

Taxon: Molineria capitulata	Family: Hypoxidaceae
Common Name(s): palm grass weevil lily	Synonym(s): Curculigo capitulata (Lour.) Kuntze Curculigo recurvata W. T. Aiton Leucojum capitulatum Lour.

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 23 Oct 2015
WRA Score: 6.0	Designation: EVALUATE	Rating: Evaluate

Keywords: "Palm-like" Herb, Naturalized, Dense Clumping, Rarely Seeds, Spreads Vegetatively

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	y
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	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		
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		
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		
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)		
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	y
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		
605	Requires specialist pollinators		
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		
706	Propagules bird dispersed		
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m ²)	y=1, n=-1	n
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	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. & Raven, P. H. (eds.). 2000. Flora of China. Vol. 24 (Flagellariaceae through Marantaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	No evidence of domestication

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2015. 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
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 21 Oct 2015]	"Native: ASIA-TEMPERATE China: China - Fujian [s.], Guangdong, Guangxi, Guizhou, Sichuan, Xizang, Yunnan [s.] Eastern Asia: Taiwan ASIA-TROPICAL Indian Subcontinent: Bhutan; India [n.e.]; Nepal; Sri Lanka Indo-China: Indochina; Myanmar Malesia: Indonesia; Malaysia AUSTRALASIA Australia: Australia - Queensland [n.e.]"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed]	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes

Qsn #	Question	Answer
	Dave's Garden. 2015. Palm Grass, Whale Back. <i>Curculigo capitulata</i> . http://davesgarden.com/guides/pf/go/2229/ . [Accessed 21 Oct 2015]	"Hardiness: USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"
	Wu, Z. Y. & Raven, P. H. (eds.). 2000. Flora of China. Vol. 24 (Flagellariaceae through Marantaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[Elevation range exceeds 1000 m, demonstrating environmental versatility] "Forests, shady and moist places; (300–)800–2200 m."
	Geerinck, D.J.L. 1993. Flora Malesiana. Series I, Spermatophyta: Flowering plants. Volume 11, part. 2: 353-373. Amaryllidaceae (including Hypoxidaceae). Rijksherbarium / Hortus Botanicus, Leiden, The Netherlands	[Elevation range exceeds 2000 m, demonstrating environmental versatility] "Habitat - Primary and secondary forests, from sea-level up to c. 2000 m altitude."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed]	"Native: ASIA-TEMPERATE China: China - Fujian [s.], Guangdong, Guangxi, Guizhou, Sichuan, Xizang, Yunnan [s.] Eastern Asia: Taiwan ASIA-TROPICAL Indian Subcontinent: Bhutan; India [n.e.]; Nepal; Sri Lanka Indo-China: Indochina; Myanmar Malesia: Indonesia; Malaysia AUSTRALASIA Australia: Australia - Queensland [n.e.]"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Wunderlin, R. P., Hansen, B. F., Franck, A. R., Bradley, K. A., & Kunzer, J. M. (2010). Plants new to Florida. <i>Journal of the Botanical Research Institute of Texas</i> , 4(1): 349-355	" <i>Curculigo capitulata</i> (Lour.) Kuntze (Hypoxidaceae). Native to Asia and Australasia, it is commonly cultivated as an ornamental in temperate and tropical areas of the Old and New World where it sometimes becomes naturalized."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. <i>Contributions from the United States National Herbarium</i> 52: 1-415	"Commonly cultivated in Puerto Rico. Reported as adventive in Arecibo and San Juan."
	Wunderlin, R. P., Hansen, B. F., Franck, A. R., Bradley, K. A., & Kunzer, J. M. (2010). Plants new to Florida. <i>Journal of the Botanical Research Institute of Texas</i> , 4(1): 349-355	" <i>Curculigo capitulata</i> (Lour.) Kuntze (Hypoxidaceae). Native to Asia and Australasia, it is commonly cultivated as an ornamental in temperate and tropical areas of the Old and New World where it sometimes becomes naturalized. This is the first report of it naturalized in the continental United States."

