Taxon: Shirakiopsis elliptica **Family:** Euphorbiaceae

Common Name(s): jumping seed tree
musoso
sapato do diabo

Synonym(s): Sapium ellipticum (Hochst.) Pax
Shirakia elliptica (Hochst.) Kruijt

Assessor: Assessor **Status:** Assessor Approved **End Date:** 28 May 2014

WRA Score: 3.0 **Designation:** EVALUATE **Rating:** Evaluate

Keywords: Tropical Tree, Toxic Sap, Light Demanding, Bird-dispersed, Coppices

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		
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		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	y
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)	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	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	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/m2)		
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**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	No evidence

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. 2014. 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**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Native: Angola, Benin, Cameroon, Central African Republic, Congo, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, Portugal, Rwanda, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe"

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed]	

203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed]	"Altitude: 1 000-2 450 m, Mean annual rainfall: (min. 1 000) 1 200-2 000 mm" [Elevation range exceeds 1000 m, demonstrating environmental versatility]

Qsn #	Question	Answer
204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Arbonnier, M. 2004. Trees, Shrubs and Lianas of West African Dry Zones. CTA, Wageningen, The Netherlands	"Distribution. From Senegal to Cameroon, tropical Africa. Scattered, irregular distribution."
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Native: Angola, Benin, Cameroon, Central African Republic, Congo, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, Portugal, Rwanda, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe"

205	**Does the species have a history of repeated introductions outside its natural range?**	**n**
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	No evidence of widespread cultivation outside Africa was found

301	**Naturalized beyond native range**	
	Source(s)	**Notes**
	Lau, A.& Frohlich, D. 2014. Oahu Early Detection Botanists. Pers. Comm. 15 April	"Sapium ellipticum – also not published as nat , and we may not be able to as we don't have a fertile nat specimen" ... "spreading large distances from a pretty large cultivated tree in Waimea. Hopefully we'll be able to collect a fertile specimen someday."
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

302	**Garden/amenity/disturbance weed**	**n**
	Source(s)	**Notes**
	Schmitt, C. B. 2006. Montane rainforest with wild Coffea arabica in the Bonga region (SW Ethiopia): plant diversity, wild coffee management and implications for conservation. Ecology and Development Series No. 47. Cuvillier Verlag, Göttingen, Germany	[No evidence of weediness, but disturbance adapted, and potentially able to exploit disturbed habitats, and become weedy, where introduced] "Presumably, these species are relics of intense disturbance in the past, or their regeneration is tied to very sporadic disturbance events after which new recruits grow rapidly and soon reach large size. Sapium ellipticum probably requires large gaps for regeneration because it is abundant in plots with forest recovery after complete clearing in Uganda (Chapman and Chapman 1999)."
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

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

304	**Environmental weed**	**n**
	Source(s)	**Notes**
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

305	**Congeneric weed**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Shirakiopsis belongs to the tribe Hippomaneae and comprises 6 species, 3 in South-East Asia and 3 in tropical Africa. It is based on species formerly included in Sapium and later transferred to Shirakia. A few African Shirakia spp. were found to be congeneric with the Asian Shirakiopsis species. The African species mainly differ from the Asian ones in usually having much smaller and 2-celled fruits. Shirakiopsis aubrevillei (Leandri) Esser (synonyms: Sapium aubrevillei Leandri, Shirakia aubrevillei (Leandri) Kruijt) occurs from Sierra Leone to Ghana. It is listed as vulnerable in the IUCN Red List of threatened species, because of habitat loss. A root decoction is taken in Côte d'Ivoire as an aphrodisiac. The third African species, Shirakiopsis trilocularis (Pax & K.Hoffm.) Esser is endemic to Kenya and also listed as vulnerable in the IUCN Red List of threatened species." [Species formerly classified in the genus Sapium are highly invasive, but no evidence of invasive Shirakiopsis have been documented to date]
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

401	**Produces spines, thorns or burrs**	**n**
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Sapium ellipticum is a small to medium-sized, deciduous or semideciduous tree up to 12 m in height, occasionally reaching 20-25 m (max. 35). Bark light brown to very dark (almost black) and rough; branchlets are smooth and tend to droop. The young parts exude white latex when cut. Leaves elliptic to oblong lanceolate, simple, 6-15 x 2.5-4 cm, dark green, glossy, alternate; apex tapering, often attenuate; base tapering to almost rounded; margin irregularly toothed to scalloped, 1-2 glands at each side of the base, borne on short stalks; midrib and veins raised below with about 10 pairs of side veins; petiole up to 10 mm long."

