Taxon: Volkameria inermis L. **Family:** Lamiaceae

Common Name(s): garden quinine
seaside clerodendrum
unarmed glory bower

Synonym(s): Clerodendrum commersonii (Poir.) C
Clerodendrum inerme (L.) Gaertn.
Volkameria commersonii Poir.

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 23 Mar 2021

WRA Score: 9.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Naturalized, Scrambling Shrub/Liana, Thicket-Forming, Bird-Dispersed, Water-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
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	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed		
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed		
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
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	y

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	y
412	Forms dense thickets	y=1, n=0	y
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		
604	Self-compatible or apomictic	y=1, n=-1	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
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	y
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	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m2)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**n**
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	No evidence

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	NA

Qsn #	Question	Answer
201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**High**
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 22 Mar 2021]	"Native Asia-Temperate CHINA: China [Fujian Sheng, Guangdong Sheng, Guangxi Zhuangzu Zizhiqu, Hainan Sheng] EASTERN ASIA: Japan [Kyushu (s.), Ryukyu Islands], Taiwan Asia-Tropical INDIAN SUBCONTINENT: Bangladesh, India [Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu (incl. Rameswaram island), West Bengal, Karnataka], Sri Lanka PAPUASIA: Indonesia [Papua], Papua New Guinea, Solomon Islands INDO-CHINA: Indochina, India [Andaman and Nicobar Islands], Myanmar, Thailand MALESIA: Indonesia [Kalimantan, Jawa, Lesser Sunda Islands, Maluku, Sumatera], Malaysia [Sabah, Sarawak, Selangor, Johor, Melaka, Pahang, Perak], Philippines [Luzon, Mindanao, Mindoro, Cagayan Valley (Region II), Eastern Visayas (Region VIII), Panay, Autonomous Region in Muslim Mindanao] Australasia AUSTRALIA: Australia [New South Wales (n.e.), Queensland, Northern Territory (n.)] Pacific NORTHWESTERN PACIFIC: Marshall Islands, United States [Northern Mariana Islands] SOUTH-CENTRAL PACIFIC: French Polynesia SOUTHWESTERN PACIFIC: Fiji, New Caledonia, Vanuatu"

202	Quality of climate match data	High
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 22 Mar 2021]	

203	Broad climate suitability (environmental versatility)	n
	Source(s)	**Notes**
	Zich F.A., Hyland B.P.M., Whiffin T., Kerrigan R.A. (2020). Clerodendrum inerme. Australian Tropical Rainforest Plants, Edition 8. https://apps.lucidcentral.org/rainforest/. [Accessed 22 Mar 2021]	"Altitudinal range very small, at or slightly above sea level. Usually grows in close proximity to the sea and is often found near margins or on the margins of beach forest. Also occurs in Asia, Malesia and the Pacific islands."

Qsn #	Question	Answer
	Top Tropicals. (2021). Clerodendrum inerme, Volkameria inermis. https://toptropicals.com/catalog/uid/Clerodendrum_inerme.htm. [Accessed 22 Mar 2021]	"C. inerme is an evergreen mangrove plant, which has found a place in our gardens, is able to thrive near the ocean at the high tide mark, making it a potential weed in the coastal environment."
	Dave's Garden. (2021). Volkameria Species, Glory Bower, Indian Privet, Sorcerers Bush, Wild Jasmine - Volkameria inermis. https://davesgarden.com/guides/pf/go/56224/. [Accessed 22 Mar 2021]	"Hardiness: USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 22 Mar 2021]	"Native: ASIA-TEMPERATE China: China - Fujian, Guangdong, Guangxi, Hainan Eastern Asia: Japan - Kyushu [s.], Ryukyu Islands; Taiwan ASIA-TROPICAL Indian Subcontinent: Bangladesh; India - Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu [incl. Rameswaram island], West Bengal; Sri Lanka North Indian Ocean: India - Andaman and Nicobar Indo-China: Indochina; Myanmar; Thailand Malesia: Indonesia - Irian Jaya, Java, Kalimantan, Lesser Sunda Islands, Moluccas, Sumatra; Malaysia - Johore, Malacca, Pahang, Perak, Sabah, Sarawak, Selangor; Papua New Guinea; Philippines - Batan, Leyte, Luzon, Mindanao, Mindoro, Panay, Sulu Archipelago AUSTRALASIA Australia: Australia - New South Wales [n.e.], Northern Territory [n.], Queensland PACIFIC Northwestern Pacific: Marshall Islands; Northern Mariana Islands South-Central Pacific: French Polynesia Southwestern Pacific: Fiji; New Caledonia; Solomon Islands; Vanuatu"
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence from Hawaiian Islands

