

Olea europaea subsp. *europaea*

European olive

Oleaceae

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OVERVIEW

The olive tree (*Olea europaea* subsp. *europaea*) has been in cultivation for over 4,000 years (Neal 1965). They are cultivated for use in olive oil or as olives and also for landscaping. In Hawai'i, *Olea europaea* subsp. *europaea* is occasionally cultivated as an ornamental tree. It is naturalized on the islands of Hawai'i and Maui (Wagner et al. 1999, Starr et al. 1999). On Maui, cultivated olive trees can occasionally be observed in the Kula area, planted in yards and gardens. A few naturalized plants can be observed nearby as well. Though known to spread, European olive (*O. e. europaea*) is not as widely cultivated and does not appear to be nearly as aggressive as the related species, the African olive (*O. e. cuspidata*).

TAXONOMY

Family: Oleaceae (Olive family) (Wagner et al. 1999).

Latin name: *Olea europaea* L. subsp. *europaea* (Wagner et al. 1999).

Synonyms: None known.

Common names: European olive, olive (Brenzel 1995, Wagner et al. 1999).

Taxonomic notes: *Olea* is a genus of about 20 tropical and subtropical species of the Mediterranean region, Africa, southern and eastern Asia, Malesia, eastern Australia, and New Caledonia (Wagner et al. 1999).

Nomenclature: The Genus name is derived from *elaia*, the greek name for *Olea europaea* (Wagner et al. 1999).

Related species in Hawai'i: Also occurring in Hawai'i is African olive (*Olea europaea* L. subsp. *cuspidata* (Mill.) P. Green), which is documented as naturalized on the islands of Kaua'i, Maui, and Hawai'i (Lorence et al. 1995, Starr et al. 1999, Wagner et al. 1999). African olive can be distinguished from European olive (*O. e. europaea*) by having golden brown lower leaf surfaces and smaller fruits (6-7 mm long). Both subspecies tend to naturalize, though *O. e. europaea* appears to be the less aggressive of the two, at least on Maui.

DESCRIPTION:

"Trees to 8-10 m tall with a broad crown, sometimes shrubby; young branches grayish lepidote. Leaves narrowly elliptic to oblong or lanceolate, (1-)2-8 cm long, (0.3-)0.5-1.5(-2) cm wide, upper surface glabrous, lower surface moderately to densely grayish, green, or golden lepidote. Flowers in axillary, decussate panicles shorter than the leaves; corolla white, ca. 3.5-4 mm long. Drupes green when immature, becoming black or brownish at maturity, subglobose to narrowly ellipsoid, 6-19 mm long. Subspecies *europaea* with

lower leaf surface densely grayish lepidote and thick, fleshy fruit 15-19 mm long." (Wagner et al. 1999).

BIOLOGY & ECOLOGY

Cultivation: The olive tree has been in cultivation for over 4,000 years (Neal 1965). They are cultivated for use in olive oil or as olives and also for landscaping. *Olea* tolerates shallow, stony soil, with little fertilizer, and thrive in areas with dry, hot summers and also does well in coastal areas. They can survive in temperatures down to 15 degrees Fahrenheit (Brenzel 1995). Olive has many valuable uses to humans. The wood was used for posts and doors in the temple of Jerusalem. In modern times, it is made into canes and brushes. The seeds have been used to make rosaries. And the fruit is rich in oil which is not only used to produce olive oil for cooking, but also used in lubricants for soap, perfumes, or lighting. The fruit is pickled and stuffed with pimentos making the common olives that we eat today. The oil and fruit are valuable markets for southern Europe. Spain alone produces about 250 million pounds of oil a year, yielding about 700 gallons per acre (Neal 1965).

Invasiveness: In Hawai'i, *Olea europaea* subsp. *europaea* is naturalized on Hawai'i and Maui (Starr et al. 1999, Wagner et al. 1999). Fruits are presumably spread by game birds to nearby areas. On the island of Hawai'i, this species is apparently spreading rapidly in the Parker Ranch area (Wagner et al. 1999). However, on Maui, this does not seem so and plants are only occasionally naturalized.

Pollination: Not known.

Propagation: *Olea* plants can be grown from seeds and cuttings (Brickell and Zuk 1997).

Dispersal: Humans disperse this plant over vast distances in landscaping and cultivation. Seeds then travel over shorter distances from initial plantings through gravity and presumably birds.

Pests and Diseases: According to Brickell and Zuk (1997), olive trees are susceptible to olive knot, *Verticillium* wilt, mushroom rot, lesion nematode, Southern blight, and scale insects.

DISTRIBUTION

Native range: *Olea europaea* subsp. *europaea* is native to the Mediterranean region (Brickell and Zuk 1997).

Global distribution: *Olea europaea* subsp. *europaea* is widely cultivated throughout the world.

State of Hawai'i distribution: Naturalized populations of *Olea europaea* subsp. *europaea* are known from the islands of Hawai'i and Maui (Starr et al. 1999, Wagner et al. 1999). On the island of Hawai'i, *O. e.* subsp. *europaea* was first collected as

naturalized in 1982 (Wagner et al. 1999). It is now spreading rapidly in the Parker Ranch area, west of Ke'amuku Camp, elevation approximately 900-920 m (2,953-3,018 ft), presumably spread by fruit eating birds (Wagner et al. 1999).

Island of Maui distribution: On Maui, *Olea europaea* subsp. *europaea* is occasionally cultivated as an ornamental tree and is sparingly naturalized in at least the Kula area along the Haleakala Hwy., adjacent to pasture land, 2,730 ft (830 m) elevation.

CONTROL METHODS

Control methods are from Santos et al. (1992) and are meant for the subsp. *cuspidata*, but probably could apply to subsp. *europaea*. A combined strategy using many methods is suggested. Large trees could be controlled using a cut stump method, followed by foliar or manual treatment of small seedlings and saplings. Follow up treatment of seedlings after a rainy period is also suggested.

Physical control: Hand pulling of small seedlings is effective, but Santos et al. (1992) found the best results with a foliar spray of seedlings.

Chemical control: Foliar treatment for seedlings using 5% Garlon 4 in water was found to be effective. Drawbacks are non-target effects through drift of herbicide.

Cut stump treatment: a mixture of Tordon RTU and undiluted Garlon 4 was the most effective cut stump mixture. This method was less effective than Garlon foliar, but resulted in less drift and non-target effects. This may be more useful in sensitive areas.

Biological control: None known.

Cultural control: The public could be discouraged from planting *Olea* species, especially near natural areas.

Noxious weed acts: None known.

MANAGEMENT RECOMMENDATIONS: Though known to spread in Hawai'i, the European olive (*Olea europaea* subsp. *europaea*) does not seem to be as aggressive or widely planted as the African olive (*Olea europaea* subsp. *cuspidata*). Maps should be continually refined and the populations should be monitored to watch for some type of change in the future. Plants that spread to natural areas should be detected and controlled as early as possible to avoid large infestations. It could be suggested that the public not plant it near natural areas.

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