

Lauraceae—Laurel family

Umbellularia californica (Hook. & Arn.) Nutt.

California-laurel

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Growth habit, occurrence, and uses. The genus *Umbellularia* contains a single species—*Umbellularia californica* (Hook. & Arn.) Nutt.—that has many common names (Coombes 1992; Stein 1990), the best known being California-laurel, California-olive, Oregon-myrtle, myrtlewood, bay, laurel, and pepperwood. California-laurel is a broad-leaved evergreen that matures either as a shrub or tall forest tree. Over much of its range, it attains heights of 12 to 24 m and diameters of 46 to 76 cm, but near the ocean, in the chaparral, and on other severe or rocky sites it is confined to prostrate or shrub sizes (Harlow and others 1979; Jepson 1910). In the protected bottomlands of southern Oregon and northern California, mature trees are 91 to 305 cm in diameter and 30 or more m tall (Harlow and others 1979). A maximum circumference of 1,387 cm at 137 cm above ground (AFA 2000) and a maximum height of 53.3 m have been reported (Sargent 1961).

Several racial variations are recognized. *Umbellularia californica* forma *pendula* Rehd. is an uncommon, broad-spreading tree distinctive for its pendulous branchlets that contrast strongly with typically ascending branch growth (Jepson 1910; Rehder 1940). *U. californica* var. *fresnensis* Eastwood has fine white down on the lower surfaces of leaves and branches of the panicle (Eastwood 1945). Several forms that Jepson (1910) describes—gregarious, rockpile, dwarf, and prostrate—may indicate other varietal differences.

The range of California-laurel spans more than 11 degrees of latitude, from near the 44th parallel in the Umpqua River Valley of Douglas County, Oregon, south beyond the 33rd parallel in San Diego County, California, nearly to the Mexican border. California-laurel is widely distributed in the coast ranges and less abundantly in inland valleys and the Siskiyou and Sierra Mountains (Sudworth 1908). It may be found from sea level to 1,220 m in much of its range, and from 610 to 1,520 m in southern California (Jepson 1910). Pure, dense stands of California-laurel develop in some areas, but more often it is intermixed with other tree and shrub species. It grows in many kinds of soils under both cool-humid and hot-dry atmospheric conditions (Stein 1990). In xeric climates, it is most prominent where soil moisture is favorable—on alluvial deposits or protected slopes, along watercourses, near springs and seeps—but in its shrub form, it also is found on dry slopes and is a common component of chaparral (Sampson and Jespersen 1963).

All parts of the tree have served human needs. Wood of this species compares favorably in machining quality with the best eastern hardwoods (Davis 1947) and is used for woodenware, interior trim, furniture, paneling, veneer, and gunstocks. Burls and other growths with distorted grain are especially prized for making the gift and novelty items that are marketed extensively as “myrtlewood.” Dried leaves are used for seasoning meats and soups (McMinn 1970). In an

earlier day, Hudson Bay Company trappers brewed a comforting tea from the leaves to overcome chill (Ross 1966). David Douglas learned that hunters made a drink from the bark and declared it “by no means an unpalatable beverage” (Harvey 1947). Native Americans ate substantial quantities of the fruit and seeds, made a drink from the bark of the roots, and used the leaves for several internal and external medicinal purposes, including vermin control (Chesnut 1902).

Extracts of the leaves, seeds, and wood have strong chemical properties and should be used with caution. Vapor from the aromatic leaves can cause sneezing, headache, sinus irritation, other severe discomforts, and even unconsciousness (Drake and Stuhr 1935; Peattie 1953). The leaves contain considerable menthol (Stein 1974) and the ketone umbellulone, which when extracted from the leaf oil, interferes strongly enough with respiration, heartbeat, and blood circulation to cause death in laboratory animals (Drake and Stuhr 1935). Umbellulone also has fungicidal and germicidal properties (Drake and Stuhr 1935). Oils from the wood, leaves, and seeds have been sold for pharmaceutical purposes such as treating catarrh, nervous disorders, rheumatism, meningitis, intestinal colic, and dyspepsia (Peattie 1953; Sargent 1895; Stuhr 1933).

