

5. CUPRESSUS Linnaeus, Sp. Pl. 2: 1002. 1753.

柏木属 bai mu shu

Trees (rarely shrubs) evergreen, monoecious; branchlets ascending, rarely pendulous, often decussately arranged, terete or 4-angled in cross section. Leaves decussate, 4-ranked; juvenile leaves needlelike; adult leaves scalelike, with an abaxial resin gland, usually not dimorphic along branchlets. Pollen cones ovoid or oblong; microsporophylls 6–16, each with 2–6 pollen sacs. Seed cones terminal, solitary, globose or subglobose, dehiscent when mature in 2nd year; cone scales 8–16, decussate, peltate, woody, each fertile scale bearing 3–20 seeds; free bract apex a short mucro. Seeds slightly flattened, ridged, with lateral, narrow wings. Cotyledons 2–5.

About 17 species: N Africa, Asia, S Europe, SW North America; nine species (four endemic, four introduced) in China.

Cupressus cashmeriana Royle ex Carrière (Traité Gén. Conif., ed. 2, 1: 161. 1867) known with certainty only from Bhutan, might possibly extend into China, in SE Xizang. That is if *Cupressus assamica* Silba (J. Intern. Conifer Preserv. Soc. 1: 19. 1994) described from SE Xizang with *Kingdon Ward 12449* (BM) as the holotype, is indeed a synonym of *C. casmeriana*, as was given by A. Farjon (World Checkl. Bibliogr. Conif. 45. 1998).

1a. Branchlets flattened; seed cones 0.8–1.5 cm in diam.; seeds 3–5(or 6) per cone scale 9. *C. funebris*
1b. Branchlets terete or 4-angled; seed cones 1–3 cm in diam.; seeds more than 8 per cone scale.

2a. Branchlets terete.

3a. Branchlets loosely or densely arranged, ultimate ones pendulous or irregularly spreading, slender, 1–1.4 mm

in diam.; seed cones dark grayish brown at maturity, 1–1.8 cm in diam. 6. *C. torulosa*

3b. Branchlets densely arranged, ultimate ones spreading, ascending, or drooping but not pendulous, stout,

1.2–2 mm in diam.; seed cones brown or reddish brown at maturity, 1.2–2 cm in diam.

4a. Branchlets not glaucous; bracts with a small, free mucro at apex 7. *C. chengiana*

4b. Branchlets often glaucous; bracts with a prominent, large, free mucro at apex 8. *C. gigantea*

2b. Branchlets 4-angled.

5a. Leaves with a conspicuous abaxial gland 5. *C. arizonica*

5b. Leaves without a conspicuous abaxial gland.

6a. Leaves green, not glaucous.

7a. Leaves obtuse or subacute at apex; seed cones 2–3 cm in diam.; cone scales 8–14 3. *C. sempervirens*

7b. Leaves acute at apex; seed cones 1–1.5 cm in diam.; cone scales 6–10 4. *C. goveniana*

6b. Leaves bluish green or grayish green, glaucous.

8a. Seed cones with ca. 12 cone scales; branchlets stout, ultimate ones 1.5–2 mm in diam. 8. *C. gigantea*

8b. Seed cones with 6–10 seed scales; branchlets thin, ultimate ones 0.8–1 mm in diam.

9a. Branchlets spreading or drooping but not pendulous; seed cones 1.5–3.2 cm in diam., with

(6–)8–10 cone scales 1. *C. duclouxiana*

9b. Branchlets pendulous; seed cones 1–1.5 cm in diam., with 6–8 cone scales 2. *C. lusitanica*

1. *Cupressus duclouxiana* Hickel in A. Camus, [Les Cyprès] Encycl. Econ. Sylvicult. 2: 91, f. 419–424. 1914.

干香柏 gan xiang bai

Cupressus austrotibetica Silba.

Trees to 25 m tall; trunk to 80 cm d.b.h.; crown conical when young, rounded or broadly domed when old; branches densely arranged; branchlets spreading or drooping but not pendulous, thin, ultimate ones 4-angled, 0.8–1 mm in diam. Leaves closely appressed, slightly glaucous abaxially, 1–2 mm on ultimate branchlets, ridged or ± gibbous with an inconspicuous or more visible abaxial gland, base long decurrent on leading branchlets, apex acute or slightly obtuse. Pollen cones subglobose or oblong, (4–)5–7 mm; microsporophylls (12–)16–20. Seed cones dark brown or purplish brown when ripe, glaucous, globose, 1.5–3.2 cm in diam.; cone scales (6–)8–10, each fertile

scale with numerous seeds. Seeds brown or purplish brown, 3–5 mm, with 3 ridges. $2n = 22^*$.

• Forests on mountain slopes; 1400–3300 m. ?Guizhou, SW Sichuan, C and NW Yunnan, SE Xizang.

