

Caesalpinia decapetala

Cats claw

Fabaceae

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OVERVIEW

Caesalpinia decapetala is a woody vine with sharp thorns and yellow flowers that forms impenetrable thickets (Wagner et al. 1999). This native of tropical Asia can be found on Ni'ihau, Kaua'i, O'ahu, East Maui, Hawai'i (Wagner et al. 1999), and Moloka'i (Tina Lau pers. comm.). This species was introduced as a fence plant for ranches before 1910 (Wagner et al. 1999), but the recurved thorns proved lethal, killing a cow on Kaua'i (Robert Hobdy pers. comm.). *C. decapetala* is widespread on Kaua'i, O'ahu, and Hawai'i. On Maui, *C. decapetala* is known from two locations. The larger of the two infestations is restricted to the Halehaku (Kakipi) gulch area and side tributaries. This population is thought to have come in on equipment from another island during construction of the new bridge. With sharp thorns all the way to the ground, controlling *C. decapetala* in this steep gulch would be difficult. At this location, *C. decapetala* may not be a feasible target for eradication, but through delineation of the area and education, it may be possible to keep it from invading throughout the watershed. The second infestation was recently found in Ulupalakua. This small patch has not yet spread far. *C. decapetala* has also been targeted for eradication on Moloka'i by the Moloka'i Invasive Species Committee (MOMISC).

TAXONOMY

Family: Fabaceae (pea family) (Wagner et al. 1999).

Latin name: *Caesalpinia decapetala* (Roth) Alston (Wagner et al. 1999).

Synonyms: *Reichardia decapetala* Roth; *Biancaea sepiaria* (Roxb.) Tod.; *Caesalpinia sepiaria* Roxb. (Haselwood et al. 1983, Wagner et al. 1999).

Common names: Cats claw, wait-a-bit, Mysore thorn, thorny poinciana, *puakelekino* (Wagner et al. 1999).

Taxonomic notes: *Caesalpinia* is a diverse genus of 70 or more species of trees, scandent to climbing shrubs (often thorny), and perennials found in scrub and lowland rainforest, and on mountain slopes in tropical and subtropical areas (Brickell and Zuk 1997). Most *Caesalpinia* are evergreen, some lose leaves in the tropical dry season. The leaves of all *Caesalpinia* are bipinnate, some very large with numerous leaflets, the flowers are in spikes from the upper leaf axils and may be quite showy, mostly in shades of red, yellow or cream, with separate petals and often conspicuous stamens. The seeds are in typical leguminous pods (Turner and Wasson 1997). The widespread species *C. bonduc*, *C. crista*, and *C. major* have been greatly confused since Linnaeus applied *C. bonduc* to two different species. A survey of the nomenclatorial history is given by

Hattink (1974); his conclusions have been followed here. Thus for Hawai'i the species generally known as *C. crista* is referred to *C. bonduc*, and *C. jabayo* becomes *C. major*.
Nomenclature: Named in honor of Cesalpino (1519-1603), Italian botanist, philosopher, and physician to Pope Clement VIII (Wagner et al. 1999).

Related species in Hawai'i: Other *Caesalpinia* species known to be occurring in the state of Hawai'i include *C. bonduc* (indigenous), *C. kawaiensis* (endemic and endangered), *C. major* (introduced), and *C. pulcherrima* (introduced) (Neal 1965, Wagner et al. 1999).

DESCRIPTION

"Climbers or shrubs with sprawling branches, forming large impenetrable thickets, with recurved prickles on young branches and leaf rachises. Leaves with 3-15 pairs of pinnae, leaflets 5-12 pairs per pinna, oblong-elliptic, 1-2.2 cm long, 0.4-1.1 cm wide, apex rounded, stipules deciduous, obliquely ovate, 8-20 mm long, entire. Flowers perfect, 25-30 mm in diameter, in axillary and / or terminal racemes, when axillary often serial; petals yellow, upper one veined or blotched with red, 12-15 mm long. Pods dehiscent, slightly swollen, 6.5-11 cm long, 2-3 cm wide. Seeds 4-9 black, ellipsoid, laterally flattened, 8-12 mm long, 6-8 mm wide." (Wagner et al. 1999).

BIOLOGY & ECOLOGY

Cultivation: *C. decapetala* is cultivated and naturalized in tropical regions throughout the world (GRIN 2002). *C. decapetala* can be used as a fence plant for ranches, as it forms impenetrable thorny hedges. In Hawai'i, it was introduced as an ornamental fence plant as early as 1888 (Wester 1992).

