

*Pinus halepensis* Miller subsp. *halepensis*, ALEPPO PINE, JERUSALEM PINE. Tree, evergreen, with 1 trunk to 350 mm diameter, principal branches somewhat horizontal on mature specimen, in range 8–15+ m tall (reproductive); monoecious; shoots with long shoot-short shoot organization; long shoot growth beginning in late winter and early spring, with closely spaced, nonphotosynthetic scale leaves along new axis, producing a short shoot in the axil of scale leaf = a “fascicle” of 2 photosynthetic leaves (needles) held together by 9–10 tightly wrapped, membranous to scarios leaves at the base, glabrous, having resin ducts throughout plant, aromatic, especially when crushed or damaged.

**Stems:** internodes initially hidden by persistent bases of scale leaves; young twigs flexible and knobby with helically arranged remnants of scale leaves; light ash gray; bark large-scaly, not peeling and tightly attached, gray or recently exposed portions cinnamon brown.

**Leaves:** of 3 types (scale, foliage, wrapper); scales leaves on new long shoots helically alternate, simple, sessile with decurrent bases; foliage leaves (needles) terminal and 2 paired (opposite) on short shoot, photosynthetic, simple, sessile; wrapper leaves scarios and mostly cylindric around bases of foliage leaves; blade of scale leaves initially long-acuminate, 3–8 mm long, coppery brown and conspicuously fringed, with spreading to recurved tip, blade eventually abscising leaving a highly reduced and obtuse-rounded rim subtending fascicle, rim < 1 mm long,  $\pm$  persistent at base of each short shoot; wrapper leaves forming a scarios cylinder around needles, 3.5–6 mm long, brownish aging gray, with ringlike ridges; blade of foliage leaves (needles)  $\pm$  hemi-cylindric but channeled, long-linear, (40–)65–110  $\times$   $\pm$  0.8 mm, flexible, glossy green with minute white specks (stomates) formed in faint parallel lines, with minute, shallow, blunt teeth on margins, acute and whitish or reddish at tip, venation observe, upper surface with 2 white lines of stomates in channel, lower side rounded with 5 white lines.

**Pollen cone:** in dense terminal clusters of to 20 initiating spring growth, cluster 15–35 mm long, each cone axillary to a scale leaves, preformed at end of previous growing season; bracts subtending pollen cone 4–6, surrounding basal 1/4–1/3 of cone, cupped and broadly ovate to ovate, 3.5–4  $\times$  1.8–5 mm, pale golden brown or pale reddish brown with wide translucent-membranous margins, glabrous and lacking fringe; cone of many overlapping and closely spaced, helically alternate microsporophylls; cone ovoid, 6–8  $\times$  3–3.5 mm increasing to 11 mm long, the microsporophylls somewhat umbrellalike (peltate), ca. 1.2 mm across, pale brownish yellow, bearing 2 large pollen sacs under each scale; pollen pale yellow, copious, dry and wind-dispersed.

**Seed cone:** solitary, terminal on new spring shoot, at pollination  $\pm$  ellipsoid, 8–9  $\times$  4–5 mm, glaucous and purplish red, consisting of many, spreading, helically alternate sterile bracts, each bract subtending a cone scale, cone scale bearing 2 ovules at base on upper surface with the micropyles facing toward central axis; bract somewhat rounded, 1–1.2 mm wide with keel rounded below midpoint; initially shorter but at pollination ovule-bearing cone scale slightly longer than subtending bract and fleshy, broadly 3–4-sided above midpoint; bracts subtending seed cone at pollination  $\pm$  deltate, ca. 1 mm long; unopened seed cone symmetric and narrowly ovoid, 75–90  $\times$  ca. 40 mm, brown and green, cone scales tightly packed, each 4–5-sided and conforming in outline to other scales in helix, having a horizontal, lens-shaped scar in center traversed by a low horizontal ridge, lacking a sharp point (umbo); opened seed cone (shedding seeds) broadly ovoid with widely spreading, stiff, wooden cone scales, to 80 mm diameter, each cone scale with 2 winged seeds on upper surface (seed fertile or sterile and aborted), scale

surface chestnut brown and having outline of seed wings. **Seed:** winged, 21–25 mm long (incl. wing); wing = modified tissue of cone scale surface, papery (scarious), asymmetrically lanceolate-ovate, 6.5–8.5 mm wide, glossy tannish with dark brown streaks and tip, with 1 margin straight (adjacent to other side on cone scale), rounded at tip; seed ellipsoid slightly compressed top-to-bottom, 5.5–8 (–9) × 3–4 mm, dull dark brown. Early February–early April.

Naturalized. Evergreen tree commonly cultivated throughout range near homes and along roadsides, but individuals occasionally found as saplings or reproducing adults established where they could not have been planted, especially in chaparral. *Pinus halepensis* has also been referred to as *P. brutia*, and based on mature seed cone and leaf length, our individuals fit subsp. *halepensis*. Species of pine exhibit long shoot-short short organization; they have three types of leaves, closely spaced, awl-shaped cauline leaves formed on long shoots; a cauline leaf often subtends a short shoot, consisting of photosynthetic leaves (needles) confined as a bundle (fascicle) by shorter, scarious, wrapping leaves. Aleppo pine is a two-needled pine, having foliage leaves never exceeding 110 millimeters in length, and the fascicles abscise after several years. Blades of cauline leaves abscise while short shoots are forming, but their bases are persistent and still evident on vegetative twigs before bark forms. During late winter dense clusters of pollen cones emerge from buds and then release clouds of yellow pollen. Young seed cones are less obvious but can be recognized as purplish red structures terminating new growth that occurs several weeks after pollen starts to be discharged.

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