

Olea europaea subsp. *cuspidata*

African olive

Oleaceae

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OVERVIEW

Olea europaea subsp. *cuspidata*, native to the Mediterranean region, is widely cultivated throughout the world. In Hawai'i, this species is naturalized on the islands of Hawai'i, Maui, and Kaua'i (Lorence et al. 1995, Starr et al. 1999, Wagner et al. 1999). On Maui, *O. e.* subsp. *cuspidata* is widely cultivated and has been planted in numerous locations as a wind break or as a hedge. This species produces numerous bird dispersed fruits and often carpets of seedlings are observed nearby plantings. Seedlings and saplings are also observed spreading from plantings and are commonly seen along roads, in disturbed areas, woodlands, and pastures from sea level up to at least 5,000 ft (1,524 m) on East Maui in both moist and dry conditions. This species will increasingly become a management problem in natural areas nearby plantings. Due to the already widespread distribution on Maui, island wide control is probably not feasible, and early detection and control in natural areas will be necessary to limit invasion in these sensitive areas. This species is currently widely sold, even with its invasive tendencies. The public could be encouraged not to plant harmful species such as this one and growers could be asked to grow non-harmful alternatives.

TAXONOMY

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

Latin name: *Olea europaea* L. subsp. *cuspidata* (Wall. ex G. Don) Ciferri (Wagner et al. 1999).

Synonyms: *O. e.* subsp. *africana* (Mill.) P. Green, *O. africana* Mill., *O. chrysophylla* Lam. (Wagner et al. 1999). Erroneously identified as *Linociera ligustrina* Sw. previously in Hawai'i (Wagner et al. 1999).

Common names: African olive.

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 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 *Olea europaea* L subsp. *europaea*. It can be distinguished from *O. e.* subsp. *cuspidata* by having gray lower leaf surfaces and larger fruits (Wagner et al. 1999). Both subspecies tend to naturalize, though *O. e.* subsp. *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. This subspecies is distinguished by having lower leaf surface moderately to densely green or golden lepidote and thinly fleshy fruit ca. 6-7 mm long." (Wagner et al. 1999).

BIOLOGY & ECOLOGY

Cultivation: In Hawai'i, this particular subspecies, *O. e.* subsp. *cuspidata*, is commonly cultivated as a hedge or windbreak and sometimes as single trees. *Olea* tolerates shallow, stony soil, with little fertilizer, and thrive in areas with dry, hot summers and also does well in coastal areas (Brenzel 1995).

Invasiveness: This tall prolific tree is widely planted and spread by fruit eating birds. It has the potential to shade out native vegetation. It is naturalized on the islands of Hawai'i, Kaua'i, and Maui (Wagner et al. 1999; Lorence et al. 1995; Starr et al. 1999). It is now becoming a serious pest in Waimea, Hawai'i and 'Ainahou, Hawai'i Volcanoes National Park. On Maui, this species is seen spreading along roads, in pastures, and waste areas nearby plantings. It is widely planted and naturalized from Ha'iku to Ulupalakua from sea level up to 5,000 ft elevation (1,524 m).

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), *Olea* species are susceptible to olive knot, *Verticillium* wilt, mushroom rot, lesion nematode, Southern blight, and scale insects.

DISTRIBUTION

Native range: *Olea europaea* subsp. *cuspidata* is native to the Mediterranean region (Wagner et al. 1999).

Global distribution: *Olea europaea* subsp. *cuspidata*, the African olive, has been cited as a pest in Australia, New Zealand, and Hawai'i where it has been introduced. In Australia, African olive became established on Norfolk Island, shortly after its introduction there in 1788. It was brought by European settlers and used as a fence post timber. As the native vegetation was cleared, African olive became a major weed and

developed into monoculture closed forests. In 1984, plans to clear alien olive in the Norfolk Island National Park and replant with the native Norfolk Island Pine (*Araucaria heterophylla*) were made. Because African olive is so well established there, control of it within the Park is estimated to be ongoing for at least the next century (Paul Stevenson pers. comm. 1997). African olive was also introduced in the early 1800's to the Sydney area and used in erosion control. Today, it is well established in the vicinity.

State of Hawai'i distribution: *Olea europaea* subsp. *cuspidata* was first collected by Fosberg in 1965 under the incorrect name of *Linociera ligustrina*. It is now known from Hawai'i, Kaua'i, and Maui. On the island of Hawai'i, it is spreading in the 'Ainahou Ranch vicinity (Wagner et al. 1999). In Hawai'i Volcanoes National Park, this species is found on over 14,825 acres (6,000 ha) between 1,640-3,280 ft (500-1,000 m) elevation and is expanding with the removal of cattle (Santos et al. 1992). On Kaua'i, it was first reported by Lorence et al. (1995) as abundantly naturalized from planted trees in secondary forests. On Maui, it was first reported by Starr et al. (1999) as naturalized in at least the Kula area, elevation 3,640 ft (1,109 m). A single cultivated specimen was recently reported from Midway Atoll where no regeneration was noted (Starr and Martz 1999).

Island of Maui distribution: Carpets of seedlings are readily seen under planted hedges of *Olea europaea* subsp. *cuspidata*. Plants also are observed naturalizing away from cultivated plants often germinating across the street or down the road (within 1 mile) and are likely dispersed by fruit eating birds or other animals. Naturalized plants have been observed from sea level up to about 5,000 ft elevation on Haleakala, Maui. It is widely planted and naturalized from Ha'iku to Ulupalakua.

CONTROL METHODS

Control methods are from Santos et al. (1992). 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: At the least, *Olea europaea* subsp. *cuspidata* could be discouraged from future plantings. A replacement hedge, such as native *Dodonaea viscosa*, 'a'ali'i, could be offered instead. *Olea europaea* subsp. *cuspidata* is widely planted and trying to remove existing plantings would be tough. It is not yet established in native areas of Maui, though it is creeping up to higher elevations of Haleakala and can be found near the Makawao Forest Reserve. The pasture areas and gulches adjacent to Haleakala National Park are places to look for and remove outliers of *O. e.* subsp. *cuspidata*. The single specimen on Midway Atoll should be controlled to prevent future spread there.

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