Invasiveness: *C. decapetala* is extremely thorny and aggressive. It climbs on vegetation, has a smothering habit, and makes walking impossible. In Australia, *C. decapetala* is listed as an environmental weed of subtropical rainforest and remnants in New South Wales (Nagle 1995). In Hawai'i, *C. decapetala* presents a formidable opposition for ranches and has the capability to take over large areas of land. State Forester Robert Hobdy saw a dead cow in a thicket on Kaua'i. Apparently the animal had gotten caught and struggled to free itself. The cow ended up suspended on the thicket four feet above ground with its four legs sticking straight up (Robert Hobdy pers. comm.). Besides taking over pasture, *C. decapetala* can engulf native forest, water delivery systems, and utility right of ways.

Pollination: Large numbers of yellow flowers tend to appear during winter and spring on Maui. Insects found on *C. decapetala* on Maui include the Sonoran carpenter bee (*Xylocopa sonorina*), bean butterfly (*Lampides boeticus*), honey bee (*Apis mellifera*), and crazy ants (*Technomyrmex albipes*). The first three were found on the flowers and could potentially be pollinating the flowers. The ants were found in the seed pods.

Propagation: *C. decapetala* can be propagated from seeds. It can also be propagated from cuttings. According to Hosaka and Thistle (1954), "Wherever the vine-like stems touch moist ground they take root and form new plants. Even old trunks, cut and used for fence posts, will take root and grow."

Dispersal: The medium sized seeds may be dispersed by rodents and granivorous birds, but man is almost certainly the principal dispersal agent in Hawai'i (Smith 1985). Hosaka and Thistle (1954) note that the seed is spread considerable distances by running water. It is thought that the Maui plants may have been the result of seeds in mud on large machinery used to do road work on the Hana Hwy. (R. Hobby pers comm.)

Pests and Diseases: Fungal canker, dieback, spider mite, whitefly, and mealy bug problems can occur on *C. decapetala* (Brickell and Zuk 1997).

DISTRIBUTION

Native range: Native to tropical Asia, India, and China (Haselwood et al. 1983; Turner and Wasson 1997). The native range includes Asia - temperate regions of China, Japan, and Korea; and Asia - tropical regions of Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam (GRIN 2002). Average temperatures in these areas range from 50-over 68 F (10-over 20 C) in January to 68-over 86 F (20-over 30 C) in July (Hammond 1986). Average annual rainfall in these areas is approximately 40-over 80 in (100-over 200 cm) (Hammond 1986).

Global distribution: *C. decapetala* is cultivated and naturalized in tropical regions throughout the world (GRIN 2002). *C. decapetala* has successfully invaded Africa, Hawai'i, Australia, subtropical New Zealand islands, Fiji, French Polynesia, and New Caledonia (PIER 1999, Wagner et al. 1999, Spriggs 2001). In South Africa, *C. decapetala* is a declared noxious weed (PIER 1999) and is reported to invade disturbed lowland moist forest margins, threatening the bio-diversity of the forests (Spriggs 2001). In the Pacific, *C. decapetala* is currently under a control program on Raoul, Kermadec Islands (PIER 1999). Missouri Botanical Garden (2002) specimen database includes the following collection locations. South America: Columbia, 1,580 m (5,184 ft), 2.32.34N and 76.34.4W; and Peru, 700-2,475 m (2,297-8,120 ft), 4.34-13.38 S and 72.52-79.32W. Africa: Burundi, 1,450 m (4,757 ft); Tanzania, 1,162-2,088 m (3,812-6,850 ft), 01.01.32-03.16.03S and 031.25-037.54.10E; and Uganda, 1,200 m (3,937 ft), .37N and 32.35E.

State of Hawai'i distribution: *C. decapetala* was first recorded in Hawai'i in 1888 (Wester 1992). *C. decapetala* can now be found naturalized along roadsides, in gulches, along stream beds, in moist regions, near abandoned house sites, and other disturbed areas, 0 – 250 m (820 ft), on Ni'ihau, Kaua'i, O'ahu, Lana'i, Moloka'i, East Maui, and Hawai'i (Wagner et al. 1999, Tina Lau pers. comm.). *C. decapetala* is a weed in pastures, range lands, and waste places (Haselwood et al. 1983). Infestations can be found along the Honouliuli trail of the Wai'anae Mountains and on the windward side of O'ahu, the upper pastures and adjacent forest of much of northeastern Kaua'i, and Halehaku gulch and Ulupalakua, Maui (Wagner et al. 1999). On the island of Hawai'i, *C. decapetala* is locally common in Ka'u and perhaps elsewhere. On Moloka'i, *C. decapetala* is known from 3 populations in Kalae defined by interconnected gulches (Tina Lau pers. comm.).

