Falcataria moluccana

Molucca albizia
Fabaceae

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OVERVIEW

Falcataria moluccana has been widely planted throughout the world for ornament and reforestation. It was first introduced to Hawai'i in 1917 by Joseph Rock (Little and Skolmen 1989). In Hawai'i, *F. moluccana* has been planted by the hundreds of thousands for ornament and reforestation. Trees are attractive and the wood is useful for a variety of things from furniture making to canoe building. However, trees are spreading from initial plantings to adjacent pastures, forests, and disturbed areas. Because of its widespread distribution throughout the state coupled with its popularity, perhaps the best approach currently would be to control the tree in certain sites where it is not wanted, such as natural areas, pastures, and farmland. Seeds tend to fall nearby and trees do not disperse over a long distance (miles), except when people move the tree to a new area. If this dispersal trend were to change, such as if a vector to spread the trees further arrived or if it was planted again on a grand scale to new areas, the tree may become a bigger problem.

TAXONOMY

Family: Fabaceae (pea family) (Wagner et al. 1999).
Latin name: *Falcataria moluccana* (Miq.) Barneby and Grimes (Herbarium Pacificum Staff 1998).
Synonyms: *Paraserianthes falcataria* (L.) I. Nielsen (Wagner et al. 1999), *Albizia falcataria* (L.) Fosberg, *A. falcata* (L.) Backer (Little and Skolmen 1989).
Common names: Molucca albizia (Little and Skolmen 1989).
Taxonomic notes: There seems to be a lot of name changing and rearranging that has occurred within this complex.
Nomenclature: Previously named *Paraserianthes* derived from the Greek *para*, meaning near, *serianthes*, from the Greek *serikon*, meaning silk, and *anthos*, meaning flower, referring to the silky appearance of the flowers (Wagner et al. 1999).
Related species in Hawai'i: A number of species related to *Falcataria moluccana* have been planted in Hawai'i. One related species that was widely planted on Maui is *Paraserianthes lophantha* (Willd.) I. Nielsen subsp. *montana* (Jungh.) I. Nielsen [syn. *Albizia lophantha, Albizia montana*], of which over 140,000 trees were planted on Maui from 1910-1960 in the areas of Koolau, Kula, Makawao, and Waihou Springs (Skolmen 1960). This species was recently reported by Oppenheimer and Bartlett (2002) as naturalized in the Kula Forest Reserve on Maui. This species is also invasive in New Zealand (Haley 1997). Other species planted in lesser numbers in Hawai'i from 1910-

1960 include: *Albizia acle, A. caribaea, A. chinensis, A. katangensis, A. lebbekoides, A. procera, A. saponaria, and A. zygia* (Skolmen 1960).

DESCRIPTION

"Trees up to 40 m tall, bark white, gray, or greenish, smooth or slightly warty, young parts densely reddish brown tomentose or puberulent. Leaves with a nectary below the lowermost pair of pinnae and smaller ones between or below most pairs of pinnae, pinnae (4-)8-15 pairs, leaflets 15-25 pairs per pinna, obliquely elliptic, falcate, 10-20 mm long, 3-6 mm wide, midrib strongly excentric near 1 of the margins. Flowers in panicles ca. 20 cm in diameter, often with 2 serial branches from 1 bract scar; calyx 1-1.5 mm long, silky pubescent, the teeth .5 mm long; corolla cream or greenish yellow, 3-4.5 mm long (excl. stamens); stamens 10-17 mm long. Pods 9-12 cm long, 1.5-2.5 cm wide, densely pubescent or glabrous, with a narrow, longitudinal wing along the upper suture. Seeds transversely arranged, ellipsoid, 5-7 mm long, 2.5-3.5 mm wide, laterally flattened, with a pleurogram ca. 3 mm long and 1.5 mm wide" (Wagner et al. 1999).

BIOLOGY & ECOLOGY

Cultivation: *F. moluccana* was originally introduced to Hawai'i in 1917 by Joseph Rock from North Borneo and Java as an ornamental and for reforestation (Wagner et al. 1999, Little and Skolmen 1989). About 138,000 *F. moluccana* trees were planted for reforestation in Hawai'i between 1910 and 1960 (Skolmen 1960). Most of the trees, about 112,500, were planted on Kaua'i, about 16,700 trees were planted on O'ahu, 8,600 on Hawai'i island, 4 on Moloka'i, and 14 on Maui. Additional plantings have occurred on all the islands as well. *F. moluccana* trees are aesthetic and have a laterally branching self cleaning habit, smooth attractive gray bark, and pretty white silky feather like flowers. In newly built subdivisions in Ha'iku where old plantations persist, many of the larger trees are kept because they are attractive. On Maui, canoe builders have used trees from near the Ha'iku reservoir. It is grown elsewhere in the world as a shade tree for coffee (Smith 1998). According to Little and Skolmen (1989), "The heartwood is pale yellow brown with a pink tinge and the sapwood is white. The wood is lightweight, coarse-textured, and essentially unfigured. It has strength equivalent to ponderosa pine and machines well. On the island of Hawai'i, over 1 million board feet of timber have been cut. Most of which was made into corestock veneer. It has also been used in lumber from for lightweight pallets, boxes, and shelving. It is also suitable for internal furniture parts."

