

5. **ALNUS** Miller, Gard. Dict., Abr. ed. 4, 1: [51]. 1754.

栲木属 qi mu shu

Trees or shrubs deciduous. Buds stalked with 2(or 3) scales or sessile with several overlapping scales. Leaves usually serrate or dentate, rarely incised or entire. Male inflorescence elongate, pendulous, cylindrical, with numerous overlapping bracts, each bract subtending (3 or)4(or 5) bracteoles and 3 flowers; calyx 4-lobed; stamens (1–)4; anthers 2-loculed, thecae connate, apex glabrous. Female inflorescence 1, or 2–numerous in a raceme or panicle, ovoid or ellipsoid, conelike; bracts numerous, overlapping, woody, persistent, apex 5-lobulate, each bract subtending 2 flowers. Nutlets 2 in each bract axil, compressed, with membranous or papery wings. Fl. mainly spring, *Alnus formosana* and *A. nepalensis* autumn.

About 40 species: Bangladesh, Bhutan, China, India, Japan, Korea, Nepal, Sikkim; Europe, North and South America; ten species (five endemic) in China.

Three or more divergent subgroups (subgenera) of *Alnus* are often treated as separate genera (J. J. Furlow, J. Arnold Arbor. 71: 1–67. 1990).

Various *Alnus* species are grown to protect dikes, some are valued for timber, and the roots have nodules with nitrogen-fixing bacteria.

1a. Female inflorescence 1.

2a. Nutlet with papery wings, 1/4–1/3 as wide as nutlet; peduncle usually erect, 1–3 cm 1 *A. ferdinandi-coburgii*

2b. Nutlet with membranous wings, ca. 1/2 as wide as nutlet; peduncle slender, pendulous, 3–8 cm.

3a. Branchlets, petioles, peduncles, and leaves sparsely white pubescent abaxially when young 2. *A. cremastogyne*

3b. Branchlets, petioles, peduncles, and leaves densely yellow-brown tomentose abaxially,

especially

when young 3. *A. lanata*

1b. Female inflorescences 2–numerous, in a raceme or panicle.

4a. Female inflorescences in a panicle.

5a. Female inflorescences numerous; nutlet with membranous wings; leaves entire or remotely minutely serrate 4. *A. nepalensis*

5b. Female inflorescences 5–13; nutlet with papery wings; leaves remotely serrate 5. *A. henryi*

4b. Female inflorescences in a raceme.

6a. Buds sessile, with 3–6 scales; peduncle long 6. *A. mandshurica*

6b. Buds stipitate, with 2 scales; peduncle very short.

7a. Leaves suborbicular, brownish pubescent abaxially, margin undulate-incised 7. *A. hirsuta*

7b. Leaves oblong, obovate-oblong, ovate-elliptic, or ovate-lanceolate, glabrous or sparsely pubescent on both surfaces when young, margin minutely serrate.

8a. Peduncle of female inflorescence 3–5 mm 8. *A. formosana*

8b. Peduncle of female inflorescence 10–20 mm.

9a. Leaves obovate, obovate-elliptic, or obovate-lanceolate, base cuneate 9. *A. japonica*

9b. Leaves obovate-oblong, oblanceolate-oblong, or oblong, base subrounded, subcordate,

or

broadly cuneate 10. *A. trabeculosa*

1. *Alnus ferdinandi-coburgii* C. K. Schneider, Bot. Gaz. 64: 147. 1917.

川滇栲木 chuan dian qi mu

Trees to 20 m tall; bark dark gray, smooth. Branches dark gray or gray-brown; branchlets red-brown, densely pubescent when young, glabrescent. Buds stipitate, with 2 glabrous scales. Petiole 1–2 cm, densely yellow pubescent; leaf blade ovate, ovate-elliptic, or obovate-oblong, rarely lanceolate, 5–16 × 3–7 cm, both surfaces yellow pubescent along veins, abaxially bearded in axils of lateral veins, base subrounded or cuneate, margin obscurely and remotely minutely serrate or subentire, apex abruptly acute; lateral veins 12–17 on each side of midvein. Female inflorescence 1, globose or oblong, 1.5–3 × 1–1.5 cm; peduncle erect, robust, 1.5–3 cm;

bracts woody, 3–4 mm, base cuneate, apex rounded, 5-lobed. Nutlet narrowly elliptic, ca. 3 mm, with papery wings ca. 1/3 as wide as nutlet. Fl. May–Jul, fr. Aug–Sep.

• Forests on mountain slopes, streamsides; 1500–3000 m. Guizhou, SW Sichuan, Yunnan.

