

**8. JUNIPERUS** Linnaeus, Sp. Pl. 2: 1038. 1753.

刺柏属 ci bai shu

*Sabina* Miller.

Trees or shrubs evergreen, monoecious or dioecious; bark thin, exfoliating in long strips; branchlets not arranged in a plane, terete or 3-, 4-, or 6-angled in cross section. Leaves decussate or in whorls of 3, decurrent or non-decurrent; juvenile leaves always needlelike; adult leaves scalelike or needlelike, usually not dimorphic along branchlets but sometimes different on juvenile and adult branchlets, with 1 or 2 pale stomatal bands adaxially, or in addition a few stomata near base abaxially. Pollen cones yellow, ovoid or oblong; microsporophylls 6–16, each with 2–8 pollen sacs. Seed cones terminal or axillary, berrylike, globose or ovoid, indehiscent or slightly dehiscent when mature in (1st or)2nd(or 3rd) year; cone scales connate or fused, succulent; each fertile scale bearing 1–3 seeds; free bract apex a small point. Seeds 1–6(–10) per cone, wingless, usually with resin pits. Cotyledons 2–6.

About 60 species: N hemisphere; 23 species (ten endemic, two introduced) in China.

- 1a. Leaves always needlelike, base jointed, not decurrent; cones axillary; seed cones with 3 whorled cone scales.
  - 2a. Leaves adaxially with 2 whitish stomatal bands separated by a green midvein ..... 1. *J. formosana*
  - 2b. Leaves adaxially with 1 white stomatal band, without a green midvein.
    - 3a. Leaves “V”-shaped in cross section, 10–23 × ca. 1 mm, rigid, deeply grooved adaxially, white stomatal bands narrower than green margins ..... 2. *J. rigida*
    - 3b. Leaves nearly flat in cross section, 4–10 × 1–2 mm, white stomatal band broader than green margins ..... 3. *J. sibirica*
- 1b. Leaves needlelike, scalelike, or both, base of needlelike leaves not jointed, decurrent; cones terminal; seed cones with 3–8 decussate or whorled cone scales.
  - 4a. All leaves needlelike.
    - 5a. Leaves decussate or in whorls of 3, very short, 2–4.5 mm; seed cones 1–3-seeded ..... 4. *J. gaussenii*
    - 5b. Leaves in whorls of 3 only; seed cones either 1-seeded or 2- or 3-seeded.
      - 6a. Seed cones 2- or 3-seeded ..... 5. *J. procumbens*
      - 6b. Seed cones 1-seeded.
        - 7a. Leaves abaxially keeled, without longitudinal grooves ..... 6. *J. pingii*
        - 7b. Leaves abaxially convex or obtusely ridged, with thin longitudinal grooves along ridge or at base.
          - 8a. Branchlets pendulous; leaves loosely appressed, 3–6 mm, to 10 mm in young plants, convex with longitudinal grooves at base abaxially ..... 7. *J. recurva*
          - 8b. Branchlets not pendulous; leaves spreading, ascending, or appressed, 1–10 mm, obtusely ridged with longitudinal grooves on ridge (or at base) abaxially.
            - 9a. Leaves closely appressed, small, 1–2 × 0.5–1.2 mm; branchlets 4- or 6-angled 8. *J. chengii*
            - 9b. Leaves spreading or ascending, larger, 4–10 × 1–1.3 mm; branchlets not angled.
              - 10a. Leaves ascending, 4–6 × ca. 1 mm; branchlets loosely arranged, usually straight, long ..... 9. *J. baimashanensis*
              - 10b. Leaves spreading or ascending, 5–10 × 1–1.3 mm; branchlets densely arranged, straight or curved, usually short ..... 10. *J. squamata*
      - 4b. Leaves scalelike, both scalelike and needlelike, or needlelike only on young plants.
        - 11a. Seed cones (1 or)2- or 3(–5)-seeded.
          - 12a. Leaves scalelike, needlelike only on young plants.
            - 13a. Shrubs erect or decumbent, rarely small trees; branchlets densely arranged, slender, 0.8–1 mm in diam. .... 14. *J. sabina*
            - 13b. Trees, rarely shrubs; branchlets loosely arranged, stout, 1–2 mm in diam. .. 15. *J. semiglobosa*
          - 12b. Leaves both scalelike and needlelike, sometimes one form predominates.
            - 14a. Shrubs decumbent.
              - 15a. Leaves of both types present ..... 13. *J. davurica*
              - 15b. Mostly scalelike leaves present ..... 12. *J. chinensis*

- 14b. Trees.  
 16a. Leaves predominantly scalelike on mature plants, gland basal on scalelike leaves ..... 11. *J. virginiana*  
 16b. Leaves both scalelike and needlelike on mature plants, gland central on scalelike leaves ..... 12. *J. chinensis*
- 11b. Seed cones 1-seeded.  
 17a. Abaxial gland of scalelike leaves basal.  
 18a. Branchlets 4-angled, curved ..... 19. *J. saltuaria*  
 18b. Branchlets terete, straight, rarely curved.  
 19a. Branchlet systems tapering, ultimate branchlets gradually shorter toward apex of system; leaves without cuticular wax covering ..... 17. *J. komarovii*  
 19b. Branchlet systems not tapering ultimate branchlets of equal length or irregularly unequal; leaves covered with cuticular wax ..... 18. *J. przewalskii*
- 17b. Abaxial gland of scalelike leaves central.  
 20a. Ultimate branchlets thin, ca. 1 mm in diam.; seed cones small, 5–8(–10) × 5–6 mm 16. *J. convallium*  
 20b. Ultimate branchlets thicker than 1 mm (to 2 mm); seed cones larger, (7–)8–16 × 8–13 mm.  
 21a. Branchlets terete or slightly 4-angled ..... 20. *J. tibetica*  
 21b. Branchlets 4-angled, sometimes ± terete.  
 22a. Branchlet systems not tapering; scalelike leaves decussate or sometimes in whorls of 3 ..... 21. *J. indica*  
 22b. Branchlet systems tapering; scalelike leaves decussate.  
 23a. Shrubs procumbent to small trees ..... 22. *J. pseudosabina*  
 23b. Shrubs or trees to 15 m ..... 23. *J. centrasiatca*

**1. *Juniperus formosana*** Hayata, J. Coll. Sci. Imp. Univ. Tokyo 25(19): 209. 1908.

刺柏 ci bai

*Juniperus chekiangensis* Nakai; *J. formosana* var. *concolor* Hayata; *J. formosana* f. *tenella* Handel-Mazzetti; *J. mairei* Lemée & H. Léveillé.

