

*Falcataria moluccana*  [简体中文](#) [正體中文](#)

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Fabales	Fabaceae

**Common name** tamaligi paepae (English, Samoa), falcata (English), parasiente (Portuguese), ukall ra ngebard (Palauan), tuhke kerosene (English), mara (Portuguese), tamaligi, tamalini (Samoan), albizzia (English), tuhkehr karisihn (Pohnpeian), tamaligi palagi (English, American Samoa), tuhke kerosin (Pohnpeian), peacock plume (English), sau (English), malacana (English), tamaligi uliuli (English, Samoa), 'arapitia (Cook Islands), albízia (Portuguese)

**Synonym** *Adenantha falcataria*, L.  
*Albizia falcataria*, (L.) Fosb.  
*Albizia moluccana*, Miq.  
*Paraserianthes falcataria*, (L.) I. Nielsen  
*Albizia falcata*, auct. pl.  
*Albizia moluccana*, F.A. Miquel  
*Paraserianthes falcataria*, subsp. *falcataria*

## Similar species

**Summary** *Falcataria moluccana* is an invasive, nitrogen-fixing tree species. It has been introduced to the Seychelles, Mauritius, Reunion and many Pacific islands; including, most notably, Hawaii where it has become a problematic invader. Its rapid growth habit allows it to outcompete slow-growing native trees, and its abundant, high-quality litter alters nutrient dynamics in the soil. This affects decomposition rates and microorganism and invertebrate community composition. Ecosystem processes may be altered in both terrestrial and aquatic environments where *F. moluccana* invades riparian areas.



[view this species on IUCN Red List](#)

## Species 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 large 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 0.5 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).

## Lifecycle Stages

Produces abundant seeds contained in lightweight pods and are dispersed by wind (Little & Skolmen, 1989 in Starr *et al.*, 2003).



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Falcataria moluccana*

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## Uses

*Falcataria moluccana* was originally introduced to Hawaii in 1917 from North Borneo and Java. Since then this tree has been planted in the hundreds of thousands. It is used for reforestation and as an ornamental due to its aesthetic looks, including attractive gray bark and feather-like flowers (Wagner et al. 1999; Starr et al. 2003). Plantations of *F. moluccana* have also been established in Hawaii short-rotation forestry applications, due to its fast growth and nitrogen fixation capacity (Binkley & Giardina, 1997 in Hughes & Denslow, 2005). The wood is used for a variety of purposes including canoe building and furniture making (Starr et al. 2003).

Japanese farmers in Palau planted *F. moluccana* for use as a shade tree for cacao, coffee and tea plantations (Endress, 2002).

More recently *F. moluccana* has been approved for use as a biofuel, to generate electricity on the Hawaiian island of Kauai (Eagle, 2008; Chimera et al., 2010).

## Habitat Description

*Falcataria moluccana* grows well on a variety of soil types, including degraded sites and acidic or nutrient poor soils (Hughes & Denslow, 2005). It is able to grow on poor soils due to its nitrogen-fixing roots (Kitalong, 2008). In Hawaii *F. moluccana* often establishes on young lava flows with minimal soil development (Mascaro et al. 2009). In Hawaii *F. moluccana* spreads rapidly in areas below 305 m elevation with 2,032-3,810 mm annual rainfall (Little & Skolmen, 1989 in Starr et al., 2003).

## General Impacts

The exotic nitrogen-fixing tree *Falcataria moluccana* dramatically alters forest structure and litter inputs in forests it invades. In rare wet lowland forest on young lava flows in Hawaii, *F. moluccana* is a particular problem as it grows rapidly, reducing light-levels and outcompeting native slow-growing *Metrosideros polymorpha*. Enhanced leaf litter quality and quantity of *F. moluccana* compared to native species causes increases in soil nutrient levels, decomposition rates, microorganism community composition and soil invertebrates. Ecosystem processes are altered in both terrestrial and aquatic environments where *F. moluccana* invaded riparian areas (Hughes & Denslow, 2005; Allison et al., 2006; Atwood et al., 2010).

For a detailed account of the impacts of *F. moluccana* please read [Impacts of Falcataria moluccana](#).

