

Delairea odorata

Cape ivy
Asteraceae

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OVERVIEW

Delairea odorata, Cape ivy, native to Southern Africa, is a popular ornamental climbing vine used in landscaping. *D. odorata* is an aggressive smothering vine that escapes from cultivation. It has become a serious weed in several places such as California, New Zealand, Australia, and Hawai'i. The potential range of Cape ivy in Hawai'i, as predicted by Jacobi and Warshauer (1992), could be much larger than it is currently, with the potential to occupy a variety of ecological zones. On Maui, *D. odorata* is spreading from initial plantings where it is sprawling and climbing in vegetation along roads, scrub woodland, and in gulches in both wet and dry areas from approximately 1,200-4,000 ft (366-1,219 m) elevation. Areas that could be threatened by *D. odorata* in the future, based on where it has invaded on the Big Island, include native shrubland, mesic forests, and dry forests. On Maui, *D. odorata* infestations are fairly thick where they occur and complete control appears difficult. However, it has yet to invade natural areas. Early detection and swift control in natural areas will be crucial to prevent large infestations in native vegetation on Maui in the future.

TAXONOMY

Family: Asteraceae (sunflower family) (Wagner et al. 1999).

Latin name: *Delairea odorata* Lem. (Herbst and Wagner 1999, Wagner et al. 1999).

Synonyms: *Senecio mikanioides* Otto ex Walp. (Herbst and Wagner 1999, Wagner et al. 1999).

Common names: Cape ivy, German ivy, Italian ivy, Parlor ivy (Wagner et al. 1999, PLANTS 2001).

Taxonomic notes: The name was changed from *Senecio mikanioides* to the more widely accepted placement *Delairea odorata* (Herbst and Wagner 1999).

Nomenclature: Unknown.

Related species in Hawai'i: There are currently no other *Delairea* species in Hawai'i.

DESCRIPTION

"Fleshy perennial vines, woody at least below; stems 1-30(-60) dm long, glabrous throughout. Leaves broadly deltate, blades 3-10 cm long, 3-6 cm wide, palmately veined, shallowly 3-10 lobed, petioles 1.5-7 cm long. Heads in dense terminal and axillary cymes, discoid; involucre bracts 3-4 mm long; disk corollas yellow, ca. 4.5 mm long. Achenes ca. 2 mm long." (Wagner et al. 1999).

BIOLOGY & ECOLOGY

Cultivation: *D. odorata* is widely cultivated throughout the world as an ornamental (Wagner et al. 1999). The plant was originally introduced to the United States sometime in the 19th century as a Victorian-era houseplant (Alvarez 1997). *D. odorata* is thought to have been introduced as an ornamental to Kona, Hawai'i around 1909 (Haselwood and Motter 1983). In Hawai'i, it is a hardy plant with attractive evergreen fleshy leaves and small yellow flowers (without ray florets). It is easy to propagate and grow as a vine or groundcover, capable of vigorously climbing up posts, hedges, other trees and shrubs, fences, banks, and walls. Neal (1965) calls *D. odorata*, "both a weed and an ornamental."

