

**Taxon:** *Majidea zanguebarica* J. Kirk ex Oliv.

**Family:** Sapindaceae

**Common Name(s):** black pearl tree  
mgambo tree  
velvet seed tree

**Synonym(s):** *Majidea zanguebarica* subsp.

**Assessor:** Chuck Chimera

**Status:** Assessor Approved

**End Date:** 15 Nov 2018

**WRA Score:** 2.0

**Designation:** EVALUATE

**Rating:** Evaluate

**Keywords:** Tropical Tree, Naturalized, Monoecious, Self-Fertile, Animal-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	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)	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	n
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		
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	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	n
607	Minimum generative time (years)		
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	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m <sup>2</sup> )	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		
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
	WRA Specialist. 2018. Personal Communication	This species has not been cultivated over sufficient generations to distinguish it from wild varieties

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. 2018. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. 2018. 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
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"DISTR. ... Madagascar; cultivated in Nairobi Arboretum, also in Rodrigues, India (Assam), Sri Lanka, Singapore and Hawaii"

202	Quality of climate match data	High
	Source(s)	Notes
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Madagascar; cultivated in Nairobi Arboretum, also in Rodrigues, India (Assam), Sri Lanka, Singapore and Hawaii"

203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Dave's Garden. (2018). <i>Majidea</i> Species, Black Pearl, Pearl of Zanzibar. <i>Majidea zanguebarica</i> . <a href="https://davesgarden.com/guides/pf/go/176960/">https://davesgarden.com/guides/pf/go/176960/</a> . [Accessed 14 Nov 2018]	"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)"

Qsn #	Question	Answer
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Range Madagascar; cultivated in Nairobi Arboretum, also in Rodrigues, India (Assam), Sri Lanka, Singapore and Hawaii ... KENYA Kilifi District: Marafa, 19 Nov. 1961, Polhill & Paulo 803! Kwale District: Diani Forest, 11–13 July 1972, Gillett & Kibuwa 19874! Lamu District: Witu, Mambosasa Forest Station, 29 Jan. 1958, Verdcourt 2128! TANZANIA Pangani District: Bushiri, 30 Nov. 1950, Faulkner 715! Tanga District: near Moa, Mtotohovu, 10 Sept. 1951, Greenway 8708! Uzaramo District: Dar es Salaam, Yacht Club, 4 Jan. 1970, B.J. Harris 3806! Zanzibar: , Pangajuu Cave-well, 10 June 1930, Vaughan 1340" [Based on available distribution data, species appears to be confined to lowland tropics]
	Llamas, K.A. 2003. Tropical Flowering Plants. Timber Press, Portland, OR	"Tropical Africa, Madagascar, possibly Zanzibar. Semideciduous tree, 35-60 ft.; zones 10-11."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Madagascar; cultivated in Nairobi Arboretum, also in Rodrigues, India (Assam), Sri Lanka, Singapore and Hawaii"
	Parker, J.L. & Parsons, B. (2012). New plant records from the Big Island for 2009. Bishop Museum Occasional Papers 113: 55–63	"Mgambo, or velvet-seed, is a small, fast-growing tree that is cultivated sparingly on the Big Island for its attractive black, velvety seeds. This specimen was naturalizing in the Kealakehe area, near Kailua-Kona. Several seedlings and saplings, many flowering, were sprouting up near a large, fruiting cultivated tree."

205	Does the species have a history of repeated introductions outside its natural range?	y
	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	"A large majidea growing at Foster Botanical Garden appears to have been the source of seeds planted in several places around O'ahu. It is also reported to be grown on the Big Is land. Majidea is said to have been introduced from Sri Lanka by Loy Marks in the early 1960s."
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"cultivated in Nairobi Arboretum, also in Rodrigues, India (Assam), Sri Lanka, Singapore and Hawaii"

301	Naturalized beyond native range	y
	Source(s)	Notes
	Broome, R, Sabir, K, & Carrington, S. (2007) Plants of the Eastern Caribbean. <a href="http://ecflora.cavehill.uwi.edu/index.html">http://ecflora.cavehill.uwi.edu/index.html</a> . [Accessed 14 Nov 2018]	"Majidea zanguibarica ... Found in the Lesser Antilles in Barbados, St. Vincent Status: Introduced" [Introduced, but not reported as naturalized]

