

<b>Taxon:</b> <i>Flueggea virosa</i> (Roxb. ex Willd.) Royle	<b>Family:</b> Phyllanthaceae
<b>Common Name(s):</b> Chinese waterberry common bushweed simpleleaf bushweed snowberry tree white berry-bush	<b>Synonym(s):</b> <i>Phyllanthus virosus</i> Roxb. ex Willd. <i>Securinega virosa</i> (Roxb. ex Willd.)

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 14 Sep 2018
<b>WRA Score:</b> 7.0	<b>Designation:</b> H(HPWRA)	<b>Rating:</b> High Risk

**Keywords:** Dioecious Tree, Naturalized, Spiny Forms, Bird-Dispersed, Fire Resprouter

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		
305	Congeneric weed		
401	Produces spines, thorns or burrs		
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	y
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
408	Creates a fire hazard in natural ecosystems		
409	Is a shade tolerant plant at some stage of its life cycle		
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		
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	n
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	y=1, n=-1	y
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
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Widespread distribution. No evidence of domestication] " <i>Flueggea virosa</i> occurs naturally throughout tropical Africa from Mauritania east to Somalia and south to South Africa, and also in Madagascar and Réunion. It is also distributed from Egypt, the Arabian Peninsula, through tropical Asia to Japan, Australia and Polynesia."
	Friis, I., & Vollesen, K. (2005). Flora of the Sudan-Uganda Border Area East of the Nile: Catalogue of vascular plants, 2nd pt. Vegetation and phytogeography. Kgl. Danske Videnskabernes Selskab, Copenhagen, Denmark	No evidence

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

103	Does the species have weedy races?	
	<b>Source(s)</b>	<b>Notes</b>
	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
	<b>Source(s)</b>	<b>Notes</b>
	Barker, C., & Van Weizen, P. (2010). <i>Flueggea</i> (Euphorbiaceae s. 1. or Phyllanthaceae) in Malesia. Systematic Botany, 35(3), 541-551	"Distribution-Old World Tropics (Fig. 3) from West Africa to Asia and Australia."

Qsn #	Question	Answer
	<p>USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a>. [Accessed 13 Sep 2018]</p>	<p>"Native Africa NORTHERN AFRICA: Egypt (s.e.) NORTHEAST TROPICAL AFRICA: Chad, Ethiopia, Somalia, Sudan EAST TROPICAL AFRICA: Kenya, Tanzania, Uganda WEST-CENTRAL TROPICAL AFRICA: Burundi, Cameroon, Central African Republic, Rwanda, Zaire WEST TROPICAL AFRICA: Burkina Faso, Cote D'Ivoire, Gambia, Ghana, Guinea, Mali, Nigeria, Senegal, Sierra Leone, Togo SOUTH TROPICAL AFRICA: Angola, Malawi, Mozambique, Zambia, Zimbabwe SOUTHERN AFRICA: Botswana, Namibia, South Africa, [Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, North West] Swaziland WESTERN INDIAN OCEAN: Comoros, Madagascar Asia-Temperate ARABIAN PENINSULA: Yemen CHINA: China, [Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hunan, Shandong, Yunnan] Hong Kong EASTERN ASIA: Taiwan Asia-Tropical INDIAN SUBCONTINENT: Bangladesh, India, [Andhra Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Orissa, Punjab, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal] Nepal, Pakistan PAPUASIA: Papua New Guinea INDO-CHINA: Cambodia, India, [Andaman and Nicobar] Myanmar, Thailand, Vietnam MALESIA: Indonesia, Malaysia, Philippines Australasia AUSTRALIA: Australia [New South Wales (e.), Northern Territory (n.), Queensland (n. &amp; e.), Western Australia (n.e.)]"</p>
	<p>Airy Shaw, H. A. (1980). A partial synopsis of the Euphorbiaceae-Platylobeae of Australia (excluding Phyllanthus, Euphorbia and Calycopeplus). Kew Bulletin, 577-700</p>	<p>"<i>Securinega virosa</i> ... Tropical Africa and Asia eastward to China and Japan, and with varying frequency through Malesia to Celebes, the Moluccas and the Lesser Sunda Is."</p>

<b>202</b>	<b>Quality of climate match data</b>	<b>High</b>
	<b>Source(s)</b>	<b>Notes</b>
	<p>USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a>. [Accessed 13 Sep 2018]</p>	

<b>203</b>	<b>Broad climate suitability (environmental versatility)</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>

Qsn #	Question	Answer
	Hyde, M.A., Wursten, B.T., Ballings, P. & Coates Palgrave, M. (2018). Flora of Zimbabwe: Species information: <i>Flueggea virosa</i> subsp. <i>virosa</i> . <a href="https://www.zimbabweflora.co.zw">https://www.zimbabweflora.co.zw</a> . [Accessed 13 Sep 2018]	"Altitude range: (metres) Up to 1530 m"
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	" <i>Flueggea virosa</i> is common in a wide variety of habitats, in forest edges, bushland, grassland, woodland and thickets. In drier areas, it occurs mainly along watercourses, and in swampy habitats, sometimes on termite mounds and rocky slopes; it is also common in disturbed localities and fallow land from sea-level up to 2300 m altitude." [Elevation range >1000 m]
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2008. Flora of China. Vol. 11 (Oxalidaceae through Aceraceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	"Scrub on slopes; 100-2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hunan, Shandong, Taiwan, Yunnan [widespread in Africa, E and SE Asia, and Oceania]."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	" <i>Flueggea virosa</i> occurs naturally throughout tropical Africa from Mauritania east to Somalia and south to South Africa, and also in Madagascar and Réunion. It is also distributed from Egypt, the Arabian Peninsula, through tropical Asia to Japan, Australia and Polynesia."