Shrubs or trees to 15 m tall; bark brown; crown usually pyramidal or cylindrical; branches spreading or ascending; branchlets pendulous, 3-angled. Leaves in whorls of 3, linear-lanceolate or linear-needlelike, 1.2–2 cm × 1.2–2 mm, slightly concave adaxially, with 2 white, broad stomatal bands separated by a narrow, green midvein, green and obtusely keeled abaxially, base jointed, not decurrent, apex sharply pointed. Pollen cones axillary, globose or ellipsoid, 4–6 mm; microsporophylls 9–12, in whorls of 3, each with 4 or more pollen sacs. Seed cones axillary, light reddish brown when ripe, glaucous or not, subglobose or broadly ovoid, 6–9 × 6–8 mm, with 6 fused scales in 2 alternating whorls, often 3-seeded, with a single seed on each scale of apical whorl. Seeds ovoid-triangular, 4–5 × 3–3.5 mm, 3- or 4-ridged, base with 3 or 4 resin pits, apex pointed.

• Forests; 200–3400 m. S Anhui, W Fujian, E Gansu, Guizhou, W Hubei, S Hunan, S Jiangsu, Jiangxi, NE Qinghai, S Shaanxi, Sichuan, Taiwan, S Xizang, Yunnan, Zhejiang.

**2. *Juniperus rigida*** Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(3): 233. 1846.

杜松 du song

*Juniperus utilis* Koidzumi; *J. utilis* var. *modesta* Nakai. Shrubs erect, or small trees to 10 m, dioecious; crown pyramidal or cylindrical; branches ascending; branchlets pendulous, 3-angled when young. Leaves in whorls of 3, green abaxially, linear-needlelike, thick, “V”-shaped in cross section, 1–2.3 cm × ca. 1 mm, rigid, deeply grooved with a narrow, white stomatal band adaxially, prominently keeled abaxially, base jointed, not decurrent, apex sharply pointed. Pollen cones axillary, ellipsoid or subglobose, 3–5 mm; microsporophylls 9–12(or more), in whorls of 3, each with 4–6 pollen sacs. Seed cones axillary, light brownish blue or bluish black when ripe, usually glaucous, globose, 6–8 mm in diam. Seeds often subovoid, ca. 5 mm, indistinctly 4-ridged, apex obtuse or rounded.

Dry areas in mountains; below 2200 m. Gansu, N Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi [Japan, Korea].

Only subsp. *rigida*, described here, occurs in China; subsp. *conferta* (Parlatore) Kitamura (*J. conferta* Parlatore) is a decumbent, coastal shrub that occurs in Japan and E Russia (Sakhalin).

**3. *Juniperus sibirica*** Burgsdorff, Anleit. Sich. Erzieh. Holzart. 2: 124. 1787.

鲜卑刺柏 xian bei ci bai

*Juniperus communis* Linnaeus var. *montana* Aiton (1789), not Neilreich (1859); *J. communis* var. *nana*

(Willdenow) Baumgarten; *J. communis* var. *saxatilis* Pallas; *J. nana* Willdenow.

Shrubs procumbent, to 70 cm; branchlets densely arranged, 3-angled, thick, ca. 2 mm in diam. Leaves in whorls of 3, ascending, lanceolate or linear, usually subfalcate, 4–10 × 1–2 mm, slightly concave adaxially with a single white stomatal band broader than green marginal bands, keeled abaxially, base jointed, not decurrent. Pollen cones axillary, subglobose or ellipsoid, 3–5 mm; microsporophylls 9–12, each with 3–6 pollen sacs. Seed cones brownish black when ripe, glaucous, globose or subglobose, 4–7 mm in diam. Seeds 1–3 per cone, 3–4 mm.

Mountain areas; 600–4200 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, Xinjiang, Xizang [Korea, Japan, Mongolia, Russia (Far East, Siberia); C and W Asia to W Himalaya, Europe, W North America]. Records of *Juniperus communis* Linnaeus from China (e.g., in FRPS) are probably referable to *J. sibirica* (which some authors treat as *J. communis* var. *saxatilis*); however, typical *J. communis* is distributed from Europe to Siberia, E to the Amur River.

**4. *Juniperus gaussonii*** W. C. Cheng, Trav. Lab. Forest. Toulouse T. 1(3, 8): 3. 1940.

昆明柏 kun ming bai

*Juniperus chinensis* Linnaeus var. *gaussenii* (W. C. Cheng) Silba; *Sabina gaussonii* (W. C. Cheng) W. C. Cheng & W. T. Wang.

Shrubs or small trees to 8 m tall; branches ascending or spreading; branchlets spreading or drooping, straight or slightly curved. Leaves toward base of branchlets, decussate or in whorls of 3, all needlelike, 2–4.5 mm, usually keeled abaxially, with a rhombic or oblong gland, base decurrent, apex sharply pointed; leaves toward apex of branchlets 6–8 mm, grooved along midvein abaxially. Pollen cones not seen. Seed cones terminal on very short branchlets, usually glaucous, bluish black when ripe, ovoid, ca. 6 mm, 1- or 2(or 3)-seeded, apex rounded or slightly 2-lobed. Seeds ovoid, ca. 5 mm, with a few shallow resin pits, apex indistinctly ridged.

• 1200–2000 m. C Yunnan.

A little-known species found in C Yunnan and in part described from planted trees in or near Kunming. It is in need of further collection and study.

**5. *Juniperus procumbens*** (Siebold ex Endlicher) Miquel in Siebold & Zuccarini, Fl. Jap. 2: 59. 1870.

铺地柏 pu di bai

*Juniperus chinensis* Linnaeus var. *procumbens* Siebold ex Endlicher, Syn. Conif. 21. 1847; *Sabina procumbens* (Siebold ex Endlicher) Iwata & Kusaka.

Shrubs procumbent, to 70 cm; branches creeping, much elongated, leading shoots and branchlets ascending. Leaves in whorls of 3, all needlelike, unequal in length, 6–8 mm, rigid, slightly concave adaxially, with 2 white stomatal bands adaxially, base decurrent apex sharply pointed. Pollen cones not seen. Seed cones black when

ripe, glaucous, subglobose, 8–9 mm in diam., 2- or 3-seeded. Seeds ca. 4 mm, ridged.