Qsn #	Question	Answer
	Parker, J.L. & Parsons, B. (2012). New plant records from the Big Island for 2009. Bishop Museum Occasional Papers 113: 55–63	"Mgambo, or velvet-seed, is a small, fast-growing tree that is cultivated sparingly on the Big Island for its attractive black, velvety seeds. This specimen was naturalizing in the Kealakehe area, near Kailua-Kona. Several seedlings and saplings, many flowering, were sprouting up near a large, fruiting cultivated tree. Material examined. HAWAII: North Kona distr. Kealakehe, 2178898N, 187120E. Naturalized specimen found growing near large cultivated tree with many other keiki across a fence. This flowering specimen was approximately 4 ft tall, 6 Aug 2009, J. Parker & R. Parsons BIED95."

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

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

304	Environmental weed	n
	Source(s)	Notes
	Parker, J.L. & Parsons, B. (2012). New plant records from the Big Island for 2009. Bishop Museum Occasional Papers 113: 55–63	"This specimen was naturalizing in the Kealakehe area, near Kailua-Kona. Several seedlings and saplings, many flowering, were sprouting up near a large, fruiting cultivated tree." [No evidence of impacts to date]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2011. The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	"Four or five species from Africa and Madagascar." [No evidence that other species have become invasive]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	[No evidence] "Shrub or tree 2–22 m. tall; bark rough or ± smooth, whitish buff; slash cream to pale orange; twigs with raised whitish lenticels. Leaf-rhachis 10–30 cm. long, 4-angled in cross-section; petiolules 1 mm. long; leaflets drying bright green, drooping when young, in 5–7 pairs, arranged regularly or tending to be alternate, ovate-lanceolate, 5–7 cm. long, 2–3 cm. wide, shortly bluntly acuminate or acute, asymmetrically cuneate at the base, glabrous and shining; lateral veins in 7–15 faint pairs."

402	Allelopathic	n
	Source(s)	Notes
	WRA Specialist. 2018. Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Shrub or tree 2–22 m. tall; bark rough or ± smooth, whitish buff; slash cream to pale orange; twigs with raised whitish lenticels. Leaf-rhachis 10–30 cm. long, 4-angled in cross-section; petiolules 1 mm." [Sapindaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	O'Dwyer, R. (2012). The black-and-white colobus monkeys ( <i>Colobus angolensis palliatus</i> ) of Diani Forest, Kenya. Behavioural responses to habitat fragmentation. Student report 444. Swedish University of Agricultural Sciences, Uppsala	" <i>Majidea zanguebarica</i> was foraged from 3.51% of the time by the DF troops. It is a tree species native to the coral rag forest of the southern Kenyan coast (Birch 2011). Young leaves made up 29% of the foraging observations for this tree species and so it was most likely used as a protein source."
	Marcel Hladik, B. S. (2010). Feeding ecology of the crowned sifaka ( <i>Propithecus coronatus</i> ) in a coastal dry forest in northwest Madagascar (SFUM, Antrema). Lemur News, 5: 43-47	"Tab. I: Food species accounting for 50 and 75 % of the diet of <i>Propithecus coronatus</i> during the dry season and the wet season. Eaten plant species are listed in decreasing order" [Young leaves, mature leaves and flowers of <i>Majidea zanguebarica</i> are consumed]
	WRA Specialist. 2018. Personal Communication	Palatable to at least one lemur species and colobus monkeys. Probably palatable to browsing animals, but concrete evidence is currently lacking.

405	Toxic to animals	n
	Source(s)	Notes
	O'Dwyer, R. (2012). The black-and-white colobus monkeys ( <i>Colobus angolensis palliatus</i> ) of Diani Forest, Kenya. Behavioural responses to habitat fragmentation. Student report 444. Swedish University of Agricultural Sciences, Uppsala	[No evidence] " <i>Majidea zanguebarica</i> was foraged from 3.51% of the time by the DF troops. It is a tree species native to the coral rag forest of the southern Kenyan coast (Birch 2011). Young leaves made up 29% of the foraging observations for this tree species and so it was most likely used as a protein source."

