

Taxon: *Cynanchum gerrardii* (Harv.) Liede

Family: Apocynaceae

Common Name(s): milk-rope

Synonym(s): *Cynanchum sarcostemmatoides* K.
Cynanchum tetrapterum (Turcz.) R.A.
Sarcocyphula gerrardii Harv.

Assessor: Chuck Chimera

Status: Assessor Approved

End Date: 17 Jun 2020

WRA Score: 6.0

Designation: EVALUATE

Rating: Evaluate

Keywords: Tropical Climber, Naturalized, Fish Poison, Reduced Leaves, Wind-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	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	n
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)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
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		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans		
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		

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	y
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic		
605	Requires specialist pollinators		
606	Reproduction by vegetative fragmentation		
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
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	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m ²)		
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
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[No evidence of domestication] "Very widespread, but not frequent." ... "Uses. Zulus eat young shoots; in East Africa used as fish poison; in Somalia eaten, much liked by pregnant women (Gillett 3939)."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2020). 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
	JSTOR Global Plants. (2006). Entry for <i>Cynanchum gerrardii</i> (Harv.) Liede [family ASCLEPIADACEAE]. Entry From <i>Flora Somalia</i> , Vol 3. Author: S. Liede-Schumann. plants.jstor.org	" Range N1, 2 Eritrea, Ethiopia and southwards to South Africa, and Madagascar, the Comores, Saudi Arabia and Yemen"

202	Quality of climate match data	High
	Source(s)	Notes
	JSTOR Global Plants. (2006). Entry for <i>Cynanchum gerrardii</i> (Harv.) Liede [family ASCLEPIADACEAE]. Entry From <i>Flora Somalia</i> , Vol 3. Author: S. Liede-Schumann. plants.jstor.org	

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	"0-1,500 m; close to the sea or further inland, on rocky outcrops, in sandy or clayey depressions, often in slightly disturbed sites. Very widespread, but not frequent." [Elevation range exceeds 1000 m, demonstrating some environmental versatility]

204	Native or naturalized in regions with tropical or subtropical climates	y
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Qsn #	Question	Answer
	Source(s)	Notes
	Friis, I., Vollesen, K. & Danske, K. (1998). Flora of the Sudan-Uganda Border Area East of the Nile. I. Catalogue of Vascular Plants, 1st part. Kgl. Danske Videnskabernes Selskab, Copenhagen, Denmark	"General distribution: Sudan to Ethiopia and So-malia, south to South Africa (Transvaal, Natal, East Cape); also in Madagascar and tropical Arabia."
	Frohlich, D. & Lau, A. 2012. New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27-54	"Material examined. O'AHU: Koko Crater Botanical Garden, UTM 636719, 2354330. New naturalized record. Climbing up side of crater above Erythrina grove in mixed alien vegetation. Also found growing thickly in a 5 meter x 5 m area along the Koko Head trail in a Leucaena leucocephala/ Hylocereus undatus thicket. Sprawling leafless vine. Flowers minute, fruits a dehiscent pod, 4 Apr 2011, OISC 2011040401."

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	Notes
	Frohlich, D. & Lau, A. 2012. New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27-54	" ... only known to be cultivated on O'ahu at Koko Crater Botanical Garden ..."
	Schmelzer, G.H. (2010). <i>Cynanchum orangeanum</i> (Schltr.) N.E.Br. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). PROTA (Plant Resources of Tropical Africa, Wageningen, Netherlands. https://uses.plantnet-project.org/en/Cynanchum_gerrardii_(PROTA) . [Accessed 17 Jun 2020]	[Used within native range. Limited evidence of cultivation outside native range] "Several other <i>Cynanchum</i> species occurring in the region are medicinally used. <i>Cynanchum gerrardii</i> (Harvey) Liede occurs throughout East Africa, southern Africa, the Indian Ocean islands, as well as Saudi Arabia and Yemen. In East Africa the latex is used as a fish poison. In South Africa and Somalia the young shoots are eaten as a vegetable."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Only record of naturalization from the Hawaiian Islands (i.e. no further evidence of introduction outside)

301	Naturalized beyond native range	y
	Source(s)	Notes
	Frohlich, D. & Lau, A. 2012. New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27-54	"The first sighting was by a member of the OISC field crew, who found a small patch climbing up the side of Koko Crater above the botanical garden's Erythrina grove. The second location for this species was along the Koko Head Trail, a popular hiking trail that follows the rim of the expired volcano. The population covered approximately 15 square ft, smothering a <i>Leucaena leucocephala</i> patch (J. Atwood 2011, pers. comm.)." ... "Material examined. O'AHU: Koko Crater Botanical Garden, UTM 636719, 2354330. New naturalized record. Climbing up side of crater above Erythrina grove in mixed alien vegetation. Also found growing thickly in a 5 meter x 5 m area along the Koko Head trail in a <i>Leucaena leucocephala</i> / <i>Hylocereus undatus</i> thicket. Sprawling leafless vine. Flowers minute, fruits a dehiscent pod, 4 Apr 2011, OISC 2011040401."

