

Taxon: *Pterolepis glomerata* (Rottb.) Miq.

Family: Melastomataceae

Common Name(s): false meadow beauty

Synonym(s): *Rhexia glomerata* Rottb.

Assessor: Chuck Chimera

Status: Assessor Approved

End Date: 26 Aug 2019

WRA Score: 13.0

Designation: H(Hawai'i)

Rating: High Risk

Keywords: Tropical Subshrub, Environmental Weed, Agamospermous, Prolific Seeder, 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)		
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	y
302	Garden/amenity/disturbance weed		
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)	y
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		
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		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		

Qsn #	Question	Answer Option	Answer
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets		
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	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	n
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal		
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	y
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m ²)	y=1, n=-1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
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
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	[No evidence of domestication] "Most species of <i>Pterolepis</i> are concentrated in eastern central Brazil. Two species, <i>P. trichotoma</i> and <i>P. glomerata</i> , have become widespread and reach southern Mexico and the West Indies, respectively. The former has already produced a descendent, <i>P. stenophyllu</i> , in northern Central America, and <i>P. glomerata</i> has been introduced to and become naturalized in Hawaii."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	NA

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
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to tropical regions of eastern South America from Santa Catarina, Brazil, north to the Lesser Antilles; in Hawai'i apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins, on Kaua'i, O'ahu, and Hawai'i. First collected on O'ahu in 1949 (Greenwell s.n., BISH)."
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 25 Aug 2019]	"Native Southern America CARIBBEAN: Dominica, Grenada, Guadeloupe, Martinique, St. Lucia, St. Vincent and Grenadines, [Saint Vincent] Trinidad and Tobago, United States [Puerto Rico] NORTHERN SOUTH AMERICA: French Guiana, Guyana, Suriname, Venezuela [Amazonas, Anzoategui, Apure, Bolivar, Guarico, Miranda, Monagas, Sucre] BRAZIL: Brazil [Paraná, Santa Catarina] WESTERN SOUTH AMERICA: Bolivia SOUTHERN SOUTH AMERICA: Paraguay [Canindeyú, Presidente Hayes] Naturalized Pacific NORTH-CENTRAL PACIFIC: United States [Hawaii]"

202	Quality of climate match data	High
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Qsn #	Question	Answer
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 25 Aug 2019]	

203	Broad climate suitability (environmental versatility)	
	Source(s)	Notes
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	" <i>Pterolepis glomerata</i> occurs from the Dominican Republic (Hispaniola) and Puerto Rico over the Lesser Antilles and Trinidad to Venezuela, the Guianas, and south to Santa Catarina in Brazil; reaching adjacent Paraguay and Bolivia; in natural and disturbed savannas and coastal vegetation (restinga) from sea level to 1000 m altitude. Locally naturalized in Hawaii (Almeda 1990)." [Adapted to a tropical climate, but elevation range suggests it may be able to tolerate cooler temperatures at higher elevations]

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Native to tropical regions of eastern South America from Santa Catarina, Brazil, north to the Lesser Antilles; in Hawai'i apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins, on Kaua'i, O'ahu, and Hawai'i. First collected on O'ahu in 1949 (Greenwell s.n., BISH)."
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	"Two species, <i>P. trichotoma</i> and <i>P. glomerata</i> , have become widespread and reach southern Mexico and the West Indies, respectively. The former has already produced a descendent, <i>P. stenophyllu</i> , in northern Central America, and <i>P. glomerata</i> has been introduced to and become naturalized in Hawaii."

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in Hawai'i apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins, on Kaua'i, O'ahu, and Hawai'i. First collected on O'ahu in 1949 (Greenwell s.n., BISH)." [No evidence of intentional introduction or cultivation]

301	Naturalized beyond native range	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in Hawai'i apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins, on Kaua'i, O'ahu, and Hawai'i. First collected on O'ahu in 1949 (Greenwell s.n., BISH)."