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	**Notes**
	Imada, C.T., Staples, G.W. & Herbst, D.R. 2005. Annotated Checklist of Cultivated Plants of Hawai'i. http://www2.bishopmuseum.org/HBS/botany/cultivatedplants/. [Accessed 22 Mar 2021]	"Clerodendrum inerme (Linnaeus) J. Gaertner (Confirmed) First Collected: 1974 Locations: Harold L. Lyon Arboretum (Confirmed) Ho'omaluhia Botanical Garden (Confirmed) Waimea Arboretum & Botanical Garden"

Qsn #	Question	Answer
	El Mokni, R., Kasri, M., & El Aouni, M. H. (2013). Volkameria inermis (Lamiaceae) a new alien species naturalized to the Tunisian coast, first record for North-Africa. Flora Mediterranea 23: 117-122	"It is popularly known as “Seaside Clerodendron” in English (cf. Manoharan & al. 2008). It was introduced in all tropical and inter-tropical countries in the world (cf. N’guessan & al. 2010)."
	Starr, F., Starr, K. & Loope, L. (2003). Clerodendrum inerme. http://www.starrenvironmental.com/. [Accessed 22 Mar 2021]	"This plant has aggressive growth characteristics and may prove to naturalize in places where it is planted, such as Hawai'i. Small seedlings have been observed on the Big Island and it is will probably be documented as an escape from gardens in the near future both there and on Maui."

301	Naturalized beyond native range	y
	Source(s)	**Notes**
	El Mokni, R., Kasri, M., & El Aouni, M. H. (2013). Volkameria inermis (Lamiaceae) a new alien species naturalized to the Tunisian coast, first record for North-Africa. Flora Mediterranea 23: 117-122	"Volkameria inermis L. (Lamiaceae), originating from India, Ceylon, Burma, Malaya, tropical Australia, Polynesia and Philippine Islands, was found naturalized in a coastal area of Hammamet-South (North-East of Tunisia). This report represents the first record for Tunisia anc for the North-Africa." ... "Our recent observations (December 2011; fig. 2-5) show that V. inermis is still present, behaves as a perennial species and continues to reproduce and spread gradually. Its spread and distribution is so far strictly linked to the coastal area of Hammamet-South."
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence in the Hawaiian Islands as of February 2019

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	Starr, F., Starr, K. & Loope, L. (2003). Clerodendrum inerme. http://www.starrenvironmental.com/. [Accessed]	"A large planting of C. inerme can be observed in south Maui on the beach side of the residences along Po'olenalena beach where it rambles over naupaka (Scaevola sericea) and other native coastal plants. Though packed with fragrant flowers and attractive green foliage, this plant shows invasive tendencies and is able to thrive near the ocean at the high tide mark, making it a potential weed in the coastal environment. The full potential invasiveness of C. inerme in Hawai'i is not yet known. Continued monitoring and documentation of its invasive tendencies on Maui and elsewhere in the state are suggested."

Qsn #	Question	Answer
	Josekutty, P. C., Wakuk, E. E., & Joseph, M. J. (2002). Invasive/weedy angiosperms in Kosrae, federated states of Micronesia. Micronesica Suppl. 6: 61–65	[Classified among a group of "highly potent invasive species " but impacts have not been detailed in this publication] "Abstract—An updated account of alien angiosperm species in Kosrae, Federated States of Micronesia (FSM), based on a recent survey of flora in Kosrae is presented. A few highly potent invasive species in Kosrae are Merremia peltata (L.) Merr., Vigna marina (Burm f.) Merr., Panicum maximum Jacq., Pennisetum polystachyon Schult., Saccharum spontaneum L., Commelina diffusa Burn., Chromolaena odorata (L.) King and Robinson, Clerodendrum inerme (L.) Gaertn., Wedelia trilobata (L.) Hitche and the parasitic weed Cuscuta filiformis L." … "Clerodendrum inerme (L.) Gaertn. (Verbanaceae) is well established along the coast and in the disturbed wetland. It is a slow invader into the agricultural land. Kosraeans grow them around the house because it is used in their traditional medicine. It is spreading slowly into the agroforestry system."
	Thaman, B and Niukula, J. (2013). Monuriki Invasive Plant Project – Feasibility Study. Ver.1. National Trust of Fiji, Suva	[Recommended for control. A weedy native with potentially negative environmental impacts] "Some priority might be given to the selective removal of two native plants, beach privet, aria (Clerodendrum inerme), which seems to be spreading out of control on some escarpment and lower coastal open slope locations,"