Cultivated for ornament. Anhui, Fujian, Jiangsu, Jiangxi, Liaoning, Shandong, Yunnan, Zhejiang [native to Japan (including Bonin Islands)].

**6. *Juniperus pingii*** W. C. Cheng ex Ferré, Bull. Soc. Hist. Nat. Toulouse 79: 76. 1944.

垂枝香柏 chui zhi xiang bai

Shrubs or trees monoecious; branchlets prominently 6-angled or not. Leaves in whorls of 3, 3–5(–7) × 1–1.5 mm, glaucous, all needlelike, concave and with a faint green midvein adaxially, keeled and without longitudinal grooves abaxially, base decurrent, apex acuminate. Pollen cones axillary, ovoid or globose, 3–4 mm; microsporophylls 6–9, whorled, each with 2–3 pollen sacs. Seed cones axillary, black when ripe, lustrous, ovoid or subglobose, 7–9 mm, 1-seeded. Seeds ovoid or subglobose, 5–7 mm, with prominent resin pits, base rounded, apex obtuse.

• Forests or thickets on mountain slopes; 2600–4900 m. S Gansu, NW Hubei, S Qinghai, S Shaanxi, Sichuan, Xizang, Yunnan.

1a. Branchlets pendulous, usually slender; trees ..... 6a. var. *pingii*

1b. Branchlets not pendulous, usually stout; shrubs or small trees.

2a. Leaves appressed, strongly arched, 3–4 mm; branchlets prominently 6-angled 6b. var. *wilsonii*

2b. Leaves ascending, straight or slightly arched, 4–7 mm; branchlets usually not 6-angled ..... 6c. var. *carinata*

**6a. *Juniperus pingii* var. *pingii***

垂枝香柏(原变种) chui zhi xiang bai (yuan bian zhong) *Sabina pingii* (W. C. Cheng ex Ferré) W. C. Cheng & W. T. Wang.

Trees to 30 m tall; branchlets pendulous, usually slender, prominently 6-angled. Leaves slightly curved or straight on young trees, 3–4 mm.

• Forests on mountain slopes; 2600–3800 m. SW Sichuan, NW Yunnan.

**6b. *Juniperus pingii* var. *wilsonii*** (Rehder) Silba, Phytologia Mem. 7: 36. 1984.

香柏 xiang bai

*Juniperus squamata* Buchanan-Hamilton ex D. Don f. *wilsonii* Rehder, J. Arnold Arbor. 1: 190. 1920; *Sabina pingii* var. *wilsonii* (Rehder) W. C. Cheng & L. K. Fu; *S. squamata* (Buchanan-Hamilton ex D. Don) Antoine var. *wilsonii* (Rehder) W. C. Cheng & L. K. Fu.

Shrubs erect or procumbent, or small trees to 6 m tall; branchlets not pendulous, stout, prominently 6-angled.

Leaves appressed, strongly arched, (2–)3–4 mm.

• Thickets in mountain regions; 2600–4900 m. S Gansu, NW Hubei, S Qinghai, S Shaanxi, Sichuan, Xizang, Yunnan.

**6c. *Juniperus pingii* var. *carinata*** Y. F. Yu & L. K. Fu, Novon 7: 443. 1998.

直叶香柏 zhi ye xiang bai

Shrubs procumbent or erect to 4 m, rarely small trees; branchlets not pendulous, stout, usually not 6-angled. Leaves ascending, straight or slightly arched, 4–7 mm.

• Montane forests and thickets; 2700–4500 m. S Gansu, S Shaanxi, Sichuan, Xizang, Yunnan.

**7. *Juniperus recurva*** Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 2: 55. 1825.

垂枝柏 *chui zhi bai*

Shrubs or trees monoecious or rarely dioecious; bark light grayish brown or brown; crown conical or broadly pyramidal; branches ascending in apical part of plant and spreading toward base; branchlets pendulous, curved. Leaves in whorls of 3, loosely appressed, greenish white or slightly glaucous adaxially, all needlelike, nearly straight, slightly incurved, 3–10 × ca. 1 mm, concave adaxially, base decurrent, convex with longitudinal grooves at base abaxially, apex sharply pointed. Pollen cones axillary, yellow, ovoid-oblong or ellipsoid-ovoid; microsporophylls 10–16, decussate, each with 3 pollen sacs. Seed cones axillary, slightly glaucous when young, maturing purplish black and not glaucous, ovoid, 6–12 × 5–9 mm, 1-seeded. Seeds ovoid or conical-ovoid, 5–9 × 3–6 mm.

Forests or thickets; 1800–3900 m. SE Xizang, NW Yunnan [Afghanistan, Bhutan, N India, Kashmir, N Myanmar, Nepal, Pakistan, Sikkim].

- 1a. Seed cones 7–12 × 6–9 mm; seeds ovoid, 6–8 × 5–6 mm; leaves without a green midvein adaxially ..... 7a. var. *recurva*  
1b. Seed cones 6–8 × 5–6 mm; seeds conical-ovoid, 5–6 × 3–4 mm; leaves with a prominent, green midvein adaxially .. 7b. var. *coxii*

**7a. *Juniperus recurva* var. *recurva***

垂枝柏(原变种) *chui zhi bai* (yuan bian zhong)

*Sabina recurva* (Buchanan-Hamilton ex D. Don)

Antoine.

Trees small, rarely shrubs. Branchlets short, pendulous. Leaves 3–8 mm long, adaxial surface of leaves greenish white, slightly glaucous, with an obscure midvein. Seed cones 7–12 × 6–9 mm. Seeds ovoid, 6–8 × 5–6 mm.

Forests or thickets; 2700–3900 m. SE Xizang, NW Yunnan [Afghanistan, Bhutan, N India, Kashmir, Nepal, Pakistan, Sikkim].

**7b. *Juniperus recurva* var. *coxii*** (A. B. Jackson) Melville, Kew Bull. 13: 533. 1959.

小果垂枝柏 *xiao guo chui zhi bai*

*Juniperus coxii* A. B. Jackson, New Fl. & Silva 5: 33. 1932; *Sabina recurva* var. *coxii* (A. B. Jackson) W. C. Cheng & L. K. Fu.

Shrubs, rarely trees. Branchlets long, pendulous. Leaves 6–10 mm, adaxial surface of leaves with 2 greenish white stomatal bands and a prominent, green midvein. Seed cones 6–8 × 5–6 mm. Seeds conical-ovoid, 5–6 × 3–4 mm, 3-ridged.

