

4. ZELKOVA Spach, Ann. Sci. Nat., Bot., sér. 2, 15: 356. 1841, nom. cons.

榉属 ju shu

Trees, deciduous. Branchlets never spinose, never corky or winged. Stipules 2, free, linear-lanceolate, caducous, leaving a short transverse scar on each side of leaf base. Leaves distichous, margin serrate to crenate; venation pinnate; secondary veins extending to margin, each ending in a tooth. Flowers appearing at same time as leaves, polygamous. Male flowers: clustered in proximal leaf axil of young branchlets. Perianth campanulate, 4-6(or 7)-lobed. Stamens equal in number to perianth lobes; filaments short, erect. Female and bisexual flowers: usually solitary or rarely 2-4-clustered in distal leaf axil of young branchlets. Perianth 4-6-parted, tepals imbricate. Stamines absent or rarely developed. Ovary sessile; ovule pendulous, slightly amphitropous. Style excentric. Drupes oblique, dorsally keeled; endocarp hard; perianth persistent; stigmas beak-shaped. Seed slightly compressed, apex concave; endosperm absent; embryo curved; cotyledons broad, apically slightly notched to 2-lobed. 2n = 28.

Five species: E and SW Asia, SE Europe; three species (two endemic) in China.

We are following traditional usage in referring to the fruits as drupes. The exocarp is green but not fleshy, and the fruit resembles the samara of *Hemiptelea* but has no wing.

- 1a. Drupe 5-7 mm in diam., obovoid-globose, surface smooth, apex only slightly oblique 3. *Z. sinica*
- 1b. Drupe 2.5-3.5 mm in diam., irregularly and obliquely ovate-conic, surface covered by an irregular network of low ridges, apex strongly oblique.
- 2a. Young branchlets brownish purple to brown, glabrous or sparsely pubescent; leaf blade smooth and glabrous or abaxially sparsely pubescent along veins and adaxially sparsely hispid 1. *Z. serrata*
- 2b. Young branchlets gray to grayish brown, densely covered with grayish white pubescence; leaf blade abaxially densely pubescent, adaxially strigose 2. *Z. schneideriana*

1. *Zelkova serrata* (Thunberg) Makino, Bot. Mag. (Tokyo) 17: 13. 1903.

榉树 ju shu

Abelicea hirta C. K. Schneider; *Corchorus serrata* Thunberg; *Planera acuminata* Lindley; *P. japonica* Miquel; *Ulmus keaki* Siebold; *Zelkova acuminata* Planchon; *Z. formosana* Hayata; *Z. hirta* C. K. Schneider; *Z. keaki* Maximowicz; *Z. serrata* (Thunberg) Makino var. *tarokoensis* (Hayata) Li; *Z. tarokoensis* Hayata.

Trees, to 30 m tall, d.b.h. to 1 m, deciduous. Bark grayish white to grayish brown, exfoliating. Branchlets brownish purple to brown, pubescent or glabrescent. Winter buds conic-ovoid to ovoid. Stipules brownish purple, lanceolate, 7-9 mm. Petiole 2-6 mm, pubescent; leaf blade elliptic to ovate-lanceolate, 3-10 x 1.5-5 cm, papery to thickly papery, glabrous or abaxially sparsely pubescent along veins, adaxially sparsely hispid, base slightly oblique, rounded, or shallowly cordate, margin serrate to crenate, apex caudate-acuminate; secondary veins 9-15 on each side of midvein. Male flowers: shortly pedicellate, ca. 3 mm in diam. Perianth (5 or)7(or 8)-parted to middle. Female flowers: subsessile, ca. 1.5 mm in diam. Perianth 4- or 5(or 6)-parted. Ovary pubescent. Drupes pea green, subsessile, 2.5-3.5 mm in diam., surface covered by an irregular network of low ridges. Fl. Apr, fr. Sep-Nov. 2n = 28.

Valleys, beside streams; 500-2000 m. Anhui, Fujian, Gansu (Qin Ling), N Guangdong, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning (Dalian), Shaanxi (Qin Ling), Shandong, Sichuan, Taiwan, Zhejiang [Japan, Korea, Russia (Kuril Islands)].

The bark and leaves are used medicinally.

2. *Zelkova schneideriana* Handel-Mazzetti, Symb. Sin. 7: 104. 1929

大叶榉树 da ye ju shu

Trees to 35 m tall, d.b.h. to 80 cm. Bark grayish brown to dark gray, exfoliating. Young branchlets gray to grayish brown, densely covered with grayish white pubescence. Winter buds usually united, ovoid to ovate. Stipules linear-lanceolate, to 9 mm. Petiole 3-7 mm, pubescent; leaf blade ovate to elliptic-lanceolate, 3-10 x 1.5-4 cm, thickly papery, abaxially green to reddish purple and densely pubescent, adaxially green to brown and strigose, base slightly oblique, margin serrate to crenate, apex acuminate to acute; secondary veins 8-15 on each side of midvein. Male flowers: solitary or 2- or 3-clustered, shortly pedicellate. Female and bisexual flowers: usually solitary in distal leaf axil of young branchlets. Drupes pea green, subsessile, 2.5-3.5 mm in diam., surface covered by an irregular network of low ridges. Fl. Apr, fr. Sep-Nov. 2n = 28*.

• Beside streams; 200-1100 m (1800-2800 m in Xizang and Yunnan). Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, SE Sichuan, SE Xizang, Yunnan, Zhejiang.

The high quality timber is resistant to decay and the bark fiber is used for manufacturing ropes and paper.

3. *Zelkova sinica* C. K. Schneider in Sargent, Pl. Wilson. 3: 286. 1916.

大果榉 da guo ju

Trees to 30 m tall, d.b.h. to 60 cm. Bark grayish white,

smooth or exfoliating. Branchlets brown to brownish gray, grayish white pubescent or glabrescent. Winter buds globose to ovoid. Stipules brown, linear-lanceolate, 5–10 mm. Petiole slender, 2–10 mm, gray pubescent; leaf blade ovate to elliptic, (1.5–)3–6(–8) × (1–)1.5–3(–3.5) cm, papery to thickly papery, glabrous except for a few hairs on major veins, base rounded to broadly cuneate, margin crenate, apex acuminate or rarely acute; secondary veins 6–10 on each side of midvein. Male flowers: solitary or 1- or 3-clustered, 2–3 mm in diam. Tepals (5 or)6(or 7), ovate-oblong. Stamens basally white pubescent. Female flowers: solitary. Tepals 5 or 6. Ovary pubescent. Drupes irregularly obovoid-globose, 5–7 mm in diam., smooth; stalk 0–3 mm, pubescent. Fl. Apr, fr. Aug–Sep. $2n = 28^*$.

• Valleys, beside rivers; 800–2500 m. Gansu, Hebei, Henan, NW Hubei, Shaanxi, S Shanxi, N Sichuan.