303	Agricultural/forestry/horticultural weed	
	Source(s)	**Notes**
	Josekutty, P. C., Wakuk, E. E., & Joseph, M. J. (2002). Invasive/weedy angiosperms in Kosrae, federated states of Micronesia. Micronesica Suppl. 6: 61–65	[A slow invader of agricultural land. Impacts unspecified] "Clerodendrum inerme (L.) Gaertn. (Verbanaceae) is well established along the coast and in the disturbed wetland. It is a slow invader into the agricultural land. Kosraeans grow them around the house because it is used in their traditional medicine. It is spreading slowly into the agroforestry system."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	A possible weed of sugarcane. Impacts unspecified. Included in the citation: Backer, C.A. (1973). Atlas of 220 Weeds of sugarcane fields in Java. Editor of 1973 Edition: Steenis, C. G. G. J. van. Published by Deventer: Ysel Press (239 pp.). A reprint of an original publication from the early 1930's

304	Environmental weed	n
	Source(s)	**Notes**
	Biswas, S. R., Choudhury, J. K., Nishat, A., & Rahman, M. M. 2007. Do invasive plants threaten the Sundarbans mangrove forest of Bangladesh?. Forest Ecology and Management, 245(1): 1-9	"Based on the severity of damage and magnitude of spread, we classified the invasive species into three broad categories viz. highly invasive (HI), invasive (I) and potentially invasive (PI)." ... "Table 1 Recorded invasive plants from Sundarbans mangrove forests" [Clerodendrum inerme listed in table as PI, potentially invasive, but this species is native to the region]

Qsn #	Question	Answer
	Starr, F., Starr, K. & Loope, L. (2003). Clerodendrum inerme. http://www.starrenvironmental.com/. [Accessed 22 Mar 2021]	[Potential coastal weed] "A large planting of C. inerme can be observed in south Maui on the beach side of the residences along Po'olenalena beach where it rambles over naupaka (Scaevola sericea) and other native coastal plants. Though packed with fragrant flowers and attractive green foliage, this plant shows invasive tendencies and is able to thrive near the ocean at the high tide mark, making it a potential weed in the coastal environment. The full potential invasiveness of C. inerme in Hawai'i is not yet known. Continued monitoring and documentation of its invasive tendencies on Maui and elsewhere in the state are suggested."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	
	Source(s)	**Notes**
	Meyer, J-Y. 2000. Preliminary review of the invasive plants in the Pacific islands (SPREP Member Countries). Pp. 85-144 in Sherley, G. (ed.). Invasive species in the Pacific: a technical review and draft regional strategy. SPREP, Apia, Samoa	[Clerodendrum inerme = Volkameria inermis] "Among the most significant invasive taxa found in most of these islands are ... the ornamental shrubs Clerodendrum spp...." ... "Many dominant invasive species have been introduced as garden ornamentals because of their showy flowers or leaves, such as Antigonon leptotus in Guam, Miconia calvescens in Tahiti and Hawaii, Hedychium spp. and Clerodendrum quadriloculare in many islands" ...
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Volkameria aculeate and Volkameria glabra listed as weeds of unspecified impacts.

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	[No evidence] "Shrubs. Branches and branchlets pubescent. Petiole ca. 1 cm to leaf subsessile; leaf blade elliptic-lanceolate, ovate-lanceolate, or elliptic, thick papery, abaxially pubescent, adaxially subglabrous and glandular, base obtuse, margin entire, apex obtuse. Inflorescences usually 3-flowered, pubescent; peduncle 2–4 mm; bracts linear, ca. 2 cm. Calyx subtruncate, with minute rudimentary teeth, outside pubescent, inside glabrous, sparsely glandular. Corolla white; tube 2–3 cm, ca. 2 mm in diam. at throat; lobes elliptic, ca. 7 mm. Stamens exserted, pubescent at base of filaments. Style and ovary glabrous. Drupes gray-yellow, obovoid to subglobose, –11 mm in diam."

