

**3. LARIX** Miller, Gard. Dict., Abr. ed. 4, 1: [744]. 1754.

落叶松属 *luo ye song shu*

Trees deciduous; branches irregularly whorled, spreading; branchlets strongly dimorphic: long branchlets with leaves present only in 1st year, older parts with leaves in dense tufts on lateral short branchlets developed from axillary buds. Leaves spirally arranged on long branchlets, in dense clusters of 15–50 or more on short branchlets, sessile, turning yellow and falling in autumn, linear-needlelike, flattened, longitudinally keeled adaxially, sometimes also slightly so abaxially, ca. 1.8 mm wide, flexible, stomatal lines abaxial or on each surface, vascular bundle 1, resin canals 2, usually marginal. Cones borne at apex of short branchlets, solitary. Pollen not saccate, with a narrow, equatorial ridge. Seed cones shortly pedunculate, usually erect, purplish, reddish, or rarely green, maturing in 1st year. Seed scales thin, ± leathery, opening to release seeds, persistent. Bracts included or exerted, ovate or lanceolate, midvein prominent abaxially, forming an apical cusp. Seeds small; wing persistent, relatively long, membranous. Cotyledons 6–8. Germination epigeal.  $2n = 24^*$ .

Fifteen species: boreal and temperate regions of Asia, Europe, and North America; 11 species (four endemic, two introduced) in China.

- 1a. Seed cones ovoid or narrowly ovoid; bracts included or slightly exerted, shorter than seed scales; branchlets not pendulous.
  - 2a. Seed scales triangular-ovate, ovate, or subrhombic, usually densely purplish brown hairy abaxially, apex rounded ..... 7. *L. sibirica*
  - 2b. Seed scales pentagonal- or quadrangular-ovate, glabrous, usually smooth and shining on exposed part abaxially, apex emarginate or ± truncate.
    - 3a. Seed scales ± recurved at margin distally; 1st-year branchlets glaucous ..... 11. *L. kaempferi*
    - 3b. Seed scales not recurved distally; 1st-year branchlets not glaucous.
      - 4a. Seed scales at middle of cones pentagonal-ovate, ± convex, longer than wide ..... 8. *L. gmelinii*
      - 4b. Seed scales at middle of cones suborbicular, subrectangular, or ± square, as long as or longer than wide.
        - 5a. First-year branchlets reddish brown or light brown, usually sparsely to densely pubescent; seed scales 16–40, broadly square-ovate or square-orbicular; tips of bracts not exposed .... 9. *L. olgensis*
        - 5b. First-year branchlets light yellow or yellowish gray, glabrous; seed scales 45–50, suborbicular; tips of bracts slightly exposed ..... 10. *L. decidua*
- 1b. Seed cones cylindrical or ovoid-cylindrical; bracts obviously exerted, longer than or rarely equal to seed scales; branchlets pendulous.
  - 6a. Bracts straight or slightly recurved at apex.
    - 7a. Seed cones stout; seed scales gray or yellow-gray, square-orbicular or oblong, longer than wide, apex rounded or square-orbicular ..... 5. *L. himalaica*
    - 7b. Seed cones relatively slender; seed scales dark brown or dark gray, square-orbicular, obtriangular-orbicular, or subsquare, as wide as or wider than long, apex truncate, emarginate, or truncate-rounded 6. *L. potaninii*
  - 6b. Bracts reflexed or recurved.
    - 8a. Seed cones ellipsoid-cylindrical, 2.5–4 cm; seed scales obtriangular- or reniform-orbicular, densely long hairy abaxially; short branchlets densely yellow hairy; leaves 1.2–3.5 cm, keeled on both sides 4. *L. mastersiana*
    - 8b. Seed cones cylindrical, 4.5–11 cm; seed scales obovate-quadrangular or suboblong, usually densely pubescent and tuberculate abaxially; short branchlets glabrous or subglabrous; leaves 2.5–5 cm; keeled only adaxially.
      - 9a. Pollen cones ovoid, 6–8 mm; short branchlets wider than long ..... 3. *L. kongboensis*
      - 9b. Pollen cones ovoid-conical or columnar, 10–22 mm; short branchlets as wide as long.
        - 10a. Bracts obviously reflexed, obovate- or ovate-lanceolate, 5–7 mm at widest part; short branchlets slender, only bases of scales persistent ..... 1. *L. griffithii*
        - 10b. Bracts obliquely spreading and recurved, lanceolate, 3.5–5.5 mm at widest part; short branchlets stout, scales persistent, revolute ..... 2. *L. speciosa*

