

4. PTEROCARYA Kunth, Ann. Sci. Nat. (Paris) 2: 345. 1824.

枫杨属 feng yang shu

Trees deciduous, monoecious. Branchlets with chambered pith. Terminal buds oblong, naked, or with 2–4 overlapping scales. Leaves odd- or even-pinnate; leaflets 5–21(–25), margin serrate. Inflorescences lateral or terminal on old or new growth, pendulous; male and female inflorescences separate: male spike solitary, lateral on old growth or at base of new growth; female spike terminal on new growth. Male flowers with an entire bract; bracteoles 2; sepals 4; stamens 5–18, anthers glabrous or pubescent. Female flowers with a small, entire bract, adnate to ovary but nearly free at base; bracteoles 2, adnate to ovary but nearly free above bract on posterior side; sepals 4, adnate to ovary, free at apex; style short; stigmas carinal, 2-lobed, plumose. Fruiting spike elongate, pendulous. Fruit a 2-winged nutlet, 4-chambered at base. Germination epigeal.

Six species: E and SW Asia; five species (two endemic) in China.

- 1a. Terminal buds with 2–4 caducous scales; branchlets with narrow bands of bud-scale scars; male spike lateral at base of new growth; bract of female flowers ca. 3 mm, densely tomentose; nutlets without lacunae in wall.
 - 2a. Leaflets 11–21; axis of fruiting spike pubescent; nutlets glabrous, wings semiorbicular, 1.3–2.1 × 0.9–1.8 cm 4. *P. rhoifolia*
 - 2b. Leaflets 7–13; axis of fruiting spike glabrous or pubescent; nutlets glabrous or pubescent, wings orbicular-ovate to elliptic-rhomboid, 1–3 × 1–2 cm 5. *P. macroptera*
- 1b. Terminal buds naked; branchlets without bud-scale scars; male spike lateral on old growth or scattered on new growth; bracts of female flowers less than 2 mm, glabrous or puberulent; nutlets with large lacunae in wall.
 - 3a. Leaflets 5–11(–15); rachis wingless; nutlet wings broad, elliptic-ovate 1. *P. hupehensis*
 - 3b. Leaflets usually 6–21(–25); rachis winged or not; nutlet wings narrow, linear or oblong-linear.
 - 4a. Rachis usually winged, at least in part; leaflets elliptic or elliptic-lanceolate, 6–12 × 2–3 cm, apex obtuse to acute 2. *P. stenoptera*
 - 4b. Rachis wingless; leaflets ovate or elliptic-ovate, 9–17 × 3–7 cm, apex acute to acuminate 3. *P. tonkinensis*

1. *Pterocarya hupehensis* Skan in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 493. 1899.

湖北枫杨 hu bei feng yang

Pterocarya sprengeri Pampanini.

Trees to 20 m tall. Leaves odd-pinnate, (18–)20–25 cm; petiole 5–7 cm, glabrous; rachis wingless, glabrous; leaflets 5–11(–15), petiolule to 2 mm, blade long elliptic to ovate-elliptic, 8–12 × 3.5–5 cm, abaxially glabrous except for hairs along midvein, in dense clusters in axils, and scattered along secondary veins, base subrounded, oblique, apex shortly acuminate. Fruiting spike 30–45 cm, axis glabrous or slightly pubescent. Nutlets subglobose, slightly ribbed, 7–8 mm, glabrous; wings broad, elliptic-ovate, 1–1.5 × 1.2–1.5 cm. Fl. Apr–May, fr. Aug.

• Streambanks in moist forests; 700–2000 m. N Guizhou, W Hubei (Changyang Xian), S Shaanxi, W Sichuan.

2. *Pterocarya stenoptera* C. de Candolle, Ann. Sci. Nat., Bot., sér. 4, 18: 34. 1862.