Qsn #	Question	Answer
	<p>USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a>. [Accessed 13 Sep 2018]</p>	<p>"Native Africa NORTHERN AFRICA: Egypt (s.e.) NORTHEAST TROPICAL AFRICA: Chad, Ethiopia, Somalia, Sudan EAST TROPICAL AFRICA: Kenya, Tanzania, Uganda WEST-CENTRAL TROPICAL AFRICA: Burundi, Cameroon, Central African Republic, Rwanda, Zaire WEST TROPICAL AFRICA: Burkina Faso, Cote D'Ivoire, Gambia, Ghana, Guinea, Mali, Nigeria, Senegal, Sierra Leone, Togo SOUTH TROPICAL AFRICA: Angola, Malawi, Mozambique, Zambia, Zimbabwe SOUTHERN AFRICA: Botswana, Namibia, South Africa, [Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga, North West] Swaziland WESTERN INDIAN OCEAN: Comoros, Madagascar Asia-Temperate ARABIAN PENINSULA: Yemen CHINA: China, [Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hunan, Shandong, Yunnan] Hong Kong EASTERN ASIA: Taiwan Asia-Tropical INDIAN SUBCONTINENT: Bangladesh, India, [Andhra Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Orissa, Punjab, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal] Nepal, Pakistan PAPUASIA: Papua New Guinea INDO-CHINA: Cambodia, India, [Andaman and Nicobar] Myanmar, Thailand, Vietnam MALESIA: Indonesia, Malaysia, Philippines Australasia AUSTRALIA: Australia [New South Wales (e.), Northern Territory (n.), Queensland (n. &amp; e.), Western Australia (n.e.)] Cultivated Africa WEST-CENTRAL TROPICAL AFRICA: Gabon WEST TROPICAL AFRICA: Nigeria"</p>

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	<p>USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a>. [Accessed 13 Sep 2018]</p>	<p>"Cultivated Africa WEST-CENTRAL TROPICAL AFRICA: Gabon WEST TROPICAL AFRICA: Nigeria Naturalized Africa WESTERN INDIAN OCEAN: Mauritius, Reunion"</p>
	<p>Liogier, A.H. &amp; Martorell, L.F. 2000. Flora of Puerto Rico and adjacent islands: a systematic synopsis. Second Edition Revised. La Editorial, UPR, San Juan, Puerto Rico</p>	<p>"<i>Flueggea virosa</i>...between Cayey and Guayama, Puerto Rico, probably an escape from cultivation; a native to India, China, Malesia, Australia, tropical Africa"</p>

Qsn #	Question	Answer
	Wunderlin, R.P. & Hansen, B.F. 2003. Guide to the Vascular Plants of Florida. University Press of Florida, Gainesville, FL	"Miami-Dade Co. Native to the Old World tropics. Escaped from cultivation"
	Starr, F., Starr, K. & Loope, L.L. 2004. New plant records from the Hawaiian Archipelago. Bishop Museum Occasional Papers 79: 20-30	"Native to tropical Africa and Asia to Japan, Australia, and Polynesia and a weed in Florida (FLEPPC, 1999), <i>F. virosa</i> (Chinese waterberry, white currant) is naturalized in the Ha'iku area of East Maui, where it is common in pastures and waste areas along Ha'ikü Rd."

301	Naturalized beyond native range	y
	Source(s)	Notes
	University of Florida Herbarium / Florida Museum of Natural History. (1995-2018). <i>Flueggea virosa</i> . Collector/# : G.N. Avery 2369 [coll. with] C.D. Byrd. Date coll.: 19 Aug 82. <a href="https://www.floridamuseum.ufl.edu">https://www.floridamuseum.ufl.edu</a> . [Accessed 13 Sep 2018]	"Forming a thicket mixed with <i>Schinus</i> along roadside in front of 10 ac of badly overgrown pineland. Plants to 3 m high: pith star-shaped."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"It is listed as an invasive species in Florida, the United States."
	Starr, F., Starr, K. & Loope, L.L. 2004. New plant records from the Hawaiian Archipelago. Bishop Museum Occasional Papers 79: 20-30	"Native to tropical Africa and Asia to Japan, Australia, and Polynesia and a weed in Florida (FLEPPC, 1999), <i>F. virosa</i> (Chinese waterberry, white currant) is naturalized in the Haiku area of East Maui, where it is common in pastures and waste areas along Haiku Rd."
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 13 Sep 2018]	"Naturalized Africa WESTERN INDIAN OCEAN: Mauritius, Reunion"
	University of Florida Herbarium / Florida Museum of Natural History. (1995-2018). <i>Flueggea virosa</i> . Collector/#: John Popenoe 1062. Date coll.: December 4, 1977. <a href="https://www.floridamuseum.ufl.edu">https://www.floridamuseum.ufl.edu</a> . [Accessed 13 Sep 2018]	"Shrub, naturalized along fence rows and in fields, Redlands area near corner of Coconut Palm drive and Richard Road. Possibly escaped from the Redland Fruit and Spice Park."