**1. Larix griffithii** J. D. Hooker, Himal. J. 1: 255–256, 2: 44, 藏红杉 *zang hong shan*  
481. 1854.

*Larix griffithiana* Carrière; *Pinus griffithiana* (Carrière) Voss; *P. griffithii* (J. D. Hooker) Parlatore (1868), not M'Clelland (1854).

Trees to over 20 m tall; trunk to 80 cm d.b.h.; bark gray-brown or dark brown, deeply fissured longitudinally; long branchlets initially reddish brown, light brown, or yellowish brown; short branchlets 6–8 mm in diam., nearly smooth, with remnants of bud scales and rings of revolute scales bases; winter buds ovoid-globose or globose, not resinous. Leaves 2.5–5.5 cm × 1–1.8 mm, keeled abaxially and toward base adaxially. Seed cones maturing brown or light brown, cylindrical or cylindrical-ellipsoid, 5–11 × 2.2–3 cm. Seed scales obovate-square, ± flat, 1.1–1.4 × 1.1–1.4 cm at middle of cones, pubescent toward base abaxially, margin denticulate toward apex, apex truncate or slightly emarginate. Bracts ovate- or obovate-lanceolate, longer than seed scales, 5–7 mm at widest part, obviously reflexed. Seeds grayish white, with irregular purplish spots, obliquely obovoid, ca. 10 mm including wing. Pollination Apr–May, seed maturity Oct.

Mountains; 3000–4100 m. S and E Xizang [Bhutan, Nepal, Sikkim].

The timber is used for construction, pit props, railway sleepers, and making furniture, and the bark yields tannins. The tree is also used for afforestation.

2. *Larix speciosa* W. C. Cheng & Y. W. Law in W. C. Cheng & al., Acta Phytotax. Sin. 13(4): 84. 1975.

怒江红杉 nu jiang hong shan

*Larix griffithiana* Carrière var. *speciosa* (W. C. Cheng & Y. W. Law) Silba; *L. griffithii* J. D. Hooker var. *speciosa* (W. C. Cheng & Y. W. Law) Farjon.

Trees to 25 m tall; bark dark red-brown, fissured, scaly; branchlets pendulous; long branchlets initially purplish brown or brown, occasionally glaucous, glabrous; short branchlets stout, 6–8 mm in diam., with several rings of revolute bud scales; winter buds red- or purple-brown, ovoid or conical. Leaves oblanceolate-linear, 2.5–5.5 cm × 1.5–2 mm, flat or keeled toward base adaxially, keeled abaxially, stomatal lines present on abaxial surface. Seed cones pedunculate (peduncle 5–7 mm), maturing red- or purple-brown, cylindrical, 7–9 × 2–3 cm. Seed scales ca. 100, obovate-oblong or suboblong, 1.2–1.5 cm × 8–9 mm, densely pubescent and verruculose abaxially, base auriculate, apex truncate, emarginate. Bracts exserted, lanceolate, obliquely recurved, 3.5–4.5 mm at widest part, apex tapered. Seeds pale gray, with irregular yellow-brown spots, obliquely ovoid, ca. 5 mm; wing 5–7 mm. Pollination Apr–May, seed maturity Sep–Oct.

• Mountains; 2600–4000 m. SE Xizang, NW Yunnan.

3. *Larix kongboensis* R. R. Mill, Novon 9: 79. 1999.