Qsn #	Question	Answer
	Marcel Hladik, B. S. (2010). Feeding ecology of the crowned sifaka ( <i>Propithecus coronatus</i> ) in a coastal dry forest in northwest Madagascar (SFUM, Antrema). <i>Lemur News</i> , 5: 43-47	[No evidence] "Tab. I: Food species accounting for 50 and 75 % of the diet of <i>Propithecus coronatus</i> during the dry season and the wet season. Eaten plant species are listed in decreasing order" [Young leaves, mature leaves and flowers of <i>Majidea zanguebarica</i> are consumed]
	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

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Sunshine Seeds. (2018). <i>Majidea zanguebarica</i> . <a href="http://www.sunshine-seeds.de/Majidea-zanguebarica-47178p.html?language=en">http://www.sunshine-seeds.de/Majidea-zanguebarica-47178p.html?language=en</a> . [Accessed 14 Nov 2018]	"Pests: Whiteflies, spider mites > especially under glass"

407	Causes allergies or is otherwise toxic to humans	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
	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
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Hab. Dry evergreen forest fringes, riverine and coastal bushland; particularly <i>Julbernardia</i> , <i>Cynometra</i> , <i>Brachystegia</i> woodland, lowland evergreen forest, semideciduous often flooded forest, open ground with <i>Hyphaene</i> etc., also abandoned sisal plantations, often on coral; 0-300 m." [Fire ecology unknown]

Qsn #	Question	Answer
409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Sunshine Seeds. (2018). <i>Majidea zanguebarica</i> . <a href="http://www.sunshine-seeds.de/Majidea-zanguebarica-47178p.html?language=en">http://www.sunshine-seeds.de/Majidea-zanguebarica-47178p.html?language=en</a> . [Accessed 14 Nov 2018]	"Locations: sun to semi-shade"
	Dave's Garden. (2018). <i>Majidea</i> Species, Black Pearl, Pearl of Zanzibar. <i>Majidea zanguebarica</i> . <a href="https://davesgarden.com/guides/pf/go/176960/">https://davesgarden.com/guides/pf/go/176960/</a> . [Accessed 14 Nov 2018]	"Sun Exposure: Full Sun Sun to Partial Shade"
	Birch, W. (1963). Observations on the Littoral and Coral Vegetation of the Kenya Coast. <i>Journal of Ecology</i> , 51(3), 603-615	"Table 2. List of species in forest under storey and shrub layer" [Includes <i>Majidea zanguebarica</i> , suggesting this species is somewhat shade tolerant]

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Llamas, K.A. 2003. <i>Tropical Flowering Plants</i> . Timber Press, Portland, OR	"Moderate moisture to seasonally dry. Average, well-drained soil."
	The Garden Geeks. (2018). <i>Majidea zanguebarica</i> . <a href="http://thegardengeeks.net/plant-guide/6843-majidea_zanguebarica">http://thegardengeeks.net/plant-guide/6843-majidea_zanguebarica</a> . [Accessed 15 Nov 2018]	"Soil Type: Black pearl tree ( <i>majidea zanguebarica</i> ) prefers moderately fertile, humus rich, well drained soil"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Davies, F. G. & Verdcourt, B. (1998). <i>Flora of Tropical East Africa - Sapindaceae</i> . A.A. Balkema, Rotterdam, Netherlands	"Shrub or tree 2–22 m. tall; bark rough or ± smooth, whitish buff; slash cream to pale orange; twigs with raised whitish lenticels. Leaf-rhachis 10–30 cm. long, 4-angled in cross-section; petiolules 1 mm."

