Passiflora ligularis

Sweet granadilla
Passifloraceae

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OVERVIEW

Native to the Andes of South America, *Passiflora ligularis* (sweet granadilla) is rarely cultivated on Maui, yet it has been found in remote lowland wet forest on West Maui. *P. ligularis* has proven invasive on other Hawaiian Islands, similar to, though not as invasive as, its relative *P. mollissima*. Present in the state since 1909, *P. ligularis* was only recently documented from Maui, and at this time, it seems likely that major infestations of this vine could be prevented by controlling known individuals in natural areas, and discouraging future plantings, especially near natural areas in moist parts of the island.

TAXONOMY

Family: Passifloraceae (Passion flower family) (Wagner et al. 1999).
Latin name: *Passiflora ligularis* Juss. (Wagner et al. 1999).
Synonyms: None found.
Common names: Sweet granadilla, lemi wai, lani wai, lemona (Neal 1965, Wagner et al. 1999).
Taxonomic notes: The genus, *Passiflora*, is made up of about 430 species mainly from tropical America (Wagner et al. 1999).
Nomenclature: "The name *Passiflora*, or passion flower, is derived from the floral morphology that, to the early Spanish explorers, bore signs of the passion of Christ." (Wagner et al. 1999).
Related species in Hawai'i: *Passiflora* is represented in Hawai'i by 25 or so species, of which 12 are naturalized (Neal 1965, Wagner et al. 1999). The naturalized species are *P.* x *caerula*, *P. edulis*, *P. foetida*, *P. laurifolia*, *P. manicata*, *P. mollissima*, *P. pulchella*, *P. quadrangularis*, *P. suberosa*, *P. subpeltata*, and *P. vitifolia* (Wagner et al. 1999).

DESCRIPTION

"Lianas; stems terete or weakly angled, striate. Leaves with blades cordate, 10-22 cm long, 7-17 cm wide, glabrous, margins entire, petioles with 4-8 elongate, usually paired, filiform nectaries 4-10 mm long, stipules oblong-ovate, 20-40 mm long. Flowers pendent, campanulate, 8-12 cm in diameter, peduncles solitary or paired, bracts ovate, 3-5 cm long, 1-3 cm wide; hypanthium 0.5-0.9 cm long; sepals and petals white or white tinged with violet; corona purple-banded, filamentous, ca. 3 cm long. Berries orange with white specks at maturity, globose, 5-7 cm in diameter, aril grayish, edible." (Wagner et al. 1999).

Distinguished from other naturalized *Passiflora* in Hawai'i by entire, cordate leaves; terete or weakly angled, striate stems; elongate, 4-10 mm long, petiole nectaries (Wagner et al. 1999).

BIOLOGY & ECOLOGY

Cultivation: Cultivated for its edible fruit (Morton 1987).

Invasiveness: "This vine is a weed with many similarities to *P. mollissima*. The major infestation is at Ka'upulehu, Hualalai, Hawai'i." (Smith 1998). *P. ligularis* is listed by Randall (2002) as a weed.

Pollination: No information found.

Propagation: "The sweet granadilla can be grown from seeds or cuttings." (Morton 1987).

Dispersal: Jacobi and Warshaeur (1992) note the primary dispersal agents of a related species, *P. mollissima*, are "believed to be several species of birds, rodents, feral pigs (*Sus scrofa*), and humans." *P. ligularis* is likely dispersed by similar agents.

Pests and diseases: In Hawai'i, a passion vine butterfly, *Agrius vanillae*, spends its larval stage on many *Passiflora* species (HDOA 2002). "In Haiti, the planted seeds are often devoured by rodents, though the seeds of *P. edulis* in the same situation have never been disturbed. Squirrels ravage the crop in the forests of Ecuador." (Morton 1987).

DISTRIBUTION

Native range: Native to the Andes of South America (Wagner et al. 1999). "The sweet granadilla is subtropical, not tropical. In its natural range, it is wild and cultivated at elevations of 3,000 to 8,850 ft (900-2,700 m)." (Morton 1987).

Global distribution: "It has been grown in Hawaii since late in the 19th Century. In 1916, the United States Department of Agriculture received seeds from Quito, Ecuador. The vine is not suited to California, has been grown in greenhouses in Florida but has never survived for long. Northern gardeners sometimes plant it as a summer ornamental. It is not reported in Guam; may be grown to some extent in New Guinea. Trial plantings in Israel were killed by cold weather. It is cultivated and naturalized in Jamaica and, in recent years, has been blooming and fruiting prolifically in mountainous Haiti." (Morton 1987).

"In Hawaii, it finds sufficiently cool temperatures at 3,000 ft (900 m). In Jamaica, the vine volunteers freely at altitudes between 3,500 and 4,000 ft (1,000-1,200 m). At 5,000 to 8,200 ft (1,500-2,500 m) in Colombia, the vine fruits well. At higher altitudes, it flourishes and blooms but will not fruit. An elevation of 6, 000 ft (1,828 m), where the clouds descend on peaks in the afternoon, has proven ideal in Haiti. The vine is intolerant of heat. It will do well over the winter in Florida but declines with the onset of hot weather." (Morton 1987).

State of Hawai'i distribution: "In Hawai'i naturalized in mesic to wet, disturbed areas, climbing over vegetation, 0-280 m, on Kaua'i, O'ahu, Moloka'i, and Hawai'i. Cultivated prior to 1871." (Wagner et al. 1999). It is also now known from Maui (Meidell et al. 1998).

Island of Maui distribution: Rarely cultivated. Naturalized plant known from "disturbed *'Ohi'a/Uluhe* Lowland Wet Forest in the vicinity of Kaulawelewele, West Maui, at 847 m." (Meidell et al. 1998).

CONTROL METHODS

Physical control: Young plants can be hand pulled.

Chemical control: None found.

Biological control: There have been many attempts at bio-control of the related *P. mollissima* in Hawai'i. We found no information on bio-control for *P. ligularis.*

Cultural control: *P. ligularis* could be discouraged in plantings, especially near natural areas.

Noxious weed acts: *P. mollissima* and *P. pulchella* are listed as State Noxious Weeds in Hawai'i, *P. ligularis* is not. (HDOA 1992).

MANAGEMENT RECOMMENDATIONS

P. ligularis is rarely cultivated on Maui, yet it has been found in remote lowland wet forest on West Maui. *P. ligularis* has proven invasive on other Hawaiian Islands, similar to, though not as invasive as, its relative *P. mollissima*. It seems likely that major infestations of this vine could be prevented by controlling the known naturalized individuals on West Maui, and discouraging future plantings, especially near natural areas in moist parts of the island.

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