Qsn #	Question	Answer
	Oppenheimer, H. & Bustamante, K.M. 2014. New Hawaiian plant records for 2013. Bishop Museum Occasional Papers 115: 19–22	" <i>Pterolepis glomerata</i> (rottb.) miq. New island record a weedy herb naturalized on Kaua'i, O'ahu, Moloka'i, Lāna'i, and Hawai'i (Wagner et al. 1999: 912; Hughes 1995: 7; Wood 2006: 18), this species was recently collected in two sites in wet lowland forest on East Maui. Material examined. MAUI: East Maui, Hāna Distr, Kawaipapa, 792 m, 23 Apr 2013, Oppenheimer, Bustamante, & J.Q.C. Lau H41325 (Bish); Waihoi Valley, vicinity of Waiohonu stream, 930 m, 29 May 2013, Oppenheimer et al. H51316."
	Wood, K. R. (2006). New plant records and rediscoveries within the Hawaiian Islands. Bishop Museum Occasional Papers 88: 15-19	" <i>Pterolepis glomerata</i> (Rottb.) Miq. New island record. <i>Pterolepis glomerata</i> has been previously recorded on the islands of Kaua'i, O'ahu, Moloka'i, and Hawai'i. The following collection documents this herb as being naturalized on Lāna'i along the Lāna'i Hale summit ridge. Material examined. LĀNA'I: Palea region, between Palea and Kamiki, <i>Metrosideros</i> mixed mesic forest fringe, 930 m, 8 Oct 1998, K.R. Wood 7531 (BISH, PTBG, F, K, MO, NY, US)."
	Hughes, G. D. 1995. New Hawaiian plant records II. Bishop Museum Occasional Papers. 42: 1-10	" <i>Pterolepis glomerata</i> (Rottb.) Miq. Previous knowledge: First collected on Oahu in 1949 (Greenwell s.n., BISH). Hawaiian Archipelago distribution Kauai, Oahu, and Hawaii. Native to tropical regions of eastern South America from Santa Catarina, Brazil, N to the Lesser Antilles (Wagner et al. 1990: 913). Significance: New island record for Molokai on the Wailau Trail, 800 m, in 1992 (Hughes 18, US). Apparently only sparingly naturalized in wet mesic forest in disturbed areas. Identification by W.L. Wagner."
	Plucknett, D. L., & Stone, B. C. (1961). The principal weedy Melastomaceae in Hawaii. Pacific Science 15: 301-303	" <i>Pterolepis glomerata</i> (Rottb.) Miquel. Specimens of this plant have been collected from Palikea in the Waianae range, and from Poamoho and Pupukea in the Koolau range on Oahu ."

302	Garden/amenity/disturbance weed	
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in Hawai'i apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins" [A disturbance weed that impacts natural ecosystems and endangered plant taxa. See 3.04]