412	Forms dense thickets	
	Source(s)	Notes
	Davies, F. G. & Verdcourt, B. (1998). <i>Flora of Tropical East Africa - Sapindaceae</i> . A.A. Balkema, Rotterdam, Netherlands	"Hab. Dry evergreen forest fringes, riverine and coastal bushland; particularly <i>Julbernardia</i> , <i>Cynometra</i> , <i>Brachystegia</i> woodland, lowland evergreen forest, semideciduous often flooded forest, open ground with <i>Hyphaene</i> etc., also abandoned sisal plantations, often on coral; 0-300 m." [Unknown, but unlikely. No description of dense thickets from native range]

501	Aquatic	n
	Source(s)	Notes
	Davies, F. G. & Verdcourt, B. (1998). <i>Flora of Tropical East Africa - Sapindaceae</i> . A.A. Balkema, Rotterdam, Netherlands	[Terrestrial] "Shrub or tree 2–22 m." ... "Dry evergreen forest fringes, riverine and coastal bushland; particularly <i>Julbernardia</i> , <i>Cynometra</i> , <i>Brachystegia</i> woodland, lowland evergreen forest, semideciduous often flooded forest, open ground with <i>Hyphaene</i> etc., also abandoned sisal plantations, often on coral; 0-300 m."



Qsn #	Question	Answer
502	Grass	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2011. The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	Sapindaceae

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	Kubitzki, K. (ed.). 2011. The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	Sapindaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Shrub or tree 2–22 m."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	[No evidence] "Hab. Dry evergreen forest fringes, riverine and coastal bushland; particularly Julbernardia, Cynometra, Brachystegia woodland, lowland evergreen forest, semideciduous often flooded forest, open ground with Hyphaene etc., also abandoned sisal plantations, often on coral; 0-300 m."

602	Produces viable seed	y
	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	"A large majidea growing at Foster Botanical Garden appears to have been the source of seeds planted in several places around O'ahu."
	Dave's Garden. (2018). Majidea Species, Black Pearl, Pearl of Zanzibar. <i>Majidea zanguebarica</i> . <a href="https://davesgarden.com/guides/pf/go/176960/">https://davesgarden.com/guides/pf/go/176960/</a> . [Accessed 14 Nov 2018]	"Propagation Methods: From seed; direct sow outdoors in fall From seed; germinate in a damp paper towel"
	Parker, J.L. & Parsons, B. (2012). New plant records from the Big Island for 2009. Bishop Museum Occasional Papers 113: 55–63	"This specimen was naturalizing in the Kealakehe area, near Kailua-Kona. Several seedlings and saplings, many flowering, were sprouting up near a large, fruiting cultivated tree."

Qsn #	Question	Answer
603	Hybridizes naturally	
	Source(s)	Notes
	WRA Specialist. 2018. Personal Communication	Unknown. No evidence found

604	Self-compatible or apomictic	y
	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	"A large majidea growing at Foster Botanical Garden appears to have been the source of seeds planted in several places around O'ahu." [Suggests one tree was able to produce fertile seeds and therefore is self-compatible]
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Monoecious tall trees with greyish bark"

605	Requires specialist pollinators	n
	Source(s)	Notes
	Pitchandikulam Forest Virtual Herbarium. (2018). <i>Majidea zanguebarica</i> - Reproduction & Dispersal. <a href="http://www.pitchandikulam-herbarium.org">http://www.pitchandikulam-herbarium.org</a> . [Accessed 15 Nov 2018]	"Mode of pollination: <i>Majidea zanguebarica</i> is pollinated by a wide variety of insects."
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	[o evidence from floral morphology] "Inflorescence with main axes 8–15(–30) cm. long, all parts densely velvety pubescent; flowers pleasantly scented; bracts elliptic to lanceolate-elliptic, 1.3–1.7 cm. long, 6–8 mm. wide, pedicels 3–6 mm. long. Sepals ovate, 5–7 mm. long, the outermost larger than the other 4; petals 4, yellow-green to red with white hairs, elliptic, 6 mm. long, 2 mm. wide, soon falling; disk hardly visible in the female flowers, pink-tinged and conspicuous in the male. Stamens exerted; filaments yellow-green to orange-red, 6 mm. long; staminodes very short. Male flowers without an ovary rudiment."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Sunshine Seeds. (2018). <i>Majidea zanguebarica</i> . <a href="http://www.sunshine-seeds.de/Majidea-zanguebarica-47178p.html?language=en">http://www.sunshine-seeds.de/Majidea-zanguebarica-47178p.html?language=en</a> . [Accessed 15 Nov 2018]	"Propagation: Seeds/Cuttings" [No reports of natural vegetative spread]
	Parker, J.L. & Parsons, B. (2012). New plant records from the Big Island for 2009. Bishop Museum Occasional Papers 113: 55–63	"This specimen was naturalizing in the Kealakehe area, near Kailua-Kona. Several seedlings and saplings, many flowering, were sprouting up near a large, fruiting cultivated tree." [No observations of suckering or vegetative spread in this population]