402	Allelopathic	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	Unknown. Other species in the related genus Clerodendrum have allelopathic properties

403	Parasitic	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 22 Mar 2021]	No evidence. Family: Lamiaceae (alt. Labiatae) Subfamily: Ajugoideae

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	Saenger, P. 2002. Mangrove Ecology, Silviculture and Conservation. Kluwer Academic Publisers, Dordrecht, The Netherlands	"Clerodendrum inerme contains neo-clerodane diterpenes which are responsible for growth inhibition and anti-feeding activity in insects."
	Hong, P.N. & Hoang, T. S. 1993. Mangroves of Vietnam. IUCN, Bangkok, Thailand	[Palatable to goats] "Generally mangroves in Vietnam are not used for grazing as in some other countries...Every day, at neap tide, the goats usually go down to the mangrove area for foraging. Avicennia marina is the preferred species because it is more palatable...The animals also graze on Rhizophora, Kandelia, Excoecaria agallocha and Clerodendron inerme."
	Thaman, B and Niukula, J. (2013). Monuriki Invasive Plant Project – Feasibility Study. Ver.1. National Trust of Fiji, Suva	[Palatable to goats] "There are some indigenous species, such as aria (Clerodendrum inerme), which in the absence of goats, are becoming excessively weedy and spreading to form almost impenetrable thickets."

405	Toxic to animals	n
	Source(s)	**Notes**
	Wagstaff, D.J. (2008). International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence. Used medicinally

406	Host for recognized pests and pathogens	
	Source(s)	**Notes**
	van Valkenburg, J.L.C.H. & Bunyapraphatsara, N., (2001). Clerodendrum L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyapraphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 22 Mar 2021]	"Diseases and pests Leaves of Clerodendrum indicum are often attacked by the fungus Cercoseptoria clerodendri."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	Safford, W.E. (1905). The Useful Plants of the Island of Guam. U.S. Government Printing Office, Washington, D.C.	"C. inerme is used by the natives of Guam, the Philippines, and Samoa as a remedy for intermittent fevers. The leaves, made into poultices, applied to swellings prevent suppuration."

Qsn #	Question	Answer
	Wiart, C. (2006). Medicinal plants of Asia and the Pacific. CRC Press, Boca Raton, FL	"In Burma, the plant is used to counteract the putrefaction of the genitals. In Taiwan and China, the leaves are used externally to treat skin diseases."
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence. Used medicinally

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	Northern Land Manager. (2004). Fire responses of Clerodendrum inerme. http://www.landmanager.org.au/. [Accessed 7 Nov 2014]	"Adult fire response: Resprouter (<30% mortality when subject to 100% leaf scorch) Resprouting type: Basal (lignotuber) +/- epicormic"
	van Valkenburg, J.L.C.H. & Bunyapraphatsara, N., (2001). Clerodendrum L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyapraphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 22 Mar 2021]	[No evidence] "Clerodendrum can be found in many habitats ranging from mangrove, salt marshes and beach forest through grassland thickets up to cloud forest, on soils ranging from saline soils with up to 6.4% salinity, sand dunes to limestone formations."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	**Notes**
	Top Tropicals. (2021). Clerodendrum inerme, Volkameria inermis. https://toptropicals.com/catalog/uid/Clerodendrum_inerme.htm. [Accessed 22 Mar 2021]	"Clerodendrum inerme is a sun loving plant and a sunny spot should be chosen for it. "
	van Valkenburg, J.L.C.H. & Bunyapraphatsara, N., (2001). Clerodendrum L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyapraphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 22 Mar 2021]	"It can be grown in full sun or shade in any well-drained, friable soil. However, Clerodendrum is most abundant at lower elevations."
	Dave's Garden. (2021). Volkameria Species, Glory Bower, Indian Privet, Sorcerers Bush, Wild Jasmine - Volkameria inermis. https://davesgarden.com/guides/pf/go/56224/. [Accessed 22 Mar 2021]	"Sun Exposure: Full Sun Sun to Partial Shade Light Shade Partial to Full Shade Full Shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Rauch, F.D. & Weissich, P.R. (2000). Plants for Tropical Landscapes: A Gardener's Guide. University of Hawaii Press, Honolulu, HI	"Clerodendrum inerme is very salt, heat and wind tolerant and thrives in any soil, including beach sand."

Qsn #	Question	Answer
	Top Tropicals. (2021). Clerodendrum inerme, Volkameria inermis. https://toptropicals.com/catalog/uid/Clerodendrum_inerme.htm. [Accessed 22 Mar 2021]	"The plant is not choosy about the soil and can even withstand droughts."

