TAXACEAE


Trees or shrubs evergreen, dioecious or rarely monoecious. Leaves spirally arranged or decussate, linear or lanceolate, abaxial surface with 1 stomatal band on each side of prominent or inconspicuous midvein, resin canal present or absent. Pollen cones solitary in leaf or bract axils, or aggregated into spikelike complexes apically on branches; microsporophylls numerous; pollen sacs 3–9, radially arranged or on outer side of microsporophyll and then with distinct adaxial and abaxial surfaces; pollen nonsaccate. Seed-bearing structures solitary or paired in axils of leaves or bracts, pedunculate or sessile, with several overlapping or decussate bracts at base; ovule solitary, borne at apex of floral axis, erect. Seed sessile or pedunculate, drupelike or nutlike, partially enclosed in a succulent, saccate or cupular aril, or completely enclosed within aril; female gametophyte tissue abundant. Cotyledons 2.

Germination epigeal, hypogeal in Torreya.

Five genera and 21 species; mainly N hemisphere (except Austrotaxus R. H. Compton: New Caledonia); four genera (one endemic) and 11 species (five endemic, one introduced) in China.


1a. Leaves with midvein ± inconspicuous adaxially; pollen sacs borne on outer side of microsporophylls, with distinct adaxial and abaxial surfaces; seed-bearing structures paired in leaf axils, sessile; seed completely enclosed within aril ................................................................. 4. Torreya

1b. Leaves with midvein prominent adaxially; axillary; pollen sacs various; seed-bearing structures solitary in axils of leaves or bracts, shortly pedunculate or subsessile; seed surrounded by a cupular or saccate aril, but with distal part exposed.

2a. Leaves decussate, with resin canal; pollen cones arranged in terminal (very rarely lateral) spikes; seed-bearing structures long pedunculate; aril saccate, almost completely enclosing seed except for extreme apex .................................................................................................................. 3. Amentotaxus

2b. Leaves spirally arranged, sessile, without resin canal; pollen cones solitary in leaf axils, not forming spikes; seed-bearing structures shortly pedunculate or subsessile; aril cupular, enclosing only proximal part of seed.

3a. Branchlets irregularly alternate; abaxial stomatal bands of leaves pale yellow or pale grayish green; aril of seed red when ripe ........................................................................................................ 1. Taxus

3b. Branchlets subopposite or subwhorled; abaxial stomatal bands of leaves white powdery; aril of seed white when ripe .................................................................................................................. 2. Pseudotaxus


Trees or shrubs evergreen, dioecious; branchlets irregularly alternate, basal part with few or several persistent or early deciduous bud scales; winter bud scales overlapping, with prominent or indistinct, longitudinal adaxial ridges. Leaves 2-ranked, spirally arranged, sessile, or shortly petiolate in Taxus cuspidata, linear, straight or falcate, decurrent, adaxial surface with raised midvein, abaxial surface with 2 pale gray, grayish blue, or pale yellow stomatal bands, resin canal absent. Reproductive structures axillary, solitary. Pollen cones pedicellate, globose, with overlapping bracts at base; microsporophylls 6–14, shield-shaped, each with 4–9 radially arranged pollen sacs. Seed-bearing structures subsessile, with several overlapping bracts, 2 or 3 distal pairs of which are decussate. Aril red or orange when ripe, succulent. Seed nutlike, ripening in 1st year, enclosed within cupular aril but with apex exposed; hilum prominent. Cotyledons 2. Germination epigeal. 2n = 24.

About nine species: mainly N hemisphere; three species in China. Taxus sumatrana (Miquel) de Laubenfels (T. celebica (Warburg) H. L. Li), from Indonesia (Sulawesi and Sumatra) and the Philippines, has been recorded from China (e.g., Fl. Taiwan, ed. 2). Such records are based on a broad concept of that species, including the taxa treated in this account as T. wallichiana var. chinensis and T. wallichiana var. mairei (but excluding the type of T. wallichiana). The total number of distinct species of Taxus occurring in Asia is quite controversial and in need of further study.

The papillae and other characters of the abaxial leaf surface are best observed in fresh, young leaves. The papillae are minute and are best seen using a microscope or a lens of x 25 magnification or greater.

