

Family: *Orchidaceae*

Taxon: *Spathoglottis plicata*

Synonym:

Common Name: Malayan ochid
Philippine ground orchid
boat orchid

Questionnaire :	current 20090513	Assessor:	Patti Clifford	Designation: H(HPWRA)
Status:	Assessor Approved	Data Entry Person:	Patti Clifford	WRA Score 16
101	Is the species highly domesticated?		y=-3, n=0	n
102	Has the species become naturalized where grown?		y=1, n=-1	
103	Does the species have weedy races?		y=1, n=-1	
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"		(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data		(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)		y=1, n=0	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)	n
303	Agricultural/forestry/horticultural weed		n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)	y
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs		y=1, n=0	n
402	Allelopathic		y=1, n=0	
403	Parasitic		y=1, n=0	n
404	Unpalatable to grazing animals		y=1, n=-1	
405	Toxic to animals		y=1, n=0	n
406	Host for recognized pests and pathogens		y=1, n=0	
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
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	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	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	y=1, n=-1	
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	2
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	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	y
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)	y=1, n=-1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score **16**

Supporting Data:

101	2011. WRA Specialist. Personal Communication.	[Is the species highly domesticated? No] No evidence.
102	2011. WRA Specialist. Personal Communication.	[Has the species become naturalized where grown? NA]
103	2011. WRA Specialist. Personal Communication.	[Does the species have weedy races?? NA]
201	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"? High] Native range: India; Myanmar; Thailand; Indonesia; Malaysia; Papua New Guinea; Philippines; Australia - Queensland [n.]; New Caledonia; Samoa; Solomon Islands; Tonga
202	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Quality of climate match data? High] Native range: India; Myanmar; Thailand; Indonesia; Malaysia; Papua New Guinea; Philippines; Australia - Queensland [n.]; New Caledonia; Samoa; Solomon Islands; Tonga
203	2011. Anonymous. Terrestrial orchids in Malaysia. http://www2.ktokai-u.ac.jp/~ttnaka/Kinabalu/Mt.Kinabalu.html	[Broad climate suitability (environmental versatility)? Yes] "In Malaysia, even <i>Spathoglottis plicata</i> grew wild at high elevation, but generally not higher than ca. 1,500 m. In Iriomote Island, Japan, <i>Spathoglottis plicata</i> was found in the lowland at about 60 or 240 m above sea level. In the lowland of Malaysia, encroachment of industrial development as well as large-scale plantations have minimized the natural habitats for <i>Spathoglottis plicata</i> ."
203	2011. Dave's Garden. PlantFiles: ground orchid, boat orchid, Philippine orchid, <i>Spathoglottis plicata</i> . Dave's Garden, http://davesgarden.com/guides/pf/go/2540/	[Broad climate suitability (environmental versatility)?] USDA Hardiness zones: 11 (above 4.5 degrees Celsius) 40 degrees Fahrenheit.
204	2011. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Native or naturalized in regions with tropical or subtropical climates? Yes]. Native range: India; Myanmar; Thailand; Indonesia; Malaysia; Papua New Guinea; Philippines; Australia - Queensland [n.]; New Caledonia; Samoa; Solomon Islands; Tonga
205	2011. Culturesheet.org. <i>Spathoglottis plicata</i> Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Does the species have a history of repeated introductions outside its natural range? Yes] Introduced in West Africa 6), adventive in southern Florida and naturalized in Hawaii and Puerto Rico.
301	1995. Thompson, S.A./Wright, F.W.Jr.. <i>Spathoglottis plicata</i> (Orchidaceae): new to Dominica, another record from the Lesser Antilles. Caribbean Journal of Science. 31: 148-149. http://academic.uprm.edu/publications/cjs/VO L31/P148-162.pdf	[Naturalized beyond native range? Yes] Naturalized and spreading in Dominica.
301	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Naturalized beyond native range? Yes] Naturalized in open, disturbed, usually grassy areas in mesic to wet forest on all the main Hawaiian Islands except Niihau and Kahoolawe.
302	2011. Culturesheet.org. <i>Spathoglottis plicata</i> Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Garden/amenity/disturbance weed? No] " <i>Spathoglottis plicata</i> is a plant that easily escapes the garden and settles in the wild in humid tropical environments, in these populations there are no growers that select the good ones and offspring reverts to specimens that don't fully open their flowers." [scored as an environmental weed]
302	2011. WRA Specialist. Personal Communication.	[Garden/amenity/disturbance weed? No] Scored as an environmental weed.
303	2007. Randall, R.. Global Compendium of Weeds - <i>Spathoglottis plicata</i> [online database]. http://www.hear.org/gcw/species/spathoglottis_plicata/	[Agricultural/forestry/horticultural weed? No] No evidence.