Invasiveness: *F. moluccana* can spread from abundant seeds contained in lightweight pods that blow in the wind. Little and Skolmen (1989) report that this tree is established naturally in abandoned sugarcane fields as well as in the forest wherever there are seed trees. They add that the tree produces abundant seeds and rapidly spreads in areas below 1,000 ft (305 m) elevation with 80-150 (2,032-3,810 mm) annual rainfall. In addition, growth rates are rapid with as much as 15 ft (4.5 m) a year (Little and Skolmen 1989). Folks who live near these trees on Maui note that the trees drop large limbs and no items of importance should be underneath them.

Pollination: Unknown.

Propagation: *F. moluccana* can be propagated from seeds.

Dispersal: *Falcataria moluccana is* originally dispersed long distances via humans who plant the tree for landscaping, forestry, or other purposes. From there, *Falcataria*, with prolific seed production, spreads to nearby forests, pastures, and open areas. Seed pods are lightweight and spread on the wind (Little and Skolmen 1989). Smith (1998) reports that seeds were sown from aircraft in Hawai'i.

Pests and diseases: Unknown.

DISTRIBUTION

Native range: *F. moluccana* is native to the Moluccas, New Guinea, New Britain, and the Solomon Islands (Wagner et al. 1999).

Global distribution: *F. moluccana* is widely planted throughout the world for reforestation (Wagner et al. 1999).

State of Hawai'i distribution: In Hawai'i, *F. moluccana* is naturalized in disturbed mesic to wet areas, 25-600 m (82-1,968 ft), on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i (Wagner et al. 1999; Oppenheimer and Bartlett 2002). According to Smith (1998), it grows from sea level to 1,500 m (4,921 ft) elevation, but is common in mesic, lowland areas, in windward O'ahu, in the Mililani area and above Lualualei, and on Kaua'i in upper Wailua. On Hawai'i, we observed it invading abandoned cane land in Wood Valley.

Island of Maui distribution: Oppenheimer and Bartlett (2002) recently reported *Falcataria moluccana* as a new island record for Maui. The collection of the naturalized specimen was from Pohakupule Gulch, 183 m (600 ft) elevation, Honokahau, West Maui. It will be published as a range extension from East Maui also where it was recently collected on East Kuiaha Rd., Ha'iku, 198 m (650 ft) elevation (Starr et al. 2003, in press). There are a few sites on Maui where *Falcataria moluccana* was observed during recent baseline mapping. On West Maui, it is present at the location mentioned above as well as in Kapalua, on Hwy. 30, near Office Road. There is also a fairly good size plantation in Waihe'e above the abandoned macadamia nut plantation and surrounding the reservoir. Large trees that were planted are observed here as well as trees of all different size classes that are spreading from the initially planted trees. In Ha'iku, East Maui, there is a similar plantation style planting with trees of different size classes spreading away from the initial plantings. Both planted and naturalized trees are also located along the Hana Hwy. near the Kolea section of the Forest Reserve. Most of these locations are in the lowlands in mesic to wet sites.

CONTROL METHODS

Not much literature was available for the control of *Falcataria moluccana*. However, there was information from New Zealand on the control of related species, *Paraserianthes lophantha* subsp. *montana*. This information is listed below.

Physical control: Seedlings can be hand pulled. Debris should be disposed of in a way that will contain seeds so that new plants don't crop up in unwanted areas.

Chemical control: Trees can be controlled chemically with either a cut stump or frill method. For *cut stump*, cut tree near ground level and paint immediately with an herbicide, such as Garlon 3A. This method works well if the entire tree is to be removed. Haley (1997) reports that felling trees may open up new space and light gaps for *Falcataria* seedling growth, so frilling is the preferred method. For *frill* method, girdle or ring the bark from a height of 20 cm to ground level and paint exposed area immediately with an herbicide, such as Garlon 3A. This method is best to control many trees without having to remove any debris. It is uncertain whether *basal bark* method works, but it could be tried. Paint around the trunk with an herbicide, such as Garlon 4, completely painting around the trunk. This method, if it controls this species effectively, works well to kill a lot of trees in a timely manner.

Biological control: No information on biological control was found.

Cultural control: The public could be asked not to spread trees to areas currently free of *Falcataria*. Alternative trees, such as the native koa (*Acacia koa*) could be used instead.

Noxious weed acts: Not listed on any noxious weed lists.

MANAGEMENT RECOMMENDATIONS

Falcataria moluccana has been widely planted in Hawai'i and is spreading from initial plantings to nearby forests, pastures, and disturbed areas. Most plantings are in lowland mesic to wet areas. Sites that are near natural areas, such as the West Maui sites near Kapalua that are adjacent to the Pu'u Kukui watershed and the Hana Hwy. sites that are below East Maui rain forests may be areas to do some control work. This species could be monitored in the future to keep track of spread. The related species, *Paraserianthes lophantha* subsp. *montana*, of which over 140,000 were planted on Maui, mostly in the Kula Forest Reserve, should be investigated, mapped, and monitored. Alternative trees, such as koa (*Acacia koa*) could be used in the future in landscaping efforts.

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