Qsn #	Question	Answer
	Flynn, T. & Lorence, D.H. 2002. Additions to the flora of the Hawaiian Islands. Bishop Museum Occasional Papers 69:	" <i>Molineria capitulata</i> (Lour.) Herb. New naturalized record. Syn. <i>Curculigo capitulata</i> (Lour.) Kuntze; <i>Molineria recurvata</i> (Dryand.) W.T. Aiton Native to a wide region across India and Southeast Asia as far as northern Queensland, Australia, <i>M. capitulata</i> has been cultivated as an ornamental in the Hawaiian Islands for a very long time. These collections represent the first evidence that it has naturalized in at least three localities on Kaua'i. It would be interesting to observe how this species is reproducing, as it rarely produces seed in cultivation." ... "Material examined. KAUAI: Lihu'e Distr., Kipu Road, near entrance to Rice Ranch around Kipu, on roadside bank, ca 150 m, 4 Mar 1988, D. Lorence et al. 5838; Hanalei Distr., Ha'ena, abundantly naturalized along Limahuli Stream mauka of Kūhiō Hwy., ca 20 ft, 29 May 1988, K. Nagata 3857(BISH), Hanalei Distr., Mānoa Stream, lowland secondary mesic forest of <i>Aleurites</i> , <i>Syzygium cuminii</i> , <i>Mangifera</i> , <i>Terminalia catappa</i> , and <i>Schefflera</i> ; naturalized locally on stream banks forming dense clumps, ca 6 m, 18 Mar 2000, D. Lorence & T. Flynn 8467 (BISH, NY, US)."
	Dassanayake, M.D. & Clayton, W.D. 2000. A Revised Handbook of the Flora of Ceylon. Volume 14. A.A. Balkema, Rotterdam, Netherlands	"Somewhat common garden plant in lowlands and mid-country, and occurring wild as an escape from cultivation."

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	Siqueira, J. D. (2006). Bioinvasão vegetal: dispersão e propagação de espécies nativas e invasoras exóticas no campus da Pontifícia Universidade Católica do Rio de Janeiro (PUC-Rio). <i>Pesquisas, Botânica</i> , 57: 319-330	" <i>Curculigo</i> ou capim-palmeira (<i>Curculigo capitulata</i> Kuntze). Pertencendo à família <i>Amaryllidaceae</i> , esta espécie asiática é utilizada como ornamental. No campus da PUC-Rio, onde foi introduzida no passado em alguns canteiros, a espécie vem se multiplicando e ampliando sua área geográfica, sobretudo nas encostas, margem de rio e áreas mais úmidas. Seus rizomas vigorosos favorecem a sua propagação impedindo, em algumas áreas, o desenvolvimento de outras espécies." [Translation: <i>Curculigo</i> , or palm grass (<i>curculigo capitulata</i> Kuntze). Belonging to the <i>Amaryllidaceae</i> family, this Asian species is used as an ornamental. On the campus of PUC -Rio, where it was introduced in the past in some sites, the species is multiplying and expanding its geographical area, particularly in slopes, riverbanks and more humid areas . Its vigorous rhizomes favor the propagationpreventing, in some areas, development of other species.]
	Brown, S.H. & Marshall, T. 2013. <i>Creeping and Clumping Ground Covers for South Florida Gardens and Landscapes</i> . IFAS, University of Florida, Fort Myers, FL. http://lee.ifas.ufl.edu/ . [Accessed 22 Oct 2015]	"Hard to uproot once established." [Control & removal may be difficult]
	Dave's Garden. 2015. Palm Grass, Whale Back. <i>Curculigo capitulate</i> . http://davesgarden.com/guides/pf/go/2229/ . [Accessed 21 Oct 2015]	"On Jul 13, 2010, abken from New Orleans, LA wrote: I have to rate this neutral because it is positively easy to grow from small transplants but negative because once you've got it YOU'VE GOT IT. Be warned: grow in a container or within a growth restricting barrier. Old garden plant in the South, but few know what it is."
	Useful Tropical Plants Database. 2015. <i>Molineria capitulate</i> . http://tropical.theferns.info/viewtropical.php?id=Molineria+capitulata . [Accessed 22 Oct 2015]	"The plant is often grown as an ornamental and has the potential to become a weed. It has a tendency to spread and establish itself, and is rather well naturalized in the cemetery at Retalhuleu and in the Jardin Botanico in Guatemala[331]."

