

Family: *Simaroubaceae*

Taxon: *Soulamea amara*

Synonym: NA

Common Name: Buwa hati
kayu sulamu
sulamu pohon
Dschiri pangpang
bitter tree

Questionnaire : current 20090513
Status: Assessor Approved

Assessor: Chuck Chimera
Data Entry Person: Chuck Chimera

Designation: L(Hawai'i)

WRA Score -1

101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?	y=1, n=-1	
103	Does the species have weedy races?	y=1, n=-1	
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	n
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	n
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	n
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	
405	Toxic to animals	y=1, n=0	
406	Host for recognized pests and pathogens	y=1, n=0	
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	
801	Prolific seed production (>1000/m ²)	y=1, n=-1	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	
Designation: L(Hawai'i)		WRA Score	-1

Supporting Data:

101	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Is the species highly domesticated? No evidence]
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	2003. Vander Velde, N.. The Vascular Plants of Majuro Atoll, Republic of the Marshall Islands. Atoll Research Bulletin. 503: 1-141.	[Species suited to tropical or subtropical climate(s) 2-High] "Indigenous, to at least on some atolls of the Marshall Islands, but of recent introduction to Majuro. Rare. Indo-Pacific as far east as Solomon Islands and Vanuatu in Melanesia and to the Caroline Islands and Marshall Islands in Micronesia."
202	2003. Vander Velde, N.. The Vascular Plants of Majuro Atoll, Republic of the Marshall Islands. Atoll Research Bulletin. 503: 1-141.	[Quality of climate match data 2-High]
203	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. 1(6): 193–226.	[Broad climate suitability (environmental versatility)? No. Coastal tropical species] "The majority of the localities are situated on small islands or islets, and atolls, a peculiarity which it shares with very many other beach plants, such as <i>Pisonia grandis</i> , <i>Suriana maritima</i> , etc. Though its distribution is less erratic as compared with <i>Suriana</i> , it is less common than could be expected; the reason of its preference will probably rather lie in a sort of exacting habitat than in the chances offered by dispersal."
203	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Broad climate suitability (environmental versatility)? No. Tropical littoral species] "Simaroubaceae are found in moist lowland tropical forest (although <i>Brucea mollis</i> is recorded as a high as 1,800 m in the Philippines, and <i>Odyndea gabonensis</i> at 2,500 m in Gabon), dry deciduous forest, and open sandy or savannah- type vegetation. <i>Soulamea amara</i> is a littoral species, <i>Castela</i> and <i>Holacantha</i> are found in desert and dry scrub environments, and <i>Leitneria</i> , <i>Samadera indica</i> and occasionally <i>Pierreodendron</i> inhabit swamp forest."
204	2003. Vander Velde, N.. The Vascular Plants of Majuro Atoll, Republic of the Marshall Islands. Atoll Research Bulletin. 503: 1-141.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Indigenous, to at least on some atolls of the Marshall Islands, but of recent introduction to Majuro. Rare. Indo-Pacific as far east as Solomon Islands and Vanuatu in Melanesia and to the Caroline Islands and Marshall Islands in Micronesia."
204	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Thirteen species, one widespread in SE Asia and Polynesia (<i>S. amara</i> Lam.),..."
205	2005. Imada, C.T./Staples, G.W./Herbst, D.R.. Annotated Checklist of Cultivated Plants of Hawai'i. The Bishop Museum, http://www2.bishopmuseum.org/HBS/botany/cultivatedplants/	[Does the species have a history of repeated introductions outside its natural range?? Hawaii] "First Collected: 1995 Locations: Waimea Arboretum & Botanical Garden (Confirmed)"
205	2012. WRA Specialist. Personal Communication.	[Does the species have a history of repeated introductions outside its natural range? No evidence]
301	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Naturalized beyond native range? No evidence]
301	2012. Wagner, W.L./Herbst, D.R./Khan, N./Flynn, T.. Hawaiian Vascular Plant Updates: A Supplement to the Manual of the Flowering Plants of Hawai'i & Hawai'i's Ferns & Fern Allies. http://botany.si.edu/pacificislandbiodiversity/hawaiianflora/supplement.htm	[Naturalized beyond native range? No evidence]
302	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? No evidence]
303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No evidence]
304	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No evidence]