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1 Herbarium, Institute of Botany, Chinese Academy of Sciences, 20 Nanxinunc, Xiangshan, Beijing 100093, People’s Republic of China.
2 Herbarium, Shenzhen Fairy Lake Botanical Garden, Liantang, Shenzhen, Guangdong 518004, People’s Republic of China.
3 Herbarium, Royal Botanic Garden Edinburgh, 20a Inverleith Row, Edinburgh EH3 5LR, Scotland, United Kingdom.
1a. Leafy branchlets ± flat in living state; leaves linear to lanceolate, gradually tapered distally, usually falcate, apex gradually acuminate or abruptly tapered and indistinctly mucronate; winter bud scales early deciduous or some persistent at base of branchlets .................................................. 2. Taxus wallichiana

1b. Leafy branchlets “V”-shaped in cross section in living state; leaves linear, almost equally wide throughout length, straight or slightly falcate, apex shortly mucronate to cuspidate; winter bud scales persistent at base of branchlets.

2a. Leaves usually straight, midvein densely and evenly papillate abaxially, base usually symmetric; seed columnar-oblong, ± equally wide throughout length, obtusely ridged on 2 sides distally; hilum elliptic ......................................................................................................................... 1. Taxus fuana

2b. Leaves slightly falcate, midvein not papillate abaxially, base ± asymmetric; seed ovoid or trigonous-ovoid, distal part with 3 or 4 or more obtuse ridges; hilum usually triangular or quadrangular .......... 3. Taxus cuspidata


Trees or large shrubs to 12 m tall; trunk to 3.5 m d.b.h.; winter buds ovoid, scales persistent at base of branchlets, ridged adaxially, abruptly acute at apex. Leafy branchlets “V”-shaped in cross section in living state, 3–6 × 3.5–6 cm in outline. Leaves borne at 60–90° to branchlet axis; petiole 1–1.5 mm; blade bright green adaxially, linear, almost equally wide throughout length, usually straight, 1.2–3(–3.5) cm × 1.5–2.5 mm, ± thick, midvein and stomatal bands both densely and evenly papillate abaxially, midvein ca. 0.2 mm wide abaxially, stomatal bands pale yellow, 0.6–0.7 mm wide, marginal bands 0.1–0.2 mm wide, base cuneate or shortly attenuate, usually symmetric, margin revolute (especially when dry), apex cuspidate, cusp 0.5–1 mm. Pollen cones ovoid, 6–8 mm; cone axis extended above apical bracts as a short stalk ca. 1 mm; bracts 2-ranked, proximal ones imbricate, small, distal ones pale green and semitransparent, much larger; microsporophylls pinkish brown. Seed-bearing structures axillary, sessile. Aril red when ripe. Seed columnar-oblong, ± equally wide throughout length, slightly bilaterally flattened, ca. 6.5–7 × 4.5–5 mm, obtusely ridged on 2 sides distally, apex sharply mucronate; hilum elliptic. Pollination Apr, seed maturity Sep–Nov.

Mixed forests and Pinus forests, usually in shade; 2500–3100 (–3400) m (descending to 1800 m in other parts of range of species). SW Xizang (Jilong Xian) [N India, Kashmir, Nepal, Pakistan].

An endangered species in China. In FRPS, two species of Taxus were recognized from SW China: the plants restricted to SW Xizang were identified as Taxus wallichiana, while those from SW Sichuan, SE Xizang, and W Yunnan were recognized as Taxus yunnanensis. However, Nan Li & L. K. Fu (Novon 7: 263–264. 1997) noted that critical study of types and authentic material revealed Taxus yunnanensis to be a synonym of Taxus wallichiana, and the plants identified in FRPS as Taxus wallichiana to be a new species, Taxus fuana.