Forests; 1800–3800 m. SE Xizang, NW Yunnan [Bhutan, N Myanmar, Sikkim].

**8. *Juniperus chengii*** L. K. Fu & Y. F. Yu, Novon 7: 443. 1998.

万钧柏 *wan jun bai*

Trees to 9 m tall; branchlets usually arched, not pendulous, thin, 4- or 6-angled, 1.1–2 mm in diam. Leaves decussate or in whorls of 3, closely appressed, lustrous abaxially, ovate, strongly arched, 1–2 × 0.5–1.2 mm, concave adaxially, obtusely ridged, with longitudinal grooves on ridges abaxially, base decurrent, apex obtuse or acute. Pollen cones not seen. Seed cones purplish black when ripe, oblong to globose, 9–11 × ca. 9 mm, 1-seeded. Seeds triangular-ovoid, ca. 9 × 7 mm, ridged.

• 3100–3200 m. NW Yunnan (Zhongdian Xian).

This recently described species is known from a single collection, with very small leaves but otherwise close to *Juniperus pingii*, of which it may be a variety. More material needs to be collected and studied.

**9. *Juniperus baimashanensis*** Y. F. Yu & L. K. Fu, Novon 7: 443. 1998.

德钦柏 *de qin bai*

Shrubs to 60 cm; branches glaucous; branchlets ascending, loosely arranged and almost parallel, thin, usually straight, long, not angled. Leaves in whorls of 3, ascending, needlelike, straight or slightly incurved, 4–6 × ca. 1 mm, concave, with a white stomatal band and without a green midvein adaxially, obtusely ridged with longitudinal, thin grooves on ridges abaxially, base decurrent, apex sharply acuminate. Pollen cones not seen. Seed cones brownish black when ripe, globose, ca. 6 × 6 mm, 1-seeded. Seeds triangular-ovoid, ca. 5 × 5 mm.

• Mountain slopes; ca. 3400 m. NW Yunnan (Dêqên Xian).

This recently described species is known from a single collection, with non-pendulous branchlets but otherwise close to *Juniperus pingii*, of which it may be a variety. More material needs to be collected and studied.

**10. *Juniperus squamata*** Buchanan-Hamilton ex D. Don in Lambert, Descr. Pinus 2: 17. 1824.

高山柏 *gao shan bai*

Shrubs erect or procumbent, or small trees to 12 m tall; branches ascending or horizontally spreading; branchlets densely arranged, straight or curved, usually short, not angled. Leaves in whorls of 3, spreading or ascending, sometimes nearly appressed, needlelike, straight or slightly curved, (2.5–) 5–10 × 1–1.5 mm, slightly concave, with white stomatal bands adaxially, obtusely ridged with longitudinal, thin groove on ridge or at base abaxially, base decurrent, apex acute or acuminate. Pollen cones ovoid, 3–4 mm; microsporophylls 9–12, each with 3 pollen sacs. Seed cones black or bluish black when ripe, ovoid or subglobose, 4–8 × 4–6 mm, 1-seeded. Seeds ovoid, 3.5–6 × 2–5 mm, ridged, with resin pits.

Forests, thickets, valleys, and roadsides in mountain areas; 1600–4500 m. S Anhui, W Fujian, S Gansu, E Guizhou, W Hubei, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [Afghanistan, Bhutan, N India, Kashmir, N Myanmar, Nepal, Pakistan, Sikkim].

Four varieties occur in China: var. *squamata* and var. *fargesii* are commonly recognized, whereas the other two were recently described from single collections and need further study, given the wide geographical range and considerable variation found in the foliage of this species.

- 1a. Leaves straight or slightly curved.
  - 2a. Leaves ascending or nearly appressed, usually short and broad ..... 10a. var. *squamata*
  - 2b. Leaves spreading or ascending, usually long and narrow ..... 10b. var. *fargesii*
- 1b. Leaves strongly curved.
  - 3a. Leaves ascending or nearly appressed, densely arranged, internodes not exposed ..... 10c. var. *parvifolia*
  - 3b. Leaves spreading, loosely arranged, internodes exposed ..... 10d. var. *hongxiensis*

**10a. *Juniperus squamata* var. *squamata***

高山柏(原变种) gao shan bai (yuan bian zhong)  
*Juniperus morrisonicola* Hayata; *J. squamata* var. *morrisonicola* (Hayata) H. L. Li & H. Keng; *J. recurva* Buchanan-Hamilton ex D. Don var. *squamata* (Buchanan-Hamilton ex D. Don) Parlatore; *Sabina squamata* (Buchanan-Hamilton ex D. Don) Antoine.

Shrubs. Leaves ascending or nearly appressed, usually short and broad, straight or slightly incurved, 5–7 × 1.2–1.5 mm at base.

Montane thickets; 2300–4400 m. W Hubei, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [Afghanistan, Bhutan, N India, Kashmir, N Myanmar, Nepal, Pakistan, Sikkim].

**10b. *Juniperus squamata* var. *fargesii*** Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 59. 1914.

长叶高山柏 chang ye gao shan bai

*Juniperus fargesii* (Rehder & E. H. Wilson) Komarov; *J. kansuensis* Komarov; *J. lemeana* H. Léveillé & Blinovskij.

Shrubs erect or procumbent, or trees. Leaves spreading or ascending, usually long and narrow, straight or slightly curved, 6–10 × 0.8–1 mm at base.

• Forests, valleys, roadsides; 1600–4500 m. S Anhui (Huang Shan), W Fujian (Liancheng Xian), S Gansu, E Guizhou (Jiangkou), SW Shaanxi (Taibai Shan), Sichuan, Yunnan.

**10c. *Juniperus squamata* var. *parviflora*** Y. F. Yu & L. K. Fu, Novon 7: 444. 1998.

小叶高山柏 xiao ye gao shan bai

Shrubs. Leaves ascending or appressed, densely arranged, internodes not exposed, strongly curved, thick, small, 2.5–3.5 × 0.8–1.2 mm.

• Montane forests and thickets; 3200–3800 m. SW Sichuan.

**10d. *Juniperus squamata* var. *hongxiensis*** Y. F. Yu & L. K. Fu, Novon 7: 444. 1998.

洪溪高山柏 hong xi gao shan bai

Shrubs; branchlets with exposed internodes. Leaves spreading, loosely arranged, internodes exposed, strongly arched, small, 3.5–4.5 × 1–1.3 mm.

• Mountains; 3600–3700 m. S Sichuan (Meigu Xian).