Invasiveness: *D. odorata* has several aggressive characteristics. To begin, the plant has spread to many corners of the world as a popular ornamental. *D. odorata* has become a weedy pest in England, California, Oregon, Hawai'i, Australia, and New Zealand (Bailey and Bailey 1976, NSW Agriculture 1993, PLANTS 2001, CalEPPC 1999). *D. odorata* can invade different habitat types ranging from disturbed to native ecosystems and occurs in both dry to moist conditions. In California, *D. odorata* invades terrain ranging from steep salt exposed bluffs along the Pacific Ocean to shady inland alder riparian habitat (Alvarez 1997). On Maui, *D. odorata* is naturalized in both moist lowland scrub to dry middle elevations, mostly in or adjacent to urban areas. On Hawai'i island, it is growing densely in the canopy in mamane (*Sophora chrysophylla*) shrubland and is reported as a weedy groundcover in the understory of koa/ohia (*Acacia koa/Metrosideros polymorpha*) forests of South Kona (Cuddihy and Stone 1990). *D. odorata* spreads both vegetatively, through the spread of stolons, and sexually by seeds. *D. odorata* can also spread when fragments (as short as an inch) break off either in machinery or carried off by runoff, and can re-root in new areas (Alvarez 1997). Parts of plants can also be spread in green waste. *D. odorata* is capable of rapid growth rates. In the Golden Gate National Recreation Area (GGNRA), *D. odorata* is said to be spreading more rapidly than any other invasive pest plant of concern (Alvarez 1997). *D. odorata* forms impenetrable mats in both shade and sun, and climbs native vegetation forming a dark canopy layer (Alvarez 1997). Invasion leads to several problems. For one, native vegetation is crowded out and reproduction is hindered (Alvarez 1997). *D. odorata* has also been implicated in reducing numbers of native insect fauna potentially threatening other species relying on those invertebrates (Alvarez 1997). Another potential problem is toxicity of the plant. *D. odorata* contains pyrrolizidine alkaloids which may have a toxic effect on aquatic organisms (Alvarez 1997). With *D. odorata* invading riparian areas of California, it could potentially have a negative effect on stream life. It may also be potentially toxic to humans. There is one report in California by a man claiming that after walking through a patch of Cape ivy when it was profusely in flower, he became lightheaded, blacked out and had a seizure. Apparently, prior to this episode, he experience coughing fits while trying to clear the plant, which was not in flower at the time, from his ranch (Pat Bily pers. comm.).

Pollination: Unknown.

Propagation: *D. odorata* can be propagated by seeds and by stem cuttings (Brickell and Zuk 1997).

Dispersal: Long distance dispersal is currently mostly by humans spreading the plant in landscaping. Haselwood and Motter (1983) report that *D. odorata* is dispersed by either wind-blown seeds, or vegetatively as cuttings. Seeds have a wispy pappus and can spread on the wind, though in California, Nelson (1999) reports that this is not the main means of spread due to poor seed set and germination. He notes further that seed set and germination is occasionally enhanced by hard frosts, cool winters, and rain events. The main spread of Cape ivy occurs by vegetative means as the vine sprawls and spreads across the landscape. Parts of the plant can resprout once broken off. This allows plants to spread to new areas in dumped organic debris. Parts of the plant can also disperse along water courses. Nelson (1999) reports that pieces of *D. odorata* are transported via flooding along the coast of Big Sur river in California.

Pests and diseases: Brickell and Zuk (1997) report the following pests for *Senecio*: rust, whiteflies, aphids, and spider mites.

DISTRIBUTION

Native range: *D. odorata* is native to South Africa (Wagner et al. 1999).

Global distribution: *D. odorata* has become a weedy pest in many places where it has been introduced as an ornamental including England, California, Oregon, Hawai'i, Australia, and New Zealand (Bailey and Bailey 1976, NSW Agriculture 1993, USDA-NRCS 2001, CalEPPC 1999). In California, *D. odorata* is currently distributed along the coastal counties from north to south California at elevations from sea level to 656 ft (200 m) (CalFlora 2001). Along the coast of California, *D. odorata* is an invader of riparian areas, climbing up into native over-story trees such as willows and cottonwoods, and covering the under-story like a solid mat (CalEPPC 1994). In New Zealand, German ivy is a pest of coastal plant communities and lowland forest margins, shrublands, rocklands, roadsides, quarries, farm hedges, wasteland, and house gardens (Haley 1997).

State of Hawai'i distribution: In the state of Hawai'i, *D. odorata* is known from Maui and Hawai'i. During a study to predict potential range of *D. odorata* using vegetation data from forest bird transects on Hawai'i, Jacobi and Warshauer (1992) found *D. odorata* predominately on the western flanks of Mauna Kea and Mauna Loa, and on the northern and western slopes of Hualalai Volcano. It was found only at stations with less than 100 in (2,500 mm) of annual rainfall but encompassed an elevation range between 1,640 and 8,200 ft (500-2,500 m). *D. odorata* was found to be established in 19 different vegetation units that ranged from dry shrub communities to rain forest. Jacobi and Warshauer (1992) found that *D. odorata* has a large potential distribution area and could potentially invade all transect stations on the western and southwestern sides of the island and possibly those of the upper portions on the eastern side.