2. *Alnus cremastogyne* Burkill in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 499. 1899.

栲木 qi mu

Trees to 40 m tall; bark gray, smooth. Branchlets gray or gray-brown, glabrous. Buds stipitate, with 2 scales, glabrous. Petiole 1–2 cm, glabrous, sometimes light yellow pubescent when young; leaf blade obovate, obovate-oblong, oblong, or oblanceolate, 4–14 × 3.5–8 cm, abaxially densely glandular, subglabrous, bearded in axils of lateral veins, adaxially sparsely glandular,

villous when young, glabrescent, base cuneate or subrounded, margin obscurely and remotely obtusely serrate, apex abruptly acute; lateral veins 8–10 on each side of midvein. Female inflorescence 1, axillary, oblong, 1–3.5 × 0.5–2 cm; peduncle pendulous, slender, 4–8 cm, glabrous, sometimes pubescent when young. Nutlet ovate, ca. 3 mm, with membranous wings ca. 1/2 as wide as nutlet. Fl. May–Jul, fr. Aug–Sep.

• Forests on mountain slopes or along streambanks; 500–3000 m. SE Gansu, N Guizhou, S Shaanxi, Sichuan, Zhejiang; cultivated in Jiangsu.

3. *Alnus lanata* Duthie ex Bean, Bull. Misc. Inform. Kew 1913: 164. 1913.

毛栲木 mao qi mu

Trees to 20 m tall; bark yellow-gray, smooth. Branchlets gray-brown or purplish brown, striate, densely yellow-brown tomentose when young. Buds stipitate; stipe densely yellow-brown tomentose; scales 2, sparsely pubescent. Petiole 1–2 cm, densely yellow-brown tomentose when young, becoming sparsely pubescent in furrow; leaf blade obovate-oblong or oblong, 5–14 × 3–8 cm, abaxially densely yellow-brown tomentose, with dense, resinous glands, adaxially sparsely villous, base subrounded, rarely broadly cuneate, margin irregularly minutely serrate, apex abruptly acute; lateral veins 10–13 on each side of midvein. Female inflorescence 1, oblong, 1.5–4 × 0.8–2 cm; peduncle slender, densely yellow-brown tomentose when young; bracts 3–5 mm, woody, base cuneate, apex rounded, 5-lobed. Nutlet ovate-elliptic, ca. 3 mm, with membranous wings ca. 1/2 as wide as nutlet. Fl. May–Jul, fr. Aug–Sep.

• Streamsides in forests; 1600–2300 m. W Sichuan (Kangding Xian, Luding Xian).

4. *Alnus nepalensis* D. Don, Prodr. Fl. Nepal. 58. 1825.

尼泊尔栲木 ni po er qi mu

Alnus boshia Buchanan-Hamilton ex D. Don;
Clethropsis nepalensis (D. Don) Spach.

Trees to 15 m tall; bark gray or dark gray, smooth. Branchlets dark brown, sparsely yellow pubescent when young, glabrescent. Buds stipitate, with 2 glabrous, ribbed scales. Petiole robust, 1–2.5 cm, subglabrous; leaf blade obovate-lanceolate, obovate-oblong, ovate, or elliptic, 4–16 × 2.5–10 cm, abaxially with dense, resinous glands, yellow pubescent along veins, bearded in axils of lateral veins, adaxially glabrous, base cuneate or broadly cuneate, rarely subrounded, margin entire or remotely minutely serrate, apex abrupt or acute, rarely acuminate; lateral veins 8–16 on each side of midvein. Female inflorescences numerous, in a panicle, ellipsoid, 2–2.2 cm × 7–8 mm; peduncle robust, 2–8 mm, glabrous; bracts ca. 4 mm, woody, persistent, base cuneate, apex rounded, 5-lobed.

Nutlet oblong, ca. 2 mm, with membranous wings ca. 1/2 as wide as nutlet. Fl. May–Jun, fr. Jul–Sep. $2n = 28$, 56.

Riverbanks or village margins, often forming pure stands; 200–2800 m. Guangxi, Guizhou, SW Sichuan, Xizang, Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, Sikkim, N Thailand, N Vietnam].

The wood is light and soft and is used for making inexpensive furniture and boxes.

5. *Alnus henryi* C. K. Schneider in Sargent, Pl. Wilson. 2: 495. 1916.