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	Florida Exotic Pest Plant Council. (2001). List of Invasive Species. <a href="https://www.fleppc.org/list/2001/list01nl.pdf">https://www.fleppc.org/list/2001/list01nl.pdf</a> . [Accessed 13 Sep 2018]	"Category II - Invasive exotics that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species. These species may become ranked Category I, if ecological damage is demonstrated." [Includes <i>Flueggea virosa</i> ]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	" <i>Flueggea virosa</i> ... References: Puerto Rico-CW-261, United States of America-N-440, United States of America-N-419, United States of America- E-80, Global-N-85, United States of America-W-112, United States of America- EW-179, United States of America-N-839, United States of America-N-101, United States of America-Q-1197, Singapore-N- 1290, United States of America-N-1292, Madagascar-N-1000, Global-W-1376, Global-I-1404, Global-CD-1611, Singapore-N-1839, United States of America-N-2092, Burkina Faso-W-1977, Singapore-W-1977." [Cited as a weed in a number of publications. Insufficient evidence to answer yes to question 3.04]

Qsn #	Question	Answer
	University of Florida Herbarium / Florida Museum of Natural History. (1995-2018). <i>Flueggea virosa</i> . Collector/# : G.N. Avery 2369 [coll. with] C.D. Byrd. Date coll.: 19 Aug 82. <a href="https://www.floridamuseum.ufl.edu">https://www.floridamuseum.ufl.edu</a> . [Accessed 13 Sep 2018]	"Forming a thicket mixed with <i>Schinus</i> along roadside in front of 10 ac of badly overgrown pineland. Plants to 3 m high: pith star-shaped."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"It is listed as an invasive species in Florida, United States."
	Anonymous. (2001). FNGA Urges Florida's Nursery & Landscape Industry to Phase Out 34 Invasive Plants. <i>Wildland Weeds</i> 4(4): 20-21	"The Florida Nurserymen and Growers Association (FNGA) is urging Florida's nursery and landscape industry professionals to phase out production, sale and use of 34 plants thought to be invasive. This is in addition to the voluntary ban on 11 other plants announced by FNGA in 1999." [Those 34 species agreed upon by the group include <i>F. virosa</i> ]

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	
	Source(s)	Notes
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	Listed as an environmental weed, but no evidence of adverse impacts found in literature

305	Congeneric weed	
	Source(s)	Notes
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	[A few species listed as naturalized or weeds, but impacts unspecified or unknown] " <i>Flueggea acidoton</i> ... References: United States of America-N- 101." ... " <i>Flueggea flexuosa</i> ... References: Global-N-85" ... " <i>Flueggea suffruticosa</i> ... References: Ukraine-R-643, Global-W- 1324, Europe-W-1325, Taiwan-N-1403, Ukraine-N-2014, Armenia-W-1977, Norway-W-1977, Taiwan-W-1977."

401	Produces spines, thorns or burrs	
	Source(s)	Notes
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Dioecious, deciduous, much-branched shrub or small tree up to 4(–6) m tall; bark grey-brown, smooth, fissured or rough; branches erect or arching, lower branches often with thorny end."
	Wu, Z.Y., Raven, P.H. & Hong, D.Y. (eds.). 2008. <i>Flora of China</i> . Vol. 11 (Oxalidaceae through Aceraceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	"Shrubs 1–6 m tall, glabrous; branchlets sharply angular when young, reddish brown, smooth, later darker and lenticellate; ultimate branchlets not spine-tipped. Stipules lanceolate, 1.5–3 mm, entire or margins minutely lacerate; petiole 2–9 mm; leaf blade elliptic, oblong, obovate, or rotund, 2–5 × 1–3 cm, papery, base obtuse to cuneate, margin entire, slightly revolute when dry, apex rounded to acute, mucronulate, white-green abaxially; lateral veins 5–8 pairs."



Qsn #	Question	Answer
	Barker, C., & Van Weizen, P. (2010). <i>Flueggea</i> (Euphorbiaceae s. 1. or Phyllanthaceae) in Malesia. <i>Systematic Botany</i> , 35(3), 541-551	"Specimens with spiny branch ends also occur within <i>F. virosa</i> ."
	WRA Specialist. 2018. Personal Communication	Some forms have spiny or thorny branch tips, and others do not