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes

Qsn #	Question	Answer
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[Grows in disturbed habitats] "0-1500 m; close to the sea or further inland, on rocky outcrops, in sandy or clayey depressions, often in slightly disturbed sites."
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	y
	Source(s)	Notes
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	" <i>Cynanchum acutum</i> ... Weed of: Cereals, Orchards & Plantations, Pastures"
	Nemat Alla, M. M., Serag, M. S., El-Bastawisi, Z. M., El-Fatah, A., & Shaimaa, N. (2012). Ecophysiological study on the invasive weed <i>Cynanchum acutum</i> L. <i>Journal of Plant Production</i> , 3(1), 117-129	"The increasing invasiveness of <i>Cynanchum acutum</i> could be attributed to its ability to adapt with different and diverse environmental variables in several habitats. Therefore, studying the ecophysiological characteristics of this invasive weed in areas of two different governorates (Damietta and Kaliobia) could be a key process in managing efforts in arable, cultivated and natural area habitats."

Qsn #	Question	Answer
401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	JSTOR Global Plants. (2006). Entry for <i>Cynanchum gerrardii</i> (Harv.) Liede [family ASCLEPIADACEAE]. Entry From Flora Somalia, Vol 3. Author: S. Liede-Schumann. plants.jstor.org	[No evidence] "Climber, 0.5–3 m high; stems semisucculent, finely striate, obscurely glaucous, glabrescent, basally corky, with thin, yellowish bark. Leaves scale-like, often not exactly opposite, 0.8–1.2 x 0.5–0.8 mm, acute. Inflorescences 4–7-flowered; peduncle 0–2.5 mm long; pedicels 2–4.5 mm long. Flowers sweetly scented; corolla-lobes c. 3 x 1–1.5 mm, deflexed, ovate, acuminate, green to greenish white. Corona white, cup-shaped, c. 1.5 mm long, slightly exceeding the gynostegium, tube more than 3/4 of corona length, staminal parts triangular, apically erect to inflexed, with straight margins, connate to the filament. Gynostegium sessile, 1.5 x 1.2 mm; anther wings 0.4 mm long; connective appendages 0.4 x 0.5 mm, ovate to triangular, narrower than the anthers, strongly inflexed; stigmatic head white, 0.8 x 0.2, flat to depressed-conical. Follicles 1(–2) per flower, 8–12 cm long, with shortly beaked tip. Seeds 5–6 x 2–3 mm, pear-shaped, densely pubescent, not winged, with tuft of c. 2 cm long hairs."

402	Allelopathic	
	Source(s)	Notes
	Golzardi, F. et al. (2015). Allelopathic Effect of Two <i>Cynanchum acutum</i> L. Populations on Emergence and Shoot Development of Barley. <i>J. Appl. Environ. Biol. Sci.</i> , 5 (1), 166-175	[Unknown. Allelopathy documented in genus] "Experimental study is carried out in order to assess the potential allelopathic effect of leaf, stalk and root of two <i>Cynanchum acutum</i> L. populations (Karaj and Kerman) on germination percentage, radicle and shoot length of barley (<i>Hordeum vulgare</i> L.). Polyethylene glycol solvable (PEG) is utilized to distinguish the osmotic and allelopathic effects of distillate extracted from <i>C. acutum</i> . Result showed the watery distillate of before mentioned organs in two populations had allelopathic effects on germination trait and crops development; so that by increasing the concentration rate of distillate, the germination percentage, radicle and shoot length of aforementioned crop decreased. Kerman's population showed rather osmotic potential compared to Karaj ones. <i>H. vulgare</i> germination traits respectively presented the highest sensitivity to distillate extracted from <i>C. acutum</i> . The watery distillate extracted from leaf and root had a drastic allelopathic effect compared to those that released from <i>C. acutum</i> stalks, which was dedicated the lowest allelopathic effect. Different PEG concentrations had no significant effect on germination trait. Thus, the whole inhibitor effects observed in distillates is pertained to their available allelochemical substance."