贡布红杉 gong bu hong shan

Trees to 25 m tall; long branchlets light reddish brown in 2nd year, later turning light gray, glabrous; short branchlets broadly obconical, 2–4.5 × 4.5–6 mm; leaf cushions glabrous. Leaves linear-oblong, straight or slightly falcate, 0.9–2.2 cm × 0.6–1.1 mm when mature, keeled only adaxially and proximally. Pollen cones reddish, broadly conical, 6–8 × 5.5–6.5 mm. Seed cones maturing gray-brown, oblong-ellipsoid, 4.5–5 × 2.2–2.5 cm. Seed scales broadly obovate-reniform, ca. 8 × 10 mm at middle of cones, minutely whitish pubescent abaxially, apex broadly rounded, entire or shallowly retuse. Bracts exserted, lanceolate, exposed part ca. 8 × 5.5 mm, strongly reflexed, tapered gradually then finally more abruptly into a cusp, cusp 1.5–4 mm, upturned at apex. Seeds not seen. Pollination Apr, seed maturity late summer–autumn.

• Rocky slopes; 3200–3500 m. SE Xizang (Gongbo'gyamda).

4. *Larix mastersiana* Rehder & E. H. Wilson in Sargent, Pl. Wilson, 2: 19. 1914.

川红杉 chuan hong shan

*Larix griffithii* J. D. Hooker var. *mastersiana* (Rehder & E. H. Wilson) Silba.

Trees to 25 m tall; trunk to 0.8 m d.b.h.; bark grayish brown or dark brown, irregularly and longitudinally fissured; branchlets pendulous; long branchlets yellowish brown or brown, turning yellowish gray or dark gray, initially puberulent; short branchlets 3–4 mm in diam., densely brownish yellow pubescent; winter buds ovoid-orbicular. Leaves linear, 1.2–3.5 cm × ca. 1 mm, keeled on both sides. Seed cones brownish purple, maturing brown, cylindrical-ellipsoid, 2.5–4 × 1.5–2 cm. Seed scales cordate or obovate-reniform, 0.8–1.1 × 1–1.3 cm at middle of cones, densely brown pubescent abaxially, apex emarginate. Bracts exserted, dark brown-purple, broadly lanceolate, obviously reflexed, 1.1–1.5 cm. Seeds light gray, obliquely obovoid, 7–9 mm including wing. Pollination Apr–May, seed maturity Oct.

• Mountains; 2300–3500 m. Sichuan.

An endangered species. The timber is used for construction, pit props, railway sleepers, and making furniture, and the bark yields tannins. The species is also used for afforestation.

5. *Larix himalaica* W. C. Cheng & L. K. Fu in W. C. Cheng & al., Acta Phytotax. Sin. 13(4): 84. 1975.

须弥红杉 xu mi hong shan

*Larix potaninii* Batalin var. *himalaica* (W. C. Cheng & L. K. Fu) Farjon & Silba.

Branchlets pendulous; long branchlets light yellow or brownish yellow, bright in 2nd year, finally yellowish gray; short branchlets 2–5 mm in diam., glabrous, with rings of reflexed bud scales; winter buds subglobose or conical-globose. Leaves linear, 1–2.5 cm × ca. 1 mm, flat or keeled toward base adaxially, keeled abaxially. Seed cones erect, purplish brown, maturing dark brown, cylindrical, 2–6.5 × 2.8–3.2 cm, apex obtuse. Seed

scales suborbicular or oblong-orbicular, 1.2–1.5 × 0.9–1.3 cm at middle of cones, longer than wide, densely pubescent abaxially, finally glabrous, apex rounded or broadly rounded. Bracts exerted, purplish or purplish brown, lanceolate-oblong, straight, slightly longer than or equaling seed scales, 1.4–1.7 cm, apex obtuse. Seeds obliquely triangular-ovoid, ca. 9 mm including wing.

River basins, valleys; 3000–3500 m. S Xizang [Nepal].