须弥红豆杉 xu mi hong dou shan

Trees or shrubs to 30 m tall; trunk to 1.3 m d.b.h.; bark variably colored, grayish brownish, reddish, or purplish, peeling off in strips or cracking and falling off as thin scales; winter bud scales early deciduous or some persistent at base of branchlets, triangular-ovate, with or without longitudinal ridges abaxially. Leafy branchlets ± flat in living state, 3–9 × 1.5–6 cm in outline. Leaves borne at (50–)60–90° to branchlet axis, subsessile or with petiole to 1 mm; blade dark green and glossy adaxially, paler abaxially, linear to lanceolate, gradually tapered distally, usually falcate, (0.9–)1.5–3.5(–4.7) cm × (1.5–)2–4(–5) mm, midvein slightly elevated adaxially, 0.1–0.2 mm wide, densely and evenly papillate abaxially, or with papillae scattered on midvein or in 1–several lateral rows adjacent to stomatal band, or midvein not papillate, stomatal bands pale yellowish, 0.6–0.9 mm wide, densely and evenly papillate, marginal bands 0.1–0.4 mm wide, base cuneate or attenuate, asymmetric, margin flat to revolute, apex gradually acuminate or abruptly tapered and indistinctly mucronate, macro 0.1–0.5 mm. Pollen cones scattered along 2nd year branchlet axis, ± sessile or shortly pedunculate (peduncle ca. 0.5 mm), pale yellowish, ovoid, 5–6 × ca. 3 mm; bracts usually 6, broadly ovate, pale green; microsporophylls 8–14, each with (4 or)5 or 6(–8) pollen sacs. Seed-bearing structures borne toward distal end of branchlet axis. Aril red or orange when ripe, often ± translucent. Seed ovoid or obovoid, occasionally columnar-oblong, sometimes slightly flattened, 5–8 × 3.5–5 mm, usually with obtuse ridges (sometimes trigonous and 3-ridged); apex with small macro; hilum elliptic to suborbicular or rounded-trigonous. Pollination Sep–Apr, seed maturity Aug–Dec.

Broad-leaved, coniferous, and mixed forests, thickets, deforested rocks, open slopes; 100–3500 m. S Anhui, Fujian, S Gansu, N Guangdong, N Guangxi, Guizhou, W Hunan, Jiangxi, S Shaanxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Bhutan, N India, Laos, Myanmar, Sikkim, Vietnam].

Can be used within its native range for afforestation. The wood is an excellent building material, and is also used in making vehicles, agricultural implements, furniture, and stationery. A compound recently isolated from the leaves may prove promising as an antitumor agent.

1a. Leaves linear to lanceolate, thin and soft ................................................................ 2a. var. wallichiana

1b. Leaves linear, thick textured.
2a. Leaves straight to distally falcate, usually 1.5–2.2 cm × ca. 3 mm, midvein of same color as stomatal band, densely and evenly papillate, margin flat in living state. ......................... 2b. var. chinensis

2b. Leaves usually falcate, 2–3.5 cm × 2.5–4 mm, midvein of different color to stomatal band, not papillate, or with papillae scattered on midvein or in 1–several lateral rows adjacent to stomatal band, margin revolute. ................. 2c. var. mairei

2a. Taxus wallchichiana var. wallchichiana

2b. Taxus wallchichiana var. chinensis

2c. Taxus wallchichiana var. mairei


Nothotaxus Florin.
Shrubs evergreen, dioecious; branches usually whorled; branchlets subopposite or subwhorled, base with persistent bud scales; winter bud scales overlapping, ridged adaxially. Leaves spirally arranged, distichous; petiole very short or leaves sessile; blade linear, basally twisted, straight or slightly falcate, midvein raised both adaxially and abaxially, abaxial stomatal bands 2, white, resin canal absent, base obtuse, decurrent, apex mucronate. Reproductive structures axillary, solitary, sessile. Pollen cones globose, with 4 pairs of decussate basal bracts; microsporophylls 6–12, shieldlike, decussate; pollen sacs 4–6, radially arranged. Seed-bearing structures with 7 pairs of decussate basal bracts in 4 series each of 3 or 4 bracts. Ovule erect, sessile. Aril white when ripe, cupular, succulent. Seed ripening in 1st year, nutlike, ovoid, slightly flattened, enclosed within aril except for distal, exposed part, apex with a small mucro. Cotyledons 2. Germination epigean. 2n = 24*.

• One species: China.