402	Allelopathic	
	Source(s)	Notes
	Shinwari, M. I., Iida, O., Shinwari, M. I., & Fujii, Y. (2017). Evaluation of phytodiversity for allelopathic activity and application to minimize climate change impact: Japanese Medicinal Plants. <i>Pakistan Journal of Botany</i> , 49, 139-144	[Potentially. Inhibits lettuce seed germination in laboratory tests] "Climate change impact is ready to interfere in agro-ecosystems. Improvement of adaptations of crops to forthcoming climatic changes must be focused in research. In the present study, leaf litter of 160 medicinal plant samples (156 species) belonging to 134 genera and 74 families were collected from Research Center for Medicinal Plant Resources, Tanegashima, Japan and subjected to evaluation of their allelopathic effects using the Sandwich method. Lettuce ( <i>Lactuca sativa</i> L.) was used as a test plant material in the bioassay because of its reliability for germination. Top ten medicinal plant species found with maximum inhibition activity were <i>Melia azedarach</i> (Meliaceae) followed by <i>Tylophora tanakae</i> (Ascepiadaceae), <i>Cinchona</i> sp. (Rubiaceae), <i>Flueggea virosa</i> (Phyllanthaceae), <i>Hibiscus acetosella</i> (Malvaceae), <i>Justicia procumbens</i> (Acanthaceae), <i>Terminalia chebula</i> (Combretaceae), <i>Hibiscus syriacus</i> (Malvaceae), <i>Lycium chinense</i> (Solanaceae) and <i>Elaeocarpus japonicas</i> (Elaeocarpaceae)."

403	Parasitic	n
	Source(s)	Notes
	Neuwinger, H.D. 1996. <i>African Ethnobotany: Poisons and Drugs : Chemistry, Pharmacology, Toxicology</i> . CRC Press, Boca Raton, FL	"A dense, many-branched shrub, sometimes a small spreading tree up to about 6 m, although more commonly 2-3 m, evergreen or deciduous. Stem up to about 8 cm in diameter. Bark grey-brown, smooth. Branches spirally arranged upwards." [Urticaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	Notes
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	"The leaves and fruits are readily browsed by livestock, and are also given as fodder."
	Ratshibvumo, T. & Mutshinyalo, T. 2008. <i>Flueggea virosa</i> . PlantZAfrica. SANBI. <a href="http://pza.sanbi.org/flueggea-virosa">http://pza.sanbi.org/flueggea-virosa</a> . [Accessed 13 Sep 2018]	"The leaves are browsed by goats."

405	Toxic to animals	y
	Source(s)	Notes
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	"The leaves and fruits are readily browsed by livestock, and are also given as fodder." [Apparently not toxic to other livestock]

Qsn #	Question	Answer
	Abule, E., Snyman, H. A., & Smit, G. N. (2005). Comparisons of pastoralists perceptions about rangeland resource utilisation in the Middle Awash Valley of Ethiopia. <i>Journal of Environmental Management</i> , 75(1), 21-35	[Toxic to camels] "Flueggea virosa is a woody plant that has an effect only on camels. It paralyses the camels and progresses to a gradual death of the animal. However, the Afar pastoralists, in periods of critical feed shortage, chop the leaves with the branches and give them to cattle, sheep and goats."

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Khalid, A. N., Afshan, N. S., & Elahi, H. (2010). <i>Masseella flueggeae</i> on <i>Flueggea virosa</i> , a new record for Pakistan. <i>Mycotaxon</i> , 114, 453-457	" <i>Masseella flueggeae</i> on <i>Flueggea virosa</i> is reported as a new record for Pakistan. This is the first report of the genus <i>Masseella</i> from this country, raising the number of rust genera known from Pakistan to twenty-two." [Restricted to Pakistan]
	WRA Specialist. 2018. Personal Communication	Unknown. Limited information on pests & pathogens of this species

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Ratshibvumo, T. & Mutshinyalo, T. 2008. <i>Flueggea virosa</i> . PlantZAfrica. SANBI. <a href="http://pza.sanbi.org/flueggea-virosa">http://pza.sanbi.org/flueggea-virosa</a> . [Accessed 14 Sep 2018]	"The small fruit is sweet and eaten by people, animals and birds when ripe. The roots and fruits are believed to be an effective snakebite remedy. Roots of this plant are also used in some African communities as contraceptives and for the treatment of syphilis, gonorrhoea, rheumatism, sterility, rashes, and an infusion of the root is taken to relieve malaria. The bark is believed to provide a treatment for diarrhoea and pneumonia."
	Quattrocchi, U. 2012. <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	[No evidence. Edible & medicinal uses] "small white edible berries, tiny shiny seeds, ripe sweet juicy fruits eaten raw, leaves and fruits for fodder, a source of chicken and bird food"... "All part used for eczema, fevers and rheumatoid arthritis. Stem, flowers and tender fruits consumed with honey for joint pain. Stem bark extract given for fevers. Leaves pounded, fermented and used for malaria and stomachache; leaf extract, often mixed with <i>Lantana trifolia</i> leaves, given to children to stop diarrhea; leaf juice against intestinal worms, often mixed with tobacco leaf; leaves boiled and the water used for bathing children suffering from scabies and measles; leaves of <i>Securinega virosa</i> powdered and mixed with coconut oil and applied on scabies. Fruit crushed and rubbed into itching skin; roots and fruits chewed for snakebite treatment. Roots for snakebite, backache, bronchitis, cough, cold, diarrhea, menorrhagia, infertility, contraception, abdominal pain, stomachache, colic; a decoction used for bilharzia and stomachache, and as aphrodisiac; root juice in dysentery. Fish poison, the bark. Charm, magic, ritual. Veterinary medicine, fresh leaf paste to destroy worms from cattle sore."