304	2010. Ackerman, J.D./Cuevas, A.A./Flores-Saldaña, N.P./Zambrana-Torrelío, C.M.. There goes the neighborhood: Reproductive success of <i>Bletia patula</i> when <i>Spathoglottis plicata</i> moves in. PS 66-14: The 95th ESA Annual Meeting, August 1-6, 2010. ESA, Pittsburg	[Environmental Weed? Yes] Research on <i>Spathoglottis plicata</i> from Puerto Rico suggests that this species is an invasive species. "Background/Question/Methods One of the challenges of invasive species biology is knowing whether or not a naturalized species is invasive before dramatic ecosystem changes occur. In Puerto Rico, the exotic orchid, <i>Spathoglottis plicata</i> , has naturalized and spread rapidly over the last two decades. It is abundant and occupies the same habitat as the native orchid, <i>Bletia patula</i> . The two are hosts to the same native florivorous weevil, <i>Stethobaris polita</i> , a specialist on orchid flowers. We ask whether high population densities of <i>Spathoglottis plicata</i> affect the reproductive success of <i>Bletia patula</i> by elevating the abundance of the weevil. We measured local densities of the orchids where the two species grow together and also where <i>B. patula</i> grows in absence of <i>S. plicata</i> . We measured female reproductive success of <i>Bletia</i> at all sites. We also monitored the abundance of weevils and the extent of floral damage they cause on <i>Bletia patula</i> . In addition, we experimentally tested in vitro whether weevils preferred one species to the other. Finally, we modeled the distribution of both orchid species to predict the extent to which the two species may interact. Results/Conclusions Preliminary data indicate the number of weevils per <i>Bletia</i> inflorescence tends to be higher where <i>S. plicata</i> is also present. These data also show a significantly higher flower and fruit production for <i>B. patula</i> where <i>S. plicata</i> is absent. The weevil choice experiments show that the beetles do not prefer flowers of one species to the other. The current distribution of the native <i>Bletia patula</i> is almost completely limited to the northern karst region of Puerto Rico whereas the naturalized <i>S. plicata</i> has established in nearly all moist to wet habitats of the island with a high frequency of populations in the same region as <i>B. patula</i> . The <i>Spathoglottis</i> is expected to occur wherever <i>B. patula</i> exists. Our data thus far suggest that <i>Spathoglottis plicata</i> is an invasive species. It negatively affects the reproductive success of the native orchid, <i>Bletia patula</i> , through an elevation in the frequency and abundance of the florivorous weevil."
305	2007. Randall, R.P.. Global Compendium of Weeds - Index [Online Database]. http://www.hear.org/gcw/	[Congeneric weed? No] No evidence.
401	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Produces spines, thorns or burrs? No] "Erect, terrestrial perennial herbs 3-15 dm tall, pseudobulbs crowded along and obscuring rhizome, completely surrounded by the persistent fibrous leaf bases. Leaves 2-6 per pseudobulb, conspicuously plicate, linear-lanceolate."
402	2011. WRA Specialist. Personal Communication.	[Allelopathic?] Unknown.
403	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Parasitic? No] Orchidaceae.
404	2011. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals?] Unknown.
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Toxic to animals? No] No evidence.
405	2011. National Center for Biotechnology Information. PubMed. U.S. National Library of Medicine, Bethesda, Maryland http://www.ncbi.nlm.nih.gov/	[Toxic to animals? No] No evidence.
406	2011. Culturesheet.org. <i>Spathoglottis plicata</i> Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Host for recognized pests and pathogens?] <i>Cymbidium</i> mosaic virus is known to cause leaf necrosis in the genus. A particular strain of this pathogen can result in blossom necrosis, brown spots or streaks appear one or more weeks after the flower has opened. 30) <i>Cymbidium</i> ringspot virus
406	2011. WRA Specialist. Personal Communication.	[Host for recognized pests and pathogens?] Unknown.
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? No] No evidence.
407	2011. National Center for Biotechnology Information. PubMed. U.S. National Library of Medicine, Bethesda, Maryland http://www.ncbi.nlm.nih.gov/	[Causes allergies or is otherwise toxic to humans? No] No evidence.