白豆杉  bai dou shan


Shrubs to 4 m tall; bark grayish brown, peeling off in strips. Leafy branchlets ovate or elliptic in outline, 2.2–5 × 1.2–3.2 cm, axis green or yellow-green in 1st year, dark green in 2nd year, terete, sometimes with nodular projections. Leaves borne at 40–45° to axis when young but at 50–90° on mature trees; petiole absent or less than 1 mm; blade bright green adaxially in 1st year, subsequently abruptly turning very dark green, linear, straight or slightly falcate, 1–2.6 cm × 2–4.5 mm, not leathery, midvein ca. 0.4 mm wide, stomatal bands ca. 0.5–1.1 mm wide, broader than or about as wide as marginal bands, of ca. 9 rows on young plants but of 13–19 rows on adult plants, marginal bands 0.2–0.3 mm wide, base obtuse and ± asymmetric, margin revolute, apex obtuse, mucronate, mucro pale whitish green, hooked, 0.4–0.7 mm. Aril campanulate, 5–7 mm. Seed ovoid, 5–8 × 4–5 mm, slightly flattened distally. Pollination late Mar–May, seed maturity Oct.

• Evergreen and deciduous broad-leaved forests. N Guangdong, N Guangxi, NW and S Hunan, SW Jiangxi, S Zhejiang; also cultivated in Zhejiang (Hangzhou Shi, etc.) as an ornamental.

A rare species. The wood is used as a carving material and for making utensils.

Pseudotaxus liana was described from Guangxi and at the same time recorded from Hunan and Jiangxi. In the protologue (Silba, Phytologia 81: 327. 1996, as “liiana”), it was said to differ from P. chienii in its broadly ovate or ovate-oblong leaves, 1.3–2.8 cm × 3.5–5.5 mm, which are thick and leathery; it was also compared with two species in the Podocarpaceae: Podocarpus brassii Pilger, from Indonesia (Irain Jaya) and Papua New Guinea, and Prunuspytis harmsiana (Pilger) de Laubenfels, from South America. Further study is needed to ascertain whether it is distinct from Pseudotaxus chienii and, if so, to settle its generic, and possibly also familial, placement. If it is distinct, then some of the records of P. chienii may in fact belong to the new species.


穗花杉属  sui hua shan shu

Shrubs or small trees dioecious; branchlets opposite, base with bud scales not persistent; winter buds tetragonal-ovate, acute, glossy, scales, decussate, in 3–5 whorles of 4, ridged adaxially. Leaves decussate, but brought into a single plane by twisting of petioles; blade straight or slightly falcate, usually more than 5 mm wide, adaxial surface mottled when fresh, rarely smooth, rugose or ± so when dry, resin canal present below sheath of vascular bundle, sclereids present, rarely absent, base decurrent, margin slightly downcurved. Pollen cones aggregated into (1 or)2–6(–10) long, slender, compound racemes or spikes arising from bract axil near apex of branches; individual cones opposite, sessile or subsessile, elliptoid or subglobe; microsporophylls numerous, ± shield-shaped; pollen sacs 3–8, arranged radially, or adaxially and abaxially. Seed-bearing structures compressed-tetragonal or flattened abaxially, basal part with 6–10 pairs of decussate bracts arranged in 4 rows each of 3–5 bracts; ovule 1, sessile, erect. Seed ripening in 1st year, long pedunculate, elliptoid or obovoid-ellipsoid, enclosed except for apex in a saclike which is bright red or reddish yellow when ripe; bracts persistent at base.

Five or six species: China, Vietnam; three species (one endemic) in China. Amentotaxus has been placed in its own tribe (Amentotaxaceae W. C. Cheng & C. D. Chu) or family, Amentotaxaceae. Although Page (in Kubitzki, Fam. Gen. Vasc. Pl. 1: 299–302. 1990) included it in the Cephalotaxaceae, molecular data indicate very strongly that it is the sister genus of Torreya, which is similar in the size and shape of its seed and in usually having bilaterally symmetric clusters of pollen saccs.