Qsn #	Question	Answer
	Zenni, R. D., & Ziller, S. R. (2011). An overview of invasive plants in Brazil. <i>Revista Brasileira de Botânica</i> , 34(3): 431-446	[<i>Curculigo capitulata</i> included in this list of invasive plants. Impacts unspecified] "Table 1. Invasive alien plants records for the physiognomic-ecological classes (UNESCO 1973) and ecoregion (Olson et al. 2001) in Brazil. Data is from the I3N Brazil database at www.institutohorus.org.br . We gathered location references in the database from field observations, interviews and literature reviews from 2003 until 2008. Locations are mostly related to municipalities or geographical reference points. Phytophysionomies with no correspondence in the original physiognomic-ecological classes are marked with *."
	Foxcroft, L. 2002. Kruger National Park Invasive Alien Species Section. Policy Document. South African National Parks, Pretoria, SA. http://www.parks-sa.co.za/ . [Accessed]	[<i>Molineria capitulata</i> included in list of priority alien plants. Impacts unspecified] "Table 2: Second category alien plants. Species which are regarded as priority species in the KNP"

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. 2012. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Dave's Garden. 2015. Palm Grass, Whale Back. <i>Curculigo capitulata</i> . http://davesgarden.com/guides/pf/go/2229/ . [Accessed 21 Oct 2015]	[No evidence of impacts, but observed to spread into native vegetation in Brazil] "On Mar 26, 2004, Monocromatico from Rio de Janeiro Brazil (Zone 11) wrote: ... Although this is a beautiful plant, I have noticed its presence around the native vegetation here in Rio de Janeiro. Native from Asia, this plant has escaped from gardens and seems to start to become a danger."

305	Congeneric weed	n
	Source(s)	Notes
	Randall, R.P. 2012. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Flynn, T. & Lorence, D.H. 2002. Additions to the flora of the Hawaiian Islands. <i>Bishop Museum Occasional Papers</i> 69:	[No evidence] "Plants are coarse, acaulescent herbs with distinctive palm-like foliage, the leaves 2–4.5 ft long, the blades elliptic, lengthwise-pleated, concealing the inflorescences, which are head-like and hidden among the leaf bases."

Qsn #	Question	Answer
402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

403	Parasitic	n
	Source(s)	Notes
	Flynn, T. & Lorence, D.H. 2002. Additions to the flora of the Hawaiian Islands. Bishop Museum Occasional Papers 69:	"Plants are coarse, acaulescent herbs with distinctive palm-like foliage..." [No evidence of parasitism]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Chen, J., Deng, X., Zhang, L., & Bai, Z. (2006). Diet composition and foraging ecology of Asian elephants in Shangyong, Xishuangbanna, China. <i>Acta Ecologica Sinica</i> , 26(2): 309-316	[Consumed by Asian elephants] "Some species, such as <i>Spondias pinnata</i> (Anacardiaceae), <i>Microstegium ciliatum</i> (Gramineae), <i>Curculigo capitatum</i> (Hypoxidaceae), and <i>Amomum glabrum</i> (Zingiberaceae) were consumed more during the wet season."
	Ghosh, C., & Das, A. P. (2007). Rhino-Fodders in Jaldapara Wildlife Sanctuary in Duars of West Bengal, India. <i>Our Nature</i> , 5(1): 14-20	[Palatable to rhino. Likely palatable to deer, goats & possibly pigs] "Table 1. Most Preferred Rhino-fodders in JWLS." [Curculigo capitulate - Edible Parts = Young leaf, inflorescence]