**11. *Juniperus virginiana*** Linnaeus, Sp. Pl. 2: 1039. 1753.

北美圆柏 bei mei yuan bai

*Sabina virginiana* (Linnaeus) Antoine.

Trees to 30 m, dioecious; bark reddish brown; crown columnar-conical or conical; branches erect or spreading; branchlets thin, 4-angled, ca. 0.8 mm in diam. Leaves both scalelike and needlelike; needlelike leaves usually present on young plants, rarely present on adult plants, decussate or in whorls of 3, ascending, glaucous, 5–6 mm, concave adaxially; scalelike leaves decussate, rhombic-ovate, 1.5–3 mm, concave, abaxial gland basal, elliptic or ovate. Pollen cones 2–3 × ca. 1.5 mm; microsporophylls 8–12, each with 3 or 4 pollen sacs. Seed cones bluish green when ripe, glaucous, globose to ovoid, 4–6(–7) × 3–5.5 mm, 1- or 2-seeded. Seeds ovoid, 3–5 × 3–4 mm.

Cultivated for ornament and planted for afforestation. Anhui, Fujian, Jiangsu, Jiangxi, Shandong, Zhejiang [native to E Canada, E United States].

**12. *Juniperus chinensis*** Linnaeus, Syst. Nat., ed. 12, 2: 660; Mant. Pl. 1: 127. 1767.

圆柏 yuan bai

Shrubs or trees to 25 m, dioecious, rarely monoecious; bark grayish brown; crown of trees pyramidal to open, broad and irregular; branches spreading; branchlets straight or slightly curved, terete or 4-angled, 1–1.2 mm in diam. Leaves both scalelike and needlelike; needlelike leaves present on both young and adult plants, decussate or in whorls of 3, loosely arranged, ascending, nearly lanceolate, (3–)6–12 mm, with 2 white stomatal bands adaxially; scalelike leaves present on adult plants, decussate, closely appressed, 1.5–3 mm, abaxial gland near center, elliptic, slightly concave. Pollen cones yellow, ellipsoid, 4–6 × 2–3 mm; microsporophylls 14–18, each with 3 or 4 pollen sacs. Seed cones brown when ripe, usually glaucous, subglobose, 4–9 mm in diam., (1or)2- or 3(or 4)-seeded. Seeds ovoid, 3–6 × 2–5 mm, slightly flattened, ridged, with resin pits, apex blunt.

Mountains; 1400–2300 m. Anhui, Fujian, S Gansu, Guangdong, N Guangxi, Guizhou, Hebei, Heilongjiang, Henan, W Hubei, Hunan, Jiangsu, Jiangxi, Nei Mongol, S Shaanxi, Shandong, Shanxi, Sichuan, E Taiwan, Yunnan, Zhejiang [Japan, Korea, Myanmar, E Russia].

- 1a. Trees or erect shrubs; needlelike leaves in whorls of 3, loosely arranged, 8–12 mm 12a. var. *chinensis*
- 1b. Shrubs procumbent; needlelike leaves decussate or in whorls of 3, densely arranged, 3–6 mm.
  - 2a. Needlelike leaves sparse or absent on mature plants, decussate ..... 12b. var. *sargentii*

2b. Needlelike leaves usually present on mature plants, often in whorls of 3 12c. var. *tsukusiensis*

**12a. *Juniperus chinensis* var. *chinensis***

圆柏(原变种) *yuan bai* (*yuan bian zhong*)  
*Juniperus fortunei* Carrière; *J. sinensis* J. F. Gmelin (1791), not *J. chinensis* Linnaeus (1767); *J. thunbergii* Hooker & Arnott; *Sabina chinensis* (Linnaeus) Antoine; *S. chinensis* f. *pendula* (Franchet) W. C. Cheng & W. T. Wang.

Trees or erect shrubs. Needlelike leaves in whorls of 3, loosely arranged, 0.8–1.2 cm.

Below 2300 m. Anhui, Fujian, S Gansu, Guangdong, N Guangxi, Guizhou, Hebei, Henan, W Hubei, Hunan, Jiangsu, Jiangxi, Nei Mongol, S Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [Japan, Korea, Myanmar].

**12b. *Juniperus chinensis* var. *sargentii*** A. Henry in Elwes & A. Henry, *Trees Gr. Brit. Ireland* 6: 1432. 1912.

偃柏 *yan bai*

*Juniperus sargentii* (A. Henry) Takeda ex Nakai; *Sabina chinensis* var. *sargentii* (A. Henry) W. C. Cheng & L. K. Fu; *S. sargentii* (A. Henry) Miyabe & Tatewaki.

Shrubs procumbent. Needlelike leaves sparse or absent on mature plants, decussate, densely arranged, 3–6 mm.

1400–2200 m. Heilongjiang [Japan, E Russia].

**12c. *Juniperus chinensis* var. *tsukusiensis*** (Masamune) Masamune, *J. Soc. Trop. Agric. Formosa* 2: 152. 1930.

清水圆柏 *qing shui yuan bai*

*Juniperus tsukusiensis* Masamune, *Bot. Mag. (Tokyo)* 44: 50. 1930.

Shrubs procumbent. Needlelike leaves usually present on mature plants, often in whorls of 3, densely arranged, ca. 6 mm.

Mountains; ca. 2200 m. E Taiwan (Hualian Xian) [Japan].

This variety was described by G. Masamune as only differing in its procumbent habit from var. *chinensis*; the latter taxon has a variable habit from a shrub to a tall tree.

**13. *Juniperus davurica*** Pallas, *Fl. Ross.* 1(2): 13. 1789.

兴安圆柏 *xing an yuan bai*

*Sabina davurica* (Pallas) Antoine.

Shrubs procumbent; bark purplish brown; branchlets densely arranged, ca. 1 mm in diam. Leaves both scalelike and needlelike, decussate; needlelike leaves loosely arranged, narrowly lanceolate or linear-lanceolate, (3–)4–6(–9) mm, concave, with broad, white stomatal bands adaxially, arched and obtusely ridged abaxially, apex acuminate or occasionally acute; scalelike leaves densely arranged, 1–3 mm, abaxial gland central, elliptic or oblong. Pollen cones ovoid-oblong, 4–5 mm; microsporophylls 12–18, each with 2–4 pollen sacs. Seed cones borne on curved branchlets, dark brown or bluish purple when ripe, glaucous, irregularly globose, 4–6 × 6–8 mm, 1–4-seeded. Seeds ovoid, 3–5 mm, slightly flattened, apex acute.