2. *Cupressus lusitanica* Miller, Gard. Dict., ed. 8, *Cupressus* no. 3. 1768.

墨西哥柏木 mo xi ge bai mu

Trees to 30 m tall; trunk to 1 m d.b.h.; bark reddish brown, longitudinally fissured; branchlets not arranged in a plane, pendulous, thin, ultimate ones 4-angled, ca. 1 mm in diam. Leaves bluish green, glaucous, without a conspicuous abaxial gland, apex pointed. Seed cones brown, glaucous, globose, 1–1.5 cm in diam.; cone scales 6–8, each fertile scale with numerous seeds. Cultivated for ornament. Jiangsu, Jiangxi [native to Guatemala, Honduras, Mexico].

3. *Cupressus sempervirens* Linnaeus, Sp. Pl. 2: 1002. 1753.

地中海柏木 di zhong hai bai mu

Trees to 30 m tall; bark grayish brown, shallowly fissured; branches ascending or horizontally spreading; branchlets not arranged in a plane, ultimate ones 4-angled, ca. 1 mm in diam. Leaves in 4 ranks, densely appressed, dark green, not glaucous, 0.5–1 mm, ridged abaxially, without a conspicuous abaxial gland, apex obtuse or subacute. Pollen cones 4–8 mm. Seed cones yellowish gray when ripe, subglobose or ellipsoid, 2.5–4 × 2–3 cm; cone scales 8–14, each fertile scale with 8–20 seeds.

Cultivated. Jiangsu, Jiangxi [native to W Asia, E Mediterranean region].

4. *Cupressus goveniana* Gordon, J. Hort. Soc. London 4: 295. 1849.

加州柏木 *jia zhou bai mu*

Shrubs or small trees to 5 m tall; bark smooth or rough, fibrous; crown globose to columnar, dense or sparse; branchlets not arranged in a plane, ultimate ones 4-angled, ca. 1 mm in diam. Leaves green, not glaucous, without a conspicuous abaxial gland, apex acute. Pollen cones 3–4 × 1.5–2 mm; microsporophylls each with 3–6 pollen sacs. Seed cones grayish brown, not glaucous, globose, 1–2.5(–3) × 1–1.5 cm; cone scales 6–10, each fertile scale with numerous seeds. Seeds 3–4(–5) mm.

Cultivated. Jiangsu [native to W United States].

5. *Cupressus arizonica* Greene, Bull. Torrey Bot. Club 9: 64. 1882.

绿干柏 *lu gan bai*

Trees to 25 m tall; bark smooth when young, remaining so or becoming rough, furrowed, and fibrous; crown conical when young, becoming broadly columnar with age, dense; branches ascending, stout; ultimate branchlets 4-angled, 1–2 mm in diam. Leaves bluish green, slightly glaucous, ridged abaxially, with a conspicuous abaxial gland, apex acute. Pollen cones 2–5 × ca. 2 mm; microsporophylls mostly each with 4–6 pollen sacs. Seed cones gray or brown, often glaucous initially, globose or oblong, mostly 2–3 cm; cone scales 6–8, each fertile scale with numerous seeds. Seeds mostly 4–6 mm.

Cultivated. Guangxi, Jiangsu, Jiangxi [native to N Mexico, SW United States].

6. *Cupressus torulosa* D. Don in Lambert, Descr. Pinus 2: 18. 1824.

西藏柏木 *xi zang bai mu*

Cupressus tongmaiensis Silba; *C. tongmaiensis* var. *ludlowii* Silba; *C. tonkinensis* Silba.

Trees to 45 m tall; trunk to 3.5 m d.b.h.; branchlets loosely or densely arranged, terete, ultimate ones pendulous or irregularly spreading, slender, 1–1.4 mm in diam. Leaves closely arranged, scalelike, 1–1.8 mm, flat or slightly gibbous and with a rounded, sometimes inconspicuous central abaxial gland, apex usually slightly obtuse. Pollen cones 3–6 mm; microsporophylls 14–18. Seed cones dark grayish brown when ripe, not glaucous, broadly ovoid or

subglobose, 1.2–2 × 1–1.8 cm; cone scales (8–) 10–12, each fertile scale with numerous seeds; bracts with a prominent umbo or mucro at apex. Seeds ovate-oblong, flattened, 3–5 mm. $2n = 22$.

Mountains; 1800–2800 m. E and S Xizang [?Bhutan, N India, Kashmir, Nepal, ?Sikkim, ?Vietnam].

7. *Cupressus chengiana* S. Y. Hu, Taiwania 10: 57. 1964.

