

**1. CUNNINGHAMIA** R. Brown ex Richard & A. Richard in A. Richard, *Comm. Bot. Conif. Cycad.* 80, 149. 1826, nom. cons.

杉木属 shan mu shu

*Belis* Salisbury.

Trees evergreen, monoecious; branches whorled or irregularly so; winter buds ovoid. Leaves spirally arranged, sessile, lanceolate or linear-lanceolate, stomatal bands present on both surfaces but fewer adaxially, base attenuate, margin serrulate. Pollen cones terminal, clustered; microsporophylls many, spirally arranged, sessile, scalelike, distal margin serrulate; pollen sacs 3, pendulous. Seed cones 1–3 together, terminal, globose, ovoid, or cylindrical-ovoid; bracts and cone scales spirally arranged, sessile, connate proximally; bracts persistent, broadly ovate or triangular-ovate, flat, large, leathery, base cordate, margin irregularly and finely serrulate, apex long acuminate, hard; ovules 3 per bract axil, sessile; cone scales of mature cones sessile on and fused to proximal middle part of abaxial side of bract, minute, distal part free, 3-lobed, lobes irregularly serrulate at apex. Seeds 3, sessile on adaxial side of cone scale, flat, with 2 narrow, lateral wings. Cotyledons 2. Germination epigeal.  $2n = 22^*$ .

One species: ?Cambodia, China, Laos, N Vietnam.

The minute cone scales of *Cunninghamia* have often been overlooked, and in much of the literature what is termed the cone scale is in fact the bract.

**1. *Cunninghamia lanceolata*** (Lambert) Hooker, *Bot. Mag.* 54: t. 2743. 1827.

杉木 shan mu

Trees or shrubs to 50 m tall; trunk to 3 m d.b.h.; bark dark gray to dark brown, or reddish brown, longitudinally fissured, cracking into irregular flakes; crown pyramidal. Leaves glossy deep green adaxially, narrowly linear-lanceolate, straight or slightly falcate, 0.8–6.5(–7) cm × 1.5–5 mm, midvein green abaxially, 0.3–1.2 mm wide, flat with median longitudinal keel throughout, stomatal bands present on both surfaces, bands on adaxial surface 0.5–1.5 mm wide, of 7–28 rows of stomatal, white powdery or not, bands on abaxial surface 1.2–2.8 mm apart, 0.3–0.8(–1) mm from leaf margin, not or rarely white powdery, base decurrent, margin denticulate, sometimes indistinctly so, especially on old trees, with 18–55(–90) teeth per side, apex usually symmetric and spinescent, spine 0.3–2 mm. Pollen cone fascicles terminal, 1–3(–5) together, broadly obovoid, each of 8–20 cones, occasionally a few also around base of seed cone; peduncle 2–4 mm; cones narrowly oblong-conical. Seed cones terminal, 1–4 together, at pollination shortly cylindrical-ovoid, ca. 12 × 8 mm, later becoming ovoid or subglobose, 1.8–4.5 × 1.2–4 cm; bracts glaucous or rather glossy, broadly ovate or triangular-ovate, base with short claw 1/5–1/2 × total length of bract, distal part gradually narrowed toward pointed apex, 1/14–1/5 × total length of bract. Seeds dark brown, oblong or narrowly ovate, 5–6 × ca. 4 mm, narrowly winged laterally. Pollination Jan–May, seed maturity Aug–Nov.

Mixed broad-leaved forests or forming small, pure stands, rocky hillsides, roadsides; 200–2800 m. Exact native distribution uncertain owing to widespread planting: Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, C and N Taiwan, Yunnan, Zhejiang [?Cambodia, Laos, N Vietnam].

A very variable species: specimens occur with spinescent or obtuse leaf apices and with or without white stomatal bands on the adaxial

leaf surface. The latter character is at least partly dependent on the age of the tree and the position of the leaf on the tree: leaves exposed to sunlight have less conspicuous adaxial stomatal bands than those in shade, as do leaves of old trees. Variants also occur with strongly glaucous leaves.

The most important fast-growing timber tree of the warm regions S of the Chang Jiang valley; it is propagated by seed, cuttings, or suckers. The wood is strongly resistant to rot, is not eaten by termites, and is easily worked; it is used in constructing buildings, bridges, ships, and lamp posts, in furniture manufacture, and for wood fiber.

- 1a. Abaxial stomatal bands of leaves with (14–)16–28 rows of stomata; seed cones 2.5–4.5 × 2.5–4 cm ..... 1a. var. *lanceolata*  
 1b. Abaxial stomatal bands of leaves with 7–15(–20) rows of stomata; seed cones 1.8–3 × 1.2–2.5 cm ..... 1b. var. *konishii*

**1a. *Cunninghamia lanceolata* var. *lanceolata***

杉木(原变种) shan mu (yuan bian zhong)

*Pinus lanceolata* Lambert, *Descr. Pinus* 1: [52]. 1803; *Belis jaculifolia* Salisbury; *B. lanceolata* (Lambert) Hoffmannsegg; *Cunninghamia chinensis* de Vos; *C. lanceolata* var. *corticosa* Z. Y. Que & J. X. Li; *C. sinensis* R. Brown ex Richard & A. Richard; *C. unicanaliculata* D. Y. Wang & H. L. Liu; *C. unicanaliculata* var. *pyramidalis* D. Y. Wang & H. L. Liu; ?*Larix chinensis* Miller (1768), not Beissner (1896); *Raxopitys cunninghamii* J. Nelson.

Abaxial stomatal bands of leaves with (14–)16–28 rows of stomata. Seed cones 2.5–4.5 × 2.5–4 cm.

Forests, rocky hillsides, roadsides; 200–2800 m. Exact native distribution uncertain owing to widespread planting: Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang [?Cambodia, ?Laos, N Vietnam].

**1b. *Cunninghamia lanceolata* var. *konishii*** (Hayata) Fujita, *Trans. Nat. Hist. Soc. Formosa* 22: 49, 476. 1932.

台湾杉木 tai wan shan mu

*Cunninghamia konishii* Hayata, *Gard. Chron.*, ser. 3, 43: 194. 1908; *C. kawakamii* Hayata.

Flora of China 4: 54–55. 1999.

Abaxial stomatal bands of leaves with 7–15(–20) rows of stomata. Seed cones  $1.8\text{--}3 \times 1.2\text{--}2.5$  cm.

Mixed broad-leaved forests or forming small pure stands, frequently associated with *Chamaecyparis formosensis* and *C. obtusa* var. *formosana*, often planted; 1300–2000 m. Fujian, C and N Taiwan [N Laos, ?Vietnam].