Thickets or forests on rocky mountains, sand dunes; 400–1400 m.

Heilongjiang [Korea, ?Mongolia, E Russia].

Only subsp. *davurica*, described here, occurs in China; subsp. *maritima* Urossov is a decumbent shrub that occurs in E Russia (Primorye). *Juniperus davurica* is very similar to *J. sabina* but has both scalelike and needlelike leaves on mature plants; it is probably a variety of that very widespread species; similar specimens have been found in Europe (e.g., Austria: Tirol).

**14. *Juniperus sabina*** Linnaeus, *Sp. Pl.* 2: 1039. 1753.

叉子圆柏 *cha zi yuan bai*

Shrubs, rarely small trees, dioecious, rarely monoecious; bark grayish brown; branchlets densely arranged, ascending, slender, 0.8–1 mm in diam. Leaves both scalelike and needlelike; needlelike leaves usually present on young plants, rarely present on adult plants, decussate or in whorls of 3, closely appressed, 3–7 mm, concave adaxially, convex abaxially, apex sharply pointed; scalelike leaves decussate, rhombic or rhombic-ovate, 1–2.5 mm, abaxial gland central, prominent, elliptic. Pollen cones ellipsoid or oblong, 3–4 mm; microsporophylls 10–14, each with 2–4 pollen sacs. Seed cones light brownish green, brown, purplish blue, or black when ripe, often glaucous, usually irregularly globose, 5–8 × 5–9 mm, (1 or)2-seeded. Seeds ovoid, slightly flattened, 4–5 mm, ridged, with resin pits, apex blunt or slightly pointed.

Forests or thickets on rocky mountain slopes and sand dunes; 1000–3300 m. Gansu, Nei Mongol, Ningxia, NE Qinghai, N Shaanxi, N Sichuan, Xinjiang [Kazakhstan, Mongolia, Russia (Far East, Siberia); SW Asia, Europe].

At least 12 varieties have been described in this very wide-ranging species; it must be noted that ± straight fertile branchlets are occasionally found on specimens from C Asia and Europe.

- 1a. Seed-cone-bearing branchlets apically curved ..... 14a. var. *sabina*
- 1b. Seed-cone-bearing branchlets straight.
  - 2a. Shrubs ..... 14b. var. *yulinensis*
  - 2b. Small trees ..... 14c. var. *erectopatens*

**14a. *Juniperus sabina* var. *sabina***

叉子圆柏(原变种) *cha zi yuan bai* (*yuan bian zhong*)

*Juniperus arenaria* (E. H. Wilson) Florin; *J. chinensis* Linnaeus var. *arenaria* E. H. Wilson; *J. sabina* var. *monosperma* C. Y. Yang; *Sabina officinalis* Garcke; *S. vulgaris* Antoine.

Shrubs procumbent, to 1 m, rarely small trees; seed-cone-bearing branchlets apically curved.

Forests or thickets on rocky mountain slopes and sand dunes; 1000–3300 m. Gansu, Nei Mongol, Ningxia (Helan Shan), NE Qinghai, N Shaanxi, Xinjiang [Kazakhstan, Mongolia, Russia (Far East, Siberia); SW Asia, Europe].

**14b. *Juniperus sabina* var. *yulinensis*** (T. C. Chang & C. G. Chen) Y. F. Yu & L. K. Fu, *Novon* 7: 444. 1998.

榆林圆柏 *yu lin yuan bai*

*Sabina vulgaris* var. *yulinensis* T. C. Chang & C. G. Chen, *Acta Phytotax. Sin.* 19: 263. 1981.

Shrubs; seed-cone-bearing branchlets straight.

• Thickets. N Shaanxi.

**14c. *Juniperus sabina* var. *erectopatens*** (W. C. Cheng & L. K. Fu) Y. F. Yu & L. K. Fu, *Novon* 7: 444. 1998.

松潘圆柏 song pan yuan bai

*Sabina vulgaris* var. *erectopatens* W. C. Cheng & L. K. Fu in W. C. Cheng & al., *Acta Phytotax. Sin.* 13(4): 86. 1975.

Trees small; seed-cone-bearing branchlets straight.

Seed cones light brownish green at maturity.

• About 2700 m. N Sichuan (Songpan Xian).

**15. *Juniperus semiglobosa*** Regel, *Trudy Imp. S.-Peterburgsk. Bot. Sada* 6: 487. 1879.

昆仑多子柏 kun lun duo zi bai

*Juniperus jarkendensis* Komarov; *J. sabina* Linnaeus var. *jarkendensis* (Komarov) Silba; *Sabina vulgaris* Antoine var. *jarkendensis* (Komarov) C. Y. Yang.

Trees, occasionally shrubs, dioecious, rarely monoecious; branchlets loosely arranged, spreading, straight, stout, terete, 1–2 mm in diam. Leaves both scalelike and needlelike; needlelike leaves usually present on young plants, rarely present on adult plants, decussate or in whorls of 3, directed forward, 3–7 mm, concave adaxially, convex abaxially; scalelike leaves decussate, closely appressed, ± rhombic-ovate, 1–2.5 mm, abaxial gland near center. Pollen cones ± ellipsoid, 3–5 mm; microsporophylls 8–10, each with 3 or 4 pollen sacs. Seed cones light brown to bluish black when ripe, glaucous, ± obovoid-globose or nearly triangular and widest near apex, 2- or 3-seeded. Seeds 3–6 × 2–3.5 mm, angular ovoid, apices often diverging.

Forest borders; 2500–3300 m. SW Xinjiang, W Xizang

[Afghanistan, N India, Kashmir, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

**16. *Juniperus convallium*** Rehder & E. H. Wilson in *Sargent, Pl. Wilson*. 2: 62. 1914.

密枝圆柏 mi zhi yuan bai

Trees, rarely shrubs, dioecious or monoecious; branchlets densely arranged, straight or curved, terete, rarely slightly 4-angled, thin, ultimate ones usually about 1 mm in diam. Leaves grayish green, both scalelike and needlelike; needlelike leaves present only on young plants, decussate or in whorls of 3, ascending, 3–8 mm, concave adaxially; scalelike leaves decussate, rarely in whorls of 3, closely appressed, 1.5–2 × 0.8–1 mm, abaxial gland near center, convex or concave. Pollen cones 1.5–3 mm; microsporophylls 6–8, each with 2 or 3 pollen sacs. Seed cones terminal on short, curved or erect branchlets, reddish brown to purplish black when ripe, glaucous or not, ovoid, conical-ovoid, or globose, 5–8(–10) × 5–6 mm, 1-seeded. Seeds conical-globose or flattened ovoid, 3–5 mm in diam., with or without resin pits.