405	Toxic to animals	n
	Source(s)	Notes
	Chen, J., Deng, X., Zhang, L., & Bai, Z. (2006). Diet composition and foraging ecology of Asian elephants in Shangyong, Xishuangbanna, China. <i>Acta Ecologica Sinica</i> , 26(2): 309-316	[No evidence. Consumed by Asian elephants] "Some species, such as <i>Spondias pinnata</i> (Anacardiaceae), <i>Microstegium ciliatum</i> (Gramineae), <i>Curculigo capitatum</i> (Hypoxidaceae), and <i>Amomum glabrum</i> (Zingiberaceae) were consumed more during the wet season."
	Ghosh, C., & Das, A. P. (2007). Rhino-Fodders in Jaldapara Wildlife Sanctuary in Duars of West Bengal, India. <i>Our Nature</i> , 5(1): 14-20	[No evidence. Palatable to rhinos] "Table 1. Most Preferred Rhino-fodders in JWLS." [Curculigo capitulate - Edible Parts = Young leaf, inflorescence]
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Peña, J.E. 2013. Potential Invasive Pests of Agricultural Crops. CABI, Wallingford, UK	"Table 10.1. Recorded feeding list of <i>Darna pallivitta</i> (alphabetical by family) in Hawai'i" [Includes <i>Curculigo capitulate</i> , syn. for <i>Molineria capitulata</i> , along with several other species]

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes

Qsn #	Question	Answer
	Useful Tropical Plants Database. 2015. <i>Molineria capitulata</i> . http://tropical.theferns.info/viewtropical.php?id=Molineria+capitulata . [Accessed 22 Oct 2015]	"Known Hazards: None known"
	Geerinck, D.J.L. 1993. Flora Malesiana. Series I, Spermatophyta: Flowering plants. Volume 11, part. 2: 353-373. Amaryllidaceae (including Hypoxidaceae). Rijksherbarium / Hortus Botanicus, Leiden, The Netherlands	[No evidence] "Uses - The fruits are edible. Leaf fibres are (or were) used in the Philippines, according to Burkill, Diet. Econ. Prod. Malay Penins. 1 (1935) 703."
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Used medicinally] "(Tuber/rhizome for eye diseases, outer skin peeled and soaked in water; tubers pounded up and applied to cuts, wounds, on diseases of vagina; latex from rhizome hemostatic; dried rhizome chewed for gastroenteritis and stomach problems; rhizome paste applied on skin for venereal diseases; juice of crushed rhizome applied for eye diseases, and also taken for stomachache; for dysentery and diarrhea, fresh leaves and tuber ground to paste taken orally mixed with urine of a heifer. Tender leaves and twigs of <i>Mucuna monosperma</i> and <i>Curculigo capitulata</i> rhizome made into a paste and mixed with tobacco ash, this paste used to check external hemorrhage in cuts.)"
	Wagstaff, D.J. 2008. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes
	Northern Land Manager. 2004. Fire responses of <i>Molineria capitulata</i> . http://www.landmanager.org.au/fire-responses-molineria-capitulata . [Accessed 22 Oct 2015]	[Tolerates fire. Unknown if it significantly contributes to fire risk] "Adult fire response: Resprouter (<30% mortality when subject to 100% leaf scorch) Resprouting type: Basal (root suckers/rhizomes)"

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Sheat, B. & Schofield, G. 1995. Complete Gardening in Southern Africa. Struik Publishers, Cape Town, South Africa	"A shade-loving plant with tuberous rhizomes, that spreads slowly into large, evergreen clumps." ... "Useful in difficult, shaded areas that tend to dry out rapidly and regularly."
	Useful Tropical Plants Database. 2015. <i>Molineria capitulata</i> . http://tropical.theferns.info/viewtropical.php?id=Molineria+capitulata . [Accessed 22 Oct 2015]	"Succeeds in semi-shade and also in deeper shade"
	Dave's Garden. 2015. Palm Grass, Whale Back. <i>Curculigo capitulata</i> . http://davesgarden.com/guides/pf/go/2229/ . [Accessed 21 Oct 2015]	"Sun Exposure: Light Shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Useful Tropical Plants Database. 2015. <i>Molineria capitulata</i> . http://tropical.theferns.info/viewtropical.php?id=Molineria+capitulata . [Accessed 22 Oct 2015]	"Requires a fertile, humus-rich, moisture-retentive but well-drained soil"

Qsn #	Question	Answer
	Dave's Garden. 2015. Palm Grass, Whale Back. <i>Curculigo capitulata</i> . http://davesgarden.com/guides/pf/go/2229/ . [Accessed 22 Oct 2015]	"Soil pH requirements: 6.1 to 6.5 (mildly acidic) 6.6 to 7.5 (neutral)"
	University of North Florida. 2015. Plants of the UNF Campus - <i>Curculigo capitulata</i> - Palm grass. https://www.unf.edu . [Accessed 22 Oct 2015]	"Soil: adaptable" [Suggests possible tolerance of multiple soil types]