305	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Congeneric weed? No evidence]
401	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Produces spines, thorns or burrs? No] "Shrubs or small trees to 5(–15) m, dioecious or flowers bisexual (<i>S. amara</i>). Leaves unifoliolate or imparipinnate; leaflets opposite, petiolulate, leaves petiolate, entire and often revolute, densely pubescent or glabrous on adaxial surface, sometimes with glands."
402	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193–226.	[Allelopathic? Unknown, but co-occurs with other species] "associated with <i>Messerschmidia argentea</i> , <i>Scaevola taccada</i> , and <i>Ochrosia</i> , sometimes (but not in Malaysia) dominant as a rather small shrub along the shore, and of more scattered occurrence as a treelet more inland."
403	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Parasitic? No evidence] "Shrubs or small trees to 5(–15) m..." [Simaroubaceae]
404	2012. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals? Unknown]
405	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193–226.	[Toxic to animals? Unknown] No evidence
405	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Toxic to animals? Unknown] No evidence
406	2012. WRA Specialist. Personal Communication.	[Host for recognized pests and pathogens? Unknown]
407	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193–226.	[Causes allergies or is otherwise toxic to humans? Possibly, if used medicinally and taken at incorrect dosage] "Uses. The roots and fruits of this very bitter plant are often used against cholera, pleurisy, and other fevers. Powdered and mixed with water the beverage is taken against colic and cough. In poisoning, e.g. by snake bites, the fruits are wholesome by urging the patient to vomit (Rumphius, I.e., Heyne, I.e.)."
408	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193–226.	[Creates a fire hazard in natural ecosystems? No evidence that fires are an important factor in this coastal community] "A typical constituent of the <i>Barringtonia</i> formation, but much rarer than most of the species belonging to that formation, though locally common on the sandy beach and behind coral reefs, below 3 m,"
409	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193–226.	[Is a shade tolerant plant at some stage of its life cycle? Unlikely. Coastal areas and atolls are typically high light environments] "The majority of the localities are situated on small islands or islets, and atolls, a peculiarity which it shares with very many other beach plants, such as <i>Pisonia grandis</i> , <i>Suriana maritima</i> , etc."
410	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193–226.	[Tolerates a wide range of soil conditions? No] "Mr L. S. Smith (in litt.) suggested that <i>Suriana</i> and other rare littoral plants avoiding continental shores (<i>Messerschmidia argentea</i> , <i>Soulamea amara</i>) might prefer highly calcareous beaches which, of course, are much more prevalent on islands than on the mainland where rivers silt the coral by outflow of freshwater and sediments."
411	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Climbing or smothering growth habit? No] "Shrubs or small trees to 5(–15) m..." [Simaroubaceae]
412	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193–226.	[Forms dense thickets? No evidence] "A typical constituent of the <i>Barringtonia</i> formation, but much rarer than most of the species belonging to that formation, though locally common on the sandy beach and behind coral reefs, below 3 m,..." ... "sometimes (but not in Malaysia) dominant as a rather small shrub along the shore, and of more scattered occurrence as a treelet more inland." [Dominant, but no evidence that monocultures are formed]