403	Parasitic	n
	Source(s)	Notes
	JSTOR Global Plants. (2006). Entry for <i>Cynanchum gerrardii</i> (Harv.) Liede [family ASCLEPIADACEAE]. Entry From Flora Somalia, Vol 3. Author: S. Liede-Schumann. plants.jstor.org	"Climber, 0.5–3 m high; stems semisucculent, finely striate, obscurely glaucous, glabrescent, basally corky, with thin, yellowish bark. Leaves scale-like, often not exactly opposite, 0.8–1.2 x 0. –0.8 mm, acute." [Apocynaceae. No evidence]

Qsn #	Question	Answer
404	Unpalatable to grazing animals	
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[No evidence of use as fodder in genus. Lack of well-developed leaves and sap probably limits or deters browsing] "Plants twining, semi-succulent; without well-developed leaves" ... "Uses. Zulus eat young shoots; in East Africa used as fish poison; in Somalia eaten, much liked by pregnant women (Gillett 3939)."

405	Toxic to animals	
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[Used as a fish poison. Toxicity to other animals unknown] "Uses. Zulus eat young shoots; in East Africa used as fish poison; in Somalia eaten, much liked by pregnant women (Gillett 3939)."

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[No evidence, but caution is warranted due to reports of use as a fish poison] "Uses. Zulus eat young shoots; in East Africa used as fish poison; in Somalia eaten, much liked by pregnant women (Gillett 3939)."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	"0-1500 m; close to the sea or further inland, on rocky outcrops, in sandy or clayey depressions, often in slightly disturbed sites. Very widespread, but not frequent." [No evidence]
	Smith, G. (2017). <i>Field Guide to Succulents of Southern Africa</i> . Struik Nature, Cape Town, South Africa	[No evidence, A climber of dry habitats, but succulent nature would limit ability to burn] "Scandent and twining climber with narrow but succulent branching stems."

Qsn #	Question	Answer
409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[Disturbed habitats typically high light environments] "0-1500 m; close to the sea or further inland, on rocky outcrops, in sandy or clayey depressions, often in slightly disturbed sites. Very widespread, but not frequent."
	Bingham, M.G. et al. (2020). Flora of Zambia: Species information: individual images: <i>Cynanchum gerrardii</i> . https://www.zambiaflora.com . [Accessed 17 Jun 2020]	[In full sun] "Open rocky plateau at the rim of limestone gorge in full sun twining over a shrub"
	WRA Specialist. (2020). Personal Communication	Shade tolerance unknown, but common in open, disturbed, and presumably high light environments

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	"on rocky outcrops, in sandy or clayey depressions, often in slightly disturbed sites."

411	Climbing or smothering growth habit	y
	Source(s)	Notes
	JSTOR Global Plants. (2006). Entry for <i>Cynanchum gerrardii</i> (Harv.) Liede [family ASCLEPIADACEAE]. Entry From Flora Somalia, Vol 3. Author: S. Liede-Schumann. plants.jstor.org	"Climber, 0.5–3 m high; stems semisucculent, finely striate, obscurely glaucous, glabrescent, basally corky, with thin, yellowish bark. Leaves scale-like, often not exactly opposite, 0.8–1.2 x 0. –0.8 mm, acute."

412	Forms dense thickets	n
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	"0-1500 m; close to the sea or further inland, on rocky outcrops, in sandy or clayey depressions, often in slightly disturbed sites. Very widespread, but not frequent." [No evidence]

501	Aquatic	n
	Source(s)	Notes
	Friis, I., Vollesen, K. & Danske, K. (1998). Flora of the Sudan-Uganda Border Area East of the Nile. I. Catalogue of Vascular Plants, 1st part. Kgl. Danske Videnskabernes Selskab, Copenhagen, Denmark	[Terrestrial] "General habitat range: in lowland and medium altitude deciduous bushland, especially on rocky outcrops."

Qsn #	Question	Answer
502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 15 Jun 2020]	Family: Apocynaceae Subfamily: Asclepiadoideae Tribe: Asclepiadeae Subtribe: Cynanchinae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 15 Jun 2020]	Family: Apocynaceae Subfamily: Asclepiadoideae Tribe: Asclepiadeae Subtribe: Cynanchinae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	"Plants ascending, twining, 0.5-2 m high, richly acrocaulously branched; subterranean organs consisting only of fibrous roots."
	Bruyns, P. V. (2014). The Apocynaceae of Namibia. <i>Strelitzia</i> 34. South African National Biodiversity Institute, Pretoria	"Succulent trailer to climber to 3 m, with grey-green cylindrical slightly roughened branches arising from fibrous roots, glabrescent. Leaves reduced to minute lanceolate sessile scale-like rudiments 1.0–1.5 × 0.7–1.0 mm pressed to branch, caducous."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	"Very widespread, but not frequent."