411	Climbing or smothering growth habit	y
	Source(s)	**Notes**
	Starr, F., Starr, K. & Loope, L. (2003). Clerodendrum inerme. http://www.starrenvironmental.com/. [Accessed 22 Mar 2021]	"A large planting of C. inerme can be observed in south Maui on the beach side of the residences along Po'olenalena beach where it rambles over naupaka (Scaevola sericea) and other native coastal plants."
	Zich F.A., Hyland B.P.M., Whiffin T., Kerrigan R.A. (2020). Clerodendrum inerme. Australian Tropical Rainforest Plants, Edition 8. https://apps.lucidcentral.org/rainforest/. [Accessed 22 Mar 2021]	"Often grows into a rather untidy vine but frequently flowers and fruits as a shrub about 1-4 m tall. Vine stem diameters to 3 cm recorded."
	El Mokni, R., Kasri, M., & El Aouni, M. H. (2013). Volkameria inermis (Lamiaceae) a new alien species naturalized to the Tunisian coast, first record for North-Africa. Flora Mediterranea 23: 117-122	[Scrambling & sometimes a liana] "Volkameria inermis L. [= V. neriifolia Roxb., Clerodendrum inerme (L.) Gaertn., Clerodendrum neriifolium (Roxb.) Schauer] is an evergreen erect bush, often scrambling or scandent that can reach up to 3 m tall but sometimes a liana and measures up to 13 m long."

412	Forms dense thickets	y
	Source(s)	**Notes**
	Thaman, B and Niukula, J. (2013). Monuriki Invasive Plant Project – Feasibility Study. Ver.1. National Trust of Fiji, Suva	"Common vines in the forest include the scrambling, arching and high climbing beach privet, aria (Clerodendrum inerme), which forms increasingly impenetrable thickets, mostly in rocky areas"
	Whistler, W.A. (1992). Flowers of the Pacific Island Seashore: A guide to the littoral plants of Hawaii, Tahiti, Samoa, Tonga, Cook Islands, Fiji and Micronesia. Isle Botanica, Honolulu, HI	"It grows on rocky or sandy shores in coastal thickets, along mangrove swamps, on the seaward margin of littoral forests, or climbs as a liana into the canopy of littoral forest."
	Some Magnetic Island Plants. (2021). Clerodendrum inerme. https://somemagneticislandplants.com.au/plants/seaside-clerodendrum. [Accessed 22 Mar 2021]	"It has the potential to form dense brambles smothering other plants, and would probably be difficult to remove."

501	Aquatic	n
	Source(s)	**Notes**
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Not aquatic, but near aquatic environments] "...seashores, saline marshes and swamps, muddy tidal river banks, edges of mangrove forest"

502	Grass	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 22 Mar 2021]	Family: Lamiaceae (alt. Labiatae) Subfamily: Ajugoideae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 22 Mar 2021]	Family: Lamiaceae (alt. Labiatae) Subfamily: Ajugoideae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	El Mokni, R., Kasri, M., & El Aouni, M. H. (2013). Volkameria inermis (Lamiaceae) a new alien species naturalized to the Tunisian coast, first record for North-Africa. Flora Mediterranea 23: 117-122	"Volkameria inermis L. [= V. neriifolia Roxb., Clerodendrum inerme (L.) Gaertn., Clerodendrum neriifolium (Roxb.) Schauer] is an evergreen erect bush, often scrambling or scandent that can reach up to 3 m tall but sometimes a liana and measures up to 13 m long."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	El Mokni, R., Kasri, M., & El Aouni, M. H. (2013). Volkameria inermis (Lamiaceae) a new alien species naturalized to the Tunisian coast, first record for North-Africa. Flora Mediterranea 23: 117-122	[No evidence] "Volkameria inermis L. is originating from India, Ceylon, Burma, Malaya, tropical Australia, Polynesia and Philippine Islands (Jayaweera 1982). It grows near the seashore in tropical Asia and the Pacific (Turner & Wasson 1997). It is widely distributed throughout India, South and South East Asia, Australia and Pacific islands."

602	Produces viable seed	y
	Source(s)	**Notes**
	van Valkenburg, J.L.C.H. & Bunyapraphatsara, N., (2001). Clerodendrum L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyapraphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 22 Mar 2021]	"Clerodendrum is propagated by seed, softwood and semi-ripe cuttings, root cuttings or simply by rooted suckers."

