

Rubus ellipticus
Yellow Himalayan raspberry
Rosaceae

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OVERVIEW

Rubus ellipticus is a brambling raspberry with yellow fruits, native to tropical and subtropical India and Asia. This species has spread from cultivation and has become a pest in wet disturbed forests of Hawai'i. *R. ellipticus* forms impenetrable thickets and crowds out native species in moist to wet disturbed areas of Hawai'i from 2,270-5,580 ft (700-1,700 m) elevation. Some have deemed *Rubus ellipticus* the worst of the *Rubus* invaders in Hawai'i. On Maui, *R. ellipticus* is not yet established in the wild. However, plants have been observed on hapu'u (*Cibotium* spp.) tree ferns and parts that are shipped from infested areas of Hawai'i. *Rubus ellipticus* is a noxious weed in Hawai'i and is therefore illegal to transport inter-island. However, this is currently occurring with *Rubus ellipticus* in the hapu'u trade. *Rubus ellipticus* is not easily controlled. There are likely other locations in gardens on Maui where *Rubus ellipticus* occurs that we are not aware of yet. Early detection of *Rubus ellipticus* on hapu'u ferns will be key to preventing its establishment on Maui. The public could assist by checking their hapu'u ferns for *Rubus ellipticus* or other unwanted hitch-hikers.

TAXONOMY

Family: Rosaceae (rose family) (Wagner et al. 1999).

Latin name: *Rubus ellipticus* Sm., *Rubus ellipticus* Sm. var. *obcordatus* Focke (Wagner et al. 1999).

Synonyms: *Rubus flavus* Buch.-Ham. ex D. Don, *Rubus gowreephul* Roxb. (GRIN 2003).

Common names: Yellow Himalayan raspberry, yellow raspberry, cheeseberry (Wagner et al. 1999, GRIN 2003).

Taxonomic notes: The genus *Rubus* is a large genus made up to about 250 species primarily of north temperate regions and the Andes of South America (Wagner et al. 1999).

Nomenclature: The genus name *Rubus* is the Latin name for bramble and originates from the word *ruber*, meaning red (Wagner et al. 1999).

Related species in Hawai'i: In Hawai'i, there are two endemic *Rubus* species, including *Rubus hawaiiensis* ('akala), known from mesic to wet forest and subalpine woodland, 660-3,070 m (2,165-10,072 ft), on Kaua'i, Moloka'i, Maui, and Hawai'i, and *R. macraei* ('akala), known from East Maui and Hawai'i (Wagner et al. 1999). Several naturalized species also occur in Hawai'i, including *Rubus argutus* (prickly Florida blackberry), *R. discolor* (Himalayan blackberry), *Rubus glaucus* Benth. (Andean raspberry), *Rubus*

niveus (hill or mysore raspberry), *R. rosifolius* (thimbleberry), and *R. sieboldii* (Wagner et al. 1999).

DESCRIPTION

"Stout, weakly climbing, evergreen shrubs; stems often 30-40 dm long, forming impenetrable thickets several m wide, primocanes usually erect, covered with usually spreading prickles up to 5 mm long, floricanes covered with stout, recurved, longitudinally elongate prickles up to 6 mm long and densely covered with slender, spreading prickles, also sparsely to moderately pilose. Leaves persistent, palmately compound, thick, leaflets 3, broadly obcordate, the terminal one largest, usually 6-8 cm long, 5-6.5 cm wide, those of the primocanes slightly smaller, upper surface sparsely pilose, lower surface densely velvety pilose, midrib with a few small, stout, recurved prickles and smaller straight ones, margins serrate, petiolules 1.5-3 cm long, petiolules and petioles densely covered with long, straight prickles and scattered stout, recurved prickles, also sparsely to moderately pilose. Flowers in short, terminal panicles, tomentose and covered throughout with short prickles, pedicels 3-10 mm long; petals white, obovate, 7-9 mm long. Fruit yellow, depressed-hemispherical, ca. 0.8 cm long, glabrous." (Wagner et al. 1999).

"Our plants are referred to var. *obcordatus*, which is distinguished from var. *ellipticus* by the obcordate to subtruncate, rather than acuminate, leaflets." (Wagner et al. 1999).

BIOLOGY & ECOLOGY

Cultivation: *Rubus ellipticus* is widely cultivated as an ornamental in warm regions.

Invasiveness: *Rubus ellipticus* has spread in Hawai'i shortly after its introduction and is now naturalized in moist to wet disturbed forests from 2,270-5,580 ft (700-1,700 m) elevation (Santos et al. 1992, Wagner et al. 1999). It is well adapted to open sunny areas as well as wet shady rainforests (Santos et al. 1992). It spreads by vigorous vegetative growth as well as by birds and other mammals that eat the fruit. *Rubus ellipticus* is hard to kill once established. On Maui, there are no established populations in the wild, however, *Rubus ellipticus* plants are being found on hapu'u ferns that are shipped from the island of Hawai'i. The potential for it to become more widely established in the Hawaiian Islands is currently high.

Pollination: Not known.

Propagation: *Rubus* species can be propagated from seeds and cuttings.

Dispersal: In Hawai'i, *Rubus ellipticus* is spreading from the island of Hawai'i to the island of Maui as contaminants in hapu'u fern trunks and parts, such as mulch. Multiple sites on Maui have been identified, suggesting repeated arrivals. This allows *R. ellipticus* to spread to wherever hapu'u ferns are sold in the State. Humans transport the plant long distances for use as an ornamental or as an edible crop. *Rubus ellipticus* is capable of aggressive vegetative growth. It can also be spread by animals that eat the fruit, including birds and mammals.