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in Hawai'i apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins" [A weed of disturbed habitats that impacts natural ecosystems and threatens rare plant taxa. See 3.04]
	Ross, P. (1961). The Plant Ecology of the Teak Plantations in Trinidad. Ecology, 42(2), 387-398	"Plants found only in the teak coup were typically light-demanding ones." [This study documented the plants that invaded three teak plantations in Trinidad. They included <i>Pterolepis glomerata</i> , but no impacts were documented]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	y
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Qsn #	Question	Answer
	Source(s)	Notes
	<p>US Fish and Wildlife Service. (2015). Endangered and Threatened Wildlife and Plants; Endangered Status for 49 Species From the Hawaiian Islands; Proposed Rule. Federal Register Vol. 80, No. 189: 58820-58909</p>	<p>"Nonnative Plants in the Lowland Wet Ecosystem: Nonnative plants threatening the lowland wet ecosystem plants proposed for listing" ... Nonnative Plants in the Wet Cliff Ecosystem: Nonnative plants threatening the wet cliff ecosystem plants proposed for listing" ... "or subshrub in the Melastomataceae family. Native to South America, <i>P. glomerata</i> is naturalized on Kauai, Oahu, Molokai, and Hawaii Island (Almeda 1999, p. 912–913; Wagner et al. 2012, p. 52). This species has rapid growth, early maturity to fruiting, a high germination rate, possible asexual reproduction, the ability of fragments to root, and seed dispersal by birds (University of Florida Herbarium 2006). These attributes allow it to displace native vegetation through competition. All plants in the Melastomataceae family are included in the Hawaii State Noxious Weed List (HAR Title 4, Subtitle 6, Chapter 68). It is a pest in lowland wet habitat and along trail margins and cliffs (Almeda 1999, p. 912–913)." [<i>Pterolepis glomerata</i> listed as one of the weeds of these ecosystem that threaten listed plants]</p>
	<p>DOFAW Oahu Native Ecosystems Protection and Management. (2015). Report to the Hawaii Invasive Species Council. https://dlnr.hawaii.gov/hisc. [Accessed 26 Aug 2019]</p>	<p>"<i>Pterolepis glomerata</i> (<i>Pterolepis</i>): A wide spread invasive in the Koolau mountain range and member of the notoriously invasive Melastome family, there are no known established populations in the Waianae range. <i>P. glomerata</i> thrives in wet forests and establishes in undisturbed areas. There is a high potential of introduction and spread via hikers and staff. Very small seeds easily carried by mud, as well as wind-dispersed; have a long lived seed bank. Mature plants have been observed along the Kaala boardwalk, shelter and camp site and along Kumaipo trail near the summit of Kaala. Four sites at Kaala checked twice per year and a pre emergent utilized to assist in seed bank suppression. One site at Pahole NAR is monitored twice per year. DOFAW is partnering with OANRP to control this known highly invasive weed. FY15 update: <i>P. glomerata</i> at Pahole was monitored in August 2014 and February 2015. No plants were observed in August and 5 immature plants were observed in February. Few plants were observed at Kaala. Kumaipo ridge (where it was believed to have been brought in) continues to be a source of plants and all plants controlled in FY15 (1 mature and 3 immatures) at Kaala were at this site."</p>
	<p>OANRP Staff. (2007). 2007 Status Reports for the Mākua Implementation Plan and the Draft O'ahu Implementation Plan. United States Army Garrison, Hawai'i Directorate of Public Works Environmental Division, Schofield Barracks, Hawai'i</p>	<p>"<i>Pterolepis glomerata</i> is a member of the Melastomataceae family, along with two other well known invasive species <i>Miconia calvenscens</i>, and <i>Clidemia hirta</i>. It is native to tropical regions of eastern South America. In Hawai'i, this weed has naturalized in wet to mesic disturbed sites and trail margins, primarily in the Ko'olau Mountains. In an attempt to keep it from establishing in the Wai'anae Mountains, NRS will target any small incipient populations found" ... "The primary weed threats to the MU include <i>P. cattleianum</i>, <i>S. palmifolia</i>, <i>C. hirta</i>, and <i>Pterolepis glomerata</i>. Of these, <i>C. hirta</i> and <i>P. glomerata</i> are very widespread and are not controlled."</p>

Qsn #	Question	Answer
	OANRP Staff. (2018). 2018 Status Report for the Makua and Oahu Implementation Plans. United States Army Garrison, Hawai'i Directorate of Public Works Environmental Division, Schofield Barracks, Hawai'i	"This taxon is only a target in the Waianae Mountains, where it is a control priority at Kaala, Kahanahaiki, Makaha, Makaleha, Manuwai, Ohikilolo, Pahole, and Palikea. This year, one new site was found, in contrast to five last year. The new site is located at Palikea in the heavily trafficked North Palikea Snail Enclosure; <i>P. glomerata</i> likely was spread to the area via management work. Fortunately, only two plants were found, and the site will be easy to check during the course of other field work. The decrease in total <i>P. glomerata</i> control effort seen this year in part is due to past effective control at the smallest ICAs, and in part due to a decrease in effort at the largest Manuwai ICA. Of the 19 ICAs checked this year, no plants were found at eight, and declines in plant numbers were seen at six. In general, control efforts have been most successful on the smallest, newest ICAs, while older and/or larger ICAs have been much more difficult to manage. The oldest ICA in Manuwai, for example, continues to grow in size, despite regular checks. Improved delimiting surveys, increased control of obscuring vegetation, and use of pre-emergent herbicide may assist in improving control, until an effective biocontrol is released."
	WRA Specialist. (2019). Personal Communication	<i>Pterolepis glomerata</i> is controlled on Schofield Barracks Military Reservation, Oahu when it threatens rare or endangered species. Management of taxon in an area with conservation goals that include protection of native vegetation.