603	Hybridizes naturally	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	Unknown. Hybrids documented between Clerodendrum species

Qsn #	Question	Answer
604	**Self-compatible or apomictic**	**y**
	Source(s)	**Notes**
	Raju, A. S., & Kumar, R. (2016). Pollination ecology of Clerodendrum inerme (L.) Gaertn.(Lamiaceae) in Coringa mangrove ecosystem, Andhra Pradesh, India. Journal of Threatened Taxa, 8(5), 8777-8787	"Abstract: Clerodendrum inerme (L.) Gaertn. (Lamiaceae) is bisexual, self-compatible and has a vector-dependent mixed breeding system. They are dichogamous and herkogamous; the day 1 flowers are staminate while the day 2 and 3 flowers are pistillate. The plant blooms in the evening, possesses a white long corolla with a hairy interior to exclude other insects and strong fragrance are adaptations for pollination by the hawk-moth Macroglossum gyrans. The 2nd and 3rd day flowers are nectar-rich and attract hawk-moths during the dawn and dusk hours. The plant is also visited by bees and butterflies. The bees Xylocopa and Anthophora are primary nectar robbers which collect nectar without effecting pollination. In C. inerme, three forms of flowers can be distinguished based on the position of sex organs. The first form is characterized by elongated stamens and a style which occur in close proximity to each other just after anthesis facilitating contact between the stamens and stigma. The second form is characterized by the scattered position of stamens and style. In the third form, the stamens are fully extended while the style is curved away from them, either to the left or to the right; subsequently the stamens curl inward and the style elongates. Interestingly, the three flower forms can be found within a cyme also. These forms of flowers with strong protandry prevent autonomous selfing but not geitonogamy. The fruit is a capsule and breaks open to disperse nutlets. Birds such as Acridotheres tristis, Corvus splendens, Corvus macrorhynchos and Turdoides caudatus disperse nutlets during the early winter season. Seeds germinate in June and seedlings grow gradually to produce new plants."
	Primack, R. B., Duke, N. C., & Tomlinson, P. B. (1981). Floral morphology in relation to pollination ecology in five Queensland coastal plants. Austrobaileya, 1(4): 346-355	"Self-fertilization is restricted in Sesuvium, Acanthus, and Cìerodendrum by protandry..." ... "These flowers are therefore strongly protandrous, with limited chance of pollen being transferred from anther to stigma within the same flower. Further, all flowers in a single inflorescence generally remain at the same developmental stage, so that flowers on the same inflorescence are unlikely to pollinate each other, though inflorescences at different developmental stages are often found on the same plant."

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	van Valkenburg, J.L.C.H. & Bunyapraphatsara, N., (2001). Clerodendrum L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyapraphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 22 Mar 2021]	"Pollination is mostly by butterflies, moths and bees."

Qsn #	Question	Answer
	Primack, R. B., Duke, N. C., & Tomlinson, P. B. (1981). Floral morphology in relation to pollination ecology in five Queensland coastal plants. Austrobaileya, 1(4): 346-355	"The flowers are very fragrant. No daytime visitors to the flowers were observed in several hours of observation. In two hours of observation at and just after dusk, one large hawkmoth was the only flower visitor to a large flowering bush. The hawkmoth appeared and departed suddenly. In this brief visit, the hawkmoth probed virtually every flower on the bush, spending only a second or two on each flower. Adaptations for hawkmoth pollination appear to be the long corolla with hairy interior to exclude other insects. The white corolla and strong fragrance presumably aid the hawkmoths to locate the flowers. The versatile anthers with pollen in grooves, allows the pollen to be placed precisely on the hawkmoth proboscis. The purple color of the filament and style presumably make them difficult for the hawkmoth to see and avoid. No data was obtained on fruit set." ... "The pollen/ovule ratio of Clerodendrum inerme in particular is low, suggesting that the hawkmoth pollination of this species is highly efficient."
	Raju, A. S., & Kumar, R. (2016). Pollination ecology of Clerodendrum inerme (L.) Gaertn.(Lamiaceae) in Coringa mangrove ecosystem, Andhra Pradesh, India. Journal of Threatened Taxa, 8(5), 8777-8787	"The plant blooms in the evening, possesses a white long corolla with a hairy interior to exclude other insects and strong fragrance are adaptations for pollination by the hawk-moth Macroglossum gyrans. The 2nd and 3rd day flowers are nectar-rich and attract hawk-moths during the dawn and dusk hours. The plant is also visited by bees and butterflies. The bees Xylocopa and Anthophora are primary nectar robbers which collect nectar without effecting pollination."

606	Reproduction by vegetative fragmentation	y
	Source(s)	**Notes**
	Gupta, S. P., Siddhant, S., & Gopal, G. (2010). Clerodendron inerme: an update of its indigenous uses, phytochemistry and pharmacology. International Journal of Chemical Sciences, 8(1), 203-212	"The plant produces suckers and seeds."

