

**Key to *Juniperus* of Continental North America rev. 8-1-08**

- 1a. Leaves all acicular (subulate, jointed at the base) and spreading; seed cones sessile, axillary; decumbent or rarely upright shrubs (in the western hemisphere).....***J. communis***
- 1b. Leaves decurrent (not jointed at the base), both whip- and scale-like; seed cones terminal; trees or decumbent to upright shrubs.
  - 2a. Whip- and scale-leaf margins entire (20 X) or with irregular teeth (40 X) and then with scale-leaves with acuminate to mucronate tips and seed cones tan-brown to brownish purple.
    - 3a. Whip- and scale-leaf margins with irregular teeth (40 X), scale-leaves acuminate; tan-brown to brownish-purple; branches pendulous to slightly erect
      - 3.1a. Seed cones 9-20 mm diam., (4) 6 - 10 (-13) seeds per cone, terminal branch tips drooping (hanging)
        - 3.2a. Branching radially, seed cones tan to brownish/purple.....***J. flaccida***
        - 3.2b. Branching planate, seed cones bluish-brown.....***J. poblana***
      - 3.1b. Seed cones (5-) 6 (-9) mm diam., 1-2 (3) seeds per cone, terminal branch tips erect.....***J. martinzii***
    - 3b. Whip- and scale-leaf margins smooth (entire) (40 X), scale-leaves obtuse to acute to apiculate; seed cones 1-2(3) seeded, blue-black to brownish-blue when mature; branches not drooping (but ultimate branchlets are often flaccid).
    - 4a. Prostrate to decumbent shrub; scale-leaves apiculate; both whip- and scale-leaves growing along the branchlets; peduncles generally curved.....***J. horizontalis***
    - 4b. Tree with 1(2-3) stems and rounded, flattened, pyramidal, or strict crowns; scale-leaves obtuse to acute; whip-leaves growing only at branchlet tips (on mature trees); peduncles generally straight.
      - 5a. Seed cones mostly bi-lobed (reniform), a few may be globose, seed cones maturing in 1 year.
        - 6a. Scale-leaves with mucronate tips.....***J. mucronata***
        - 6b. Scale-leaves with acute to acuminate tips.....***J. blancoi***
      - 5b. Seed cones globose, or occasionally a few on a tree are bi-lobed, seed cones maturing in 1 or 2 years.
        - 7a. Scale-leaves not overlapping, or, if so, not by more than 1/5 the length, leaf tips obtuse to acute; seed cones globose to reniform
          - 7.1a. Twigs (3-5 mm dia.) with smooth bark, twigs (6-15 mm dia.) with bark exfoliating in plates, reddish-copper beneath; seed cones maturing in 2 yrs, most seed cones normal, rarely with exserted seeds.....***J. scopulorum***
          - 7.1b. Twigs (3-5 mm dia.) with persistent dead whip-leaves, twigs (6-15 mm dia.) reddish-brown beneath; seed cones maturing in 1 yr. (14-16 mos.), often the seed cones with exserted (exposed) seeds; Pacific northwest near the seaside in Georgia Straits and Puget Sound.....***J. maritima***
        - 7b. Scale-leaves overlapping (more than 1/4 length), leaf tips acute; twigs (3-5 mm dia.) with persistent dead whip-leaves, twigs (6-15 mm dia.) with bark not exfoliating in plates, or, if so, brownish beneath; seed cones maturing in 1 yr.....***J. virginiana***
  - 2b. Whip- and scale-leaf margins denticulate (20 X)
    - 8a. Seed cones (1) 2 - 11 seeded, if 1-2 seeded, then bark exfoliates in quadrangular plates.
      - 9a. Seed cones (1-3 - ) 4 -5 (- 6) seeded, (1-2 seeded in var. *gamboana*) fibrous to obscurely woody; trunk bark exfoliating in square or quadrangular plates or strips (if in strips on the trunk, then plates on the upper limbs (*J. d. f. sperryi*)).....***J. deppeana***

