

Carmona retusa

Carmona
Boraginaceae

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OVERVIEW

Carmona retusa is a popular ornamental plant cultivated in Hawai'i as a hedge or specimen plant. On Maui, *C. retusa* is observed in residential plantings, mostly in low elevation neighborhoods, such as Kahului, Wailuku, Lahaina, Paia, Haiku, and Kihei. Seedlings and naturalized plants are also commonly observed in landscaping areas and wild semi-wild areas nearby plantings. In one area in Waiehu, *C. retusa* forms a dense shrubby understory in a kiawe (*Prosopis pallida*) forest. This plant is fairly widespread on Maui and is probably beyond the eradication stage. Future efforts should be aimed at monitoring, preventing infestations in natural areas, and educating the public about harmful plants that spread beyond the confines of the garden.

TAXONOMY

Family: Boraginaceae (Heliotrope family) (Lorence et al. 1995, Wagner et al. 1999).

Latin name: *Carmona retusa* (Vahl) Masamune (Lorence et al. 1995, Wagner et al. 1999).

Synonyms: *C. microphylla* (Lam.) Don; *Ehretia microphylla* Lam.; *Ehretia buxifolia* Roxb.; *Cordia retusa* Vahl (Lorence et al. 1995; Bailey and Bailey 1976; GRIN 2001).

Common names: *Carmona*, Philippine tea (Bailey and Bailey 1976), Fukien tea (Caine and Zane 2001).

Taxonomic notes: The genus *Carmona*, also commonly known as *Ehretia*, is comprised of about 50 species of evergreen or deciduous shrubs and trees of tropical and subtropical regions of both the New and Old World (Bailey and Bailey 1976).

Related species in Hawai'i: Neal (1965) lists *Ehretia acuminata* R. Br. as being cultivated in Hawai'i. It is uncertain whether this is a synonym of *Carmona retusa* or a separate species. Bailey and Bailey (1976) list *Ehretia acuminata* R. Br. as a separate species than *Ehretia microphylla* Lam., describing *E. acuminata* as a deciduous tree to 50 ft. tall and *E. microphylla* as an evergreen shrub to 12 ft. tall.

DESCRIPTION

"Evergreen shrub to small tree. Leaves in clusters of 3-5, blade obovate or oblanceolate, 1.5-4 cm x .8-2.5 cm, base decurrent onto petiole, coarsely 3-5 toothed towards apex, apex acute to obtuse or rounded, when young both surfaces with stiff white hairs, upper surface becoming scabrid, petiole 1-5 mm long. Flowers 3-12 flowered scorpioid cymes, unbranched or branched once, sepals 4-5, lanceolate, 3-4 mm long; corolla white, rotate, 8-10 mm in diam., lobes 4-5, 3-4 mm long. Fruit globose, 4-5 mm in diameter, ripening brownish orange, pericarp thin, pyrene white, bony." (Lorence et al. 1995).

BIOLOGY & ECOLOGY

Cultivation: *Carmona retusa* is very popular in bonsai in China (Caine and Zane 2001), and to a lesser extent in Japan, because it is not a traditional bonsai plant. In Hawai'i, it is cultivated as an ornamental and grown as a single specimen or in a hedge. In the Philippines, the leaves are used medicinally to treat colic, cough, diarrhea, and dysentery (Philippine Medical Plants 2001). *Carmona* can also be obtained in the form of tablets and tea bags (Philippine Medical Plants 2001).

Invasiveness: This plant escapes from initial plantings in Hawai'i. It is capable of forming shrubby thickets in kiawe understory in Waiehu, West Maui. Plants germinate in nearby landscaping and waste areas near initial plantings. Seeds are presumed to be spread by fruit eating birds.

Pollination: Unknown.

Propagation: Propagate by seeds or softwood cuttings in spring or summer (Caine and Zane 2001).