607	Minimum generative time (years)	>3
	Source(s)	**Notes**
	Northern Land Manager. (2004). Fire responses of Clerodendrum inerme. http://www.landmanager.org.au/. [Accessed 7 Nov 2014]	"Life Span: 11-over 20 years Growth Form: Subshrub or woody vine First seeds: 4-10 years"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Drupes gray-yellow, obovoid to subglobose,6–11 mm in diam." [Fruits & seeds lack means of external attachment]

702	Propagules dispersed intentionally by people	y

Qsn #	Question	Answer
	Source(s)	**Notes**
	Starr, F., Starr, K. & Loope, L. (2003). Clerodendrum inerme. http://www.starrenvironmental.com/. [Accessed 22 Mar 2021]	"C. inerme is currently a popular groundcover in coastal gardens of the Hawaiian Islands."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	**Notes**
	Starr, F., Starr, K. & Loope, L. (2003). Clerodendrum inerme. http://www.starrenvironmental.com/. [Accessed 22 Mar 2021]	"Fruit green turning black, 1 – 1.5 cm long, obovoid." [No evidence. Unlikely]

704	Propagules adapted to wind dispersal	n
	Source(s)	**Notes**
	Zich F.A., Hyland B.P.M., Whiffin T., Kerrigan R.A. (2020). Clerodendrum inerme. Australian Tropical Rainforest Plants, Edition 8. https://apps.lucidcentral.org/rainforest/. [Accessed 22 Mar 2021]	"Fruit consists of four nutlets which fit together and are borne on a receptacle like an egg in an egg cup. Fruit about 10-20 x 7-15 mm."
	Raju, A. S., & Kumar, R. (2016). Pollination ecology of Clerodendrum inerme (L.) Gaertn.(Lamiaceae) in Coringa mangrove ecosystem, Andhra Pradesh, India. Journal of Threatened Taxa, 8(5), 8777-8787	"The fruit is a capsule and breaks open to disperse nutlets. Birds such as Acridotheres tristis, Corvus splendens, Corvus macrorhynchos and Turdoides caudatus disperse nutlets during the early winter season."

705	Propagules water dispersed	y
	Source(s)	**Notes**
	Fletcher, H. R. 1938. The Siamese Verbenaceae. Bulletin of Miscellaneous Information (Royal Botanic Gardens, Kew), 193 (10): 401-445	"Ocean currents too are important as seed distributors and the fruits of Clerodendrum inerme..."
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Sea coast; 100-200 m. Fujian, Guangdong, Guangxi, Taiwan [S and SE Asia, Australia, Pacific Islands]"
	Smith, J. M. B. 1990. Drift disseminules on Fijian beaches. New Zealand Journal of Botany, 28(1): 13-20	"Table 2 Disseminules recorded on nine Fijian beaches" ... "Clerodendrum inerme ... Notes* ... "4: Recorded at Canton Island; 5:Known to be capable of floating one month."

706	Propagules bird dispersed	y
	Source(s)	**Notes**
	Raju, A. S., & Kumar, R. (2016). Pollination ecology of Clerodendrum inerme (L.) Gaertn.(Lamiaceae) in Coringa mangrove ecosystem, Andhra Pradesh, India. Journal of Threatened Taxa, 8(5), 8777-8787	"In C. inerme, the fruit is a capsule and breaks into different lobes depending on the number of nutlets produced inside. Each lobe contains a nutlet. Birds such as Acridotheres tristis, Corvus splendens, C. macrorhynchos and Turdoides caudatus disperse nutlets or seeds in the study area, occur during the early winter season. Seed germination occurs as soon as the monsoon sets in during June."
	Starr, F., Starr, K. & Loope, L. (2003). Clerodendrum inerme. http://www.starrenvironmental.com/. [Accessed 22 Mar 2021]	"Numerous seeds that appear attractive to birds are produced and vegetative growth is aggressive."

Qsn #	Question	Answer
	McConkey, K. R., Meehan, H. J., & Drake, D. R. (2005). Seed dispersal by Pacific pigeons (Ducula pacifica) in Tonga, western Polynesia. Emu, 104(4): 369-376	"Table 1. Fruit characteristics of plant species native to Tonga that have been recorded in the diet of Pacific Pigeons throughout their distributional range" [Includes Clerodendrum inerme]
	Some Magnetic Island Plants. (2021). Clerodendrum inerme. https://somemagneticislandplants.com.au/plants/seaside-clerodendrum. [Accessed 22 Mar 2021]	"The oval-shaped fruit is a drupe, a little over 1 cm long, green turning black, surrounded at the base by a scarcely spreading calyx, tinged with red. It splits into four single-seeded nutlets when mature. The seeds are dispersed by birds."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Drupes gray-yellow, obovoid to subglobose,6–11 mm in diam." [No means of external attachment]