305	Congeneric weed	
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence of another species in the genus with negative impacts. However, <i>Pterolepis pumila</i> and <i>Pterolepis glomeratum</i> are cited as weeds.

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence] "Erect, suffrutescent herbs or subshrubs up to 0.5 m tall; young branches subquadrate, strigose. Leaves ovate to oblong-ovate or elliptic, 1.4-4.5 cm long, 0.6-1.6 cm wide, 3-nerved, both surfaces sparsely to moderately strigose, margins entire or obscurely serrulate, apex acute, base obtuse to rounded, petioles 1-5 mm long."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Unknown. No evidence found

Qsn #	Question	Answer
403	Parasitic	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Erect, suffrutescent herbs or subshrubs up to 0.5 m tall" [Melastomataceae. No evidence]
404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Unknown
405	Toxic to animals	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	No evidence
	NIH U.S. National Library of Medicine. (2019). TOXNET Toxicology Data Network. https://toxnet.nlm.nih.gov/ . [Accessed]	No evidence
406	Host for recognized pests and pathogens	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Unknown
407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	NIH U.S. National Library of Medicine. (2019). TOXNET Toxicology Data Network. https://toxnet.nlm.nih.gov/ . [Accessed]	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
408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[No evidence. Unlikely given habit and habitat] "Erect, suffrutescent herbs or subshrubs up to 0.5 m tall" ... "weedy and locally naturalized in mesic to wet disturbed sites and trail margins"
409	Is a shade tolerant plant at some stage of its life cycle	

Qsn #	Question	Answer
	Source(s)	Notes
	Imada, C. & LeGrande, M. (2006). Botanical Inventory of Kalauao Valley, City & County of Honolulu, Oahu. Hawaii Biological Survey. Bishop Museum, Honolulu, HI	[Hiking trails are high light environments] "The hiking path is lined with the invasive melastome <i>Pterolepis glomerata</i> , <i>Elephantopus mollis</i> (elephant's foot), and weedy grasses such as <i>Axonopus fissifolius</i> ."
	Ross, P. (1961). The Plant Ecology of the Teak Plantations in Trinidad. <i>Ecology</i> , 42(2), 387-398	[This study documented the plants that invaded three teak plantations in Trinidad] "Plants found only in the teak coup were typically light-demanding ones." [Documented light-demanding plants included <i>Pterolepis glomerata</i>]

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	"in natural and disturbed savannas and coastal vegetation (restinga) from sea level to 1000 m altitude."
	Olivares, E., Benítez, M., Peña, E., & Colonnello, G. (2013). Aluminum accumulation and nutrients in <i>Pterolepis glomerata</i> , <i>Desmoscelis villosa</i> , and <i>Rhynchanthera grandiflora</i> in palm swamp communities. <i>Botany</i> , 91(3), 202-208	"The purpose of the study was to investigate if the herbaceous species <i>Pterolepis glomerata</i> (Rottb.) Miq. (Melastomataceae) is an aluminum (Al) accumulating species and compare its nutrition with other Al accumulators from the same family in palm swamp communities as follows: <i>Desmoscelis villosa</i> (Aubl.) (herb), and <i>Rhynchanthera grandiflora</i> (Aubl.) DC. (shrub or subshrub). This is important because <i>P. glomerata</i> belongs to the tribe Melastomeae and generally Al accumulators are perennial lignified species belonging to more basal tribes in the phylogenetic tree. Heterogeneity was observed in the soil characteristics of six sites in the palm swamp communities under study. However, in all the cases, the foliar concentrations of Al > 3 g·kg ⁻¹ , the Al transfer factors (TF) (leaves:roots) > 1, and the stoichiometric ratios Al:Ca > 1 indicated that the three species behaved as Al accumulators. A principal component analysis (PCA) of 11 chemical elements separated <i>D. villosa</i> from the other two species and associated it to Al. In this work, Al accumulation was reported for the first time in <i>P. glomerata</i> and was quantified in <i>D. villosa</i> , previously reported positive using the aluminon colorimetric method in herbarium samples. The Al tolerance in <i>P. glomerata</i> is a trait that possibly contributes to its wide distribution in acid soils throughout the neotropics and its introduction and naturalization in localities far from its site of origin."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Erect, suffrutescent herbs or subshrubs up to 0.5 m tall"