607	Minimum generative time (years)	
	Source(s)	Notes

Qsn #	Question	Answer
	Tropical Plants Database, Ken Fern. (2018). <i>Majidea zanguebarica</i> . <a href="http://tropical.theferns.info/viewtropical.php?id=Majidea+zanguebarica">http://tropical.theferns.info/viewtropical.php?id=Majidea+zanguebarica</a> . [Accessed 15 Nov 2018]	"Growth Rate: Slow"
	Parker, J.L. & Parsons, B. (2012). New plant records from the Big Island for 2009. Bishop Museum Occasional Papers 113: 55–63	[Time to maturity unknown, but smaller individuals were documented to be flowering at this site] "This specimen was naturalizing in the Kealakehe area, near Kailua-Kona. Several seedlings and saplings, many flowering, were sprouting up near a large, fruiting cultivated tree."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Fruit a thinly woody trigonous apiculate capsule, externally brownish yellow, internally bright pink, 3–3.5 cm. long, 3.5–4.5 cm. wide. Seeds bluish black, ovoid, 1.2 cm. long, finely silky pubescent, ± persistent. Mature fruits and male flowers commonly occur together in the inflorescence." [Seeds relatively large and lack means of external attachment]

702	Propagules dispersed intentionally by people	y
	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	"A large majidea growing at Foster Botanical Garden appears to have been the source of seeds planted in several places around O'ahu. It is also reported to be grown on the Big Is land. Majidea is said to have been introduced from Sri Lanka by Loy Marks in the early 1960s."
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"cultivated in Nairobi Arboretum, also in Rodrigues, India (Assam), Sri Lanka, Singapore and Hawaii"

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Dave's Garden. (2018). <i>Majidea</i> Species, Black Pearl, Pearl of Zanzibar. <i>Majidea zanguebarica</i> . <a href="https://davesgarden.com/guides/pf/go/176960/">https://davesgarden.com/guides/pf/go/176960/</a> . [Accessed ]	"Fruit a thinly woody trigonous apiculate capsule, externally brownish yellow, internally bright pink, 3–3.5 cm. long, 3.5–4.5 cm. wide. Seeds bluish black, ovoid, 1.2 cm. long, finely silky pubescent, ± persistent. Mature fruits and male flowers commonly occur together in the inflorescence." [Unlikely. Seeds relatively large and conspicuous]

Qsn #	Question	Answer
704	<b>Propagules adapted to wind dispersal</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Fruit a thinly woody trigonous apiculate capsule, externally brownish yellow, internally bright pink, 3–3.5 cm. long, 3.5–4.5 cm. wide. Seeds bluish black, ovoid, 1.2 cm. long, finely silky pubescent, ± persistent. Mature fruits and male flowers commonly occur together in the inflorescence." [Seeds lack plumes and are too large for wind dispersal]

705	<b>Propagules water dispersed</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Dry evergreen forest fringes, riverine and coastal bushland; particularly Julbemardia, Cynometra, Brachystegia woodland, lowland evergreen forest, semideciduous often flooded forest" [Buoyancy unknown. Occurrence in riverine bushland and flooded forests suggests seeds might be moved by water]

706	<b>Propagules bird dispersed</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Kirika, J. M. (2007). Frugivores, seed dispersal and tree regeneration along a human disturbance gradient in East African tropical rainforests. PhD Dissertation. Johannes Gutenberg University, Mainz	"Appendix 7.2: List of tree and seedling species recorded during the study. Given for each species are means of dispersal, succession type and where present (+) or absent (-) in the three forests." [Majidea zanguebarica - Mode of dispersal = animal]
	Bosch, C. H. (2011). <i>Majidea fosteri</i> (Sprague) Radlk. [Internet] Record from PROTA4U. Lemmens, R.H.M.J., Louppe, D. & Oteng-Amoako, A.A. (Editors). PROTA (Plant Resources of Tropical Africa), Wageningen, Netherlands. <a href="http://www.prota4u.org/search.asp">http://www.prota4u.org/search.asp</a> . [Accessed 14 Nov 2018]	[Related species presumably dispersed by birds] "The bluish black seeds, that have a slightly fleshy seed coat and contrast with the pinkish or red inner wall of the fruit valves, are probably dispersed by birds."
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	[The bright pink color and bluish black seeds are suspected of being adaptations for bird or other animal dispersal] "Fruit a thinly woody trigonous apiculate capsule, externally brownish yellow, internally bright pink, 3–3.5 cm. long, 3.5–4.5 cm. wide. Seeds bluish black, ovoid, 1.2 cm. long, finely silky pubescent, ± persistent. Mature fruits and male flowers commonly occur together in the inflorescence."