408	Creates a fire hazard in natural ecosystems	
	Source(s)	Notes

Qsn #	Question	Answer
	Nefabas, L. L., & Gambiza, J. (2007). Fire-tolerance mechanisms of common woody plant species in a semiarid savanna in south-western Zimbabwe. <i>African Journal of Ecology</i> , 45(4), 550-556	"The most abundant woody species in burnt plots in 1963 were: <i>B. africana</i> , <i>C. hereroense</i> , <i>Combretum imberbe</i> , <i>D. cinerea</i> , <i>Dombeya rotundifolia</i> , <i>Euclea divinorum</i> , <i>F. indica</i> , <i>G. monticola</i> , <i>P. maprouneifolia</i> , <i>Flueggea virosa</i> , <i>T. sericea</i> and <i>Ziziphus mucronata</i> . All these species resprouted when burnt."
	Felderhof, L. (2007). The fire patchiness paradigm: a case study in northwest Queensland. PhD Dissertation. James Cook University, Townsville	<i>Flueggea virosa</i> listed in Appendix 2 as a Fire Resprouter
	WRA Specialist. 2018. Personal Communication	Unknown. Occurs in fire prone areas within its native range & is described as a fire resprouter

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Wild Flower Nursery. (2018). <i>Flueggea virosa</i> . <a href="https://wildflownursery.co.za/indigenous-plant-database/flueggea-virosa/">https://wildflownursery.co.za/indigenous-plant-database/flueggea-virosa/</a> . [Accessed 14 Sep 2018]	"Position: Sun"
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	[Unknown. Light requirements unspecified] " <i>Flueggea virosa</i> is common in a wide variety of habitats, in forest edges, bushland, grassland, woodland and thickets. In drier areas it occurs mainly along water courses, and in swampy habitats, sometimes on termite mounds and rocky slopes; it is also common in disturbed localities and fallow land, from sea-level up to 2300 m altitude."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Barker, C., & Van Weizen, P. (2010). <i>Flueggea</i> (Euphorbiaceae s. 1. or Phyllanthaceae) in Malesia. <i>Systematic Botany</i> , 35(3), 541-551	" <i>F. virosa</i> subsp. <i>melanthesoides</i> ... soil: silicious rocks, dry stony soil, clayey loam, and silty sand."
	Dowe, J.L. (2008). Report 4: Distribution and ecological preferences of riparian vegetation in northern Australia. In G.P. Lukacs and C.M. Finlayson (eds). <i>A Compendium of Ecological Information on Australia's Northern Tropical Rivers</i> . Sub-project 1 of Australia's Tropical Rivers – an integrated data assessment and analysis (DET18). A report to Land & Water Australia. National Centre for Tropical Wetland Research, Townsville, Queensland	"Lithological preference is for sedimentary rocks as well as granites, felsic and mafic volcanic sand amphibolites in flat, gently sloping and undulating plains, and hilly ranges, and soils are predominantly sandstone, siltstone, greywacke and limestone based, and loamy red earths." [Occurs in both sandy and loamy soils]
	Bekele-Tesemma, A. (2007). <i>Useful Trees and Shrubs of Ethiopia: Identification, Propagation, and Management for 17 Agroclimatic Zones</i> . World Agroforestry Centre, Nairobi	"on black cotton soil and well drained rocky slopes."
	Welzen, P.C. van & Chayamarit, K. (2017). <i>Flora of Thailand Euphorbiaceae</i> . Naturalis Biodiversity Center, Leiden; Forest Herbarium, National Park, Wildlife and Plant Conservation Department, Bangkok. <a href="http://www.nationaalherbarium.nl/thaieuph">www.nationaalherbarium.nl/thaieuph</a>	"soil: mainly limestone, also sand and granite as bedrock."

411	Climbing or smothering growth habit	n
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Neuwinger, H.D. 1996. African Ethnobotany: Poisons and Drugs : Chemistry, Pharmacology, Toxicology. CRC Press, Boca Raton, FL	"A dense, many-branched shrub, sometimes a small spreading tree up to about 6 m, although more commonly 2-3 m, evergreen or deciduous. Stem up to about 8 cm in diameter. Bark grey brown, smooth. Branches spirally arranged upwards."

412	Forms dense thickets	
	<b>Source(s)</b>	<b>Notes</b>
	Maui Invasive Species Committee. (2011). Meeting Minutes, Friday, December 9, 2011. <a href="http://mauiinvasive.org/wp-content/uploads/pdfs/miscmeetingminutes20111209.pdf">mauiinvasive.org/wp-content/uploads/pdfs/miscmeetingminutes20111209.pdf</a>	"Flueggea virosa – Forest: this is a famine food. It is thick where it is and spreading locally. We need to do delimiting surveys."
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Flueggea virosa is common in a wide variety of habitats, in forest edges, bushland, grassland, woodland and thickets."
	University of Florida Herbarium / Florida Museum of Natural History. (1995-2018). <i>Flueggea virosa</i> . Collector/# : G.N. Avery 2369 [coll. with] C.D. Byrd. Date coll.: 19 Aug 82. <a href="https://www.floridamuseum.ufl.edu">https://www.floridamuseum.ufl.edu</a> . [Accessed 14 Sep 2018]	"Forming a thicket mixed with Schinus along roadside in front of 10 ac of badly overgrown pineland. Plants to 3 m high: pith star-shaped." [Unknown whether thickets exclude other vegetation]