412	Forms dense thickets	

Qsn #	Question	Answer
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins" [No reports of dense stands from naturalized areas within Hawaiian Islands]
	Imada, C. & LeGrande, M. (2006). Botanical Inventory of Kalauao Valley, City & County of Honolulu, Oahu. Hawaii Biological Survey. Bishop Museum, Honolulu, HI	[Common weed, but no description of dense stands] "The lower part of 'Aiea Ridge is largely forested with native species, but there is much evidence of pig damage along the trail. At ca. 510 m elevation the ridge consists of an open canopy of 'öhi'a, Acacia koa (koa), and 'öhi'ahä, with a solid understory cover of uluhe and «iekie, along with mostly native shrubs and small trees, such as Psychotria mariniana (köpiko), Wikstroemia oahuensis ('akia), and Scaevola gaudichaudiana (naupaka kuahiwi). The hiking path is lined with the invasive melastome <i>Pterolepis glomerata</i> , <i>Elephantopus mollis</i> (elephant's foot), and weedy grasses such as <i>Axonopus fissifolius</i> ."

501	Aquatic	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Terrestrial] "Erect, suffrutescent herbs or subshrubs up to 0.5 m tall ... in Hawai'i apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins"

502	Grass	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 26 Aug 2019]	Melastomataceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 26 Aug 2019]	Melastomataceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Erect, suffrutescent herbs or subshrubs up to 0.5 m tall; young branches subquadrate, strigose." [No underground storage organs]

601	Evidence of substantial reproductive failure in native habitat	n
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Qsn #	Question	Answer
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2019. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html . [Accessed 26 Aug 2019]	[No evidence. Broad native range and naturalized on several Hawaiian Islands] "Native Southern America CARIBBEAN: Dominica, Grenada, Guadeloupe, Martinique, St. Lucia, St. Vincent and Grenadines, [Saint Vincent] Trinidad and Tobago, United States [Puerto Rico] NORTHERN SOUTH AMERICA: French Guiana, Guyana, Suriname, Venezuela [Amazonas, Anzoategui, Apure, Bolivar, Guarico, Miranda, Monagas, Sucre] BRAZIL: Brazil [Paraná, Santa Catarina] WESTERN SOUTH AMERICA: Bolivia SOUTHERN SOUTH AMERICA: Paraguay [Canindeyú, Presidente Hayes] Naturalized Pacific NORTH-CENTRAL PACIFIC: United States [Hawaii]"

602	Produces viable seed	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Fruiting hypanthium 4-6 mm long, 2-5 mm wide. Seeds ca. 0.5 mm long."
	Ramirez, N., & Brito, Y. (1990). Reproductive biology of a tropical palm swamp community in the Venezuelan llanos. American Journal of Botany, 77(10): 1260-1271	"Three Melastomataceae (Clidemia capitallata, Miconia stephananthera, and Pterolepis glomerata) and one Gentianaceae species (Schultesia brachyptera) produced fruits and seed from previously emasculated flowers (Table 2)." ... "TABLE 2. Results of natural pollinated and emasculated flowers for four agamospermous species" [Pterolepis glomerata - Mean seed/fruit - Natural pollinated = 503.74]

603	Hybridizes naturally	
	Source(s)	Notes
	Renner, S. S. (1994). A revision of Pterolepis (Melastomataceae: Melastomeae). Nordic Journal of Botany, 14(1), 73-104	Unknown. No information on hybrids documented in this publication

604	Self-compatible or apomictic	y
	Source(s)	Notes
	Ramirez, N., & Brito, Y. (1990). Reproductive biology of a tropical palm swamp community in the Venezuelan llanos. American Journal of Botany, 77(10): 1260-1271	"TABLE 3. Results of controlled self- and cross-pollination and self incompatibility indices for 26 plant species" [Pterolepis glomerata produces seeds after flowers are self-pollinated. It's breeding system here is classified as AG= agamospermy]

