoid, 3–4 cm, viscid glandular when young; pericarp thin; persistent calyx adnate or ± spreading, often not reflexed. Seeds oblong, 5–6 mm including wing. Fl. Apr–May, fr. Aug–Sep.

Wild or cultivated. Forests, mountain slopes; 1200–3000 m. Guizhou, Hubei, Hunan, Sichuan, Yunnan [Vietnam].

7. *Paulownia ×taiwaniana* T. W. Hu & H. J. Chang, *Taiwania* 20: 166. 1975.

南方泡桐 nan fang pao tong

Paulownia australis Gong Tong.

Trees; crown umbellate. Trunk to 5 m. Branches spreading. Leaf blade ovate-cordate, abaxially densely viscid hairy or stellate tomentose, margin entire or undulate and angled, apex acute. Thyrse broadly conical, to 80 cm; cymes with peduncle 6–7 mm, terminal cyme subsessile. Calyx glabrescent or not after flowering; lobes 1/3–2/5 of calyx length. Corolla purple, ventrally whitish and with 2 conspicuous longitudinal folds, tubular-campanulate, 5–7.5 cm. Capsule ellipsoid, ca. 4 cm, stellate hairy when young; pericarp to 2 mm. Fl. Mar–Apr, fr. Jul–Aug.

• Secondary forests; below 1200 m. Fujian, Guangdong, Hunan, Taiwan, Zhejiang.

Paulownia ×taiwaniana appears to be intermediate between *P. kawakamii* and *P. fortunei*, and it is most likely a hybrid between these two species.

