

# *Melastoma candidum*

Asian Melastome

Melastomataceae

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## OVERVIEW

*Melastoma candidum*, native to Southeast Asia, is cultivated in Hawai'i and other tropical areas as an ornamental shrub. In Hawai'i, *M. candidum* has escaped from cultivation and is now locally abundant and invasive in mesic to wet areas, windward areas, and bog margins on Kaua'i, O'ahu, and Hawai'i from sea level up to about 900 m (2,952 ft) (Conant 1996, Wagner et al. 1999). The genus *Melastoma* is taxonomically difficult and there has been confusion with several species. *M. candidum* was previously called *M. malabathricum* (Malabar melastome, Indian rhododendron), a related species, by Hawaiian botanists and appears as this in past literature (Wagner et al. 1999). Some sources list *M. candidum* as a synonym of *M. septemnerium* (Kartesz 1996). In addition, a related species with similar appearance, *M. sanguineum* (fox-tongued melastoma, red melastome), is also cultivated and naturalized on the island of Hawai'i (Wagner et al. 1999). Furthermore, some *Tibouchina* species may also be confused as *Melastoma* species. On Maui, there has also been some confusion in identifying *Melastoma* spp. Previously not known to be present on Maui, what was thought to be *M. candidum* was recently found to be sparingly cultivated in a few locations on East Maui. After closer examination, it is now thought that species present represent both *M. candidum* and *M. sanguineum*. *M. candidum* is currently a target species for eradication by the Maui Invasive Species Committee (MISC). *M. sanguineum* will likely be added in the near future. Regardless of the confusion, all species in the genus, *Melastoma* are listed as Hawai'i state noxious weeds, making it illegal to possess, sell, and propagate in Hawai'i. On Maui, eradication of the few known *Melastoma* spp. plants now could save large amounts of time, money, and resources in the future. Even with a notoriously weedy history and noxious weed status, plants such as *Melastoma* spp. are still cultivated in Hawai'i and elsewhere. There seems to be little awareness as to which plants are actually on the noxious weed list. Education on the subject may help the general public in choosing which plants to grow in their yards.

## TAXONOMY

**Family:** Melastomataceae (Melastoma family) (Wagner et al. 1999).

**Latin name:** *Melastoma candidum* D. Don (Wagner et al. 1999).

**Synonyms:** *Melastoma septemnerium* Lour. (Meyer 2000). Previously known as *M. malabathricum* sensu Hawaiian botanists, non L. which is a related species (Wagner et al. 1999).

**Common names:** Asian melastome (Kartesz 1996). In Hawai'i, previously called and sometimes still referred to as Malabar melastome and Indian rhododendron, which are common names for *M. malabathricum*.

**Taxonomic notes:** The genus *Melastoma* is a difficult one taxonomically. It is currently comprised of about 50-70 species from India through southeastern Asia, north to Japan and south to Pacific islands and Australia (Wagner et al. 1999). The number of species will most likely be reduced once a revision is completed.

**Nomenclature:** The name is derived from the Greek *melas*, meaning black, and *stoma*, meaning mouth, in reference to the color left in the mouth when the berries of some species are eaten (Wagner et al. 1999).

**Related species in Hawai'i:** In Hawai'i, many plants in the family Melastomataceae are present and invasive, including well known weeds such as *Miconia calvescens*, *Clidemia hirta*, *Tibouchina herbacea*, and others. Within the genus, *Melastoma*, there is one other species, *Melastoma sanguineum* Sims [syn. *M. decemfidum* Roxb. ex W. Jack], known from Hawai'i island and now possibly also known from cultivated plants on Maui, and is roughly distinguished by having petals 6, with branches and petioles sparsely covered with spreading, smooth hairs 5-15 mm long, rather than petals 5, with branches and petioles densely covered with a mixture of appressed, short, lacinate scales 0.5-1 mm long in *M. candidum* (Wagner et al. 1999). Wagner et al. (1999) add, "The assemblage of genera treated here makes it difficult to key out *Melastoma* without resorting to the use of fruit type. Because fruit type is not always readily apparent in dried material, *Tibouchina urvilleana* may be confused with our 2 naturalized species of *Melastoma*, both of which differ in having yellow staminal appendages and hypanthial pubescence that consists of basally flattened, incurved hairs of overlapping lanceolate scales."