## Management Info

**Preventative measures:** A [Risk Assessment of \*Falcataria moluccana\*](#) produced a high score of 8 and a recommendation of: "reject the plant for import (Australia) or species likely to be of high risk (Pacific)." (PIER, 2005). This species is also listed on the Hawaii state Noxious Weed List (Ostertag *et al.*, 2009).

**Cultural control:** The planting of *F. moluccana* is discouraged in many regions; both where it is a known invasive and where further research is required to determine its impact (e.g Space & Flynn, 2000b; Space *et al.*, 2003; Space *et al.*, 2004; Space *et al.*, 2009). In Hawaii, Starr *et al.* (2003) recommend asking public not to spread trees and to instead plant alternatives such as native koa (*Acacia koa*).

**Manual control:** Girdling (ring-barking) of *F. moluccana* in the sapling stage may be a cost-effective control measure (Mueller-Dombois, 2008). It is relatively easy to achieve and tends to be successful (Gerlach, 2004). Uprooting seedlings and saplings, followed by chemical control can also be effective (Meyer, 2008). *F. moluccana* is also reportedly susceptible to being killed by root damage by heavy equipment (Motooka *et al.*, 2003).

**Chemical control:** *F. moluccana* is very susceptible to hormone-type herbicides. 2,4-D and glyphosate cause severe injury, while dicamba and triclopyr are even more effective. Herbicides may be applied by injecting into the trunks of trees, or as a spray on the trunk after debarking (Motooka *et al.*, 2003; Meyer, 2008).

**Integrated management:** Trees can be removed by hand or using saws, and stumps treated with a triclopyr-based herbicide to prevent resprouting (Ostertag *et al.*, 2009). Ostertag *et al.*, (2009) carried out removal experiments in Hawaii to determine native species' response to the removal of all invasive trees and shrubs from plots. While there were major environmental changes in removal plots, native species growth and litterfall productivity did not change over three years, confirming the slow growth response capabilities of Hawaiian trees. However with continued removal of invasive species, it may be possible to alter the seedbank enough to encourage native regeneration (Cordell *et al.*, 2009). Cordell *et al.* (2009) recommend non-native species removal to encourage natural regeneration, with supplemental native species planting as an additional strategy. Follow-up removal is essential to success (Cordell *et al.*, 2009). In reality, treating and sustaining such removal plots to control invasive species is highly labour intensive, and may not be feasible at a regional scale (Ostertag *et al.*, 2008).

**Other:** Recently *F. moluccana* has been approved for use as a biofuel, to generate electricity on the Hawaiian island of Kauai (Eagle, 2008; Chimera *et al.*, 2010). The president of the project states that "the project will reduce the overall amount of albizia on island and positively benefit the community". However in order to fulfill the wood requirements, an additional 2000 acres of *F. moluccana* would be necessary. However Chimera *et al.* (2010) list a number of reasons why this is unlikely to result in effective control of the invasive tree, and will most likely lead to it being more widely planted and greater spread.

## Pathway

Spread long distances by humans who plant the tree for landscaping, forestry or other purposes (Little & Skolmen, 1989 in Starr *et al.*, 2003). Grown as an ornamental garden plant due to its attractive flowers. Spread long distances by humans who plant the tree for landscaping, forestry or other purposes (Little & Skolmen, 1989 in Starr *et al.*, 2003).

## Principal source:

**Compiler:** Comité français de l'IUCN (IUCN French Committee) & IUCN SSC Invasive Species Specialist Group (ISSG)

## Review:

**Publication date:** 2008-03-14

## ALIEN RANGE

[2] AMERICAN SAMOA

[1] BANGLADESH



# GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Falcataria moluccana*

- |                              |                                     |
|------------------------------|-------------------------------------|
| [1] CAROLINE ISLANDS         | [1] CHILE                           |
| [6] COOK ISLANDS             | [3] FIJI                            |
| [17] FRENCH POLYNESIA        | [1] GUAM                            |
| [1] MAURITIUS                | [5] MICRONESIA, FEDERATED STATES OF |
| [2] NEW CALEDONIA            | [1] NIUE                            |
| [2] NORTHERN MARIANA ISLANDS | [3] PALAU                           |
| [1] PAPUA NEW GUINEA         | [1] REUNION                         |
| [3] SAMOA                    | [3] SEYCHELLES                      |
| [1] SINGAPORE                | [3] TONGA                           |
| [7] UNITED STATES            | [1] WALLIS AND FUTUNA               |

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