412	1990. Fosberg, F.R.. A Review of the Natural History of the Marshall Islands. Atoll Research Bulletin No. 330. Smithsonian Institution, Washington, D.C.	[Forms dense thickets? No evidence, although seedling carpets have formed] "No ground cover except in thinner places where it is similar to that in openings but sparser, and occasionally under <i>Soulamea</i> trees, where seedlings form a carpet. <i>Tournefortia</i> very soon drops out, <i>Soulamea</i> becomes more abundant. Finally scrub forest is <i>Soulamea</i> and <i>Scaevola</i> ." ... "Along sandy reentrant back of scrub the belt is a mixed forest of <i>Premna</i> , <i>Morinda</i> , <i>Soulamea</i> , <i>Pandanus</i> , <i>Neisoswerma</i> , <i>Scaevola</i> , etc. varying locally to pure <i>Neisoswerma</i> , on fine gray soil." ... "Away from the lagoon the woody second story becomes more abundant, forming thickets, composed of <i>Pandanus</i> , <i>Morinda</i> , <i>Terminalia</i> , <i>Soulamea</i> , a little cordial tangled with <i>I-omoea macrantha</i> and <i>Canavalia</i> , and choked with coconut seedlings of all ages."
501	2011. Globimed. <i>Soulamea amara</i> [Accessed 29 Aug 2012]. http://www.globinmed.com/index.php?option=com_content&view=article&id=100402:soulamea-amara-lamk&catid=383:s	[Aquatic? No] " <i>S. amara</i> is a shrub or small tree and up to measure about 5(-15) m tall. The young shoots and buds are rusty hairy. The leaves are simple, spirally arranged, crowded at the apex of the branchlets, leaving large scars, blade obovate-oblong in shape, with a size of measuring 10-35 cm x 4-12 cm, wedge-shaped base, obtuse apex, sometimes mucronate, entire margin, hairy, prominent below midrib while the lateral veins are parallel end in an intramarginal looped vein. The petiole is measuring 3-8 cm long. Stipules are absent."
502	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Grass? No] "Shrubs or small trees to 5(-15) m..." [Simaroubaceae]
503	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Nitrogen fixing woody plant? No] "Shrubs or small trees to 5(-15) m..." [Simaroubaceae]
504	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Shrubs or small trees to 5(-15) m..." [Simaroubaceae]
601	1962. Nooteboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Evidence of substantial reproductive failure in native habitat? No evidence] "Under the parent plant seedlings may be found in great profusion."
601	1990. Fosberg, F.R.. A Review of the Natural History of the Marshall Islands. Atoll Research Bulletin No. 330. Smithsonian Institution, Washington, D.C.	[Evidence of substantial reproductive failure in native habitat? No evidence]
602	1990. Fosberg, F.R.. A Review of the Natural History of the Marshall Islands. Atoll Research Bulletin No. 330. Smithsonian Institution, Washington, D.C.	[Produces viable seed? Yes] "No ground cover except in thinner places where it is similar to that in openings but sparser, and occasionally under <i>Soulamea</i> trees, where seedlings form a carpet."
602	2011. Globimed. <i>Soulamea amara</i> [Accessed 29 Aug 2012]. http://www.globinmed.com/index.php?option=com_content&view=article&id=100402:soulamea-amara-lamk&catid=383:s	[Produces viable seed Yes] " <i>S. amara</i> is a typical constituent of the <i>Barringtonia</i> formation, which occurs specifically on sandy beaches and behind coral reefs. It is sometimes found as a scattered treelet more inland. Under the parent plants, seedlings may be found in great profusion."
603	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Hybridizes naturally? Unknown] No hybrids reported
604	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Self-compatible or apomictic? Unknown] "Simaroubaceae can be hermaphroditic, monoecious or dioecious. The extent of self-compatibility is unknown; however, flowers of <i>Quassia amara</i> have been shown to self-fertilise (Roubik et al. 1985)." ... "Shrubs or small trees to 5(-15) m, dioecious or flowers bisexual (<i>S. amara</i>)."
605	1962. Nooteboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Requires specialist pollinators? No evidence] "Pollination. Is probably performed by insects, as the flowers are often reported to be fragrant. They are either unisexual or functionally so, or bisexual."