**6. *Larix potaninii*** Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 385. 1894.

红杉 hong shan

Trees to 50 m tall; trunk to 1 m d.b.h.; bark gray or gray-brown, rough, longitudinally fissured; crown conical; long branchlets reddish brown or purplish brown, rarely initially yellowish brown, finally dark gray; short branchlets 3–8 mm in diam., glabrous or densely yellowish brown hairy at apex; winter buds brown or dark brown, glossy, ovoid. Leaves 1.2–3.5 cm × 1–1.5 mm, keeled on both sides. Seed cones reddish or purplish, maturing purplish brown or light gray-brown, cylindrical or ovoid-cylindrical, 2.5–7.5 × 1.5–3.5 cm. Seed scales 35–90, slightly convex, 0.8–1.6 × 0.8–1.1 cm, as wide as or wider than long, ± strigose to pubescent and tuberculate abaxially, apex truncate or obtuse-rounded. Bracts often exerted, purplish brown, oblong-lanceolate, straight, apex acute or acuminate. Seeds light brown with irregular purplish spots, obliquely obovate, obliquely obovoid, 7–10 mm including wing. Pollination Apr–May, seed maturity Oct.

• Mountains, river basins; 2500–4300(–4600) m. S Gansu, S Shaanxi, Sichuan, SE Xizang, N Yunnan.

The timber is used for construction, pit props, railway sleepers, and making furniture, and the bark yields tannins. The species is also used for afforestation.

1a. First-year long branchlets grayish yellow, light yellow, or brownish yellow; seed scales ± strigose abaxially ..... 6c. var. *chinensis*

1b. First-year long branchlets red-brown, purplish brown, or yellowish brown; seed scales ± tuberculate and pubescent abaxially.

2a. Seed cones 3–5 × 1.5–2.5 cm; seed scales 35–65, thin, 0.8–1.3 cm; short branchlets slender, densely hairy at apex ..... 6a. var. *potaninii*

2b. Seed cones 5–7.5 × 2.5–3.5 cm; seed scales 75–90, thick, 1.4–1.6 cm; short branchlets stout, glabrous or subglabrous ..... 6b. var. *australis*

**6a. *Larix potaninii* var. *potaninii***

红杉(原变种) hong shan (yuan bian zhong)

*Larix griffithii* Masters (1902), not J. D. Hooker (1854); *L. tibetica* Franchet.

First-year long branchlets red-brown, purplish brown, or yellowish brown. Short branchlets slender, densely hairy at apex. Seed cones 3–5 × 1.5–2.5 cm. Seed scales 35–65, thin, 0.8–1.3 cm, ± tuberculate and pubescent abaxially.

• Mountains, river basins; 2500–4000 m. S Gansu, Sichuan, N Yunnan.

**6b. *Larix potaninii* var. *australis*** A. Henry ex Handel-Mazzetti, Symb. Sin. 7: 14. 1929.

大果红杉 da guo hong shan

*Larix potaninii* var. *macrocarpa* Y. W. Law.

First-year long branchlets red-brown, purplish brown, or yellowish brown. Short branchlets stout, 4–8 mm in diam., glabrous or subglabrous. Seed cones 5–7.5 × 2.5–3.5 cm. Seed scales 75–90, thick, 1.4–1.6 cm, ± tuberculate and pubescent abaxially.

• Mountains; (2700–)3800–4300(–4600) m. SW Sichuan, SE Xizang, NW Yunnan.

**6c. *Larix potaninii* var. *chinensis*** L. K. Fu & Nan Li, Novon 7: 262. 1997.

秦岭红杉 qin ling hong shan

*Larix chinensis* Beissner (1896), not Miller (1768).

First-year long branchlets grayish yellow, light yellow, or brownish yellow. Short branchlets 3–4 mm in diam., densely yellow pubescent. Seed cones 2.5–5 × 1.5–2.8 cm. Seed scales 40–55, ± strigose abaxially.

• Mountains; 2600–3500 m. S Shaanxi.

A vulnerable plant. The name *Larix potaninii* var. *chinensis* was published as a new combination based on *L. chinensis* Beissner (Mitt. Deutsch. Dendrol. Ges. 5: 215. 1896). However, the latter is illegitimate, being a later homonym of *L. chinensis* Miller (1768), so *L. potaninii* var. *chinensis* is effectively a new name based on Beissner's type.