台北栲木 tai bei qi mu

Trees. Branchlets yellow-green, sparsely pubescent when young. Petiole slender, 1–1.6 cm, pubescent in furrow; leaf blade broadly ovate, ovate, or elliptic, 4–8 × 2.5–5 cm, both surfaces subglabrous, base rounded, rarely rounded-cuneate, margin remotely minutely serrate, apex obtuse or acute; lateral veins 7–9 on each side of midvein. Female inflorescences 5–13 in a panicle, ellipsoid, 1.3–1.5 cm, subsessile; bracts persistent, ca. 4 mm, woody, base cuneate, apex rounded, 5-lobed. Nutlet elliptic, with papery wings ca. 1/3 as wide as nutlet. Fl. Jun–Jul, fr. Aug–Sep.

• Taiwan (Tanshui).

Treated by J. C. Liao in Fl. Taiwan, ed. 2 as an uncertain species. A. K. Skvortsov indicates that *Alnus henryi* is very similar to *A. formosana*, and further studies may show that they are conspecific.

6. *Alnus mandshurica* (Callier ex C. K. Schneider) Handel-Mazzetti, Oesterr. Bot. Z. 81: 306. 1932.

东北栲木 dong bei qi mu

Alnus fruticosa Ruprecht var. *mandshurica* Callier ex C. K. Schneider, Ill. Handb. Laubholz. 1: 121. 1904;
Duschekia mandshurica (Callier ex C. K. Schneider) Pouzar.

Shrubs or trees to 10 m tall; bark dark gray, smooth. Branchlets gray-brown, glabrous. Buds sessile, with 3–6 scales. Petiole robust, 0.5–2 cm, glabrous or sparsely pubescent, sometimes resinous glandular; leaf blade broadly ovate, ovate, elliptic, or broadly elliptic, 4–10 × 2.5–8 cm, both surfaces glabrous except bearded in axils of lateral veins abaxially, base rounded or subcordate, rarely broadly cuneate or unequal, margin densely minutely doubly or simply serrate, apex acute; lateral veins 7–13 on each side of midvein. Female inflorescences 3–6 in a raceme, oblong or globose, 1–2 cm; peduncles pendulous, 0.5–2(–3) cm, slender, glabrous or sparsely pubescent; bracts 3–4 mm, woody, base cuneate, apex rounded, 5-lobed. Nutlet ca. 2 mm, with membranous wings ca. as wide as nutlet. Fl. May–Jul, fr. Jul–Aug.

Temperate forests, streamsides; 200–1900 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [N Korea, Russia (Far East)].

7. *Alnus hirsuta* Turczaninow ex Ruprecht, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg, sér. 2, 15: 376. 1857.
辽东栎木 *liao dong qi mu*

Alnus hirsuta var. *sibirica* (Fischer ex Turczaninow) C. K. Schneider; *A. incana* (Linnaeus) Moench var. *glauca* Regel; *A. incana* var. *hirsuta* Spach; *Alnus incana* var. *sibirica* Spach; *A. sibirica* Fischer ex Turczaninow; *A. sibirica* var. *hirsuta* (Turczaninow ex Ruprecht) Koidzumi; *A. sibirica* var. *oxyloba* C. K. Schneider; *A. sibirica* var. *paucinervis* C. K. Schneider; *A. tinctoria* Sargent.

Trees to 20 m tall; bark gray-brown, smooth. Branchlets dark gray, angular, densely gray pubescent when young, glabrescent. Buds stipitate, with 2 scales, sparsely pubescent. Petiole 1.5–5.5 cm, densely pubescent; leaf blade suborbicular, rarely broadly ovate, 4–9 × 2.5–9 cm, abaxially light green or glaucescent, densely or sparsely brown hispidulous, rarely subglabrous, sometimes bearded in axils of lateral veins, adaxially dark green, sparsely villous, base rounded or broadly cuneate, rarely cuneate or subcordate, margin undulate-serrate, apex rounded, rarely acute; lateral veins 5–10 on each side of midvein. Female inflorescences 2–8 in a raceme, subglobose or oblong, 1–2 cm; peduncle 2–3 mm; bracts 3–4 mm, woody, base cuneate, apex rounded, 5-lobed. Nutlet broadly ovate, ca. 3 mm, with papery wings ca. 1/4 as wide as nutlet. Fl. May–Jul, fr. Jul–Aug.

Temperate forests, along streambanks; 700–1500 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, Shandong [Japan, Korea, Russia (Siberia)].

The wood is hard and dense, and is used for making agricultural tools and furniture.

8. *Alnus formosana* (Burkill) Makino, Bot. Mag. (Tokyo) 26: 390. 1912.