California-laurel is used to a moderate extent as an ornamental evergreen. It has thick, glossy, medium-to-dark green persistent leaves that turn orange or yellow before they drop individually and contrasting pale yellow flowers. The very dense aromatic foliage often shapes naturally into a pleasing, symmetrical, rounded crown. Since it was first cultivated in 1829 (Rehder 1940), it has demonstrated the ability to grow well far outside its natural range (Stein 1958). It can be grown as a decorative potted plant for lobbies and patios and will tolerate moderate pruning (Kasapligil and Talton 1973).

California-laurel also has wildlife values—young sprouts are choice browse in spring and summer. Year-long use is rated by Sampson and Jespersen (1963) as good to fair for deer (*Odocoileus* spp.) and fair to poor for cattle, sheep, and goats. Longhurst and others (1952) list it as a principal browse species for deer in the north coast ranges of California. Silver gray-squirrels (*Sciurus griseus*), dusky-footed wood rats (*Neotoma fuscipes*), and Steller's jays (*Cyanocitta stelleri*) feed on the seeds extensively (Bailey 1936; Van Dersal 1938). Hogs eat both seeds and roots (Jepson 1910; Van Dersal 1938).

Flowering and fruiting. California-laurel flowers regularly and often profusely. The small, pale yellow, perfect flowers grow on short-stemmed umbels that originate from leaf axils or near the terminal bud (figure 1). Flower buds develop early; those for the following year become prominent as current-year fruits are maturing. Within its long north–south range, California-laurel has been reported to flower in all months from November to May, beginning before new leaves appear (Jepson 1910; Kasapligil and Talton 1973; Rehder 1940; Unsicker 1974). The flowering period may stretch into late spring and summer with the occasional appearance of flowers originating in axils of the current year's developing leaves (Sargent 1895). California-laurel flowers at an early age; flowers have been observed on short whiplike shrubs and on 1-year-old sucker growth that originated on a long broken stub. Small insects appear to be the chief pollinators (Kasapligil 1951).

Seed crops are abundant in most years (Stein 1974). Although umbels bear 4 to 9 flowers each, generally only 1 to 3 fruits set (Jepson 1910). The age when a tree first bears fruit, the age for maximum production, and the average quantity produced have not been reported. Seeds are produced in abundance after trees are 30 to 40 years old (Harlow and others 1979). Damage to developing seed crops by insects, birds, or diseases has not been reported.

Collection, extraction, and storage. The fruits—acid drupes each containing a single, large, thin-shelled seed—ripen in the first autumn after flowering (Rehder 1940; Sargent 1895;

Sudworth 1908). As the drupes mature, their thin, fleshy hulls change from medium green to speckled yellow green (Britton 1908; Sudworth 1908) (figure 2), pale yellow (Eliot 1938), or various other hues, ranging from yellow-green tinged with dull red or purple (Peattie 1953; Sargent 1895) through purplish brown (Jepson 1910; Kasapligil 1951) to purple (Kellogg 1882; Sargent 1892; Torrey 1856). Ripe drupes may be yellow-green on one tree and dark purple on an adjacent tree (Kasapligil 1972).

Drupes fall stemless to the ground in late autumn or winter and are dispersed by gravity, wind, animals, and water (McBride 1969). Seeds are collected simply by gathering fallen drupes—if squirrels and other animals don't get there first. Shaking ripe drupes from the tree should provide a good means for making quick, efficient collections.

When soft, the fleshy hulls are readily removed from the seeds by hand. The hulls can also be removed easily by machines used for de-pulping drupes if quantity processing is required. Mirov and Kraebel (1937) obtained about 300 cleaned seeds (figure 3) from 0.45 kg (1 lb) of drupes. For 8 samples processed at Davis, California (Lippitt 1995), the seed count averaged 547/kg (248/lb) and ranged from 403 to 675/kg (183 to 306/lb).