Island of Maui distribution: *C. decapetala* can be found along the Hana Hwy. at Halehaku gulch, close to sea level. Average annual rainfall in this area is 60-80 in (152-203 cm) (Juvik and Juvik 1998). The yellow flowered vine can be seen growing on the walls and flat surfaces of the valley. The greatest density is found near the bridge on Hana highway. The density drops off on either side, but *C. decapetala* can be found all the way to the ocean and almost a mile upslope of the Hana highway. The upper extent in the gulch is not known and may need aerial surveys. A satellite patch was found in a nearby tributary, just East of Halehaku gulch. Recently, a second small population was found in Ulupalakua, at approximately 1,800 ft (549 m). The area receives average annual rainfall of about 20-30 in (51-76 cm) (Juvik and Juvik 1998). This site is far from the larger established site at Halehaku gulch and is being considered for control by the Maui Invasive Species Committee (MISC). The potential distribution on Maui could be much larger than it currently is, occupying disturbed areas, margins of mesic forests, gulches, and pastures from sea level to at least 1,800 ft (549 m) and possibly higher.

CONTROL METHODS

Physical control: *C. decapetala* is extremely prickly, and attempts at physical control must be done carefully. MOMISC has targeted *C. decapetala* for eradication and is experimenting with control methods. Heavy machinery would not be an option in Halehaku gulch due to steep and difficult terrain.

Chemical control: A visit to the site on July 25, 1998, showed that plants at the side tributary population had been controlled. It appeared to have been controlled by a foliar spray with an herbicide. This patch seemed relatively controlled by August 2002. It is not known who did the control or what was used. Plants encroaching on the road are sprayed by the road crew. Possible control methods include helicopter foliar, ground foliar, cut stump, and basal bark. Foliar spray, while costly, may be the best way to treat plants due to the numerous thorns and thicket like structure that would make basal bark or cut stump treatments difficult. The following control information for *C. decapetala* is from Motooka et al. (2002). "Sensitive to foliar applications of Glyphosate and triclopyr, and to soil applications of tebuthiuron. Adequate coverage of cats claw foliage in dense infestations is difficult. Timely repeat applications (3-9 months) of triclopyr ester at 0.25 lb/acre allows gradual reductions and opening of the canopy and eventual control. This strategy not only stresses the cats claw over a longer period but also controls newly germinated cats claw seedlings. Accessible stems may be treated basal bark with triclopyr ester at 20% product in diesel or crop oil in very low volume applications."

Biological control: Potential for biological control has not been evaluated (Smith 1985).

Cultural control: The residents of Maui could be discouraged from planting or spreading *C. decapetala*. Machinery and gear should be cleaned, especially if working in areas of *C. decapetala*.

Noxious weed acts: *C. decapetala* is currently not on the Hawai'i state noxious weed list, but is a good candidate for listing. *C. decapetala* is declared a noxious weed in South Africa (PIER 1999). It is also listed as a weed by the following three sources:

Greening Australia project, University of Hawai'i Botany Department, and Department of Land and Natural Resources.

MANAGEMENT RECOMMENDATIONS

C. decapetala is only found from two locations on the entire island of Maui. The first location is a large infestation at Halehaku gulch. The second is a small patch in Ulupalakua. For the Halehaku site, controlling upslope and lateral spread along with notifying the principal land owner / lessee and nearby residents and ranchers may be a goal to work towards. *C. decapetala* may be a good candidate for NRCS's EQUIP program which shares costs with landowners in efforts to eradicate harmful weeds. In the future, local distribution should be refined and updated, especially upslope of the road. Aerial surveys while the plant is in flower (January/February) may be the best way to refine mapping. The second site at Ulupalakua is still small and controllable. *C. decapetala* appears to be a prolific seed producer, and seed production, fertility, and viability data may be useful. Control trials should be done to test the most efficient control methods.

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