- 9b. Seed cones 2- 9 seeded
  - 10a. Mature seed cones reddish-brown to brown, with a light coat of bloom; seed cone peduncles straight.
    - 11a. Mature seed cones irregular and gibbous; seeds (2-)4-9(-11) per cone; terminal whip branches strict, foliage very loosely spaced; scale-leaves do not appear as a string-of-beads on the ultimate twig.....***J. jaliscana***
    - 11b. Mature seed cones bluish-red, very glaucous, globose; seeds 1-4 per cone; terminal whip branches recurved (nodding hook) at tip; foliage tightly-spaced; scale-leaves appear as a string-of- beads.....***J. durangensis***
  - 10b. Mature seed cones dark blue to bluish-black, with light coat of bloom, cone peduncles usually curved
    - 12a. Twigs not distichous, or sometimes sub-distichous, scale-leaves thick but not with a hood or beak, ultimate branchlets 1.3 - 1.4 mm wide, central and n. Mexico
      - 12.1a. Mature twigs 5-10 mm. long, angle of branching of ultimate twig 50-60 degrees, foliage very dense and tightly compacted, prostrate to shrubs (to 1 m.), alpine habitat.....***J. compacta***
      - 12.1b. Mature twigs 10-40 mm. long, angle of branching of ultimate twig 40-60 degrees, foliage loose, not tightly compacted, low shrub to tree (to 10 m), sub-alpine to montane habitat.....***J. monticola***
    - 12b. Twigs distichous, scale-leaves thick, usually a hood or beak, ultimate branchlets 1.4 - 1.8 mm wide, Chiapas, Mexico and n. Guatemala.....***J. standleyi***
- 8b. Seed cones 1-2 (-3) seeded, fleshy to fibrous (when mature and fresh), bark exfoliating in strips (if bark exfoliating in quadrangular plates, then seed cones 5-6 mm long)
  - 13a. Scale-leaves with a raised hemispherical gland
    - 14a. Scale-leaf glands protruding like a bead, whip-leaf glands hemispherical (var. *ashei*) or oval (var. *ovata*), dark brownish-green on dark grayish-green mature leaf; angle of branching of ultimate twig 25-40 degrees; scales leaves on ultimate twig do not appear as a string-of-beads.....***J. ashei***
    - 14b. Whip-leaf glands elongate, not hemispherical, scale-leaf gland protruding, oval to elliptical, same color as light gray-green mature leaf; twig bark grayish brown, smooth; angle of branching of ultimate twig about 60 degrees; scale-leaves on ultimate twig appear as a string of beads.....***J. saltillensis***
  - 13b. Scale-leaves without a raised hemispherical gland
    - 15a. Mature seed cones orange, reddish-orange, red, bronze, or reddish-brown, appearing pink or rose-color if covered with bloom.
    - 16a. Stem bark exfoliating in quadrangular plates; cones reddish-brown; terminal whip branches tips straight, not curved; seeds subglobose or broadly ovoid...  
.....***J. deppeana* var. *gamboana***
    - 16b. Stem bark exfoliating in longitudinal strips, often interconnected; seed cones rose, orange to reddish-brown or bronze-color; seed ovoid or if bark in quadrangular plates, then seed cones bluish-rose.
      - 17a. Mature seed cones orange to red, with light bloom appearing pink or rose-colored; whip-leaf ventral side white-glaucous, glands on whip-leaves visible, raised, elongated and divided (often 3 glands); often single stemmed shrub-trees, with stocky, clumpy foliage
        - 17.1a. Shorter whip-leaf glands, half or less as long as the associated sheath  
.....***J. arizonica***
        - 17.1b. Longer whip-leaf glands, more that half as long as the associated sheath  
.....***J. coahuilensis***
      - 17b. Mature seed cones copper to reddish-brown, with no bloom; whip-leaf ventral side not white-glaucous, glands on whip-leaves visible, raised, oval, not divided; shrubs with elongated terminal whips.....***J. pinchotii***

- 15b. Mature seed cone dark blue, dark bluish-black to bluish-brown, with a light to heavy coat of bloom appearing light blue.
- 18a. Glands on scale-leaves visible (conspicuous) and ruptured.
- 19a. Seed cones maturing in 2 yrs., 2(3) seeded, 7-10 mm long; bark on twigs (5-10 mm dia.) reddish and exfoliating in scales or flakes; single stemmed tree to 20 (-30)m, dioecious or monoecious
- 19.1a. Trunk bark red-brown; seeds cones avg. 7.7 mm (5-9); approx. 95% of the plants dioecious, leaf glands usually not ruptured, if ruptured with clear to light yellow exudate.....***J. grandis***
- 19.1b. Trunk bark brown; seeds cones avg. 8.5 mm (7-10); approx. 50% of the plants dioecious, leaf glands ruptured with yellow exudate turning dark brown to black.....***J. occidentalis***
- 19b. Seed cones maturing in 1 yr., 1 (-2) seeded, 6-10 mm long, bark on trigs brown to ash, not exfoliating in scales or flakes, shrubs to small trees, mostly dioecious.
- 20a. Seed cones fibrous to woody pericarp, (7-) 9-10 (-13) mm. diam., bluish-brown under glaucous, 1 (-2) seeded; dioecious (1.9% monoecious), branchlets approx. as wide as scale-leaf length; scale-leaves closely appressed and generally flattened, branchlets terete.....***J. californica***
- 20b. Seed cones with soft, juicy pericarp, 6-8 mm diam., reddish-blue to brownish-blue, globose to ovoid, scale-leaf glands barely visible, not conspicuous, few (less than 1/5) of the whip-leaf glands with a white crystalline exudate (visible without a lens), ultimate twigs 1.3 - 1.5 mm wide.....***J. monosperma***
- 18b. Glands on scale-leaves scarcely visible, not conspicuous
- 21a. Plants monoecious, ultimate twigs 1.3 - 1.5 mm wide, seed cones bluish brown, glaucous, 8-9 mm diam., 1 seeded, leaf glands not conspicuous (embedded in the leaf, therefore not visible).....***J. osteosperma***
- 21b. Plants dioecious, ultimate twigs 0.7 - 1.1 mm wide, seed cones blue.
- 22a. Ultimate twigs very slender (0.7- 0.8 mm. wide); stem bark of fibrous- ragged; longitudinal strips; mature seed cones globose, bluish, 5-8 mm. diam., 1 (2) seeds per cone; seeds 4-6 mm. long, 3-4 mm. wide; strong central axis, usually single-stemmed tree (to 10 m.), with a globose or broad-conic crown; foliage with faint odor of aromatic (terpenoid) compounds, scale-leaf glands not conspicuous, visible on whip-leaves but seldom ruptured.....***J. comitana***
- 22b. Ultimate twigs slender (0.8-1.1 mm. wide), trunk bark exfoliating in quadrangular plates on the lower part, then grading into longitudinal strips on the upper branches, occasionally trunk exfoliating only in strips; mature seed cones bluish and very glaucous, 5-7 mm. diam., 1 (2) seeds per cone; seeds globose to ovoid, 5-6 mm. long, 4-5 mm. wide; shrubs branched at base or short trees (to 10 m.) with horizontally broadened crowns; foliage with strong odor of aromatic (terpenoid) compounds, scale-leaf glands not conspicuous, whip-leaf glands visible but not usually ruptured.....***J. angosturana***