Qsn #	Question	Answer
402	**Allelopathic**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

403	**Parasitic**	**n**
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Sapium ellipticum is a small to medium-sized, deciduous or semi-deciduous tree up to 12 m in height, occasionally reaching 20-25 m (max. 35)."

404	**Unpalatable to grazing animals**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"The leaves are rich in protein and are used as fodder for livestock, especially in East Africa."
	Franzel, S., Wambugu, C., Tuwei, P., & Karanja, G. 2003. The adoption and scaling up of the use of fodder shrubs in central Kenya. Tropical grasslands, 37(4): 239-250	[Evaluated as a potential fodder tree, suggesting palatability] "Researchers are also conducting studies on other shrub species, both exotic and indigenous, to help farmers diversify their feed sources. These species include Leucaena trichandra, Morus alba (mulberry) and Sapium ellipticum."

405	**Toxic to animals**	
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"The leaves are rich in protein and are used as fodder for livestock, especially in East Africa." ... "The latex from the young twigs is sticky and caustic." [Despite toxic properties, the plant is still used as a source of fodder for animals. Unknown if the leaves are toxic in large quantities]
	Kabirizi, J., Kityali, A., Mpairwe, D., & Ssewannyana, E. 2005. Indigenous forage trees and shrubs as feed resources for intensive goat production in Uganda Pp 101-112 in Small stock in development. Masaka, Uganda, 15–19 November 2004. NR International, Aylesford, UK	[Reportedly toxic, but used as animal fodder. Toxicity to animals unclear] "Table 1 Uses of some indigenous forage trees and shrubs in smallholder goat production systems" ... "Sapium ellipticum" ... 'Part used as forage = Leaves/ twigs and bark; goats and cattle" ... "Medicinal and veterinary uses - The bark is used to treat general body pains and tuberculosis. Roots are used as medicine for chronic coughs and colds. The latex is poisonous but is used as medicine for constipation."

406	**Host for recognized pests and pathogens**	
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Diseases and pests - The seeds in the fruits of Shirakiopsis elliptica are often damaged by insects. The fruits are sometimes galled."

Qsn #	Question	Answer
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Insect larvae that frequently infest the seeds straighten their bodies convulsively, causing the seeds to jump several centimetres into the air. Wood is liable to borer attack."

407	Causes allergies or is otherwise toxic to humans	y
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"In Côte d'Ivoire and Congo Shirakiopsis elliptica is considered very poisonous and a very drastic purgative." ... "The sweet fruits are eaten in Nigeria and Tanzania. As the latex of the plant is considered poisonous, the consumption of the fruits merits caution. " ... "Despite its toxicity, Shirakiopsis elliptica has numerous local medicinal uses throughout its distribution area. As virtually nothing is known concerning its chemistry and pharmacology, research seems warranted to evaluate its potential. More research needs to be effected as well concerning the toxicity or palatability of the fruits, as its consumption by humans could be hazardous."
	Arbonnier, M. 2004. Trees, Shrubs and Lianas of West African Dry Zones. CTA, Wageningen, The Netherlands	"Latex. Highly caustic to the skin, arrow-poison."
	Schmidt, E., Lötter, M. & McCleland, W. 2002. Trees and shrubs of Mpumalanga and Kruger National Park. Jacana Media, Johannesburg, South Africa	"Sap is suspected to be poisonous."