408	2011. WRA Specialist. Personal Communication.	[Creates a fire hazard in natural ecosystems? No] Herbaceous. [does not accumulate large amounts of biomass.
409	2011. Dave's Garden. PlantFiles: ground orchid, boat orchid, Philippine orchid, Spathoglottis plicata. Dave's Garden, http://davesgarden.com/guides/pf/go/2540/	[Is a shade tolerant plant at some stage of its life cycle? Yes] Light shade.
409	2011. Learn to Grow. Spathoglottis plicata. http://www.learn2grow.com/plants/spathoglottis-plicata/	[Is a shade tolerant plant at some stage of its life cycle? Yes] Full sun, partial sun, partial shade.
410	1997. Clarkson, B.D.. Vegetation succession (1967-89) on five recent montane lava flows, Mauna Loa, Hawaii. New Zealand Journal of Ecology. 22: 1-9. http://www.nzes.org.nz/nzje/free_issues/NZJecol22_1_1.pdf	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] In this research, on vegetation succession on lava flows on Mauna Loa, Hawaii, Spathoglottis plicata had invaded two of the four sites.
410	2011. Learn to Grow. Spathoglottis plicata. http://www.learn2grow.com/plants/spathoglottis-plicata/	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] Soil pH: acidic to neutral. Plant in loam.
411	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Climbing or smothering growth habit? No] "Erect, terrestrial perennial herbs 3-15 dm tall, pseudobulbs crowded along and obscuring rhizome, completely surrounded by the persistent fibrous leaf bases
412	2011. WRA Specialist. Personal Communication.	[Forms dense thickets? No] No evidence of thicket formation.
501	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Aquatic? No] Herbaceous terrestrial.
502	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Grass? No] Orchidaceae.
503	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Nitrogen fixing woody plant? No] Herbaceous.
504	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? Yes] Pseudobulbs crowded along and obscuring rhizome.
601	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Evidence of substantial reproductive failure in native habitat? No] "Widespread in tropical Asia from Northern India to the West Pacific across Southeast Asia to Australia 1) in various of the Indian and Malay Islands, Hong-Kong, Southern China and the Pacific Islands of Samoa and New Caledonia 2). In Australia, it grows in lowland regions or low ranges, in or close to swamps, in seasonally inundated areas and in moist, grassy patches close to streams, in Melaleuca swamp forest and gallery closed forest."
602	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Produces viable seed? Yes] "Spathoglottis plicata is a plant that easily escapes the garden and settles in the wild in humid tropical environments, in these populations there are no growers that select the good ones and offspring reverts to specimens that don't fully open their flowers. This is important to know when selecting plants and propagating from seed: take care to buy plants which are guaranteed to open up completely, and - if you're the trader - be sure to sell plants (or splits) that have flowered before."
603	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Hybridizes naturally?] "There's no problem in crossing this Spathoglottis plicata with other members of this genus, but R. J. Ferry reports that selfed or F1 hybrids often produces hybrids which are nearly sterile."
603	2011. WRA Specialist. Personal Communication.	[Hybridizes naturally?] Unknown.
604	1992. Ackerman, J.D./del Castillo, M.. The orchids of Puerto Rico and the Virgin Islands. La Editorial, UPR,	[Self-compatible or apomictic? Yes] Flowers are self-pollinating.

604	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Self-compatible or apomictic? Yes] Spathoglottis plicata will self-pollinate in the absence of pollinators.
605	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Requires specialist pollinators? No] Spathoglottis plicata will self-pollinate in the absence of pollinators.
606	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Reproduction by vegetative fragmentation? Yes] "Splitting plants is very easy. You can separate them by just separating the pseudobulbs, it's not necessary to keep backbulbs attached: a single pseudobulb without shoots will push new growth and those with shoots will continue to grow without fuss. There's no real consensus on the best time for splitting, growers normally postpone it until repotting is called for and when a flush of fresh shoots appears."
607	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Minimum generative time (years)? 2] Under optimum conditions it is possible to have a seed to flower period of 15 months.
701	1992. Ackerman, J.D./del Castillo, M.. The orchids of Puerto Rico and the Virgin Islands. La Editorial, UPR,	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Yes] In Puerto Rico a few populations are found in road cuts in the Luquillo Mountains.
702	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Propagules dispersed intentionally by people? Yes] Spathoglottis plicata is a terrestrial orchid with considerable horticultural value: rather easy and forgiving in cultivation, good stature, showy flowers and exceptionally fast growing.
703	2011. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence of produce contamination.
704	2004. Medeiros, A.C.. Phenology, reproductive potential, seed dispersal and predation, and seedling establishment of three invasive plant species in a Hawaiian rain forest. University of Hawaii Manoa,	[Propagules adapted to wind dispersal? Yes] Wind dispersed.
705	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Propagules water dispersed? Yes] "In Australia, it grows in lowland regions or low ranges, in or close to swamps, in seasonally inundated areas and in moist, grassy patches close to streams, in Melaleuca swamp forest and gallery closed forest."
706	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Bird dispersed? No] Capsule, 3.5-4cm long.
707	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Propagules dispersed by other animals (externally)? No] Capsule 6-ribbed. [no means of external attachment.]
708	1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.	[Propagules survive passage through the gut? No] Capsules cylindrical 6-ribbed, 3.5-4 cm long. [Unlikely to be eaten.]
801	1992. Ackerman, J.D./del Castillo, M.. The orchids of Puerto Rico and the Virgin Islands. La Editorial, UPR,	[Prolific seed production (>1000/m ²)? Yes] Spathoglottis plicata produces numerous flowers over and extended period of time and fruit production is prolific.
802	2011. WRA Specialist. Personal Communication.	Evidence that a persistent propagule bank is formed (>1 yr)?] Unknown.
803	2011. WRA Specialist. Personal Communication.	[Well controlled by herbicides?] Unknown.
804	2011. Culturesheet.org. Spathoglottis plicata Blume. Culturesheet.org, http://culturesheet.org/orchidaceae:spathoglottis:plicata	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "Splitting plants is very easy. You can separate them by just separating the pseudobulbs, it's not necessary to keep backbulbs attached: a single pseudobulb without shoots will push new growth and those with shoots will continue to grow without fuss. There's no real consensus on the best time for splitting, growers normally postpone it until repotting is called for and when a flush of fresh shoots appears."
805	2011. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)?] Unknown.