602	Produces viable seed	y
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2020). <i>Cynanchum gerrardii</i> . http://tropical.theferns.info . [Accessed 17 Jun 2020]	"Propagation Seed"
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	"Seeds 5-6 mm long, 2-3 mm wide, pyriform, medium brown; seta and a seta side with regularly arranged papillae and trichomes 0.3 mm long, wingless, margins entire; coma 20-25 mm long."

603	Hybridizes naturally	
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Qsn #	Question	Answer
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	Unknown. No evidence in this publication

604	Self-compatible or apomictic	
	Source(s)	Notes
	Kadereit J., & Bittrich V. (eds). (2018). <i>The Families and Genera of Vascular Plants, Volume XV. Flowering Plants Eudicots Apiales, Gentianales (except Rubiaceae)</i> . Springer, Cham, Switzerland	[Unknown] "Flowers are bisexual. In a few genera of Rauvolfioids, gender dimorphism and associated functional dioecy have been reported (e.g., <i>Carissa</i> , Schroeder 1951, and <i>Rauvolfia</i> , Koch et al. 2002), and in <i>Cynanchum</i> (<i>Glossonema</i>) <i>varians</i> (Ali and Ali 1996) and <i>Cynanchum hemsleyanum</i> (= <i>Metaplexis japonica</i> , Tanaka et al. 2006), both Asclepiadoideae, andromonoecy has been demonstrated."

605	Requires specialist pollinators	
	Source(s)	Notes
	Kadereit J., & Bittrich V. (eds). (2018). <i>The Families and Genera of Vascular Plants, Volume XV. Flowering Plants Eudicots Apiales, Gentianales (except Rubiaceae)</i> . Springer, Cham, Switzerland	[Unknown. Members of genus are moth or wasp-pollinated] "In Asclepiadoideae, some species tend to be specialists, being pollinated exclusively or nearly so by one pollinator, whereas others are generalists, with several types of insects visiting the same flower, which may or may not be pollinators (Fishbein and Venable 1996)." ... "In Marsdenieae (Asclepiadoideae), Hesperidae butterflies have been reported to transfer <i>Hoya australis</i> pollinia (Forster 1992a), but several visitors and possible pollinators have been observed for <i>Marsdenia cymulosa</i> (Forster 1992b). <i>Cynanchum hemsleyanum</i> (= <i>Metaplexis japonica</i>) was found to be moth-pollinated (Sugiura and Yamazaki 2005)." ... "various wasps were found to carry pollinaria of Old World <i>Cynanchum</i> species (Kugler 1973)."

606	Reproduction by vegetative fragmentation	
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[Unknown if stem fragments can root or spread vegetatively] "Plants ascending, twining, 0.5-2 m high, richly acrocaulously branched; subterranean organs consisting only of fibrous roots."

607	Minimum generative time (years)	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes

Qsn #	Question	Answer
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[The coma, a tuft of hairs on the tip of a seed, aids in wind dispersal, but could also allow for attachment to clothing or footwear] "Seeds 5-6 mm long, 2-3 mm wide, pyriform, medium brown; seta and aseta side with regularly arranged papillae and trichomes 0.3 mm long, wingless, margins entire; coma 20-25 mm long."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Frohlich, D. & Lau, A. 2012. New plant records for the Hawaiian islands. <i>Bishop Museum Occasional Papers</i> 113: 27-54	"known to be cultivated on O'ahu at Koko Crater Botanical Garden, was found in two separate locations."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	No evidence. Unlikely. Limited cultivation and not cultivated with crops

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Kadereit J., & Bittrich V. (eds). (2018). <i>The Families and Genera of Vascular Plants, Volume XV. Flowering Plants Eudicots Apiales, Gentianales (except Rubiaceae)</i> . Springer, Cham, Switzerland	[Family description] "Wind dispersal is the rule for the majority of genera of the APSA clade, with the dispersal unit being the seed, which in almost all cases has a coma."
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[The coma, a tuft of hairs, especially on the tip of a seed, aids in wind dispersal] "Seeds 5-6 mm long, 2-3 mm wide, pyriform, medium brown; seta and aseta side with regularly arranged papillae and trichomes 0.3 mm long, wingless, margins entire; coma 20-25 mm long."