**7. *Larix sibirica*** Ledebour, Fl. Altaic. 4: 204. 1833.

鲜卑落叶松 xian bei luo ye song

*Larix decidua* subsp. *sibirica* (Ledebour) Domin; *L. decidua* var. *sibirica* (Ledebour) Regel; *L. russica* (Endlicher) Sabine ex Trautvetter; *L. sukaczewii* Dylis; *Pinus larix* Linnaeus var. *russica* Endlicher.

Trees to 40 m tall; trunk to 80 cm d.b.h.; bark dark gray to dark brown, rough, longitudinally fissured; crown conical, branchlets not pendulous, yellow or yellowish gray, glossy, densely hairy when young, glabrescent; short branchlets densely grayish hairy at apex; winter buds subglobose. Leaves 2–4 cm, keeled abaxially, apex acute or obtuse. Seed cones purplish or reddish brown, rarely green, maturing pale brown or purplish brown, ovoid or narrowly so, 2.5–4.5 × 2–3.5 cm. Seed scales 25–40, ovate or narrowly rhombic-ovate, 1.5–2 × 1–1.8 cm, usually densely rusty brown pubescent abaxially, rarely subglabrous, apex obtuse. Bracts included, violet, oblong-lanceolate, 1/4–1/2 as long as seed scales, midvein elongated into a caudate cusp. Seeds light gray, obliquely obovoid, 1–1.5 cm including wing. Pollination May, seed maturity Sep–Oct.

Mountains, lowland taiga; 500–3500 m. Xinjiang [Mongolia, E Russia].

The timber is used for construction, bridge building, vehicles, poles, and making furniture, and the bark yields tannins. The species is also cultivated for afforestation and as an ornamental.

**8. *Larix gmelinii*** (Ruprecht) Kuzeneva, Trudy Bot. Muz. Rossiisk. Akad. Nauk 18: 41. 1920.

落叶松 *luo ye song*

Trees to 35 m tall; trunk to 90 cm d.b.h.; bark gray to dark gray, longitudinally fissured, scaly; crown ovoid-conical; branchlets initially yellowish brown, aging gray-brown or gray, slender, ca. 1 mm in diam., glabrous or pubescent; short branchlets 2–4 mm in diam., yellowish hairy at apex; winter buds subglobose, scales dark brown. Leaves 1.5–3 cm × 0.7–1 mm, keeled abaxially. Seed cones purplish red, maturing yellow-brown or purplish brown, ovoid or ovoid-oblong, 1.2–4 × 1–3 cm. Seed scales 14–45, pentagonal-ovate, 1–1.5 × 0.8–1.2 cm at middle of cone, glabrous and glossy abaxially, margin truncate or emarginate toward apex. Bracts ovate-lanceolate, 1/3–1/2 as long as seed scales, apex cuspidate. Seeds grayish with light brown spots, obliquely ovoid, ca. 10 mm including wing. Pollination May–Jun, seed maturity Sep.

Hills, mountains, rocky slopes, peatlands, swamps, lowland subarctic plains, river basins, valleys; 300–2800 m. Hebei, Heilongjiang, NW Henan, Jilin, Nei Mongol, Shanxi [Korea, Mongolia, E Russia].

The timber is used for construction, poles, vehicles, bridge building, and wood fiber. The trunk is used for producing resin, and the bark for tannins. The species is also cultivated for afforestation and as an ornamental.