501	Aquatic	n
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	[Terrestrial] "Dioecious, deciduous, much-branched shrub or small tree up to 4(-6) m tall" ... "Flueggea virosa is common in a wide variety of habitats, in forest edges, bushland, grassland, woodland and thickets. In drier areas it occurs mainly along water courses, and in swampy habitats, sometimes on termite mounds and rocky slopes; it is also common in disturbed localities and fallow land, from sea-level up to 2300 m altitude."

502	Grass	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 14 Sep 2018]	Family: Phyllanthaceae Subfamily: Phyllanthoideae Tribe: Phyllanthaeae

503	Nitrogen fixing woody plant	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network. 2018. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 14 Sep 2018]	Family: Phyllanthaceae Subfamily: Phyllanthoideae Tribe: Phyllanthaeae

Qsn #	Question	Answer
504	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Barker, C., & Van Weizen, P. (2010). <i>Flueggea</i> (Euphorbiaceae s. 1. or Phyllanthaceae) in Malesia. <i>Systematic Botany</i> , 35(3), 541-551	"Shrubs or small trees, deciduous, up to 3(--6) m high"
601	<b>Evidence of substantial reproductive failure in native habitat</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	" <i>Flueggea virosa</i> is widely distributed in diverse ecological habitats and therefore not threatened by genetic erosion. International Livestock Research Institute, Kenya holds a single accession. It is listed as an invasive species in Florida, United States."
602	<b>Produces viable seed</b>	y
	<b>Source(s)</b>	<b>Notes</b>
	Bekele-Tesemma, A. (2007). <i>Useful Trees and Shrubs of Ethiopia: Identification, Propagation, and Management for 17 Agroclimatic Zones</i> . World Agroforestry Centre, Nairobi	"Propagation: Seedlings, wildings and cuttings." ... "SeedTreatment: Not necessary but seed that has passed an animal gut has better germination than other seed."
	Ratshibvumo, T. & Mutshinyalo, T. 2008. <i>Flueggea virosa</i> . PlantZAfrica. SANBI. <a href="http://pza.sanbi.org/flueggea-virosa">http://pza.sanbi.org/flueggea-virosa</a> . [Accessed 14 Sep 2018]	"The fruit must be cleaned and the small seeds dried. Sow the seeds at least within a month of collecting in a well-drained seedling growth medium. Germination is normally very good."
603	<b>Hybridizes naturally</b>	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2018. Personal Communication	Unknown. No evidence found
604	<b>Self-compatible or apomictic</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. <i>Plant Resources of Tropical Africa 11(1). Medicinal Plants 1</i> . PROTA Foundation, Wageningen, Netherlands	"Dioecious, deciduous, much-branched shrub or small tree"
	Neuwinger, H.D. 1996. <i>African Ethnobotany: Poisons and Drugs : Chemistry, Pharmacology, Toxicology</i> . CRC Press, Boca Raton, FL	"Flowers borne on separate plants"
605	<b>Requires specialist pollinators</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Ratshibvumo, T. & Mutshinyalo, T. 2008. <i>Flueggea virosa</i> . PlantZAfrica. SANBI. <a href="http://pza.sanbi.org/flueggea-virosa">http://pza.sanbi.org/flueggea-virosa</a> . [Accessed 14 Sep 2018]	"A variety of insects such as wasps and bees pollinate the flower."

Qsn #	Question	Answer
	Luvonga, E. B. (2015). Diversity and pollination activity of flower visiting insects associated with avocado along the slopes of Taita hills in Kenya. MSc Thesis. Masinde Muliro University of Science and Technology	"Table 4.12: Bee floral resources" [ <i>Apis mellifera</i> visits & presumably pollinates <i>Flueggea virosa</i> ]

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Bekele-Tesemma, A. (2007). Useful Trees and Shrubs of Ethiopia: Identification, Propagation, and Management for 17 Agroclimatic Zones. World Agroforestry Centre, Nairobi	"Propagation Seedlings, wildings and cuttings." [No evidence of vegetative spread]
	Ratshibvumo, T. & Mutshinyalo, T. 2008. <i>Flueggea virosa</i> . PlantZAfrica. SANBI. <a href="http://pza.sanbi.org/flueggea-virosa">http://pza.sanbi.org/flueggea-virosa</a> . [Accessed 14 Sep 2018]	"The fruit must be cleaned and the small seeds dried. Sow the seeds at least within a month of collecting in a well-drained seedling growth medium. Germination is normally very good. It is a low maintenance plant that can grow without any extra feeding except watering at least once every second week. Once this plant is established, routine maintenance is unnecessary. It can be used for creating a soft screening and is ideal as a backdrop. It attracts birds and butterflies. It can also be used for creating a hedge or barrier." [No evidence of vegetative spread]