Pests and diseases: Not known.

DISTRIBUTION

Native range: *Rubus ellipticus* is native to tropical and subtropical India (Wagner et al. 1999). GRIN (2003) lists the following areas as native for *R. ellipticus*: Asia-temperate: China - Guangxi, Guizhou, Sichuan, Xizang, and Yunnan; and Asia-Tropical: Bhutan; India; Myanmar; Nepal; Philippines - Luzon; Sri Lanka; and Thailand.

Global distribution: *Rubus ellipticus* is naturalized in Hawai'i and elsewhere in the tropics (Wagner et al. 1999, GRIN 2003).

State of Hawai'i distribution: In Hawai'i, *Rubus ellipticus* was first collected in 1961 by Degener and Degener (1968) in the town of Volcano, where it had been introduced for its edible fruits. Degener and Degener recognized the potential for the plant to become a serious pest to native ecosystems and recommended that it be controlled immediately to stop its spread. *Rubus ellipticus* is now established in the Volcano and Laupahoehoe area, 1,060-1,220 m (3,478-4,003 ft) elevation (Wagner et al. 1999). *Rubus ellipticus* is considered a major threat to the Ola'a Forest Tract of Hawai'i Volcanoes National Park (Jacobi and Warshauer 1975). Gerrish et al. (1992) report that "*Rubus ellipticus* is best known from a major infestation around the farm lots on Wright Road near the town of Volcano and around the summit of Kilauea. From Volcano and the east side of the Kilauea Caldera, it extends down-slope to 1,800 ft and up-slope to about 4,000 ft. at Kipuka Puaulu in Hawai'i Volcanoes National Park. From this line, *R. ellipticus* has spread northeast through the Ola'a Tract of the national park, the Ola'a Forest Reserve and the Pu'u Maka'ala Natural Area Reserve to Stainback Highway. Clumps are scattered along Stainback Highway between 1,800 and 5,100 ft elevation." Santos et al. (1992) report that the current *Rubus ellipticus* infestation occurs between 2,270-5,580 ft (700-1,700 m) elevation, where it is well adapted to the full sun of open canopy forests or pastures and the deep shade of rain forests. *Rubus ellipticus* occurs in areas that receive average annual rainfall amounts of 50-275 in (127-635 cm) (Jacobi and Warshauer 1992).

Island of Maui distribution: On Maui, *Rubus ellipticus* was previously not known to be present. It has recently been observed on several hapu'u (*Cibotium* spp.) tree ferns that were being cultivated in the Kula area, near 2,500 ft (762 m) elevation. Hapu'u ferns are shipped to Maui from the island of Hawai'i for ornamental purposes. These ferns go through a "cleaning" before they are shipped, but apparently weed seeds that lay dormant in the fern are not detected. Some time later, these weeds germinate in their new locations. Other weed species including *Melastoma* spp., *Psidium* spp., and *Rubus* spp. have been observed germinating on the surfaces of hapu'u ferns. Some of these, including *Rubus ellipticus*, are noxious weeds, which are illegal to transport inter-island.

CONTROL METHODS

Control of *Rubus* species is not easily done. Often, the plant covers large areas, is hard to handle, is hard to kill, and re-sprouts. Chemical control in Hawai'i is done for other species of *Rubus*, but it is very difficult to completely remove established populations.

Physical control: Mechanical control of this species is tough due to sharp prickles and large thickets. It may be possible to pull or dig up small seedlings. The entire plant, above and below ground, must be carefully removed to prevent re-growth. Plants are sometimes cut back to reduce biomass before chemical control is done.

Chemical control: Various forms of chemical methods can be used to control *Rubus* spp., including foliar, stem injection, cut stump and basal stem methods using glyphosate or triclopyr products. Santos et al. (1992) report that a 50% Garlon 4 in a foliar drizzle spray and a 20% Tordon 22K in water on cut stumps as moderately effective for *Rubus ellipticus*, though further testing was advised.

Biological control: Several biological control agents have been introduced to Hawai'i for the related species, *Rubus argutus* (prickly Florida blackberry).

Cultural control: The public could become familiar with *R. ellipticus* and report any sightings of it or other unusual plants growing on their hapu'u ferns.

Noxious weed acts: *Rubus ellipticus* is a noxious weed in Hawai'i (GRIN 2003).

MANAGEMENT RECOMMENDATIONS

Rubus ellipticus is a weedy raspberry that was introduced to Volcano, Hawai'i in 1961. Today, it is well established in disturbed wet forests, 1,800-5,580 ft (700-1,700 m) elevation, and thrives in sunny open pastures as well as deep rain forests (Gerrish et al. 1992, Santos et al. 1992). *Rubus ellipticus* is a potential threat to similar areas on Maui. There are currently no known wild populations of *Rubus ellipticus* on Maui. However, *Rubus ellipticus* has been found growing on hapu'u ferns that were shipped from the island of Hawai'i to Maui and grown in gardens as ornamentals. These ferns appear "clean" during transport, then seeds sprout some time later in their new locations. There are likely more locations on Maui where *Rubus ellipticus* will be found in the future. *Rubus ellipticus* is a noxious weed and strategies for preventing inter-island transport are needed. Other Hawaiian Islands should be on the look out for *R. ellipticus* on hapu'u ferns and products.

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