708	Propagules survive passage through the gut	y
	Source(s)	**Notes**
	Raju, A. S., & Kumar, R. (2016). Pollination ecology of Clerodendrum inerme (L.) Gaertn.(Lamiaceae) in Coringa mangrove ecosystem, Andhra Pradesh, India. Journal of Threatened Taxa, 8(5), 8777-8787	"In C. inerme, the fruit is a capsule and breaks into different lobes depending on the number of nutlets produced inside. Each lobe contains a nutlet. Birds such as Acridotheres tristis, Corvus splendens, C. macrorhynchos and Turdoides caudatus disperse nutlets or seeds in the study area, occur during the early winter season. Seed germination occurs as soon as the monsoon sets in during June."
	van Valkenburg, J.L.C.H. & Bunyapraphatsara, N., (2001). Clerodendrum L.[Internet] Record from Proseabase. van Valkenburg, J.L.C.H. and Bunyapraphatsara, N. (Editors). PROSEA (Plant Resources of South-East Asia) Foundation, Bogor, Indonesia. http://www.proseanet.org. [Accessed 22 Mar 2021]	"The fruits are eaten by birds, which disperse the seeds. In many species the calyx provides a contrasting colour. The pseudo-aril present in some species is actually a placental part of the pericarp that acts as an attractant to birds in the fruit dispersal process."
	Starr, F., Starr, K. & Loope, L. (2003). Clerodendrum inerme. http://www.starrenvironmental.com/. [Accessed 22 Mar 2021]	[Presumably Yes] "Numerous seeds that appear attractive to birds are produced and vegetative growth is aggressive."

801	Prolific seed production (>1000/m2)	n
	Source(s)	**Notes**
	Wu, Z. Y. & P. H. Raven, (eds). 1994. Flora of China. Vol. 17 (Verbenaceae through Solanaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.	"Fruit a drupe with 4 1-seeded pyrenes, sometimes separating into 2 2-loculed or 4 1-locular mericarps"

Qsn #	Question	Answer
802	**Evidence that a persistent propagule bank is formed (>1 yr)**	**n**
	Source(s)	**Notes**
	Baskin, C.C. & Baskin, J.M. 2014. Seeds Ecology, Biogeography, and Evolution of Dormancy and Germination. Second Edition. Academic Press, San Francisco, CA	"TABLE 9.1 Dormancy class or nondormancy (D/ND) in seeds of nonpioneer trees of evergreen rainforests." [Clerodendrum inerme - ND* = Nondormant. Seeds germinate within about 4 wk after beginning of incubation.]

803	**Well controlled by herbicides**	
	Source(s)	**Notes**
	Starr, F., Starr, K. & Loope, L. (2003). Clerodendrum inerme. http://www.starrenvironmental.com/. [Accessed 22 Mar 2021]	"No control methods have been refined or found in literature. Plants can probably be removed mechanically or chemically depending on size of infestation."

804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**y**
	Source(s)	**Notes**
	Northern Land Manager. (2004). Fire responses of Clerodendrum inerme. http://www.landmanager.org.au/. [Accessed 7 Nov 2014]	[Resprouts after fires] "Adult fire response: Resprouter (<30% mortality when subject to 100% leaf scorch) Resprouting type: Basal (lignotuber) +/- epicormic"
	Top Tropicals. (2021). Clerodendrum inerme, Volkameria inermis. https://toptropicals.com/catalog/uid/Clerodendrum_inerme.htm. [Accessed 22 Mar 2021]	[Tolerates pruning] "Trimming the plant keeps the hedges in shape and also promotes production of new branches and leaves to fill up the gaps. As flowers are produced at the ends of branches, trimming robs the plant of its flowers."

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Thrives in tropical climates
• Naturalized in Tunisia
• Weedy in Fiji and showing weedy tendencies in Hawaiian Islands
• Shade-tolerant
• Tolerates many soil types
• Climbing habit (potential to smother other plants)
• Thicket-forming
• Self-compatible
• Seeds dispersed by birds, water and intentionally by people
• Able to reproduce by suckering
• Tolerates pruning and able to resprout after fires

Low Risk Traits
• Unarmed (no spines, thorns or burrs)
• Palatable to goats and probably other animals
• Non-toxic and used medicinally
• Ornamental
• Reaches maturity in 4+ years
• Seeds are non-dormant and unlikely to form a persistent seed bank