408	Creates a fire hazard in natural ecosystems	
	Source(s)	**Notes**
	Agea, J. G., Kirangwa, D., Waiswa, D., & Okia, C. A. 2010. Household firewood consumption and its dynamics in Kalisizo Sub County, Central Uganda. Ethnobotanical Leaflets 14: 841-855	"...species such as 'Musasa' (Sapium ellipticum) which burns for a long time with strong embers and hot flames," [Used as a firewood. Could potentially increase fire risk in natural environments]
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	[Unknown if S. elliptica promotes fire] "S. ellipticum is common on the outskirts of evergreen forest and in wooded ravines. It is a tree of the afromontane rainforest and undifferentiated afromontane forest (mixed podocarpus forest), often in clearings, riverine forest also in secondary montane evergreen bushland and closed lowland forest. In Zululand, it occurs as a canopy tree in swamp forest. Its occurrence ranges from Transkei through Natal and Zululand to the Transvaal lowveld, to eastern Africa and tropical Africa, in coastal forests, on forest margins and on stream banks."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	**Notes**
	Lau, A.& Frohlich, D. 2014. Oahu Early Detection Botanists. Pers. Comm. 15 April	"many of the saplings we saw were in pretty dense shade." [In native range, identified as a shade intolerant tree, but light levels in Hawaiian forest understories may be higher than that of densely shaded tropical forests within its native range]

Qsn #	Question	Answer
	Schmitt, C. B. 2006. Montane rainforest with wild Coffea arabica in the Bonga region (SW Ethiopia): plant diversity, wild coffee management and implications for conservation. Ecology and Development Series No. 47. Cuvillier Verlag, Göttingen, Germany	"Sapium ellipticum and P. fulva are typical secondary forest species, because they are light demanding and thus need forest gaps for regeneration, but persist in the canopy of mature forest (Friis et al. 1982; Friis 1992; Althof et al. 2001; Getachew Tesfaye et al. 2002; ICRAF 2006)." ... "If the created gaps are large, light demanding species such as Sapium ellipticum and Polyscias fulva and pioneer species will be more competitive."
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Trees are light demanding."
	Ecocrop. 2007. Sapium ellipticum. http://ecocrop.fao.org/ecocrop/srv/en/cropView?id=45598. [Accessed 29 May 2014]	"Trees are light demanding."
	Althof, A. J. 2007. Human impact on flora and vegetation of Kakamega Forest, Kenya: Structure, distribution and disturbance of plant communities in an East African rainforest. PhD Dissertation. University of Koblenz and Landau, Koblenz and Landau, Germany	[Light demanding seedlings] "Due to the disrupted canopy light-demanding seedlings of Polyscias fulva, Phyllanthus fischeri or Sapium ellipticum are abundant."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Tropical Species Database. 2014. Shirakiopsis elliptica. http://theferns.info/tropical/viewtropical.php?id=Shirakiopsis+elliptica. [Accessed 28 May 2014]	"Prefers a medium to heavy soil of moderate fertility[418]. Prefers a pH in the range 5 - 6.5, tolerating 4.5 - 7[418]. Tolerant of periodic inundation of the soil[418]."
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	[Broad range suggests tolerance of many soil types] "Shirakiopsis elliptica occurs in savanna and secondary open forest, evergreen forest, fringing forest and swamp forest, from sea-level up to 2200 m altitude."

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Sapium ellipticum is a small to medium-sized, deciduous or semi-deciduous tree up to 12 m in height, occasionally reaching 20-25 m (max. 35)."

412	Forms dense thickets	n
	Source(s)	**Notes**
	Loffler, L. & Loffler, P. 2005. Swaziland Tree Atlas—including selected shrubs and climbers. Southern African Botanical Diversity Network Report No. 38. SABONET, Pretoria, S.A.	"Distribution: Sparsely scattered in northern, central-western, and southwestern Swaziland, with an isolated patch near Dingindlovu River in the Lebombo Mountains."