Amentotaxus assimica D. K. Ferguson (Kew Bull. 40: 115. 1985) was described from SE Xizang, in temperate rainforests on steep, north-facing slopes, associated with species of Magnolia, Quercus, Rhododendron, etc. It is apparently similar to A. argotaenia, but differs in having leaves without sclereids, the adaxial surface smooth or with only longitudinal striations (due to shrinkage) when dry. Further collections are needed to establish whether it is truly distinct from A. argotaenia.

1a. Stomatal bands on abaxial leaf surface 2/3 to 1.5 × as wide as green marginal bands .................. 3. A. argotaenia

1b. Stomatal bands on abaxial leaf surface 2 × as wide as green marginal bands.
2a. Leaves linear, linear-lanceolate, or linear-elliptic, 8–15 mm wide, usually straight, apex tapered or obtuse, abaxial stomatal bands pale brown or pale yellowish white; pollen cone racemes 4 or more, 10–15 cm; seed ellipsoid, 2.2–3 cm ................................................................. 1. A. yunnanensis

2b. Leaves lanceolate or linear-lanceolate, 5–10 mm wide, usually slightly falcate, tapered distally, apex acuminate, stomatal bands white; pollen cone racemes usually 2–4, less than 5 cm; seed usually obovoid-ellipsoid, 2–2.5 cm ........................................................................... 2. A. formosana


云南穗花杉 yun nan sui hua shan

Amentotaxus argotaenia (Hance) Pilger var. yunnanensis (H. L. Li) P. C. Keng.

Trees to 15 m tall; trunk to 25 cm d.b.h.; main branches spreading to form a broad, ovoid crown. Leafy branchlets ascending, broadly oblong-ovate in outline, ca. 8 × 12 cm, axis green in 1st year, thereafter light yellow to light yellowish brown, ridged. Leaves borne at ca. 60° to branchlet axis, subobovate, linear, linear-lanceolate, or linear-elliptic, usually straight, sometimes slightly falcate distally, 3.5–10(–15) × 0.8–1.5 cm, thick and leathery, midvein prominently raised adaxially, 1–2 mm wide abaxially, stomatal bands brown or pale yellowish white when dry, 3–4 mm wide, at least 2 × as wide as marginal bands, very dense, in ca. 40 rows, marginal bands 1.5–2 mm wide, base broadly cuneate or obtuse, margin slightly downcurved, apex obtuse on basal 1–3 leaves of each branchlet, tapered on others. Pollen-cone racemes borne 4–6 together, 10–15 cm; bracts 16–20 in 4 rows of 4(or 5), keeled, distal bract 8–9 × 4–5 mm; pollen sacs (4–)6 or 7(or 8). Aril reddish yellow when ripe. Seed finally reddish purple, obovoid-ellipsoid, 2.2–2.5 × 0.9–1.1 cm, apex mucronulate; peduncle 1.5–2 cm, recurved at maturity; 2 rows of basal scales persistent. Pollination Feb, seed maturity Dec.

• Scattered in damp, shady places in tropical rainforests and broad-leaved subtropical forests, ravines, cliffs; 500–1300 m. SE Taiwan.

The wood is used for making furniture, farm implements, utensils, and handicrafts; the species is a also cultivated as an ornamental tree.


穗花杉 sui hua shan

Shrubs or small trees to 7 m. Leafy branchlets ascending or suberect, broadly rectangular to obovate-elliptic in outline, 4.5–8 × 8–15 cm, axis green in 1st year, greenish yellow to yellowish red in 2nd and 3rd years, quadrangular or suberect in cross section. Leaves borne at 45–95° to branchlet axis, subobovate or petiole to 3 mm, dark green adaxially, linear or linear-lanceolate, falcate or ± straight, 2–11 cm × 5–11 mm, leathery, with sclereids, mottled adaxially when fresh, rugose with transverse striations at ca. 90° to midvein when dry, midvein raised adaxially, scarcely so abaxially, 1–1.2 mm wide with a very narrow, indistinct green band 0.15–0.2 mm wide on either side, whole midvein band 1.2–2 mm wide, stomatal bands white, 1–2 mm wide, narrower than marginal bands, of 15–25 rows, marginal bands 1.4–3 mm wide, base cuneate to attenuate, asymmetric, margin flat or very narrowly revolute, apex dark, callose, rounded to sharply triangular, obtuse on basal 1–4 (often more) leaves of each branchlet, often acuminate on others. Pollen-cone racemes borne (1 or)2–4(–10) together, 1.5–6.5 cm; cones in ca. 12 pairs, ovoid, ca. 3.5 × 2.5–3.2 mm; bracts ca. 6 at base of otherwise naked peduncle, distal bract ca. 2.5 × 2 mm, keeled; microsporophylls 6–8,