岷江柏木 *min jiang bai mu*

Trees to 30 m tall; trunk to 1 m d.b.h.; branchlets densely arranged, not glaucous, terete, ultimate ones spreading, ascending, or drooping but not pendulous, stout, 1.2–2 mm in diam. Leaves in 4 ranks, scalelike, 1–1.5 mm on ultimate branchlets, arched (gibbous) and with a conspicuous, often darker central abaxial gland, apex usually slightly obtuse, dull green, not glaucous. Pollen cones 2–4 mm; microsporophylls 12–16. Seed cones brown or reddish brown when ripe, not glaucous, globose to subglobose or oblong-ovoid, 1.2–2 cm in diam.; cone scales 8–14, each fertile scale with numerous seeds; bracts with a small, free mucro at apex. Seeds ovate-triangular, flattened, 3–5 × 2–4 mm. $2n = 22^*$.

• Mountain slopes, valleys; 800–2900 m. S Gansu, N and W Sichuan. A vulnerable species.

1a. Seed cones globose to subglobose; cone scales 8–10 7a. var. *chengiana*

1b. Seed cones oblong-ovoid; cone scales 10–14 7b. var. *jiangeensis*

7a. *Cupressus chengiana* var. *chengiana*

岷江柏木(原变种) *min jiang bai mu* (yuan bian zhong) *Cupressus chengiana* var. *kansouensis* Silba; *C. chengiana* var. *wenchuanhsiensis* Silba; *C. fallax* Franco.

Branchlets terete. Seed cones globose to subglobose; cone scales 8–10.

• Mountain slopes, valleys; 900–2900 m. S Gansu, N and W Sichuan.

7b. *Cupressus chengiana* var. *jiangeensis* (N. Zhao) Silba, Phytologia 49: 394. 1981.

剑阁柏木 *jian ge bai mu*

Cupressus jiangeensis N. Zhao, Acta Phytotax. Sin. 18: 210. 1980.

Branchlets subterete. Seed cones oblong-ovoid; cone scales 10–14.

• About 800 m. N Sichuan (Jiange Xian).

8. *Cupressus gigantea* W. C. Cheng & L. K. Fu in W. C. Cheng & al., Acta Phytotax. Sin. 13(4): 85. 1975.

巨柏 *ju bai*

Trees to 45 m tall; trunk 3(–6) m d.b.h.; branchlets densely arranged, often glaucous, stout, usually 4-angled, rarely terete, ultimate ones not drooping, 1.5–2 mm in diam. Leaves closely arranged, in 4 ranks, glaucous, scalelike, obtusely ridged or arched (gibbous) and with a rounded central abaxial gland. Seed cones usually glaucous, oblong-globose, 1.5–2 × 1.3–1.6 cm;

cone scales ca. 12, each fertile scale with numerous seeds; bracts with a prominent, large, free mucro at apex. $2n = 22^*$.

• Mountain slopes, along rivers; 3000–3400 m. SE Xizang.
An endangered species. Perhaps better treated as a variety of *Cupressus torulosa*, from which it differs mainly in its thicker ultimate branchlets, which are not drooping but spreading (xeromorphy), and in that some stands in SE Xizang contain very massive trees. However, some herbarium specimens of *C. torulosa* collected outside China in the W Himalayan region have similarly thick foliage, while another specimen from SE Xizang has ultimate branchlets only 0.8 mm wide.

9. *Cupressus funebris* Endlicher, Syn. Conif.: 58. 1847.

柏木 bai mu

Chamaecyparis funebris (Endlicher) Franco; *Cupressus funebris* var. *gracilis* Carrière.

Trees to 35 m tall; trunk to 2 m d.b.h.; branchlets arranged in a plane, pendulous, green, slender, flattened, ca. 1 mm wide. Leaves densely appressed, scalelike, dimorphic, 1–1.5 mm, apex sharply pointed; facial pairs with a linear abaxial gland; lateral pairs folded face-to-face, overlapping basal part of facial pairs, ridged abaxially. Pollen cones ellipsoid or ovoid, 2.5–5 mm; microsporophylls 10–14. Seed cones dark brown when ripe, globose, 0.8–1.5 cm in diam.; cone scales 6–8(–12), 5-angular, each fertile scale with 3–5(or 6) seeds. Seeds light brown, lustrous, obovate-rhombic or suborbicular, flattened, 2.5–3.5 mm. Cotyledons 2. Pollination Mar–May, seed maturity May–Jun. $2n = 22^*$.

• Below 2000 m. Anhui, Fujian, Gansu, N Guangdong, N Guangxi, E Guizhou, Henan, W Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang; also widely cultivated in S China.
Often classified in *Chamaecyparis* on account of its flattened foliage sprays and relatively few seeds in small cones; however, it is here placed in *Cupressus* because of its developmental characters (cones maturing in 2nd year) and chemical composition of biflavones.