Qsn #	Question	Answer
	Chapman, C. A., Wrangham, R. W., Chapman, L. J., Kennard, D. K., & Zanne, A. E. 1999. Fruit and flower phenology at two sites in Kibale National Park, Uganda. Journal of Tropical Ecology, 15(2): 189-211	"Table 1. Tree density (individuals ha-1) and tree height category of the trees for which phenology was monitored in Kibale National Park, Uganda" [Sapium ellipticum recorded at a density of 0.6 trees/hectare]
	Aine-omucunguzi, A. A., Rugunda, G. K., & Byarugaba, D. 2012. Estimation of Population of Ten Selected Forest Tree Species Used by Communities around Kalinzu Forest Reserve, South Western Uganda. Open Journal of Forestry, 2(4): 207-212	[Found at high densities, but not to the exclusion of other species] "For all the species, wildings had the highest population density, followed by saplings, while trees had the lowest population density." ... "Entandrophragma exelsum had 2136.6 individuals per hectare, Zanthoxylum gilletii had a density of 2000.6 individuals per hectare, Sapium ellipticum followed with a density of 1906.3 individuals per hectare,..."

501	Aquatic	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"S. ellipticum is common on the outskirts of evergreen forest and in wooded ravines."

502	Grass	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	Euphorbiaceae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	Euphorbiaceae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Sapium ellipticum is a small to medium-sized, deciduous or semideciduous tree up to 12 m in height, occasionally reaching 20-25 m (max.35)."

Qsn #	Question	Answer
601	**Evidence of substantial reproductive failure in native habitat**	**n**
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"S. ellipticum is common on the outskirts of evergreen forest and in wooded ravines. It is a tree of the afromontane rainforest and undifferentiated afromontane forest (mixed podocarpus forest), often in clearings, riverine forest also in secondary montane evergreen bushland and closed lowland forest. In Zululand, it occurs as a canopy tree in swamp forest. Its occurrence ranges from Transkei through Natal and Zululand to the Transvaal lowveld, to eastern Africa and tropical Africa, in coastal forests, on forest margins and on stream banks. Trees are light demanding. They have become rare in some places because of incursions into their habitat."
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Shirakiopsis elliptica has a scattered, irregular distribution in tropical Africa, and has become rare in some areas as a result of habitat degradation, but there are no indications that it is threatened by genetic erosion."

602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Shirakiopsis elliptica can be multiplied by wildlings and seed. The ripe fruits are collected and cracked to release the seeds. The seed is sown directly in the field as transplanting is difficult; pre-treatment is not necessary. The seeds can be stored for a long period in a container in a cool and dry room without loss of viability."

603	**Hybridizes naturally**	
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	[Ability to hybridize naturally unknown] "Shirakiopsis belongs to the tribe Hippomaneae and comprises 6 species, 3 in South-East Asia and 3 in tropical Africa. It is based on species formerly included in Sapium and later transferred to Shirakia. A few African Shirakia spp. were found to be congeneric with the Asian Shirakiopsis species. The African species mainly differ from the Asian ones in usually having much smaller and 2-celled fruits. Shirakiopsis aubrevillei (Leandri) Esser (synonyms: Sapium aubrevillei Leandri, Shirakia aubrevillei (Leandri) Kruijt) occurs from Sierra Leone to Ghana. It is listed as vulnerable in the IUCN Red List of threatened species, because of habitat loss. A root decoction is taken in Côte d'Ivoire as an aphrodisiac. The third African species, Shirakiopsis trilocularis (Pax & K.Hoffm.) Esser is endemic to Kenya and also listed as vulnerable in the IUCN Red List of threatened species."

604	**Self-compatible or apomictic**	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Inflorescence an axillary or terminal spike-like raceme on lateral shoots, up to 12 cm long, with numerous male flowers and 1–3 female flowers at base. Flowers unisexual, regular, petals absent, disk absent; male flowers with pedicel 1–1.5 mm long, sepals 2–3, broadly ovate, c. 0.5 mm long, pale green, stamens 2(–3), free, shortly exserted; female flowers with pedicel 1.5–4 mm long, extending in fruit to 1–2 cm, sepals 2–3, triangular-ovate, 1–1.5 mm long, yellowish, ovary superior, 2-lobed, c. 1.5 mm long, smooth, 2-celled, styles 2(–4), 2–3 mm long, fused at base, coiled, green, persistent."
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 28 May 2014]	[Self-compatibility unknown] "S. ellipticum is monoecious, flowers are unisexual."