• High mountains; 2200–4300 m. S Qinghai, NW Sichuan, E Xizang.

1a. Scalelike leaves with a concave abaxial

gland; seed cones conical-ovoid or globose;

seeds conical-globose, ca. 5 mm in diam. 16a. var. *convallium*

1b. Scalelike leaves with a convex abaxial gland; seed cones ovoid; seeds flattened

ovoid, ca. 3 mm in diam. .... 16b. var. *microsperma*

**16a. *Juniperus convallium* var. *convallium***

密枝圆柏(原变种) mi zhi yuan bai (yuan bian zhong)

*Juniperus mekongensis* Komarov; *J. ramulosa* Florin;

*Sabina convallium* (Rehder & E. H. Wilson) W. C.

Cheng & L. K. Fu.

Scalelike leaves with an oblong or elliptic, concave gland abaxially. Seed cones conical-ovoid or globose, 6–8(–10) × 5–8 mm. Seeds conical-globose, ca. 5 mm in diam., with resin pits.

• High mountains; 2200–4300 m. S Qinghai, NW Sichuan, E Xizang.

**16b. *Juniperus convallium* var. *microsperma*** (W. C. Cheng & L. K. Fu) Silba, *Phytologia Mem.* 7: 33. 1984.

小子圆柏 xiao zi yuan bai

*Sabina convallium* var. *microsperma* W. C. Cheng & L. K. Fu in W. C. Cheng & al., *Acta Phytotax. Sin.* 13(4): 86. 1975.

Scalelike leaves with an elliptic, ovate, or orbicular, convex gland abaxially. Seed cones ovoid, 5–7 × ca. 5 mm. Seeds flattened ovoid, ca. 4 × 3 mm.

• High mountains; 3200–4000 m. E Xizang.

**17. *Juniperus komarovii*** Florin, *Acta Hort. Gothob.* 3: 3. 1927.

塔枝圆柏 ta zhi yuan bai

*Juniperus glaucescens* Florin; *Sabina komarovii* (Florin)

W. C. Cheng & W. T. Wang.

Trees to 20 m, monoecious; bark brownish gray or gray; branches drooping to pendulous; branchlet systems tapering and gradually becoming shorter from base to apex of system; branchlets loosely arranged, ascending, straight or slightly curved, terete or 4-angled, thick, ultimate ones 1.2–1.5 mm in diam. Leaves decussate, occasionally in whorls of 3 on leading branches, scalelike, ovate-triangular or triangular-lanceolate, 1.5–3.5(–6) mm, without cuticular wax, abaxial gland near base, ovate or elliptic, leaf apex acute, rarely obtuse, slightly incurved but free. Pollen cones ovoid or globose, 2–3 mm; microsporophylls usually 10, each with 2 or 3 pollen sacs. Seed cones erect, purplish black or black when ripe, slightly glaucous, lustrous, ovoid or subglobose, 8–10(–12) mm, 1-seeded. Seeds ovoid, rarely obovoid, 6–8.5 mm, obtusely ridged, narrowed by resin pits toward base.

• Forests on high mountains; 3000–4000 m. S Qinghai, NW Sichuan.

**18. *Juniperus przewalskii*** Komarov, *Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR* 5: 28. 1924.

祁连圆柏 qi lian yuan bai

*Sabina przewalskii* (Komarov) W. C. Cheng & L. K. Fu;

*S. przewalskii* f. *pendula* W. C. Cheng & L. K. Fu.

Trees to 20 m, rarely shrubs, monoecious; branchlet systems not tapering and subequal in length throughout system; branchlets loosely arranged, straight or slightly

curved, terete or 4-angled, thick, ultimate ones 1.2–1.5 mm in diam. Leaves both scalelike and needlelike: all needlelike on young trees, both types on adult trees, nearly all scalelike on old trees; needlelike leaves in whorls of 3, spreading, free part 4–8 mm; scalelike leaves decussate, usually glaucous, rhombic-ovate, 1.2–3 mm, usually with cuticular wax, abaxial gland basal, orbicular, ovate, or elliptic, convex, leaf apex acute, free. Pollen cones ovoid, ca. 2.5 mm; microsporophylls 6–10, each with 2 or 3 pollen sacs. Seed cones bluish black or black when ripe, ovoid or subglobose, 0.8–1.3 cm, 1-seeded. Seeds slightly flattened globose, occasionally subglobose, 7–12 × 6–10 mm, obscurely or prominently ridged, with resin pits.

• Forests on mountain slopes; 2600–4300 m. Gansu, Qinghai, N Sichuan (Songpan Xian).

**19. *Juniperus saltuaria*** Rehder & E. H. Wilson in Sargent, Pl. Wilson. 2: 61. 1914.

方枝柏 fang zhi bai

*Sabina saltuaria* (Rehder & E. H. Wilson) W. C. Cheng & W. T. Wang.

Trees to 20 m, rarely shrubs, monoecious; branches spreading or ascending; branchlets usually curved, 4-angled, 1–1.7 mm in diam. Leaves both scalelike and needlelike; needlelike leaves present on young plants, in whorls of 3, 4.5–6 mm, ridged abaxially, apex sharply pointed; scalelike leaves decussate, 4-ranked, closely appressed, triangular-rhombic, gibbous, 1–2 mm, abaxial gland basal, inconspicuous, orbicular or ovate, slightly depressed leaf apex obtuse. Pollen cones subglobose, ca. 2 mm; microsporophylls 6–8, each with 2 or 3 pollen sacs. Seed cones erect, black or bluish black when ripe, ovoid or subglobose, 4–8(–10) mm, 1-seeded. Seeds irregularly ovoid-globose, 3.5–7 × 3–5 mm, ridged and pitted.

• Forests or thickets on mountains; 2700–4600 m. S Gansu, SE Qinghai, W Sichuan, E Xizang, NW Yunnan.

**20. *Juniperus tibetica*** Komarov, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 5: 27. 1924.

大果圆柏 da guo yuan bai

*Juniperus distans* Florin; *J. potaninii* Komarov; *J. zaidamensis* Komarov; *Sabina tibetica* (Komarov) W. C. Cheng & L. K. Fu.