605	Requires specialist pollinators	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	"The flowers are pollinated by small and medium-sized bees that collect pollen, the only reward offered (Renner 1989a)"
	Ramirez, N., & Brito, Y. (1990). Reproductive biology of a tropical palm swamp community in the Venezuelan llanos. <i>American Journal of Botany</i> , 77(10): 1260-1271	"the overlapping flowering patterns and infrequent and unspecialized pollinators may be enforcing self-compatibility and agamospermy" ... "TABLE 3. Results of controlled self- and cross-pollination and self incompatibility indices for 26 plant species" [<i>Pterolepis glomerata</i> produces seeds after flowers are self-pollinated. It's breeding system here is classified as AG= agamospermy]

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	US Fish and Wildlife Service. (2008). Endangered and Threatened Wildlife and Plants; Listing 48 Species on Kauai as Endangered and Designating Critical Habitat; Proposed Rule. <i>Federal Register</i> Vol. 73, No. 204: 62592-62742	[Ability of fragments to root] " <i>Pterolepis glomerata</i> is another member of the Melastomataceae family. The basis for its classification as invasive are the plant's germination rates, rapid growth, early maturity, ability of fragments to root, possible asexual reproduction, and seed dispersal by birds (University of Florida Herbarium 2006). Because of these attributes, it displaces native vegetation through competition."

607	Minimum generative time (years)	1
	Source(s)	Notes
	US Fish and Wildlife Service. (2008). Endangered and Threatened Wildlife and Plants; Listing 48 Species on Kauai as Endangered and Designating Critical Habitat; Proposed Rule. <i>Federal Register</i> Vol. 73, No. 204: 62592-62742	"The basis for its classification as invasive are the plant's germination rates, rapid growth, early maturity, ability of fragments to root, possible asexual reproduction, and seed dispersal by birds (University of Florida Herbarium 2006)."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R. & Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Fruiting hypanthium 4-6 mm long, 2-5 mm wide. Seeds ca. 0.5 mm long." [Small seed size likely facilitates accidental dispersal]
	Imada, C. & LeGrande, M. (2006). Botanical Inventory of Kalauao Valley, City & County of Honolulu, Oahu. Hawaii Biological Survey. Bishop Museum, Honolulu, HI	"The hiking path is lined with the invasive melastome <i>Pterolepis glomerata</i> , <i>Elephantopus mollis</i> (elephant's foot), and weedy grasses such as <i>Axonopus fissifolius</i> ."

Qsn #	Question	Answer
	OANRP Staff. (2007). 2007 Status Reports for the Mākua Implementation Plan and the Draft O'ahu Implementation Plan. United States Army Garrison, Hawai'i Directorate of Public Works Environmental Division, Schofield Barracks, Hawai'i	[Likely dispersed along trails] "In May of 2007, an 84m ² patch of <i>Pterolepis glomerata</i> was discovered on a trail in Pahole right before the Mākua overlook, most likely brought in by hikers with contaminated gear. It was treated by NRS staff a week later, and after three subsequent retreats the population was killed (Table 1.2.27). The seed bank is expected to be substantial and seedlings will very likely appear after the next big rain in Pahole. NRS will check this spot at least once a quarter and more frequently during the winter months."
	Ramirez, N. & Brito, Y. (1988). Sindromes de dispersion de una comunidad de pantanos de palmeras (morichal) en los Altos Llanos centrales venezolanos. <i>Revista Chilena de Historia Natural</i> . 61: 53-60	In this study on dispersal syndromes in a tropical palm-swamp community, <i>Pterolepis glomerata</i> had an average of 503.74 seeds per capsule. [small seed size]
	Hall, J. B. (2004). <i>A Hiker's Guide to Trailside Plants in Hawaii</i> . Mutual Publishing, Honolulu, HI	<i>Pterolepis glomerata</i> is found in upper mesic to wet disturbed areas especially along trail edges.