枫杨 feng yang

Acer mairei H. Léveillé; *Pterocarya chinensis* Lavallée; *P. esquirolii* H. Léveillé; *P. japonica* Lavallée; *P. laevigata* Lavallée; *P. stenoptera* var. *brevialata* Pampanini; *P. stenoptera* var. *kouitchensis* Franchet; *P. stenoptera* var. *sinensis* Graebner.

Trees to 30 m tall. Leaves even-pinnate, rarely odd-pinnate, 8–16(–25) cm; petiole 2–6.5 cm, sparsely pubescent; rachis often winged or sometimes only ridged or sulcate on some leaves, sparsely pubescent to tomentose; leaflets (6–)11–21(–25), sessile, long elliptic to elliptic-lanceolate, 8–12 × 2–3 cm, abaxially slightly pubescent, base oblique, cuneate or broadly cuneate, apex obtuse or acute. Fruiting spike 20–45 cm, axis pubescent at first but becoming nearly glabrous. Nutlets long ellipsoid, 6–7 mm, slightly pubescent to glabrescent; wings linear, 1.2–2.5 × 3–6 mm. Fl. Apr–May, fr. Aug–Sep. $2n = 32$.

Forests on mountain slopes or riverbanks; near sea level to 1500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].

Widely cultivated as a shade tree.

3. *Pterocarya tonkinensis* (Franchet) Dode, Bull. Soc. Dendrol. France 70: 67. 1929.

越南枫杨 yue nan feng yang

Pterocarya stenoptera C. de Candolle var. *tonkinensis* Franchet, J. Bot. (Morot) 12: 318. 1898.

Trees to 30 m tall. Leaves even-pinnate, rarely odd-pinnate, 18 cm or more; petiole 4.5–7 cm, glabrescent; rachis wingless, sometimes ridged or sulcate, pubescent

or glabrescent; leaflets 6–14, sessile, ovate or elliptic-ovate, 9–17 × 3–7 cm, abaxially glabrous except for hairs along midvein and secondary veins, base oblique, rounded or broadly cuneate, apex acute to acuminate. Fruiting spike 13–30 cm. Nutlets rhomboid, 6–7 mm, glabrous; wings linear, 1–1.7 cm × 2–6 mm. Fl. Mar, fr. May–Oct.

Wet areas along mountain streams; 200–1200 m. S Yunnan [Laos, Vietnam].

Shares many features with *Pterocarya stenoptera*, but lacks wings on the rachis and has a more southerly distribution with earlier flowering and fruiting. Transitional forms occur where the ranges of two species overlap.

4. *Pterocarya rhoifolia* Siebold & Zuccarini, Fl. Jap. 141. 1845.

水胡桃 shui hu tao

Pterocarya sorbifolia Siebold & Zuccarini.

Trees to 30 m tall. Leaves odd-pinnate, 20–25(–40) cm; petiole 3–7 cm, pubescent; rachis wingless, pubescent; leaflets (7–)11–21; lateral leaflets with petiolule ca. 1.5 mm, blade ovate-oblong to broadly oblanceolate, 6–12 × 1.5–4 cm, abaxially woolly pubescent along midvein and secondary veins, base oblique, rounded or broadly cuneate, apex acuminate; terminal petiolule 1.5–2 cm. Fruiting spike 20–30(–49) cm, axis pubescent. Nutlets 8–9 mm, base rounded, apex obtusely conical, glabrous; wings semiorbicular, ca. 1.3–2.1 × 0.9–1.8 cm. Fl. May, fr. Jun–Jul.

Wet areas along riverbanks and mountain streams. E Shandong (Lao Shan) [Japan].

5. *Pterocarya macroptera* Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 100. 1893.