Dispersal: Seedlings germinate near bases of trees and in other plantings nearby initial plantings and it is suspected that the seeds are most likely spread by fruit eating birds. Humans spread the plant long distances for use in horticulture.

Pests and Diseases: Caine and Zane (2001) lists the following pests and diseases. "Aphids, scale, chlorosis, mealy bugs, and snails. Red spider mites find this plant a special treat, and will attack it over any other plants in the area. Unfortunately, Fukien tea is very sensitive to insecticides, and Diazinon will kill the tree. Use the weakest insecticide possible that will address a particular problem, or if possible, employ predator insects. Will drop leaves if under-watered. Over-watering results in yellow, sickly leaves. It is quite sensitive to sudden changes in temperature and lighting."

DISTRIBUTION

Native range: *Carmona retusa* is native from India to Malay Peninsula and the Philippines (Bailey and Bailey 1976). GRIN (2001) provides more specific detail of the native range, listing the following. In temperate Asia, *Carmona retusa*, is native to Guangdong and Hainan, China; the Ryukyu Islands of Japan; and Taiwan. In tropical Asia, it is native to India; Indochina; Indonesia; Malayasia; Papua New Guinea; Philippines; and Sri Lanka. It is also native to the Solomon Islands in the Pacific.

Global distribution: Distribution beyond the native range is uncertain. It is grown as a bonsai plant in both China and Japan, where it is also native, and it is cultivated as an ornamental in Hawai'i, where it is not native and has naturalized. Other tree species are cultivated in North America, such as *Ehretia dicksonii*, (Brickell and Zuk 1997), though no references to *C. retusa* were made.

State of Hawai'i distribution: *Carmona retusa* was reported as naturalized by Lorence et al. (1995) on Kaua'i and West Maui. It is also naturalized on East Maui (Starr et al. 2000, in press). On Kaua'i, it was collected in 1991 in secondary vegetation of *Syzygium*, *Psidium*, *Leucaena*, and *Melinis* with forestry plantings (Lorence et al. 1995; Wagner et al. 1999). This was the first naturalized record of *Carmona* in Hawai'i.

Island of Maui distribution: On Maui, *Carmona retusa* was first collected by Robert Hobdy in 1991 from the lee side of Waihe'e dunes covering several acres at the time (Lorence et al. 1995). The site still persists today. This plant is one of the more popular ornamentals in urban areas on Maui and is common on both East and West Maui. Recent baseline surveys revealed high concentrations of cultivated and naturalized *Carmona retusa* in low elevations of Kahului, Wailuku, Waihe'e, Waikapu, Kihei, Lahaina, lower Haiku, Paia, and one naturalized location near Kipahulu. Naturalized plants can be observed in areas adjacent to initial plantings with plants often growing in other hedges, at the base of other trees or plantings, or in waste areas on the side of the road. Most of these areas are low elevation, dry to moist urban sites.

CONTROL METHODS

There were no references to control of this species. The following control methods are speculative and further trials are needed to be sure what control methods would be the most effective.

Physical control: Hand pulled or dig up small seedlings and plants.

Chemical control: According to Caine and Zane (2001), this plant is susceptible to pesticides. It would probably not be hard to kill with herbicides, using either a foliar or cut stump method.

Biological control: No biological control agents are known.

Cultural control: The public could be made aware of the potential problems caused by the spread of *Carmona* and be encouraged not to plant this species, especially near natural areas.

Noxious weed acts: This plant is not on any noxious weed lists.

MANAGEMENT RECOMMENDATIONS

Carmona seems well rooted on Maui and can be commonly observed in yards and gardens. It spreads from initial plantings and is capable of forming dense shrubby thickets in secondary vegetation. Though not a nuisance in natural areas yet, it seems likely to continue to spread and may be potentially harmful as more houses are developed closer to natural areas. This plant should be monitored to gain a better idea of potential range and rate of spread on Maui. Other Pacific Islands free of *Carmona retusa* should avoid introduction of this species.

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