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Flowers yellow, 5-10 cm long, in axillary or terminal catkinlike spikes at the ends of branchlets; no petals or sepals; numerous male flowers above with yellow stamens; 1-5 rounded female flowers at the base, larger, on longer stalks than males." ... "S. ellipticum is monoecious, flowers are unisexual." [No evidence from floral morphology]

606	Reproduction by vegetative fragmentation	n
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	[No evidence of vegetative spread] "Shirakiopsis elliptica can be multiplied by wildlings and seed." ... "Shirakiopsis elliptica can be managed by coppicing, pollarding and lopping."

607	Minimum generative time (years)	
	Source(s)	**Notes**
	Randy Stewart Landscape Designs 2010. Friday, October 22, . Tallow Tree. Sapium. http://rslandscapedesign.blogspot.com/2010/10/sapium.html. [Accessed 28 May 2014]	"Some records include: fastest recorded growth rate - ; largest on record - 120 feet with a trunk diameter of 3.5 feet. The leaves are up to 6 x 2 inches."

Qsn #	Question	Answer
701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Fruit a 2-lobed and laterally compressed drupe 8–15 mm × 6–8 mm, topped by the styles, smooth, green, turning yellowish then purple or black, slightly fleshy, 2-seeded. Seeds ellipsoid to almost globose, 5–5.5 mm in diameter, smooth, yellowish brown." [Unlikley. Fruits and seeds relatively small, but lack means of external attachment]

702	**Propagules dispersed intentionally by people**	**y**
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Ornamental: The attractive trees are suitable for planting in amenity areas."

703	**Propagules likely to disperse as a produce contaminant**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Fruit a 2-lobed and laterally compressed drupe 8–15 mm × 6–8 mm, topped by the styles, smooth, green, turning yellowish then purple or black, slightly fleshy, 2-seeded. Seeds ellipsoid to almost globose, 5–5.5 mm in diameter, smooth, yellowish brown." [Unlikely. Seeds could potentially contaminate potting media, but this is a tree that is not known to be grown with commercial produce]

704	**Propagules adapted to wind dispersal**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Fruit a 2-lobed and laterally compressed drupe 8–15 mm × 6–8 mm, topped by the styles, smooth, green, turning yellowish then purple or black, slightly fleshy, 2-seeded. Seeds ellipsoid to almost globose, 5–5.5 mm in diameter, smooth, yellowish brown."

Qsn #	Question	Answer
705	**Propagules water dispersed**	
	Source(s)	**Notes**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 28 May 2014]	[Distribution along stream banks suggests secondary dispersal by water is possible] "Its occurrence ranges from Transkei through Natal and Zululand to the Transvaal lowveld, to eastern Africa and tropical Africa, in coastal forests, on forest margins and on stream banks."
	Keay, R.W.J. 1989. Trees of Nigeria. Clarendon Press, Oxford, UK	[Distribution along streams suggests water could secondarily disperse seeds] "Habitat: savanna and forest regions, particularly the banks of streams."
	Loffler, L. & Loffler, P. 2005. Swaziland Tree Atlas—including selected shrubs and climbers. Southern African Botanical Diversity Network Report No. 38. SABONET, Pretoria, S.A.	[Occurrence in riverine forests suggests possible secondary dispersal by water] "Habitat: Riverine vegetation, forest margins, wooded ravines, and rocky outcrops in grassland."