607	Minimum generative time (years)	
	Source(s)	Notes
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"It is a fast growing hardy shrub suitable for planting under various conditions." [Unknown, but fast growth suggests possibly <4 years to reproductive maturity]
	Northern Land Manager. (2011). Fire responses of <i>Flueggea virosa</i> subsp. <i>melanthesoides</i> . <a href="http://www.landmanager.org.au/fire-responses-flueggea-virosa-subsp-melanthesoides">http://www.landmanager.org.au/fire-responses-flueggea-virosa-subsp-melanthesoides</a> . [Accessed 14 Sep 2018]	"Life Span: 11-over 20 years Growth Form: Small tree or shrub First seeds: 4-5 years" [Unclear if time to maturity refers to natural age of maturity, or first seeding following fire]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Fruit a somewhat fleshy slightly 3-lobed, globose capsule, 3–5 mm in diameter, tardily dehiscent, smooth, glabrous, white, up to 6-seeded. Seeds ovoid, 2–3 mm long, shiny, yellowish brown." ... "Seeds are dispersed by birds." [No means of external attachment]
	Ratshibvumo, T. & Mutshinyalo, T. 2008. <i>Flueggea virosa</i> . PlantZAfrica. SANBI. <a href="http://pza.sanbi.org/flueggea-virosa">http://pza.sanbi.org/flueggea-virosa</a> . [Accessed 14 Sep 2018]	"Seeds are dispersed by animals and birds."

Qsn #	Question	Answer
702	<b>Propagules dispersed intentionally by people</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Flueggea virosa is collected from the wild and is only cultivated as an ornamental." ... "The bushy nature, attractive foliage and white waxy fruits of <i>Flueggea virosa</i> make it an interesting ornamental."

703	Propagules likely to disperse as a produce contaminant	n
	<b>Source(s)</b>	<b>Notes</b>
	Neuwinger, H.D. 1996. African Ethnobotany: Poisons and Drugs : Chemistry, Pharmacology, Toxicology. CRC Press, Boca Raton, FL	"Fruit depressed-globosa, 2-3 mm long, 4-5 mm diameter, green at first, later becoming white, waxy and somewhat fleshy, slightly lobed. Seeds 2 mm long, 1.5. mm wide, shiny, yellowish-brown. Tsonga children (South Africa) eat the fruit." [No evidence that seeds contaminate produce]
	Ratshibvumo, T. & Mutshinyalo, T. 2008. <i>Flueggea virosa</i> . PlantZAfrica. SANBI. <a href="http://pza.sanbi.org/flueggea-virosa">http://pza.sanbi.org/flueggea-virosa</a> . [Accessed 14 Sep 2018]	"Seeds are dispersed by animals and birds."

704	Propagules adapted to wind dispersal	n
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Fruit a somewhat fleshy slightly 3-lobed, globose capsule, 3–5 mm in diameter, tardily dehiscent, smooth, glabrous, white, up to 6-seeded. Seeds ovoid, 2–3 mm long, shiny, yellowish brown." ... "Seeds are dispersed by birds."

705	Propagules water dispersed	y
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	" <i>Flueggea virosa</i> is common in a wide variety of habitats, in forest edges, bushland, grassland, woodland and thickets. In drier areas, it occurs mainly along watercourses, and in swampy habitats, sometimes on termite mounds and rocky slopes; it is also common in disturbed localities and fallow land from sea-level up to 2300 m altitude." [Occurrence along watercourses suggests water dispersal]
	Carr, C. J. (1998). Patterns of vegetation along the Omo River in southwest Ethiopia. <i>Plant Ecology</i> , 135(2), 135-163	"Silt berms are numerous along inside (convex) bends. The waterside edges of these recent channel depos its were often sandy and intensively used by local agropastoralists for stock grazing and planting. This cultivated steppe was comprised primarily of annual herbs, with some fast-growing trees and shrubs - especially <i>Sesbania sesban</i> and <i>Ricinis communis</i> . Other common species included <i>Cayratia ibuensis</i> , <i>Rhynchosia minima</i> , <i>Indigofera spicata</i> , <i>Tephrosia uniflora</i> , <i>Eragrostis namagensis</i> var. <i>diplachnoides</i> , <i>Securinega virosa</i> , <i>Echinochloa haploclada</i> and <i>Sorghum virgatum</i> ." [Securinega virosa = <i>Flueggea virosa</i> ]
	Bekele-Tesemma, A. (2007). Useful Trees and Shrubs of Ethiopia: Identification, Propagation, and Management for 17 Agroclimatic Zones. World Agroforestry Centre, Nairobi	[Presence in riverine forests & alluvial flats suggests movement by water] "In Ethiopia, this shrub is found mostly in open <i>Acacia</i> & <i>Combretum</i> woodlands or riverine forests on alluvial flats, on black & cotton soil and well drained rocky slopes."