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Flynn, T. & Lorence, D.H. 2002. Additions to the flora of the Hawaiian Islands. Bishop Museum Occasional Papers 69:	"Plants are coarse, acaulescent herbs with distinctive palm-like foliage, the leaves 2–4.5 ft long, the blades elliptic, lengthwise-pleated, concealing the inflorescences, which are head-like and hidden among the leaf bases."

412	Forms dense thickets	
	Source(s)	Notes
	Hubbuck, C. 2015. Gardening in the Coastal Southeast - The Genus <i>Curculigo</i> Family Hypoxidaceae. http://southeastgarden.com/curculigo.html . [Accessed 22 Oct 2015]	"Broad, pleated leaves rise two to three feet tall from underground rhizomes, making a dense, tall groundcover."
	Flynn, T. & Lorence, D.H. 2002. Additions to the flora of the Hawaiian Islands. Bishop Museum Occasional Papers 69:	"naturalized locally on stream banks forming dense clumps, ca 6 m"
	Sheat, B. & Schofield, G. 1995. Complete Gardening in Southern Africa. Struik Publishers, Cape Town, South Africa	"spreads slowly into large, evergreen clumps"

501	Aquatic	n
	Source(s)	Notes
	Geerinck, D.J.L. 1993. Flora Malesiana. Series I, Spermatophyta: Flowering plants. Volume 11, part. 2: 353-373. Amaryllidaceae (including Hypoxidaceae). Rijksherbarium / Hortus Botanicus, Leiden, The Netherlands	[Terrestrial] "Hairy herb." ... "Habitat - Primary and secondary forests, from sea-level up to c. 2000 m altitude."

502	Grass	n
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 21 Oct 2015]	"Family: Hypoxidaceae. Also placed in: Liliaceae"

503	Nitrogen fixing woody plant	n
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Qsn #	Question	Answer
	Source(s)	Notes
	USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 21 Oct 2015]	"Family: Hypoxidaceae. Also placed in: Liliaceae" [No evidence]

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y
	Source(s)	Notes
	Dassanayake, M.D. & Clayton, W.D. 2000. A Revised Handbook of the Flora of Ceylon. Volume 14. A.A. Balkema, Rotterdam, Netherlands	"Perennial herbs with tuberous subterraneous stems, often with stolons."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Geerinck, D.J.L. 1993. Flora Malesiana. Series I, Spermatophyta: Flowering plants. Volume 11, part. 2: 353-373. Amaryllidaceae (including Hypoxidaceae). Rijksherbarium / Hortus Botanicus, Leiden, The Netherlands	[No evidence. Widely distributed] "Distribution - Continental Asia (Nepal, India, Sri Lanka, Bangladesh, Thailand), Taiwan, Australia, Pacific Islands (Solomon Islands, Hawaii); Malesia: Sumatra, Malaya, Singapore, Java, Philippines (Luzon, Negros, Biliran, Mindanao), Celebes, Moluccas (Halmaheira, Talaud, Ternate, Ambon), New Guinea, Manus I."

602	Produces viable seed	y
	Source(s)	Notes
	Flynn, T. & Lorence, D.H. 2002. Additions to the flora of the Hawaiian Islands. Bishop Museum Occasional Papers 69:	"It would be interesting to observe how this species is reproducing, as it rarely produces seed in cultivation."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Propagation is usually by division of rhizomes in mature clumps, since cultivated plants rarely produce seed."
	Useful Tropical Plants Database. 2015. <i>Molineria capitulata</i> . http://tropical.theferns.info/viewtropical.php?id=Molineria+capitulata . [Accessed 23 Oct 2015]	"Propagation Seed - best sown as soon as it is ripe[200]. Division of the rootstock[200]. Offsets[200]."

603	Hybridizes naturally	
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliaceae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	[No reports of hybridization] "Five to seven spp., Asiatic monsoon area, best known <i>M. recurvata</i> (Dryand.) Nel, largely cultivated in Africa, Asia to Australia."