706	**Propagules bird dispersed**	**y**
	Source(s)	**Notes**
	Tropical Species Database. 2014. Shirakiopsis elliptica. http://theferns.info/tropical/viewtropical.php?id=Shirakiopsis+elliptica. [Accessed 28 May 2014]	"Fruit - a sweet flavor [299]. The fruit are commonly eaten by birds and said to be edible in Tanzania and Nigeria [299, 332]. However, it is recorded as containing the same white latex that is found in the younger growths and is recorded as toxic [332]. Human consumption of the fruit merits a cautious approach [299, 332]. The slightly feshy, purple to black fruit is a two-lobed drupe 8 - 15 mm long and 6 - 8 mm wide [299]."
	Schmitt, C. B. 2006. Montane rainforest with wild Coffea arabica in the Bonga region (SW Ethiopia): plant diversity, wild coffee management and implications for conservation. Ecology and Development Series No. 47. Cuvillier Verlag, Göttingen, Germany	"Table 7.2 Seed size, dormancy, dispersal agent, and wood density for selected trees" ... "Sapium ellipticum ... Dispersal agent = B (birds)"

707	**Propagules dispersed by other animals (externally)**	**n**
	Source(s)	**Notes**
	Schmelzer, G.H., 2007. Shirakiopsis elliptica (Hochst.) Esser. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11(1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	[No means of external attachment. Adapted for consumption and internal dispersal by birds and other frugivorous animals] "Fruit a 2-lobed and laterally compressed drupe 8–15 mm × 6–8 mm, topped by the styles, smooth, green, turning yellowish then purple or black, slightly fleshy, 2-seeded. Seeds ellipsoid to almost globose, 5–5.5 mm in diameter, smooth, yellowish brown."

708	**Propagules survive passage through the gut**	**y**
	Source(s)	**Notes**
	Schmitt, C. B. 2006. Montane rainforest with wild Coffea arabica in the Bonga region (SW Ethiopia): plant diversity, wild coffee management and implications for conservation. Ecology and Development Series No. 47. Cuvillier Verlag, Göttingen, Germany	[Presumably Yes] "Table 7.2 Seed size, dormancy, dispersal agent, and wood density for selected trees" ... "Sapium ellipticum ... Dispersal agent = B (birds)"

Qsn #	Question	Answer
801	**Prolific seed production (>1000/m2)**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	
	Source(s)	**Notes**
	Schmidt, E., Lötter, M. & McCleland, W. 2002. Trees and shrubs of Mpumalanga and Kruger National Park. Jacana Media, Johannesburg, South Africa	"The seeds can be stored for a long period in a container in a cool and dry room without loss of viability." [Longevity under field conditions unknown]
	Royal Botanic Gardens Kew. 2008. Seed Information Database (SID). Version 7.1. http://data.kew.org/sid/. [Accessed 28 May 2014]	Unknown. No storage information provided.

803	**Well controlled by herbicides**	
	Source(s)	**Notes**
	WRA Specialist. 2014. 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**
	Orwa C,, Mutua, A., Kindt R,, Jamnadass, R, & Anthony, S. 2009 Agroforestree Database: a tree reference and selection guide version 4.0. http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp. [Accessed 27 May 2014]	"Trees respond well to coppicing and pollarding."

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. 2014. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Thrives in tropical climates
• Naturalizing on Oahu, Hawaiian Islands (confirmation needed)
• Latex highly caustic to the skin, possibly poisonous if ingested
• Tolerates many soil types
• Seeds dispersed by birds & intentionally by people
• Seeds able to be stored for extended periods; May form a persistent seed bank
• Able to coppice & resprout after cutting
• Limited ecological information makes accurate risk prediction difficult

Low Risk Traits
• No reports of invasiveness or naturalization (with the possible exception of Oahu(), but no evidence of widespread introduction outside native range
• Unarmed (no spines, thorns or burrs)
• Provides fodder for livestock (palatable despite reports of toxicity)
• Ornamental
• Not reported to spread vegetatively

Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Unknown. Not known to form dense stands. A light demanding tree, but demonstrates some shade tolerance in Hawaiian Islands
(B) Bird-dispersed?> Dispersed by birds
Outcome = Evaluate