Trees evergreen, dioecious (occasionally monoecious); branches whorled; branchlets subopposite or subwhorled, base with bud scales not persistent; winter buds with several pairs of decussate bud scales. Leaves decussate or subopposite, 2-ranked, linear or linear-lanceolate, basally twisted, leathery, adaxial surface slightly convex with midvein ± indistinct, abaxial surface with 2 stomatal bands, resin canal present on abaxial side of vascular bundle, base decurrent, apex sharply acuminate. Pollen cones axillary, solitary, shortly pedunculate, ellipsoid or shortly columnar; microsporophylls in 4–8 whorls each of 4 microsporophylls; pollen sacs (3 or)4, marginal, pendulous. Seed-bearing structures borne in pairs in leaf axils, sessile, each with 2 pairs of decussate bracts and 1 lateral bract; ovule 1, erect. Aril succulent, base of aril with persistent bracts. Seed ripening in autumn of 2nd year, drupelike, completely enclosed within aril; female gametophyte tissue ruminate or not. Cotyledons 2. Germination hypogeous. 2n = 22.

Six species: China, Japan; SE and W United States; four species (three endemic, one introduced) in China.

1a. Leaves borne at 20–60° to branchlet axis, 3.5–9 cm, stomatal bands silvery gray initially, later turning brown ........................................................................................................ 4. T. jackii

1b. Leaves usually borne at 60–90° to branchlet axis, (0.7–)1.1–3.6(–4) cm, stomatal bands brown even when young.

2a. Leaves with 2 longitudinal grooves adaxially, midvein distinctly narrower than marginal bands 3. T. fargesii

2b. Leaves without 2 longitudinal grooves adaxially, midvein about as wide as marginal bands.

3a. Leaves (0.7–)1.1–2.5(–4.5) cm, base obtuse or broadly rounded, apex cuspidate; axis of 2nd- or 3rd-year branchlets yellowish green, light brownish yellow or pale brown ........................................ 2. T. grandis

3b. Leaves 2–3 cm, base slightly rounded or cuneate, apex very long acuminate; axis of 2nd- or 3rd-year branchlets green or reddish brown .................................................................................. 1. T. nucifera


Trees to 25 m tall; trunk to 90 cm d.b.h.; bark grayish brown or light brownish red, smooth when young, fissured and peeling off in thin strips. Axis of leafy branchlets green and glabrous in 1st year, green or reddish brown and lustrous in 2nd or 3rd year. Leaves 2-ranked, linear, straight or slightly curved, 2–3 cm × 2.2–3 mm, rigid, pale green adaxially, stomatal bands 2, pale yellow, narrow, impressed, base slightly rounded or cuneate, abruptly narrowed into a short petiole, apex very long acuminate, spinose. Seed dark green when young, purplish brown at maturity, ellipsoid-obovoid or obovoid, 2.5–3.2 × 1.3–1.7 cm. Pollination Apr–May, seed maturity Oct.

Cultivated as a slow-growing, ornamental tree. Jiangsu, Jiangxi, Shandong, Shanghái, Zhejiang [native to Japan].