Trees to 30 m, rarely shrubs, monoecious, rarely dioecious; branchlets densely or loosely arranged, mostly straight, terete or slightly 4-angled, 1–2 mm in diam. Leaves both scalelike and needlelike; needlelike leaves usually present on seedlings and young plants, in whorls of 3, 4–8 mm; scalelike leaves decussate, sometimes in whorls of 3, ovate-rhombic, obtuse, 1–3 mm, abaxial gland central, conspicuous, slightly depressed, linear-elliptic or linear. Pollen cones subglobose, ca. 2 mm in diam.; microsporophylls 6–8, each with 2 or 3 pollen sacs. Seed cones erect, brown,

black, or purplish black when ripe, ovoid or subglobose, 0.9–1.6 × 0.7–1.3 cm, 1-seeded. Seeds ovoid, rarely obovoid or globose, 7–11 × 6–8 mm, with deep resin pits.

• Forests on mountain slopes or in valleys; 2700–4800 m. S Gansu, S Qinghai, Sichuan, E and S Xizang.

**21. *Juniperus indica*** Bertoloni, Misc. Bot. 23: 16. 1862.

滇藏方枝柏 dian zang fang zhi bai

*Juniperus wallichiana* J. D. Hooker & Thomson ex E. Brandis; *J. wallichiana* var. *meionocarpa* Handel-Mazzetti; *Sabina wallichiana* (J. D. Hooker & Thomson ex E. Brandis) W. C. Cheng & L. K. Fu; *S. wallichiana* var. *meionocarpa* (Handel-Mazzetti) W. C. Cheng & L. K. Fu.

Shrubs erect or procumbent, to 2 m, rarely small trees, dioecious; ultimate branchlets densely arranged, mostly straight, usually 4-angled, sometimes terete. Leaves both scalelike and needlelike; needlelike leaves usually present on young trees, in whorls of 3, ascending, 3–8 mm, apex acuminate; scalelike leaves decussate or sometimes in whorls of 3, closely appressed, rhombic, 1.2–2 mm, abaxial gland central, or basal in needlelike leaves, oblong or linear, depressed, leaf apex obtuse. Pollen cones subglobose or ovoid, 2–3 mm; microsporophylls 6–8, each with 2 or 3 pollen sacs. Seed cones erect, black-brown when ripe, subglobose or ovoid, 6–13 × 5–8 mm, 1(or 2)-seeded. Seeds ovoid, slightly flattened, 5–6 × ca. 4 mm, smooth or obscurely ridged.

Forests or thickets on mountain slopes; 2600–5100 m. E and S Xizang, NW Yunnan [Bhutan, N India, Kashmir, Nepal, Sikkim].

**22. *Juniperus pseudosabina*** Fischer & C. A. Meyer, Index Sem. Hort. Petrop. 1842: 15, 65. 1842.

新疆方枝柏 xin jiang fang zhi bai

Shrubs erect or procumbent, or small trees to 12 m, dioecious; ultimate branchlets densely arranged, mostly straight, 4-angled or sometimes ± terete. Leaves both scalelike and needlelike; needlelike leaves usually present on seedlings and young trees, decussate or in whorls of 3, ascending, 4–8 mm, apex acuminate; scalelike leaves decussate, appressed or with free apex, rhombic, obtuse, 1.5–2 mm, abaxial gland central, or basal in needlelike leaves, oblong or broadly linear, depressed. Pollen cones ovoid or subglobose, 2–3 mm; microsporophylls 6–8, each with 2 or 3 pollen sacs. Seed cones bluish black or brownish black when ripe, ± glaucous, ovoid or broadly ovoid, 0.7–1.4 cm × 6–10 mm, 1-seeded. Seeds ovoid or ellipsoid, slightly flattened, 6–7 × 4–6 mm, ridged, base rounded or pointed, apex blunt.

Thickets on mountains; 2000–4000 m. Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, Uzbekistan].

1a. Shrubs with procumbent branches

..... 22a. var. *pseudosabina*

1b. Trees or shrubs with prominent trunk ..... 22b. var. *turkestanica*

**22a. *Juniperus pseudosabina* var. *pseudosabina***  
新疆方枝柏(原变种) xin jiang fang zhi bai (yuan bian zhong)

*Sabina fischeri* Antoine; *S. pseudosabina* (Fischer & C. A. Meyer) W. C. Cheng & W. T. Wang.

Shrubs; branches procumbent.

Thickets on mountains; 2000–3300 m. Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, Uzbekistan].

**22b. *Juniperus pseudosabina* var. *turkestanica*** (Komarov) Silba, Phytologia Mem. 7: 36. 1984.

喀什方枝柏 ka shi fang zhi bai

*Juniperus turkestanica* Komarov, Bot. Mater. Gerb.

Glavn. Bot. Sada RSFSR 5: 26. 1924; *Sabina pseudosabina* var. *turkestanica* (Komarov) C. Y. Yang.

Trees or shrubs; trunk prominent.

Mountains; 2800–4000 m. Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, Pakistan, Tajikistan, Uzbekistan].

**23. *Juniperus centrasiatatica*** Komarov, Bot. Mater. Gerb. Glavn. Bot. Sada RSFSR 5: 27. 1924.

昆仑方枝柏 kun lun fang zhi bai

*Sabina centrasiatatica* (Komarov) W. C. Cheng & L. K. Fu.

Trees to 15 m tall; crown dense; ultimate branchlets usually glaucous, 4-angled, 1.2–1.5 mm in diam. Leaves grayish green; scalelike leaves decussate, closely appressed, 1.5–2 mm, with a prominent, blunt abaxial ridge, abaxial gland central, often inconspicuous. Pollen cones ovoid or subglobose, 2–3 mm; microsporophylls 6–8, each with 2 or 3 pollen sacs. Seed cones brownish yellow or black-brown when ripe, slightly glaucous, ovoid, 0.9–1.3 cm × 8–10 mm, 1-seeded. Seeds ovoid, slightly flattened, 8–11 × 5–7 mm, base rounded.

Mountain slopes, valleys, river banks; 2600–4000 m. Xinjiang [Afghanistan, Pakistan].

This species is doubtfully distinct from *Juniperus pseudosabina* (tree form, although the habit is not a good character, as it is ecologically determined). That species, in turn, has very few and minor characters, all of a continuous nature, distinguishing it from *J. indica*. These three taxa only marginally occur in China (Xinjiang, Xizang, NW Yunnan), where the variation does not match that found in populations outside China surrounding the Xizang plateau.