## DESCRIPTION

*M. candidum*: "Erect shrubs or small trees 1.5-5 m tall, branches and petioles are densely covered with a mixture of short, appressed, lacinate scales 0.5-1 mm long and longer lanceolate scales 1.5-5 mm long. Leaves elliptic to elliptic-ovate, 4-11 cm long, 1.3-4 cm wide, 5(-7) nerved, upper surface strigose to scabrous, lower surface sericeous but with a mixture of scales on the nerves like those of the young branches, margins entire, apex acute, base obtuse to rounded, petioles 5-12 mm long. Inflorescences 2-7 flowered, pedicels 10-12 mm long in fruit, bracts and bracteoles elliptic, lanceolate, or ovate, 1-2.2 cm long, 0.5-1.3 cm wide, early deciduous; hypanthium densely covered with imbricate, lanceolate, ciliolate scales; calyx 5-lobed, triangular-lanceolate, 0.7-2 cm long; petals usually 5, pink, 2.5-3.2 cm long, 1.5-2.3 cm wide; anthers of larger stamens 10-11 mm long, anthers of smaller stamens 8.5-10 mm long. Berries 5-celled, 10-15 mm long." (Wagner et al. 1999).

*M. sanguineum*: "Erect shrubs or small trees 2-4(-8) m tall, branches and petioles sparsely covered with spreading, smooth hairs 5-15 mm long, but often intermixed with or replaced by appressed, smooth, subulate hairs usually 1 mm or less long. Leaves ovate-lanceolate, (8-)10-20 cm long, 2-4..5(-6.5) cm wide, 5(-7)-nerved, upper surface moderately covered with hairs that are adnate to the epidermis for most of their length, lower surface strigillose with scattered appressed lanceolate scales on the elevated nerves, margins entire, apex acuminate to attenuate, base obtuse to rounded, petioles 10-20(-30)

mm long. Inflorescences 2-7-flowered, pedicels 10-15 mm long in fruit, bracts and bracteoles elliptic to lanceolate, 7-15 mm long, 3-9 mm wide, early deciduous; hypanthium covered with spreading or incurved, smooth,  $\pm$  basally flattened hairs; calyx 6-lobed, ovate to triangular, 6-12 mm long, apex acuminate; petals 6, purplish pink, 2.5-4.7 cm long, 2.7-3.5 cm wide; anthers of larger stamens 12-15 mm long, connective prolonged 12-16 mm with an appendage ca. 2 mm long, anthers of smaller stamens 9-11 mm long. Berries 6-celled, 15-17 mm long." (Wagner et al. 1999).

## **BIOLOGY & ECOLOGY**

**Cultivation:** In Hawai'i, *M. candidum* and *M. sanguineum* are grown as ornamentals for their showy pinkish to purplish flowers, shrubby habit, and attractive foliage. *M. candidum* was first introduced as an ornamental from Florida to the island of Kaua'i in 1916 (Hasselwood and Motter 1983, Jacobi and Warshauer 1992, Wester 1992). *M. sanguineum* was first collected from the island of Hawai'i in 1957 (Wagner et al. 1999).

**Invasiveness:** *Melastoma candidum* escapes from cultivation and is now naturalized on Kaua'i, O'ahu, and Hawai'i in mesic to wet areas and bog margins (Conant 1996, Wagner et al. 1999). *M. sanguineum* also escapes cultivation and naturalizes in mesic sites on the island of Hawai'i in the Keaukaha area and along the highway between Volcano and Hilo (Wagner et al. 1999). Both species form dense monotypic thickets up to 2 m tall and can crowd out native vegetation. Degener (1973) shows photos of the Kilohana Crater area over run with *M. candidum*. In one of the photos, *M. candidum* was completely monotypic and was almost as tall as the person in the middle of the thicket. The invasive nature of *M. candidum* is further described by Degener (1973).

"The Malabar melastome, introduced as an ornamental of Kaua'i, has become naturalized within the last few decades. It has already replaced nearly all other vegetation in Kilohana Crater and is rapidly spreading from that locality into neighboring regions, smothering to death the more interesting native plants that stand in its way. The crater is now a devastated thicket of worthless shrubs through which neither man nor beast can penetrate for any distance. The introduction of the Melastome and its ultimate spread over the lowlands of Kaua'i, and of probably all Islands unless these are carefully guarded, will be as great a misfortune as was the introduction of the gorse, the Lantana, and the Eupatorium."

**Pollination:** Many plants in the family Melastomataceae are buzz pollinated by bees (Meyer 2000).

**Propagation:** *Melastoma* spp. can be propagated from seeds.

**Dispersal:** *Melastoma* spp. are spread long distance by humans in the horticulture trade. From gardens, plants readily escape and are further spread by fruit eating birds and possibly other mammals (Smith 1999). Dispersal from inter-island horticulture exchange is also a threat as several species of Melastomataceae and other invasive weeds have been observed moving inter-island on hapu'u fern (*Cibotium* spp.) stumps and parts.