### 2. Torreya grandis


榧树 fei shù

Trees to 25 m tall; trunk to 0.5(–2) m d.b.h.; bark light yellowish gray, dark gray, or grayish brown, with irregular vertical fissures. Leafy branchlets oblong-obovate in outline, 4–7 × 2.5–4 cm, axis green and glabrous in 1st year, thereafter yellowish green, light brownish yellow or pale brown. Leaves borne at (50–)60–90° to branchlet axis; petiole 0.5–1 mm; blade bright green and glossy adaxially, linear-lanceolate, usually straight, (0.7–)1.1–2.5(–4) cm × 2–3.5 mm, with no conspicuous grooves, midvein indistinct adaxially, (0.2–)0.5–0.7 mm wide abaxially, stomatal bands (0.2–)0.3–0.4 mm wide, marginal bands 0.5–0.7 mm wide, base obtuse or broadly rounded, ± symmetric, margin flat or very narrowly revolute, apex symmetrically or slightly asymmetrically tapered, cuspidate, cusp 0.3–1 mm. Pollen cones columnar, ca. 8 mm; bracts conspicuously ridged. Aril pale purplish brown at maturity, ellipsoid-obovoid or obovoid, 40–45 × 18–20 mm; however, very few specimens have been seen, so the distinctions are probably not genuine; it is included here in the synonymy of var. *grandis*.

1a. Leaf blade (0.7–)1.1–2.5 cm; aril of seed ellipsoid to ovoid or elongate-ellipsoid, apex obtuse-rounded .......... 2a. var. *grandis*

1b. Leaf blade 2.5–4.5 cm; aril of seed obovoid-conical, apex rounded, cuspidate ................. 2b. var. *jiulongshanensis*

2a. Torreya grandis var. *grandis* 榧树 (原变种) fei shù (yuan bian zhòng)

*Caryotaxus grandis* (Fortune ex Lindley) Henkel & W. Hochstetter; *Torreya grandis* var. *chingii* Hu; *T. grandis* var. *dielsii* Hu; *T. grandis* f. *major* Hu; *T. grandis* var. *merrillii* Hu; *T. grandis* f. *non-apiculata* Hu; *T. grandis* var. *sargentii* Hu; *T. nucifera* (Linnaeus) Siebold & Zuccarini var. *grandis* (Fortune ex Lindley) Pilger; *Tumion grande* (Fortune ex Lindley) Greene.

Leaf blade (0.7–)1.1–2.5 cm. Aril of seed ellipsoid to ovoid or elongate-ellipsoid, apex obtuse-rounded.

- Mountains, open valleys; 200–1400 m. S Anhui, N Fujian, NE Guizhou (Songtao), W Hunan, S Jiangsu, N Jiangxi, Zhejiang.


九龙山榧树 jiu long shan fei shu

Leaf blade 2.5–4.5 cm. Aril of seed obovoid-conical, apex rounded, cuspidate.

- Mountains; ca. 800 m. S Zhejiang (Suichang Xian).

### 3. Torreya fargesii


巴山榧树 ba shan fei shu

Trees or shrubs to 20 m tall; trunk to 1 m d.b.h.; bark dark gray, pale brown, or grayish brown, irregularly vertically fissured, sometimes flaking. Leafy branchlets oblong to elliptic-oblong in outline, 5–13 × 3–7.5 cm, axis green in 1st year, thereafter yellowish. Leaves borne at 55–80° to branchlet axis; petiole 0.5–1 mm; blade shining green adaxially, linear to linear-lanceolate, straight or distally falcate, 1.2–3.6(–4) cm × 2–4 mm, with 2 longitudinal grooves, midvein indistinct adaxially, 0.3–0.6 mm wide abaxially, stomatal bands light brown, (0.15–)0.2–0.3 mm wide, marginal bands 0.5–1.2 mm wide, base broadly cuneate, ± asymmetric, margin flat or very narrowly revolute, apex usually shortly and symmetrically tapered, cuspidate, cusp 0.3–1 mm. Pollen cones pale yellow, ovoid, ca. 5–6 × 4.5–5 mm; bracts in 4–12 pairs in 4 rows, longitudinally ridged. Aril pale green or slightly white powdery, with small apical micro. Seed ovoid to globose or broadly ellipsoid, 1.5–2.5 cm in diam.; inner wall of seed coat smooth or with 2 opposite longitudinal ridges; female gametophyte tissue conspicuously and deeply ruminate...

internally. Pollination Apr–May, seed maturity Sep–Oct of 2nd year.
• Coniferous, mixed, and broad-leaved forests; 1000–3400 m. 7S Anhui, W Hubei, NW Hunan, Jiangxi, S Shaanxi, Sichuan, NW Yunnan.

Suitable for afforestation and reforestation. The high quality timber is used in constructing houses, bridges, and furniture, and making implements and utensils; an oil is extracted from the seed.