604	Self-compatible or apomictic	
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Qsn #	Question	Answer
	Source(s)	Notes
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	[Unknown] "Flowers relatively small, yellowish adaxially. Stamens uniseriate, filaments long attached to the anther low down on the outer face; anther with introrse dehiscence. Ovary most often without a beak, if present, only very short."

605	Requires specialist pollinators	
	Source(s)	Notes
	Flora of Australia Online. 1987. <i>Molineria capitulata</i> . http://www.anbg.gov.au/abrs/online-resources/flora/ . [Accessed 23 Oct 2015]	"fruit appears to be set rarely, at least in cultivated plants." [Suggest pollination requirements may be specialized]
	The Botanic Gardens of Adelaide. 2005. A Rainforest Walk in the Bicentennial Conservatory. Adelaide Botanic Garden. www.botanicgardens.sa.gov.au	[Unspecified pollinator] " <i>Molineria capitulata</i> (Weevil Lily) Dense clusters of yellow flowers or their dried remains can often be found at the base of the long palmlike leaves. This unusual position for flowers attracts a pollinator that lives on the forest floor."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Dave's Garden. 2015. Palm Grass, Whale Back. <i>Curculigo capitulata</i> . http://davesgarden.com/guides/pf/go/2229/ . [Accessed 21 Oct 2015]	"On Oct 1, 2003, TerriFlorida from Plant City, FL wrote: This plant does make a good ground cover where soil is moist, but be warned, it suckers as any reliable ground cover does, and it WILL show up where you don't want it. It is also nearly impossible to remove once it pops up somewhere, without dislodging whatever it comes up through. If you choose to plant it, it is perfectly root hardy where hard frost occurs but the ground never freezes."
	Wrigley, J. W. & Fagg, M. 2013. Australian Native Plants. Sixth Edition. New Holland Publishers, Sydney	[Suckering] "Tufted, suckering perennial with several entire, narrow spade-shaped, pleated leaves to 1.5m long."

607	Minimum generative time (years)	>3
	Source(s)	Notes
	Northern Land Manager. 2004. Fire responses of <i>Molineria capitulata</i> . http://www.landmanager.org.au/fire-responses-molineria-capitulata . [Accessed 21 Oct 2015]	"Life Span: 6-20 years Growth Form: Herb First seeds: 4-10 years"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Flynn, T. & Lorence, D.H. 2002. Additions to the flora of the Hawaiian Islands. Bishop Museum Occasional Papers 69:	[Unlikely. A fleshy-fruited species that rarely produces seeds] "It would be interesting to observe how this species is reproducing, as it rarely produces seed in cultivation."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes

Qsn #	Question	Answer
	Acevedo-Rodríguez, P. & Strong, M.T. 2005. Monocotyledons and Gymnosperms of Puerto Rico and the Virgin Islands. Contributions from the United States National Herbarium 52: 1-415	"General distribution: Native to India, Sri Lanka, S. China, Malaysia and tropical Africa, now widespread in tropical regions through cultivation, sometimes adventive."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"It has been cultivated in Hawai'i for many years and is found in older gardens :throughout the state, although it has never been particularly abundant."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Unlikely. No evidence, & limited seed production would minimize risk of inadvertent contamination] "Propagation is usually by division of rhizomes in mature clumps, since cultivated plants rarely produce seed."

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Wu, Z. Y. & Raven, P. H. (eds.). 2000. Flora of China. Vol. 24 (Flagellariaceae through Marantaceae). Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis	[No evidence. Fleshy-fruited] " <i>Curculigo capitulata</i> " ... "Berry white, subglobose, 4–5 mm in diam., beakless. Seeds black with irregular stripes."