Seeds of California-laurel have lost viability in storage even at low temperatures, so yearly collection of fresh seeds is advised (Stein 1974). Viability has been maintained for 6 months when seeds were stored at 3 EC in wet, fungicide-treated vermiculite (McBride 1969). Storage trials have been very limited and tests of cool, moist storage at different moisture contents are needed. Highest germination (81%) was obtained from a seedlot with 32% moisture content (Lippitt 1995). Under favorable natural conditions, seeds on the ground retain their viability over winter, but under adverse conditions, viability may prove transient.

Seed treatment and germination. Fresh untreated seeds will germinate under room or outdoor conditions in peat moss, sawdust, vermiculite, or light-textured soil but may require 3 months or longer (Kasapligil 1951; Mirov and Kraebel 1937; Stein 1974). Germination can be speeded by scarifying, cracking, or removing the endocarp or by stratifying the seeds, but it still may require about 2 months (Kasapligil 1951; McBride 1969; Stein 1974). In light soil, 20 to 25% of untreated seeds germinated; with stratification, germination nearly doubled (Stein 1974). In 16 lots of seeds collected in 1969 from Oregon and California sources, germination by the end of March ranged from 0 to 82% after January planting deep in pots of peat or vermiculite. Parts of seedlots held in a refrigerator at 4.4 EC from November to January germinated somewhat better than those immediately planted outdoors in a peat-vermiculite mixture. The better seedlots germinated equally well in several contrasting test conditions (Stein 1974).

In comparison tests made in petri dishes, California-laurel germination was highest in 30 days under a temperature regime of 16 EC day, 7 EC night, and when evaporative stress was minimal (McBride 1969). Germination did not appear affected by light level but was highest in soil with moisture tension at 4 to 10 atmospheres.

Seedling development and nursery practice. Under forest conditions, germination has been reported to take place in autumn soon after seedfall (Harlow and others 1979; Sargent 1895; Sudworth 1908) or in late winter and spring (Stein 1958, 1974). Covered seeds germinate best, but the large seeds do not bury readily without ground disturbance or silt deposition by high water. Seedling establishment is uncommon in the drier parts of California except in protected areas and where the ground is disturbed (Jepson 1910).

Germination is hypogeal, and the fleshy cotyledons remain within the endocarp and attached to the seedling until midsummer, when the plant may be 15 to 20 cm tall (Kasapligil 1951; Sargent 1895). Generally, there are 2 large cotyledons, sometimes 3, and no endosperm

(figure 4) (Kasapligil 1951).

Young California-laurel seedlings appear flexible in their growth requirements. In the first 120 days, seedlings potted in vermiculite grew well at several levels of temperature, evaporative stress, soil moisture, and soil nutrients (McBride 1969). Seedlings grown at 18% or more of full sunlight produced the most dry weight. Seedlings produce leaves of several transitional forms as they develop (figure 5) and do not branch until they are 2 or 3 years old unless so induced by removal of the terminal bud (Kasapligil 1951). They soon develop a moderately stout taproot and are difficult to transplant if more than 1 year old unless grown in containers. Recovery after transplanting is often slow, and height growth may be limited for several seasons.

California-laurel may also be reproduced by cuttings (Unsicker 1972). Under field conditions, it sprouts prolifically from the root collar, stump, and fallen or standing trunk.

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Figure 1—*Umbellularia californica*, California-laurel: flowers develop in umbels that originate in leaf axils, H2.

Figure 2—*Umbellularia californica*, California-laurel: yellow-green mature drupe suspended from its conical capula, H 1½.

Figure 3—*Umbellularia californica*, California-laurel: exterior views of a cleaned seed, H2.

Figure 4—*Umbellularia californica*, California-laurel: longitudinal section through a seed, H2.

Figure 5—*Umbellularia californica*, California-laurel: 4-month-old seedling, H ½ (courtesy of Baki Kasapligil).