甘肃枫杨 gan su feng yang

Trees to 25 m tall. Leaves odd-pinnate, 23–45 cm; petiole 2–13 cm, tomentose; rachis wingless, tomentose; leaflets (5 or) 7–13; lateral leaflets sessile or petiolule to 2 mm, blade ovate, elliptic, or long elliptic, 9–19 × 3–6 cm, abaxially pubescent, base oblique, cordate, apex acuminate; terminal petiolule 1–2.5 cm. Fruiting spike 45–60(–70) cm, axis glabrous or tomentose. Nutlets 7–9 mm, base rounded, apex broadly conical, glabrous or pubescent; wings orbicular-ovate to elliptic-rhomboid, 1–3 × 1–2(–2.5) cm. Fl. Apr–Jun, fr. Jul–Sep.

• Forests in valleys, along mountain streams, slopes; 1100–3500 m. SE Gansu, W Hubei, Shaanxi, Sichuan, Xizang, NW Yunnan, Zhejiang.

1a. Petiole 2–6 cm; axis of fruiting spike glabrous; nutlets glabrous or nearly so 5c. var. *insignis*

1b. Petiole 4–13 cm; axis of fruiting spike pubescent; nutlets pubescent.

2a. Petiole 4–8 cm; nutlet wings elliptic-rhomboid, 2–3 × ca. 2 cm 5a. var. *macroptera*

2b. Petiole 5–13 cm; nutlet wings orbicular-ovate to elliptic, 1–2.5 × 1–1.3 cm 5b. var. *delavayi*

5a. *Pterocarya macroptera* var. *macroptera*

甘肃枫杨(原变种) gan su feng yang (yuan bian zhong)

Trees to 15 m tall. Leaves 23–30(–43) cm; petiole 4–8 cm; leaflets 7–13, lateral leaflets elliptic or long elliptic, 9–18 × 3–6 cm, base oblique, cordate, apex acuminate. Fruiting spike 45–60(–70) cm, axis tomentose. Nutlets 7–9 mm, tomentose; wings elliptic-rhomboid, 2–3 × ca. 2(–2.5) cm. Fl. May–Jun, fr. Jul–Aug.

• Forests in valleys, along mountain streams; 1600–3500 m. SE Gansu, S Shaanxi, NE Sichuan.

5b. *Pterocarya macroptera* var. *delavayi* (Franchet) W. E. Manning, Bull. Torrey Bot. Club 102: 165. 1975.

云南枫杨 yun nan feng yang

Pterocarya delavayi Franchet, J. Bot. (Morot) 12: 317. 1898; *P. forrestii* W. W. Smith.

Trees to 15 m tall. Leaves 20–45 cm; petiole 5–13 cm; leaflets 7–13, lateral ones elliptic or elliptic-ovate to elliptic-lanceolate, 7–19 × 3–6 cm, base oblique, slightly cordate or broadly cuneate, apex acute or acuminate. Fruiting spike 50–60 cm, axis tomentose. Nutlets ca. 8 mm, tomentose; wings orbicular-ovate to elliptic, 1–2.5 × 1–1.3 cm. Fl. Apr–Jun, fr. Jul–Aug.

• Forests on mountain slopes; 1900–3300 m. W Hubei, W Sichuan, Xizang, NW Yunnan.

5c. *Pterocarya macroptera* var. *insignis* (Rehder & E. H. Wilson) W. E. Manning, Bull. Torrey Bot. Club 102: 165. 1975.

华西枫杨 hua xi feng yang

Pterocarya insignis Rehder & E. H. Wilson in Sargent, Pl. Wilson. 3: 183. 1916.

Trees to 25 m tall. Leaves (20–)30–45 cm; petiole 2–6 cm; leaflets (5 or) 7–13, lateral ones ovate to long elliptic, 14–16 × 4–5 cm, base oblique, rounded, apex acuminate. Fruiting spike to 45 cm, axis glabrous or nearly so. Nutlets ca. 8 mm, glabrous; wings orbicular-ovate, 1.5(–2) × 2(–2.5) cm. Fl. May–Jun, fr. Aug–Sep.

• Forests on mountain slopes; 1100–2700 m. W Hubei, Shaanxi, Sichuan, NW Yunnan, Zhejiang.

Flora of China 4: 280–282. 1999.