705	Propagules water dispersed	n
	Source(s)	Notes
	Flynn, T. & Lorence, D.H. 2002. Additions to the flora of the Hawaiian Islands. Bishop Museum Occasional Papers 69:	[Distribution along streams suggests possible movement by water] "Hanalei Distr., Ha'ena, abundantly naturalized along Limahuli Stream mauka of Kūhiō Hwy., ca 20 ft, 29 May 1988, K. Nagata 3857 (BISH), Hanalei Distr., Mānoa Stream, lowland secondary mesic forest of Aleurites, <i>Syzygium cuminii</i> , <i>Mangifera</i> , <i>Terminalia catappa</i> , and <i>Schefflera</i> ; naturalized locally on stream banks forming dense clumps, ca 6 m, 18 Mar 2000, D. Lorence & T. Flynn 8467 (BISH, NY, US)."

706	Propagules bird dispersed	n
	Source(s)	Notes
	Dassanayake, M.D. & Clayton, W.D. 2000. A Revised Handbook of the Flora of Ceylon. Volume 14. A.A. Balkema, Rotterdam, Netherlands	[Fleshy-fruited. Seeds, if produced, may be adapted to bird dispersal, although dispersal mechanisms are unknown] "Fruit an ovoid berry, 8-12 mm broad, on a stalk about 12 mm long, whitish, thinly covered with adpressed dark hairs. Seeds 2-15 in the white pulp of the fruit, pyriform, 2.5-3 long, marked with deep longitudinal and shallow transverse grooves; endosperm hard, embryo straight."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes

Qsn #	Question	Answer
	Kubitzki, K. (ed.). 1998. The Families and genera of vascular plants. Volume III. Flowering plants, Monocotyledons: Liliaceae (except Orchidaceae). Springer-Verlag, Berlin, Heidelberg, New York	[Unknown. Ants may possibly play a role in dispersal] "Particularly intriguing is seed dispersal of underground seeds in the more or less baccate fruits of Curcuiigo, Empodium, Rhodohypoxis and Saniellia. Some of them produce seeds with a distinct strophiole, probably acting as an elaiosome. Ants or related insects might thus be involved."

708	Propagules survive passage through the gut	
	Source(s)	Notes
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	[Fleshy-fruited. Unknown if fruit are consumed or if seeds survive gut passage] "Berry ellipsoid, ca 0.25" long, white. Seeds dark brown."

801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes
	Flynn, T. & Lorence, D.H. 2002. Additions to the flora of the Hawaiian Islands. Bishop Museum Occasional Papers 69:	"It would be interesting to observe how this species is reproducing, as it rarely produces seed in cultivation."
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Propagation is usually by division of rhizomes in mature clumps, since cultivated plants rarely produce seed."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Royal Botanic Gardens Kew. (2015) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 23 Oct 2015]	[Unknown] "Storage Behaviour: No data available for species or genus. Of 2 known taxa of family HYPOXIDACEAE, 100.00% Orthodox (p/?)"

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	y
	Source(s)	Notes
	Northern Land Manager. 2004. Fire responses of <i>Molineria capitulata</i> . http://www.landmanager.org.au/fire-responses-molineria-capitulata . [Accessed 21 Oct 2015]	"Adult fire response: Resprouter (<30% mortality when subject to 100% leaf scorch) Resprouting type: Basal (root suckers/rhizomes)"

Qsn #	Question	Answer
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2015. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, demonstrating environmental versatility
- Thrives in tropical climates
- Naturalized on Kauai, Hawaiian Islands & naturalized or an escape from cultivation in Florida, Puerto Rico, Sri Lanka, Rio de Janeiro, & possibly elsewhere
- A weedy plant, difficult to remove once established
- Shade-tolerant
- Forms dense clumps, & can possibly exclude other vegetation
- A geophyte, able to resprout from tuberous, underground stems
- Able to reproduce by seeds (rarely in cultivation)
- Spreads vegetatively
- Planted intentionally by people
- Tolerates fire, & able to spread from stem fragments

Low Risk Traits

- Unarmed (no spines, thorns or burrs)
- Palatable to browsing animals in native range
- Not reported to be toxic
- Ornamental
- Rarely produces seeds in cultivation
- Reaches maturity in 4-10 years
- Limited seed production reduces risk of long-distance or inadvertent dispersal

Second Screening Results for Herbs

(A) Reported as a weed of cultivated lands?> Yes. Weedy in gardens & cultivated settings

(B) Known to form dense stands? Possibly. Forms dense clumps that may exclude other vegetation

Outcome = Evaluate Further