705	Propagules water dispersed	n
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[Coma aids in wind dispersal, and could increase buoyancy, but this plant generally occurs in dry, non-riparian habitats] "Seeds 5-6 mm long, 2-3 mm wide, pyriform, medium brown; seta and aseta side with regularly arranged papillae and trichomes 0.3 mm long, wingless, margins entire; coma 20-25 mm long."

706	Propagules bird dispersed	n
	Source(s)	Notes
	Kadereit J., & Bittrich V. (eds). (2018). <i>The Families and Genera of Vascular Plants, Volume XV. Flowering Plants Eudicots Apiales, Gentianales (except Rubiaceae)</i> . Springer, Cham, Switzerland	"Wind dispersal is the rule for the majority of genera of the APSA clade, with the dispersal unit being the seed, which in almost all cases has a coma."

Qsn #	Question	Answer
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	[No evidence. Not fleshy-fruited] "Seeds 5-6 mm long, 2-3 mm wide, pyriform, medium brown; seta and aseta side with regularly arranged papillae and trichomes 0.3 mm long, wingless, margins entire; coma 20-25 mm long."

707	Propagules dispersed by other animals (externally)	
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	"Seeds 5-6 mm long, 2-3 mm wide, pyriform, medium brown; seta and aseta side with regularly arranged papillae and trichomes 0.3 mm long, wingless, margins entire; coma 20-25 mm long." [Unknown. Coma might aid in attachment to fur or feathers]

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Kadereit J., & Bittrich V. (eds). (2018). <i>The Families and Genera of Vascular Plants, Volume XV. Flowering Plants Eudicots Apiales, Gentianales (except Rubiaceae)</i> . Springer, Cham, Switzerland	"Wind dispersal is the rule for the majority of genera of the APSA clade, with the dispersal unit being the seed, which in almost all cases has a coma." [Seeds unlikely to be consumed or internally dispersed]

801	Prolific seed production (>1000/m ²)	
	Source(s)	Notes
	Liede, S. (1996). A Revision of <i>Cynanchum</i> (Asclepiadaceae) in Africa. <i>Annals of the Missouri Botanical Garden</i> , 83(3), 283-345	"Follicles one, occasionally two per flower. 85-120 mm long, 6-8 mm diam., elongated, round in cross section, apically short beaked, light brown to dark brown. smooth, glabrous. Seeds 5-6 mm long, 2-3 mm wide, pyriform, medium brown; seta and aseta side with regularly arranged papillae and trichomes 0.3 mm long, wingless, margins entire; coma 20-25 mm long." [Seed densities unknown]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Royal Botanic Gardens Kew. (2020) Seed Information Database (SID). Version 7.1. Available from: http://data.kew.org/sid/ . [Accessed 17 Jun 2020]	Unknown. Several other species possess orthodox seeds

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown. No evidence that species has been controlled with herbicides

Qsn #	Question	Answer
804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	Frohlich, D. & Lau, A. 2012. New plant records for the Hawaiian islands. Bishop Museum Occasional Papers 113: 27–54	[Unknown] "Material examined. O'AHU: Koko Crater Botanical Garden, UTM 636719, 2354330. New naturalized record. Climbing up side of crater above Erythrina grove in mixed alien vegetation. Also found growing thickly in a 5 meter × 5 m area along the Koko Head trail in a <i>Leucaena leucocephala</i> / <i>Hylocereus undatus</i> thicket. Sprawling leafless vine. Flowers minute, fruits a dehiscent pod, 4 Apr 2011, OISC 2011040401."

Summary of Risk Traits:

High Risk / Undesirable Traits

- Elevation range exceeds 1000 m, demonstrating environmental versatility
- Grows in tropical climates
- Naturalizing on Oahu, Hawaiian Islands
- Other species in genus are invasive
- Used as a fish poison (possibly could be toxic to other animals or humans)
- Climbing, smothering growth habit
- Reproduces by wind-dispersed seeds
- Gaps in biological and ecological information may reduce accuracy of risk prediction

Low Risk Traits

- No reports of invasiveness, but limited evidence of introduction outside native range
- Unarmed (no spines, thorns, or burrs)

Second Screening Results for Vines

(A) Shade tolerant or known to form dense stands?> Shade tolerance unknown.

(B) Bird or clearly wind-dispersed?> Wind-dispersed

(C) Life cycle <4 years? Unknown

Outcome = Evaluate