**Pests and Diseases:** None known, except for the biological control agents.

## **DISTRIBUTION**

**Native range:** *M. candidum* is native to Vietnam, southern China, Philippine Islands, Taiwan, Ryukyu Islands, and southern Japan (Wagner et al. 1999). Meyer (2000) describes the native distribution of *M. candidum* as Japan, South China, Taiwan, and northern Vietnam, growing in light forests, clearings, and grass lands, or on rocky slopes from sea level to 1,500 m (4,921 ft) elevation. *M. sanguineum* is native to the Malay Peninsula, Java, Sumatra, Vietnam, and southeastern China (Wagner et al. 1999). Meyer (2000) describes the native distribution of *M. sanguineum* as Burma, Thailand, Malaysian Peninsula, Sumatra, Borneo, Moluccas, South China, and Indochina, growing in disturbed forests, along streams and roads, in open places and savannas up to 2,300 m (7,546 ft) elevation.

**Global distribution:** *M. candidum* and *M. sanguineum* are cultivated in Hawai'i and other tropical regions of the world. *M. malabathricum* is apparently invasive in Florida and North Carolina (USDA-ARS 1998).

**State of Hawai'i distribution:** Heavy infestations of *M. candidum* can be found on Kaua'i and the Puna and Hamakua Districts from sea level to 700 m (2,297 ft) (Smith 1999). On Kaua'i in some places such as the Kilohana Crater, this species is being replaced by *Rhodomyrtus tomentosa* (Smith 1999). *M. sanguineum* is naturalized in mesic sites in the Keaukaha area and along the highway between Volcano and Hilo (Wagner et al. 1999). Both species are known from a few cultivated individuals on Maui with no signs of spread yet.

**Island of Maui distribution:** On Maui, *M. candidum* is currently known only from 3 locations: Makawao, Pukalani, and Kula. All 3 are garden type plantings of a single plant each. These sites are all relatively dry located from 1,600 ft to 3,000 (488-914 m), with Makawao being the moister of the 3 locations. 2 of these locations, Kula and Makawao, have already been controlled by MISC and the Pukalani plant will probably be controlled soon. After closer inspection of flowers, it is now thought that the Pukalani plant is actually *M. sanguineum*. A suspected 4th plant was recently detected, also in Pukalani, but it has since been re-identified as *Tibouchina granulosa*.

## **CONTROL METHODS**

**Physical control:** Plants on Maui are all small, cultivated specimens and it is probably feasible to dig up the plants if so desired.

**Chemical control:** Plants can probably be cut at the base and treated with an herbicide. Cut material should be disposed of properly. This method is useful to remove the plant with a small amount of non-target effects. Basal bark methods would probably work as well, but may not be desirable in a garden setting. It is uncertain whether foliar spray

applications would work, and this would have the most non-target effects and may be unsitely in a garden situation.

**Biological control:** Several moth species (Lepidoptera) have been purposely introduced as biological control agents for *M. candidum* (as *M. malabathricum* in Teramoto and Heu 2000). Two moths in the family Pyralidae have been released. *Bocchoris adipalis* Zell., native to Malaysia, was released in 1964 (Teramoto and Heu 2000). Another, *Bocchoris fatualis* (Lederer), native to the Philippines, was released in 1958 and is now established on Kaua'i (Teramoto and Heu 2000). A moth in the Arctiidae family, *Selca brunella* Hampson, native to Malaysia, was released in 1964 and is now established on the island of Hawai'i (Teramoto and Heu 2000).

**Cultural control:** The public could be discouraged from planting any plants in the family Melastomataceae. The public could also be discouraged from planting hapu'u ferns (*Cibotium* spp.) or use hapu'u mulch that is harvested from the wild forests of Hawai'i Island as they often harbor noxious weed species such as *Melastoma* spp.

**Noxious weed acts:** All species in the genus *Melastoma* are Hawai'i state noxious weeds. *Melastoma malabathricum* is listed as a noxious weed in Florida and North Carolina (USDA-ARS 1998).

## MANAGEMENT RECOMMENDATIONS

All species of *Melastoma* are considered noxious in the state of Hawai'i. Their invasiveness is readily observed on the islands of Hawai'i and Kaua'i. On Maui, there are only a few plantings of *Melastoma* spp., and most of these have already been controlled. MISC should continue to target *Melastoma candidum*, as well as other *Melastoma* species. Maui is fortunate that there are no large infestations of *Melastoma* spp. and continued efforts are advised to detect and control plants before they become out of control. The public should be educated to not possess, propagate, or sell noxious weeds and other harmful non-native plants. There needs to be better prevention of inter-island dispersal from Kaua'i and Hawai'i to other islands. This includes plants in the horticulture trade as well as plants that may disperse accidentally as contaminants on hapu'u ferns.

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