- 1a. First-year long branchlets slender, ca. 1 mm in diam.; short branchlets 2–3 mm in diam.; seed cones 1.2–3 × 1–2 cm; seed scales 14–30, dehiscent at maturity ..... 8a. var. *gmelinii*  
1b. First-year long branchlets stout, 1.4–2.5 mm in diam.; short branchlets 3–4 mm in diam.; seed cones 2–4 × 2–3 cm; seed scales 26–45, indehiscent or slightly dehiscent at maturity toward apical part of cone ..... 8b. var. *principis-rupprechtii*

**8a. *Larix gmelinii* var. *gmelinii***

落叶松(原变种) *luo ye song* (*yuan bian zhong*)

*Abies gmelinii* Ruprecht, Beitr. Pflanzenk. Russ. Reiches 2: 56. 1845; *Larix dahurica* Turczaninow ex Trautvetter; *L. dahurica* f. *denticulata* Liou & Q. L. Wang; *L. dahurica* f. *glauca* Liou & Q. L. Wang; *L. dahurica* var. *heilingensis* (Y. C. Yang & Y. L. Chou) Kitagawa; *L. dahurica* f. *macrocarpa* Liou & Q. L. Wang; *L. gmelinii* f. *genhensis* (S. Y. Li & Adair) L. K. Fu & Nan Li; *L. gmelinii* var. *genhensis* S. Y. Li & Adair; *L. gmelinii* var. *hsinganica* Y. C. Yang & Y. L.

Chou; *L. heilingensis* Y. C. Yang & Y. L. Chou; *L. komarovii* Kolesnikov; *L. middendorffii* Kolesnikov; *L. ochotensis* Kolesnikov.

First-year long branchlets slender, ca. 1 mm in diam. Short branchlets 2–3 mm in diam. Seed cones 1.2–3 × 1–2 cm. Seed scales 14–30, dehiscent at maturity.

Hills, mountains, peatlands, swamps, lowland subarctic plains, river basins, valleys; 300–1200 m. Heilongjiang, Jilin, Nei Mongol [Korea, Mongolia, E Russia].

**8b. *Larix gmelinii* var. *principis-rupprechtii*** (Mayr) Pilger in Engler & Prantl, Nat. Pflanzenfam., ed. 2, 13: 327. 1926.

华北落叶松 *hua bei luo ye song*

*Larix principis-rupprechtii* Mayr, Fremdländ. Wald-Parkbäume 309. 1906; *L. dahurica* Turczaninow ex Trautvetter var. *principis-rupprechtii* (Mayr) Rehder & E. H. Wilson; *L. gmelinii* f. *pendula* (D. S. Zhang & Y. M. Chen) L. K. Fu & Nan Li; *L. gmelinii* var. *wulingschanensis* (Liou & Q. L. Wang) Kitagawa; *L. principis-rupprechtii* var. *pendula* D. S. Zhang & Y. M. Chen; *L. wulingschanensis* Liou & Q. L. Wang.

First-year long branchlets stout, 1.4–2.5 mm in diam. Short branchlets 3–4 mm in diam. Seed cones 2–4 × 2–3 cm. Seed scales 26–45, indehiscent or slightly dehiscent at maturity toward apical part of cone.

• Mountains, usually on rocky slopes; 600–2800 m. Hebei, NW Henan, Shanxi.

**9. *Larix olgensis*** A. Henry, Gard. Chron., ser. 3, 57: 109. 1915.

黄花落叶松 *huang hua luo ye song*

*Larix dahurica* Turczaninow ex Trautvetter f. *multilepis* Liou & Q. L. Wang; *L. gmelinii* (Ruprecht) Kuzeneva var. *olgensis* (A. Henry) Ostenfeld & Syrach-Larsen; *L. olgensis* var. *changpaiensis* Y. C. Yang & Y. L. Chou f. *intermedia* (Takenouchi) Yang & Nie; *L. olgensis* var. *changpaiensis* f. *pubibasis* Yang & Nie; *L. olgensis* f. *viridis* (E. H. Wilson) Nakai.