605	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Requires specialist pollinators? No evidence] "Flowers in Simaroubaceae are small, actinomorphic, open and 4- or 5- merous (3-merous in Soulamea), with an intrastaminal nectary disk." ... "Insect-pollination predominates in the family, the flowers typically being small, actinomorphic, open, fragrant and borne in thyrses, attracting generalist small insects such as bees and moths (e.g. Aubreville 1962; Hardesty et al. 2005)." ... "Flowers in axillary, elongate determinate thyrses, typically with a single, often ferruginous-tomentose major axis; sepals 3(-5), basally connate; petals 3(-5), glabrous to pubescent towards the base; stamens 6(-10); filaments lacking appendage; anthers basifixed to dorsifixed; staminodes absent in staminate flowers; disk fleshy, glabrous; carpels 2(3), connate; stylopedia distinct, flattened, horizontally appressed to carpel, stigma fleshy, rarely reniform."
606	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Reproduction by vegetative fragmentation? Unknown] "No ground cover except in thinner places where it is similar to that in openings but sparser, and occasionally under Soulamea trees, where seedlings form a carpet." [Evidence suggests reproduction occurs by seed only]
607	2012. WRA Specialist. Personal Communication.	[Minimum generative time (years)? Unknown]
701	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No evidence] "Fruit obcordate, up to 2 by 2 1/2 cm, strongly emarginate, wings often nearly touching by the inward curved style-bases; pericarp hard corky." [Water-dispersed, and otherwise lacking means of external attachment]
702	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Propagules dispersed intentionally by people? Possibly. Widespread distribution, but no evidence of intentional dispersal by people]
703	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Propagules likely to disperse as a produce contaminant? No evidence] "I agree with Ridley (Disp. p. 264) that the fruits possess buoyancy power and seem adapted to dispersal by seawater; Hemsley recorded that seeds have been found in the crop of birds in the Admiralty Is."
704	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Propagules adapted to wind dispersal? No] [Genus Description] "Fruit samaroid, 2-celled, obcordate, flattened, with a distinct wing, 10-20 mm long, exocarp brown at maturity, pericarp dry." [Species Description] "Fruits of Samadera indica, a species that frequents alluvial and swamp forest, and Soulamea amara, a littoral species, are dispersed by water (Nootboom 1962), which may account for their broad geographical distributions."
705	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Propagules water dispersed? Yes] "Fruits of Samadera indica, a species that frequents alluvial and swamp forest, and Soulamea amara, a littoral species, are dispersed by water (Nootboom 1962), which may account for their broad geographical distributions."
706	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Propagules bird dispersed? Possibly Yes] "Hemsley recorded that seeds have been found in the crop of birds in the Admiralty Is."
706	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	[Propagules bird dispersed? No evidence. But see Nootboom (1962)] "Fruit samaroid, 2-celled, obcordate, flattened, with a distinct wing, 10-20 mm long, exocarp brown at maturity, pericarp dry." ... "Fruits of Samadera indica, a species that frequents alluvial and swamp forest, and Soulamea amara, a littoral species, are dispersed by water..."
707	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Propagules dispersed by other animals (externally)? No evidence] "Dispersal. Unfortunately little is known on this subject. The fruits of Suriana maritima and Soulamea amara are certainly dispersed by seawater and this seems to have been very effective."
708	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Propagules survive passage through the gut? Possibly Yes] "Hemsley recorded that seeds have been found in the crop of birds in the Admiralty Is."
801	1962. Nootboom, H.P.. Simaroubaceae. Flora Malesiana. I(6): 193-226.	[Prolific seed production (>1000/m2)? Possibly. High seedling numbers under parent trees] "Shrub or small tree, up to 5 (-15) m." ... "Fruit obcordate, up to 2 by 2 1/2 cm, strongly emarginate, wings often nearly touching by the inward curved style-bases; pericarp hard corky." ... "Under the parent plant seedlings may be found in great profusion."
802	2008. Royal Botanic Gardens Kew. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown] No information on seed storage or seed longevity
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species
804	2012. WRA Specialist. Personal Communication.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Unknown]

Summary of Risk Traits

High Risk / Undesirable Traits

- Thrives in tropical climates (could naturalize in similar climate of Hawaiian Islands)
- Viable seeds dispersed by water

Low Risk / Desirable Traits

- No negative impacts or history of invasiveness have been documented
- Unarmed (no spines, thorns or burrs)
- Medicinal value