702	Propagules dispersed intentionally by people	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"in Hawai'i apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins, on Kaua'i, O'ahu, and Hawai'i. First collected on O'ahu in 1949 (Greenwell s.n., BISH)." [No evidence of intentional dispersal]

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Fruiting hypanthium 4-6 mm long, 2-5 mm wide. Seeds ca. 0.5 mm long." ... "apparently not cultivated, but weedy and locally naturalized in mesic to wet disturbed sites and trail margins" [No evidence, and unlikely given lack of cultivation]

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. <i>Manual of the flowering plants of Hawaii</i> . Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	"Fruiting hypanthium 4-6 mm long, 2-5 mm wide. Seeds ca. 0.5 mm long."
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	"Fruiting starts gradually while the plant is still flowering, the capsules releasing the seeds over several weeks (Gottsberger & Silberbauer-Gottsberger (1984) for <i>P. repanda</i> ; collector's label information for <i>P. glomerata</i> ; pers. obs. for cultivated <i>P. stenophylla</i>) Occasionally seeds may also be spread in mud on birds' feet or float some distance." [Capsules release seeds which might be wind-dispersed over short distances]

705	Propagules water dispersed	y
	Source(s)	Notes

Qsn #	Question	Answer
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	"Occasionally seeds may also be spread in mud on birds' feet or float some distance."
	Ramirez, N. & Brito, Y. (1988). Sindromes de dispersion de una comunidad de pantanos de palmeras (morichal) en los Altos Llanos centrales venezolanos. <i>Revista Chilena de Historia Natural</i> . 61: 53-60	In this study on dispersal syndromes in a tropical palm-swamp community, <i>Pterolepis glomerata</i> was dispersed by water.

706	Propagules bird dispersed	y
	Source(s)	Notes
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	"Occasionally seeds may also be spread in mud on birds' feet or float some distance."
	US Fish and Wildlife Service. (2008). Endangered and Threatened Wildlife and Plants; Listing 48 Species on Kauai as Endangered and Designating Critical Habitat; Proposed Rule. <i>Federal Register</i> Vol. 73, No. 204: 62592-62742	" <i>Pterolepis glomerata</i> is another member of the Melastomataceae family. The basis for its classification as invasive are the plant's germination rates, rapid growth, early maturity, ability of fragments to root, possible asexual reproduction, and seed dispersal by birds (University of Florida Herbarium 2006). Because of these attributes, it displaces native vegetation through competition."

707	Propagules dispersed by other animals (externally)	y
	Source(s)	Notes
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	"Occasionally seeds may also be spread in mud on birds' feet or float some distance."

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Renner, S. S. (1994). A revision of <i>Pterolepis</i> (Melastomataceae: Melastomeae). <i>Nordic Journal of Botany</i> , 14(1), 73-104	"Fruiting starts gradually while the plant is still flowering, the capsules releasing the seeds over several weeks (Gottsberger & Silberbauer-Gottsberger (1984) for <i>P. repanda</i> ; collector's label information for <i>P. glomerata</i> ; pers. obs. for cultivated <i>P. stenophylla</i>) Occasionally seeds may also be spread in mud on birds' feet or float some distance." [No evidence that fruit are consumed]

801	Prolific seed production (>1000/m2)	y
	Source(s)	Notes
	Ramirez, N. & Brito, Y. (1988). Sindromes de dispersion de una comunidad de pantanos de palmeras (morichal) en los Altos Llanos centrales venezolanos. <i>Revista Chilena de Historia Natural</i> . 61: 53-60	In this study on dispersal syndromes in a tropical palm-swamp community, <i>Pterolepis glomerata</i> had an average of 503.74 seeds per capsule.

802	Evidence that a persistent propagule bank is formed (>1 yr)	

Qsn #	Question	Answer
	Source(s)	Notes
	Royal Botanic Gardens Kew. (2019) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 26 Aug 2019]	[Unknown] "Storage Behaviour: No data available for species or genus. Of 64 known taxa of family MELASTOMATACEAE, 100.00% Orthodox(p/?)"