台湾栎木 *tai wan qi mu*

Alnus maritima (Marshall) Nuttall var. *formosana* Burkill in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 500. 1899; *A. japonica* (Thunberg) Steudel var. *formosana* Callier.

Trees to 20 m tall; bark dark gray-brown. Branches purplish brown, glabrous, striate; branchlets sparsely pubescent. Buds stipitate, with 2 glabrous, ribbed scales. Petiole 1.2–2.2 cm, slender, densely pubescent in furrow; leaf blade elliptic or oblong-lanceolate, rarely ovate-oblong, 6–12 × 2–5 cm, abaxially bearded in axils of lateral veins, adaxially subglabrous, base rounded or broadly cuneate, margin irregularly minutely serrate, apex acuminate or acute; lateral veins 6 or 7 on each side of midvein. Female inflorescence 1, or 2–4 in a raceme, ellipsoid, 1–2.5 cm; peduncle 3–5 mm, robust; bracts 3–4 mm, woody, base cuneate, apex rounded, 5-lobed. Nutlet obovate, 2–3 mm, with papery wings 1/4–1/3 as wide as nutlet. Fl. May–Jun, fr. Jul–Sep.

• Riverbanks, forming pure stands, common; near sea level to 2900 m. Taiwan (Tanshui).

9. *Alnus japonica* (Thunberg) Steudel, Nomencl. Bot., ed. 2, 1: 55. 1840.

日本栎木 *ri ben qi mu*

Betula japonica Thunberg, Nov. Act. Soc. Sci. Upsal. 6: 45. 1799; *Alnus japonica* var. *latifolia* Callier; *A. maritima* (Marshall) Nuttall var. *arguta* Regel; *A. maritima* var. *japonica* Regel; *A. reginosa* Nakai.

Trees to 20 m tall; bark gray-brown, smooth. Branches dark gray or gray-brown, striate, glabrous; branchlets brown, glabrous or yellow pubescent when young, sometimes resinous glandular. Buds stipitate, with 2 glabrous, ribbed scales. Petiole 1–3 cm, sparsely resinous glandular and pubescent; leaf blade obovate or obovate-elliptic on dwarf shoots, obovate-lanceolate on branchlets, 4–14 × 2.5–4 cm, abaxially sparsely pubescent at first, glabrescent, sometimes resinous glandular and bearded in axils of lateral veins, adaxially glabrous, base cuneate, margin remotely minutely serrate, apex mucronate, acute, or acuminate; lateral veins 7–11 on each side of midvein. Female inflorescences 2–5 in a raceme, ellipsoid, ca. 2 × 1–1.5 cm; peduncle robust, ca. 1 cm; bracts 3–5 mm, woody, base cuneate, apex rounded, 5-lobed. Nutlet obovate, 2–3 mm, with papery wings ca. 1/4 as wide as nutlet. Fl. May–Jul, fr. Jul–Aug.

Temperate forests, streambanks, roadsides; 800–1500 m. Anhui, Hebei, Henan, Jiangsu, Jilin, Liaoning, Shandong, Taiwan [Japan (including Ryukyu Islands), Korea, Russia (Far East)].

10. *Alnus trabeculosa* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 59: 51. 1922.

江南栎木 *jiang nan qi mu*

Alnus jackii Hu.

Trees to 10 m tall; bark gray or gray-brown, smooth. Branches dark gray-brown, glabrous; branchlets gray-brown, yellow pubescent. Buds stipitate, with 2 glabrous, ribbed scales. Leaves obovate-oblong, oblanceolate-oblong, or oblong, 6–16 × 2.5–7 cm, abaxially resinous glandular, glabrous except bearded in axils of lateral veins, adaxially glabrous, base subrounded, subcordate, or broadly cuneate, margin remotely minutely serrate, apex acute or acuminate to caudate; lateral veins 6–13 on each side of midvein. Female inflorescences 2–4 in a raceme, oblong, 1–2.5 × 1–1.5 cm; peduncle 1–2 cm, glabrous; bracts 5–7 mm, woody, base cuneate, apex rounded, 5-lobed. Nutlet broadly ovate, 3–4 × 2–2.5 mm, with papery wings ca. 1/4 as wide as nutlet. Fl. May–Jun, fr. Jul–Aug.

Forests on mountain valleys, riverbanks; 200–1000 m. Anhui, Fujian, N Guangdong, Guizhou, S Henan, Hubei, E Hunan, Jiangsu, Jiangxi, Zhejiang [Japan].

Flora of China 4: 301–304. 1999.