Island of Maui distribution: Recent surveys on Maui revealed several hot spot areas on East Maui where *D. odorata* can be observed naturalizing away from initial plantings. One area is along roads of Makawao, Olinda, and Pi'iholo where *D. odorata* is observed climbing in trees in a smothering manner and sprawling over the ground. Plants in

Pi'iholo were filling gulches and seemed to be more healthier and aggressive in moister winter months. In drier months, the plant seems to practically disappear, likely dying back to stems or minimal growth, then once it rains, the plant magically appears again, and grows vigorously until the next dry spell. After rains, plants are very noticeable with healthy bright green foliage and a profusion of bright yellow flowers. These are good times to map this species as it is more conspicuous. A second area where *D. odorata* infestations are readily observed occurs in the dryer more leeward slopes of Kula. Vines are observed in scrub woodland and gulches. Elevation range of naturalized plants on East Maui is from about 1,200–4,000 ft (366-1,219 m), primarily near urban sites. To date, no sites have been observed on West Maui.

CONTROL METHODS

Physical control: There are some efforts in California that show positive results using physical or mechanical methods to control *D. odorata*. However, in general, the plant is hard to control physically because pieces that break off can resprout. At the Golden Gate National Park, California, control of *D. odorata* was restricted to mechanical efforts due to a lack of funding, the predominance of Cape ivy in riparian areas, vegetation structure, and the progress and success of current efforts (Alvarez 2001). The Park aims to systematically contain and remove infestations by peeling back edges of *D. odorata* and cutting off its upward spread into the canopy. Once initial clearing was complete, a second clearing of the of plant parts in the soil was done. The debris was piled up or put in green waste at the landfill. Routine follow up weeding was done six weeks to three months after the initial work, then every two to three months for the first year, then quarterly in subsequent years. Using these methods, within two years, the Park was able to contain over 25% of approximately two hundred infestation sites.

Chemical control: New Zealanders report that *D. odorata* is readily killed with Roundup (Haley 1997). Suggested rates of application for handgun is 1 litre Roundup with 200 mls Pulse per 100 litres water and for knapsack is 100 mls Roundup with 20 mls Pulse per 10 litres water. Californians report that a combination of chemicals (.5% Triclopyr and .5% glyphosate with a silicone surfactant) applied in a foliar spray of 640 litres per hectare is effective in chemical control of *D. odorata* (Bossard and Benefield 1996). Also suggested more recently is a mixture of 1% Roundup and .5% Garlon 4 (or Brush B-Gone) (Forbert 1998). Herbicides were used on infestations of one-eighth acre and larger where the biomass exceeded 80% of the surface. Two people using herbicides greatly reduced the amount of *D. odorata* within eight months (two applications every four months) and follow up was done by hand. Solo backpack sprayers were used. For larger infestations, 100-gallon tanks mounted on a spray truck with 700 ft of high pressure hose, a small gas engine and two types of pumps were used. In more remote areas, more than 2,000 ft of hose can be attached and the spray truck can also be used as a source to fill backpacks. According to Forbert (1998), *D. odorata* can be sprayed at any time of year.

Biological control: Several surveys have been conducted by the Plant Protection Research Institute of the Agricultural Research Council in South Africa to search for effective biological controls of Cape ivy (Wing 2000). Insects that have potential include

a galling fly (*Parafreutreta regalis*), a small leaf-mining moth (*Acrolepia*), and a defoliating moth (*Diota rostrata*).

Cultural control: The public could be educated not to plant or spread *D. odorata* or other harmful non-native plants.

Noxious weed acts: *D. odorata* is a noxious weed in New Zealand (Haley, N. 1997) and Australia (NSW Agriculture 1993). In California, *D. odorata* is listed on the California Exotic Pest Plant Council's (CalEPPC) 1999 of exotic pest plant list as an A-1 in invasive plant (most invasive wildland pest plant).

MANAGEMENT RECOMMENDATIONS

D. odorata is here to stay on East Maui and will continue to spread as there is much more potential range where this invader has not reached yet. Early detection and removal in natural communities that are currently free of *D. odorata* will be crucial to prevent large infestations requiring vast resources, time, and money to remove once established. Though already fairly widespread, placing the plant on the Hawai'i noxious weed list would help prevent further spread to areas currently free of *D. odorata*.

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