707	<b>Propagules dispersed by other animals (externally)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Fruit a thinly woody trigonous apiculate capsule, externally brownish yellow, internally bright pink, 3–3.5 cm. long, 3.5–4.5 cm. wide. Seeds bluish black, ovoid, 1.2 cm. long, finely silky pubescent, ± persistent. Mature fruits and male flowers commonly occur together in the inflorescence." [Seeds relatively large and lack means of external attachment]

708	<b>Propagules survive passage through the gut</b>	<b>y</b>
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Kirika, J. M. (2007). Frugivores, seed dispersal and tree regeneration along a human disturbance gradient in East African tropical rainforests. PhD Dissertation. Johannes Gutenberg University, Mainz	"Appendix 7.2: List of tree and seedling species recorded during the study. Given for each species are means of dispersal, succession type and where present (+) or absent (-) in the three forests." [Majidea zanguebarica - Mode of dispersal = animal] [Animal dispersal syndrome suggests seeds survive gut passage]

801	Prolific seed production (>1000/m <sup>2</sup> )	n
	<b>Source(s)</b>	<b>Notes</b>
	Davies, F. G. & Verdcourt, B. (1998). Flora of Tropical East Africa - Sapindaceae. A.A. Balkema, Rotterdam, Netherlands	"Fruit a thinly woody trigonous apiculate capsule, externally brownish yellow, internally bright pink, –3.5 cm. long, 3.5–4.5 cm. wide. Seeds bluish black, ovoid, 1.2 cm. long, finely silky pubescent, ± persistent. Mature fruits and male flowers commonly occur together in the inflorescence." [Unlikely, as there are < 5 seeds per fruit and these seeds are 1.2 cm in size]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	<b>Source(s)</b>	<b>Notes</b>
	Royal Botanic Gardens Kew. (2018) Seed Information Database (SID). Version 7.1. Available from: <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a> . [Accessed 15 Nov 2018]	"Majidea zanguebarica" ... "Storage Behaviour: No data available for species or genus. Of 161 known taxa of family SAPINDACEAE, 78.88% Orthodox(p/?), 17.39% Recalcitrant(?), 0.62% Intermediate(?), 3.11% Uncertain"

803	Well controlled by herbicides	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2018. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2018. Personal Communication	Unknown

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	<b>Source(s)</b>	<b>Notes</b>
	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	[Unknown] "A large majidea growing at Foster Botanical Garden appears to have been the source of seeds planted in several places around O'ahu. It is also reported to be grown on the Big Is land. Majidea is said to have been introduced from Sri Lanka by Loy Marks in the early 1960s."

**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Thrives in tropical climates
- Naturalized on Hawaii (Hawaiian Islands)
- Reproduces by seeds
- Presumably self-fertile due to reports of single tree producing seeds
- Seeds suspected to be dispersed by birds & intentionally by people
- Gaps in biological and ecological information reduce accuracy of risk prediction

Low Risk Traits

- No reports of invasiveness or detrimental impacts in Hawaii or in other areas where cultivated
- Unarmed (no spines, thorns, or burrs)
- Leaves palatable to lemurs and monkeys (suggesting potential palatability to ungulates)
- Not reported to spread vegetatively
- Relatively large seeds unlikely to be inadvertently dispersed

Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Unknown. Tolerates partial shade. Ability to form dense stands unknown

(B) Bird or clearly wind-dispersed?> Presumably dispersed by birds

(C) Life cycle <4 years? Unknown

Outcome = Evaluate