

5. JUGLANS Linnaeus, Sp. Pl. 2: 997. 1753.

胡桃属 hu tao shu

Trees or rarely shrubs, deciduous, monoecious. Branchlets with chambered pith. Terminal buds with false-valved scales. Leaves odd-pinnate; leaflets 5–31, margin serrate or rarely entire. Inflorescences lateral or terminal on old or new growth; male spike separate from female spike, solitary, lateral on old growth, pendulous; female spike terminal on new growth, erect. Flowers anemophilous. Male flowers with an entire bract; bracteoles 2; sepals 4; stamens usually numerous, 6–40, anthers glabrous or occasionally with a few bristly hairs. Female flowers with an entire bract adnate to ovary, free at apex; bracteoles 2, adnate to ovary, free at apex; sepals 4, adnate to ovary, free at apex; style elongate with recurved branches; stigmas carinal, 2-lobed, plumose. Fruiting spike erect or pendulous. Fruit a drupelike nut with a thick, irregularly dehiscent or indehiscent husk covering a wrinkled or rough shell 2–4-chambered at base. Germination hypogeal.

About 20 species: mainly temperate and subtropical areas of N hemisphere, extending into South America; three species in China.

1a. Leaflets abaxially pubescent or rarely glabrescent, margin serrate or rarely serrulate; nuts 2-chambered at base;

husk indehiscent; shell rough ridged and deeply pitted 3. *J. mandshurica*

1b. Leaflets abaxially glabrous except in axils of midvein and secondary veins, margin entire to minutely serrulate; nuts

4-chambered at base; husk irregularly dehiscent into 4 valves; shell wrinkled or smooth ridged and deeply pitted.

2a. Leaflets 5–9; shell wrinkled, without prominent ridges 1. *J. regia*

2b. Leaflets 9–15; shell smooth-ridged with deep pits and depressions and 2 or more prominent ridges 2. *J. sigillata*

1. *Juglans regia* Linnaeus, Sp. Pl. 2: 997. 1753.

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Juglans duclouxiana Dode; *J. fallax* Dode; *J. kamaonia* (C. de Candolle) Dode; *J. orientis* Dode; *J. regia* var. *sinensis* C. de Candolle; *J. sinensis* (C. de Candolle) Dode.

Trees to 25 m tall. Leaves 25–30 cm; petiole 5–7 cm; petiole and rachis glabrescent, without glandular hairs; leaflets (3 or)5–9, entire on mature trees, sometimes obscurely serrulate on young plants; lateral leaflets subsessile or petiolule 1–2 mm, blade elliptic-ovate to long elliptic, 6–15 × 3–6 cm, abaxially glabrous except for tufts of hairs in vein axils, without glandular hairs, base oblique, subrounded, apex obtuse or acute to shortly acuminate; terminal petiolule 2.5–6 cm. Male spike 5–10(–15) cm. Stamens 6–30(–40). Fruiting spike usually with 1–3(–38) nuts. Nuts subglobose, 4–6 cm; husk glabrous, irregularly dehiscent; shell thick except in commercial varieties, wrinkled. Fl. Apr–May, fr. Oct. 2n = 32.

Mountain slopes; 500–1800(–4000) m. Widely distributed in C, E, NW, and SW China [SW Asia to Himalayas, SE Europe]. Commonly cultivated in China from 23–42° N for its edible, oily nuts and hard, fine grained wood. *Juglans regia* has a very long history of cultivation in China and elsewhere; as a result, there are many cultivars, including five Chinese taxa that L.-A. Dode (Bull. Soc. Dendrol. France 2: 67–98. 1906), recognized on the basis of differences in shell thickness, size, etc.

2. *Juglans sigillata* Dode, Bull. Soc. Dendrol. France 2: 94. 1906.

泡核桃 pao he tao

Trees to 25 m tall. Leaves 15–50 cm; petiole 7–12.5 cm, glabrescent; rachis glabrescent; leaflets 9 or 11(–15), entire or obscurely serrulate; lateral leaflets sessile or

petiolule ca. 1 mm, blade ovate-lanceolate or elliptic-lanceolate, 6–18 × 3–8 cm, base oblique, apex acuminate; terminal petiolule 2–3 cm. Male spike 13.5–18 cm. Stamens 24–27. Fruiting spike with 1–3 nuts. Nuts ovoid-globose or subglobose, 3.4–6 × 3–5 cm; husk glabrescent, irregularly dehiscent; shell thick, smooth with 2 or more prominent ridges and deep pits and depressions. Fl. Mar–Apr, fr. Sep.

Forests in valleys and on mountain slopes; 1300–3300 m. Guizhou, Sichuan, SE Xizang, Yunnan [Bhutan, Sikkim].

This distinctive relative of *Juglans regia* is cultivated in Yunnan for its edible nuts and hard wood. The name refer to the many seal-like depressions (sigillatae) in the shell, and the species has subsequently received recognition in China as the “iron walnut.”

3. *Juglans mandshurica* Maximowicz, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg, sér. 2, 15: 127. 1856.

胡桃楸 hu tao qiu

Juglans cathayensis Dode; *J. cathayensis* var. *formosana* (Hayata) A. M. Lu & R. H. Chang; *J. collapsa* Dode; *J. draconis* Dode; *J. formosana* Hayata; *J. stenocarpa* Maximowicz.

Trees or sometimes shrubs, to 25 m tall. Leaves 40–90 cm; petiole 5–23 cm; petiole and rachis sparsely to moderately glandular pubescent, occasionally densely so; leaflets (7 or)9–19, lateral ones sessile, blade elliptic to long elliptic or ovate-elliptic to long elliptic-lanceolate, 6–17 × 2–7.5 cm, abaxially tomentose or occasionally slightly pubescent, generally without glandular hairs, slightly to densely glandular and glandular pubescent along midvein, base oblique, subcordate, margin serrate, rarely serrulate, apex acuminate; terminal petiolule 1–5 cm. Male spike 9–40 cm. Stamens 12–40. Fruiting spike with 5–10(–13) nuts. Nuts globose, ovoid, or ellipsoid, 3–7.5 × 3–5 cm; husk

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densely glandular pubescent, indehiscent; shell thick, rough, with 6–8 prominent ridges and deep pits and depressions. Fl. Apr–May, fr. Aug–Oct. $2n = 32$.

Mixed forests on mountain slopes or in valleys; 500–2800 m. Anhui, Fujian, Gansu, Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [N Korea].

Juglans mandshurica has often been characterized as a species with abaxially glabrescent leaflets, fruiting spike with 4 or 5 nuts, and a distribution N and NE of the Huang He valley. *Juglans cathayensis* was thought to differ in its tomentose leaflets, fruiting spike with 6–10 nuts, and a distribution S of the Huang He.

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