Qsn #	Question	Answer
706	<b>Propagules bird dispersed</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Fruit a somewhat fleshy slightly 3-lobed, globose capsule, 3–5 mm in diameter, tardily dehiscent, smooth, glabrous, white, up to 6-seeded. Seeds ovoid, 2–3 mm long, shiny, yellowish brown." ... "Seeds are dispersed by birds."
	Ratshibvumo, T. & Mutshinyalo, T. 2008. <i>Flueggea virosa</i> . PlantZAfrica. SANBI. <a href="http://pza.sanbi.org/flueggea-virosa">http://pza.sanbi.org/flueggea-virosa</a> . [Accessed 14 Sep 2018]	"Seeds are dispersed by animals and birds."

707	<b>Propagules dispersed by other animals (externally)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Fruit a somewhat fleshy slightly 3-lobed, globose capsule, 3–5 mm in diameter, tardily dehiscent, smooth, glabrous, white, up to 6-seeded. Seeds ovoid, 2–3 mm long, shiny, yellowish brown." ... "Seeds are dispersed by birds." [No means of external attachment]

708	<b>Propagules survive passage through the gut</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Fruit a somewhat fleshy slightly 3-lobed, globose capsule, 3–5 mm in diameter, tardily dehiscent, smooth, glabrous, white, up to 6-seeded. Seeds ovoid, 2–3 mm long, shiny, yellowish brown." ... "Seeds are dispersed by birds."
	Neuwinger, H.D. 1996. African Ethnobotany: Poisons and Drugs : Chemistry, Pharmacology, Toxicology. CRC Press, Boca Raton, FL	"Fruit depressed-globosa, 2-3 mm long, 4-5 mm diameter, green at first, later becoming white, waxy and somewhat fleshy, slightly lobed. Seeds 2 mm long, 1.5. mm wide, shiny, yellowish brown. Tsonga children (South Africa) eat the fruit."
	Bekele-Tesemma, A. (2007). Useful Trees and Shrubs of Ethiopia: Identification, Propagation, and Management for 17 Agroclimatic Zones. World Agroforestry Centre, Nairobi	"Seed Treatment: Not necessary but seed that has passed an animal gut has better germination than other seed."
	Ratshibvumo, T. & Mutshinyalo, T. 2008. <i>Flueggea virosa</i> . PlantZAfrica. SANBI. <a href="http://pza.sanbi.org/flueggea-virosa">http://pza.sanbi.org/flueggea-virosa</a> . [Accessed 14 Sep 2018]	"Seeds are dispersed by animals and birds."

801	<b>Prolific seed production (&gt;1000/m2)</b>	
	<b>Source(s)</b>	<b>Notes</b>
	Schmelzer, G.H. & Gurib-Fakim, A. (Eds.). 2008. Plant Resources of Tropical Africa 11(1). Medicinal Plants 1. PROTA Foundation, Wageningen, Netherlands	"Dioecious, deciduous, much-branched shrub or small tree up to 4(–6) m tall" ... "Fruit a somewhat fleshy slightly 3-lobed, globose capsule, 3–5 mm in diameter, tardily dehiscent, smooth, glabrous, white, up to 6-seeded. Seeds ovoid, 2–3 mm long, shiny, yellowish brown." [Seed densities unspecified]

802	<b>Evidence that a persistent propagule bank is formed (&gt;1 yr)</b>	



Qsn #	Question	Answer
	<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 14 Sep 2018]	"Storage Behaviour: Orthodox p Storage Conditions: 100% viability following drying to mc's in equilibrium with 15% RH and freezing for 1 month at -20°C at RBG Kew, WP" [Longevity in soil seed bank unknown]

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	y
	<b>Source(s)</b>	<b>Notes</b>
	Nefabas, L. L., & Gambiza, J. (2007). Fire-tolerance mechanisms of common woody plant species in a semiarid savanna in south-western Zimbabwe. <i>African Journal of Ecology</i> , 45(4), 550-556	"The most abundant woody species in burnt plots in 1963 were: B. africana, C. hereroense, Combretum imberbe, D. cinerea, Dombeya rotundifolia, Euclea divinorum, F. indica, G. monticola, P. maprouneifolia, Flueggea virosa, T. sericea and Ziziphus mucronata. All these species resprouted when burnt."
	Felderhof, L. (2007). The fire patchiness paradigm: a case study in northwest Queensland. PhD Dissertation. James Cook University, Townsville	Flueggea virosa listed in Appendix 2 as a Fire Resprouter

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	<b>Source(s)</b>	<b>Notes</b>
	WRA Specialist. 2018. Personal Communication	Unknown

**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Broad climate suitability; Elevation range exceeds 1000 m, demonstrating environmental versatility
- Thrives in tropical climates
- Naturalized on Maui (Hawaiian Islands), Florida, Mauritius & Reunion, & possibly elsewhere
- Regarded as an invasive weed in Florida, with the potential to impact natural ecosystems
- Some forms are spiny
- Toxic to camels
- May form thickets that could exclude other vegetation
- Tolerates many soil types
- Reproduces by seeds
- Seeds dispersed by birds, water & intentionally by people
- Able to resprout after fires
- Gaps in biological & ecological information may limit accuracy of risk assessment

Low Risk Traits

- Non-spiny forms exist
- Provides fodder for livestock (only reported to be toxic to camels)
- Valued for its edible fruit & medicinal uses
- Dioecious
- Not reported to spread vegetatively