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Controlled by resource management programs on Oahu, Hawaiian Islands, but herbicides and efficacy unspecified

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	WRA Specialist. (2019). Personal Communication	Unknown

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	Souder, S. K. & Johnson, M. T. (2007). Host-Specificity of <i>Syphraea uberabensis</i> for Biocontrol of <i>Tibouchina herbacea</i> . Poster. 15th Annual Hawai'i Conservation Conference, Honolulu, HI	[Future biocontrol of <i>Tibouchina</i> may impact <i>Pterolepis</i>] "We are evaluating <i>Syphraea uberabensis</i> (Coleoptera: Chrysomelidae), a flea beetle from Brazil, as a potential agent for biological control of the noxious weed <i>Tibouchina herbacea</i> (Melastomataceae). Adult and larval feeding, oviposition, mortality, and behavior of <i>Syphraea uberabensis</i> have been examined on the target weed, related species and native non-target plants, utilizing the centrifugal phylogenetic method to determine host range. Conservative no-choice tests (in the absence of the target weed) indicate that <i>S. uberabensis</i> may survive and reproduce on several members of the family Melastomataceae, including <i>Tibouchina herbacea</i> , <i>Tibouchina longifolia</i> , <i>Pterolepis glomerata</i> and <i>Melastoma candidum</i> . Less suitable are the melastomes <i>Heterocentron subtriplinervium</i> and <i>Dissotis rotundifolia</i> . Other melastomes including <i>Tibouchina urvilleana</i> , <i>Medinilla cummingii</i> , <i>Clidemia hirta</i> , <i>Miconia calvescens</i> and <i>Arthrostemma ciliatum</i> appear to be unsuitable as host plants. Although adult feeding produced damage on a variety of non-native plants outside the melastome family, <i>Syphraea uberabensis</i> did not feed or lay eggs on any of the native species tested. Results to date suggest that impacts of this biocontrol agent would be confined to a few weedy melastome species."

Qsn #	Question	Answer
	<p>Calvert, F. & Johnson, M. T. (2007). Quarantine Evaluation of Biocontrol Agents for <i>Miconia calvenscens</i>: A Psyllid, <i>Diclidophlebia lucens</i>, and Stem Weevil, <i>Cryptorhynchus melastomae</i>. Poster. 15th Hawaifi Conservation Conference, Honolulu, HI</p>	<p>[Potential biocontrol agent for <i>Miconia</i> may impact <i>Pterolepis</i>] "Two insect species from Costa Rica are currently under evaluation in Hawai'i as potential agents for biological control of <i>Miconia calvenscens</i>. The phloem-feeder <i>Diclidophlebia lucens</i> (Hemiptera: Psyllidae) has small, bright orange-red adults and nymphs that excrete abundant white threads of wax. <i>Cryptorhynchus melastomae</i> (Coleoptera: Curculionidae) is a relatively large weevil that bores stems as a larva and feeds on leaves and stems as an adult. Host specificity of adult and immature <i>Diclidophlebia lucens</i> was tested on 28 test plant species, including a variety of Melastomataceae, other non-native and native Myrtales, and five unrelated endemics. Psyllids were able to survive, reproduce and develop on a broad range of melastomes, but <i>Miconia calvenscens</i>, <i>Tetrazygia bicolor</i>, <i>Heterocentron subtriplinervium</i>, <i>Arthrostema ciliatum</i> and <i>Pterolepis glomerata</i> appeared to be the most suitable hosts. Psyllids did not survive or reproduce on any non-melastomes. Preliminary host specificity testing of the weevil <i>Cryptorhynchus melastomae</i> indicates that this species is also probably restricted to melastomes. Because its larvae must feed within stems to complete their life cycle, <i>C. melastomae</i> is likely to be limited to melastomes with relatively large stems. Our hope is that these species represent the first of a suite of <i>miconia</i> insects that will prove suitable for release in Hawai'i."</p>

Summary of Risk Traits:

High Risk / Undesirable Traits

- Thrives in tropical climates
- Naturalized on Kauai, Oahu, Maui, Molokai, and Hawaii (Hawaiian Islands)
- An environmental weed in the Hawaiian Islands, threatening native ecosystems and rare and endangered plant species
- Reproduces by seeds and vegetatively from root fragments
- Agamospermous (capable of producing seeds asexually)
- Reaches maturity quickly
- Minute seeds dispersed by water, attached to birds and other animals, in soil attached to hikers, and possibly short distances by wind
- Prolific seed production (>500 seeds/fruit capsule)

Low Risk Traits

- Unarmed (no spines, thorns, or burrs)
- Non-toxic