1a. Leaves ± straight, usually shortly and symmetrically tapered at apex, grooves on adaxial surface usually not extending beyond middle of blade, marginal bands 0.5–0.9(–1.1) mm wide

1b. Leaves often strongly falcate, gradually tapered toward apex from about middle, grooves on adaxial surface extending beyond middle of blade, marginal bands (0.7–)0.9–1.2 mm wide

3a. Torreya fargesii var. fargesii

巴山榧树 (原变种) ba shan fei shu (yuan bian zhong) Torreya grandis Fortune ex Lindley var. fargesii (Franchet) Silba; Tumion fargesii (Franchet) Skeels.

Leaves ± straight, usually shortly and symmetrically tapered at apex, grooves on adaxial surface usually not extending beyond middle of blade, marginal bands 0.5–0.9(–1.1) mm wide.
• Scattered in coniferous and broad-leaved forests; 1000–1800 m. 7S Anhui, W Hubei, NW Hunan, Jiangxi, S Shaanxi, Sichuan.
The record from S Anhui is based on R. C. Ching 3036 (E, K) from Huang Shan, a locality outside the main distribution area of Torreya fargesii. This specimen was cited under T. grandis by S. Y. Hu (Taiwania 10: 24. 1964), but is provisionally and tentatively placed under T. fargesii here. However, it differs strikingly from the latter species in several features, and clearly deserves further investigation; the specimens seen are sterile and more material from the area would be required before a decision could be made as to their taxonomic status.

3b. Torreya fargesii var. yunnanensis

云南榧 yun nan fei


Leaves often strongly falcate, gradually tapered toward apex from about middle, grooves on adaxial surface extending beyond middle of blade, marginal bands (0.7–)0.9–1.2 mm wide.
• Coniferous and mixed forests in warm temperate zones, locally a common forest tree; 1500–3400 m. NW Yunnan (Gongsan Drungzu Nuzu Zizhixian, Lijiang Naxizu Zizhixian, Weixi Xian, Zhongdian Xian).

A vulnerable plant.


长叶榧树 chang ye fei shu

Trees to 12 m tall; trunk to 20 cm d.b.h.; bark gray or dark gray, falling off in thick flakes exposing pale brown cortex. Leafy branchlets horizontal or pendulous, rhombic-elliptic, ± flabellate or broadly obovate in outline, 7–9 × 5–10 cm, axis green turning greenish brown in 1st year, thereafter reddish brown and glossy. Leaves borne at 20–60° to branchlet axis, adjacent leaves (especially distal ones), with blades twisted through ca. 90° so that their surfaces nest within each other; petiole 1–2 mm, twisted; blade deep shining green adaxially, linear to linear-lanceolate, very gradually tapered from proximal 1/3 into apex, distally ± falcate, (2.5–)3–7(–9) cm × (2.5–)3–3.8(–4) mm, leathery, with 2 raised ridges extending from base to near apex, midvein extremely indistinct adaxially, strongly raised abaxially with a flat band on either side, whole midvein band ca. 1.2 mm wide, stomatal bands with silver-gray powder initially but finally brown, 0.1–0.2 mm wide, ca. 12 rows, marginal bands 0.5–0.7 mm wide, base cuneate, slightly asymmetric, strongly twisted, margin thickened abaxially and slightly downcurved but not revolute, apex cuspidate, cusp slender, tapered, 1–1.5 mm, often breaking off. Aril white powdery, with small mucro. Seed obovoid, 2–3 × ca. 1.2 cm; female gametophyte tissue deeply ruminate within. Seed maturity autumn.
• Woods; 400–1000 m. N Fujian, NE Jiangxi, S Zhejiang.

A vulnerable species. Torreya jackii is unlike the other Chinese members of the genus and is remarkably similar to Cephalotaxus fortunei, from which it can be distinguished by its sessile seed-bearing structures and by the peculiar, strongly twisted leaf arrangement.

The wood is very fragrant, and is used to make agricultural implements, utensils, and handicrafts. The leaves are also very aromatic when bruised or burned, giving off a fragrance like sandalwood oil.