Trees to 30 m tall; trunk to 1 m d.b.h.; bark gray to gray-brown, longitudinally fissured, flaking, scaly; crown pyramidal; long branchlets reddish or light brown, initially slightly shining, aging gray or dark gray, 1–1.2 mm in diam., pubescent or glabrous; short branchlets 2–3 mm in diam., densely brownish hairy at apex; winter buds purplish brown, ovoid or conical-ovoid. Leaves 1.5–2.5 cm × ca. 1 mm, keeled abaxially. Seed cones reddish purple or violet, maturing light brown and sometimes tinged with purple, ovoid-oblong. Seed scales 14–16, ovate-quadrangular or quadrangular-orbicular, usually slightly recurved distally when dry, 0.9–1.2 × ca. 1 cm, ± tuberculate, sometimes pubescent, rarely nearly glabrous abaxially, base slightly wider, apex truncate or emarginate, obtuse. Bracts included, dark purple-brown, oblong-ovate, 4–7

mm. Seeds light yellow or white, irregularly purple spotted, subobovoid, ca. 9 mm including wing. Pollination May, seed maturity Sep–Oct.

Mountains, moist slopes, swamps; 500–1800 m. Jilin, E Liaoning [Korea, E Russia].

The timber is used for construction, poles, vehicles, pit props, railway sleepers, and wood fiber. The trunk is used for producing resin and the bark for tannins. The species is also cultivated for afforestation and as an ornamental.

**10. *Larix decidua*** Miller, Gard. Dict., ed. 8, *Larix* no. 1. 1768.

欧洲落叶松 ou zhou luo ye song

*Larix europaea* Lamarck & de Candolle.

Trees to 50 m tall; trunk to 2 m d.b.h.; bark grayish brown, cracking into irregular plates; crown irregularly pyramidal; long branchlets light yellow or light grayish yellow, turning gray or blackish in 2nd or 3rd year, initially glabrous; short branchlets cylindrical or subglobose, bearing rings of scale remnants; leaf cushions densely yellow pubescent. Leaves 2–3 cm × 0.5–1 mm, flat or occasionally slightly keeled adaxially, keeled abaxially. Seed cones dark red or purplish, becoming green with pink scale margins, ovoid or ovoid-oblong. Seed scales ovate or suborbicular, 0.8–1.5 × 0.7–1.3 cm, initially reddish pubescent near base abaxially, glabrescent, base narrowed, margin incurved distally, apex repand or shallowly emarginate. Bracts included, apex 3-lobed, cusp exposed, ca. 2.5 mm. Seeds dark brownish gray, ovoid-cuneate, ca. 4 × 2.5 mm; wing pale brown, ovate.

Cultivated. Jiangxi (Lu Shan), Liaoning (Xiongyuecheng) [native to Europe].

**11. *Larix kaempferi*** (Lambert) Carrière, Fl. Serres Jard. Eur. (Ghent) 11: 97. 1856.

日本落叶松 ri ben luo ye song

*Pinus kaempferi* Lambert, Descr. Pinus 2: [Pref.] v. 1824; *Larix leptolepis* (Siebold & Zuccarini) Gordon; *L. leptolepis* var. *louchanensis* Ferré & Augère.

Trees to 35(–40) m tall; trunk to 1.5 m d.b.h.; crown broadly pyramidal, dense; long branchlets light yellow or light reddish brown, glaucous, initially pale brownish pubescent, turning glabrous and grayish brown or blackish brown in 2nd year; short branchlets bearing rings of scale remnants; leaf cushions sparsely pilose. Leaves linear-oblong, 1–2.5 cm × 0.7–1.1 mm, inconspicuously keeled abaxially, apex obtuse. Seed cones terminal, violet, maturing orange-brown tinged with purple, finally gray-brown, ovoid-globose, 1.5–3.5 × 1.5–2.5 cm. Seed scales 30–40, suborbicular, 1–1.3 × 1–1.3 cm, glabrous, margin sometimes undulate, apex entire or emarginate, usually strongly recurved. Bracts included, ligulate, ca. 1/2 as long as seed scales. Seeds brownish white mottled with red, ovoid-cuneate, slightly flattened, ca. 4 × 3 mm; wing

reddish yellow tinged with brown, ovate-oblong, ca. 8 × 4 mm.

Cultivated. Hebei, Heilongjiang, Henan, Jiangxi, Jilin, Liaoning, Shandong [Japan].

