Taxon: Phyllanthus amarus Schumach. **Family:** Phyllanthaceae

Common Name(s): black catnip
child pick-a-back
gale of wind
Gulf leaf flower
hurricane weed
shatterstone
stone breaker

Synonym(s): Diasperus nanus (Hook.f.) Kuntze
Phyllanthus nanus Hook.f.
Phyllanthus scabrellus Webb
Phyllanthus swartzii Kostel.

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 23 Feb 2017

WRA Score: 9.0 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Annual Herb, Agricultural Weed, Medicinal, Fodder, Contaminant

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
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
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
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
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
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
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y

Qsn #	Question	Answer Option	Answer
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed		
302	Garden/amenity/disturbance weed		
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	y
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
402	Allelopathic		
403	Parasitic	y=1, n=0	n
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	n
404	Unpalatable to grazing animals	y=1, n=-1	n
405	Toxic to animals	y=1, n=0	n
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n
411	Climbing or smothering growth habit	y=1, n=0	n
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
501	Aquatic	y=5, n=0	n

Qsn #	Question	Answer Option	Answer
502	Grass	y=1, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	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
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
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
603	Hybridizes naturally		
604	Self-compatible or apomictic		
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	1
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
704	Propagules adapted to wind dispersal	y=1, n=-1	y
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed		
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n

Qsn #	Question	Answer Option	Answer
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut		
708	Propagules survive passage through the gut		
801	Prolific seed production (>1000/m2)	y=1, n=-1	n
801	Prolific seed production (>1000/m2)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	n
803	Well controlled by herbicides	y=-1, n=1	y
803	Well controlled by herbicides	y=-1, n=1	y
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	n
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	n
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		
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**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Although several cultivars have been developed with higher yield and higher concentration of active compounds, more breeding efforts are needed to increase crop yield under different field conditions."
	Woodson, R., Schery, R., Webster, G., & Burch, D. (1967). Flora of Panama. Part VI. Family 97. Euphorbiaceae. Annals of the Missouri Botanical Garden, 54(3), 211-350	[No evidence of domestication] "This weedy plant, the most widespread and abundant species of Phyllanthus, has until recently been confused with P. niruri; its complicated nomenclatural history has been reviewed elsewhere (Jour. Arnold Arb. 37: 6-8, 1956; 38: 313- 315, 1957). It is easily distinguished from P. niruri, however, by its equilateral leaf bases, bisexual cymules, and ribbed instead of verruculose seeds. It is more easily confused with P. stipulatus, but that plant has unisexual cymules and broader, more rounded pistillate calyx-lobes"

102	Has the species become naturalized where grown?	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	NA

Qsn #	Question	Answer
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**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 23 Feb 2017]	"Native: Northern America : Mexico Southeastern U.S.A.: United States - Florida Southern America Brazil: Brazil Caribbean: Anguilla; Antigua and Barbuda; Bahamas; Cuba; Dominica; Dominican Republic; Grenada; Guadeloupe; Haiti; Jamaica; Martinique; Montserrat; Puerto Rico; St. Lucia; St. Vincent and Grenadines; Trinidad and Tobago; Virgin Islands (U.S.) Central America: Belize; Costa Rica; El Salvador; Guatemala; Honduras; Nicaragua; Panama Northern South America: French Guiana; Guyana; Suriname; Venezuela Southern South America: Argentina; Paraguay; Uruguay Western South America: Bolivia; Colombia; Ecuador; Peru"

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 23 Feb 2017]	

203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Phyllanthus amarus occurs in open localities, waste ground, grassy scrub vegetation and dry deciduous forest, usually on humid, sandy soils, from sea-level up to 1000 m altitude. " [Elevation range 1000 m, demonstrating environmental versatility]

204	**Native or naturalized in regions with tropical or subtropical climates**	**y**
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Phyllanthus amarus originates from tropical America and has spread as a weed throughout the tropics and subtropics. In tropical Africa it occurs in most countries. It also occurs throughout the Indian Ocean islands."

Qsn #	Question	Answer
205	**Does the species have a history of repeated introductions outside its natural range?**	**y**
	Source(s)	**Notes**
	Webster, G. (1970). A Revision of Phyllanthus (Euphorbiaceae) in the Continental United States. Brittonia, 22(1), 44-76	"Distribution: presumably indigenous to the American tropics (Webster, 1957, p. 315); now a circumtropical weed, perhaps the most ubiquitous of all tropical Euphorbiaceae. So far known in the United States only from southern Florida"

301	**Naturalized beyond native range**	**y**
	Source(s)	**Notes**
	Corlett, R.T. 1988. The Naturalized Flora of Singapore. Journal of Biogeography 15(4): 657-663	"Appendix 1 Exotic vascular plant species naturalized in Singapore" [Includes Phyllanthus amarus]
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 23 Feb 2017]	"Naturalized: . natzd. in paleotropics"
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Phyllanthus amarus originates from tropical America and has spread as a weed throughout the tropics and subtropics. In tropical Africa it occurs in most countries. It also occurs throughout the Indian Ocean islands."

302	**Garden/amenity/disturbance weed**	
	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	"a weed of open ground, waste places, damp grassland, grassland, grassy scrub and dry deciduous forest, in sandy soils" [A disturbance weed of agricultural sites]

303	**Agricultural/forestry/horticultural weed**	**y**
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"It is reported as a troublesome weed in pulses, soya bean, groundnut, cereals, sugar cane, cassava, taro, sesame, sunflower and cotton."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Phyllanthus amarus ... Weed of: Bananas, Cereals, Cotton, Orchards & Plantations, Pastures, Vegetables"

304	**Environmental weed**	**n**
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Phyllanthus amarus ... Weed of: Bananas, Cereals, Cotton, Orchards & Plantations, Pastures, Vegetables"

305	**Congeneric weed**	**y**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Norcini, J. G., Stamps, R. H., & Aldrich, J. H. (1995). Preemergent control of long-stalked phyllanthus (Phyllanthus tenellus) and leafflower (Phyllanthus urinaria). Weed Technology, 9(4): 783-788	"Leafflower (also known as chamberbitter or gripeweed) and long-stalked phyllanthus, members of the Euphorbiaceae, are becoming major problems in nurseries, landscape plantings, and turf in some areas of the southeastern U.S. (4). Phyllanthus tenellus is a naturalized perennial that reportedly occurs as far north as Sumter, SC (13). It can become invasive due to its rapid flowering and explosively dehiscent fruit. Phyllanthus urinaria, an annual primarily found in the Gulf coast states to the Carolinas, spreads less rapidly (4, 13). Both species are considered warm season weed problems. These species have the potential to spread throughout USDA hardiness zones 8a and higher."

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Monoecious, annual, erect, glabrous herb up to 60 cm tall, reddish; branchlets flattened, often slightly winged and sparsely hairy. Leaves alternate, distichous and crowded along lateral branchlets, simple and entire, sessile; stipules ovate-lanceolate to lanceolate; blade oblong to elliptical-oblong, 7–12(–20) mm × 3–6(–9) mm, base obtuse to rounded and slightly unequal, apex rounded, often pointed."

402	Allelopathic	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	Unknown. Allelopathy documented in genus (Fujii, Y., Parvez, S. S., Parvez, M., Ohmae, Y., & Iida, O. (2003). Screening of 239 medicinal plant species for allelopathic activity using the sandwich method. Weed Biology and Management, 3(4), 233-241)

403	Parasitic	n
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Monoecious, annual, erect, glabrous herb up to 60 cm tall" [Phyllanthaceae. No evidence]

404	Unpalatable to grazing animals	n
	Source(s)	**Notes**
	Setiya, A. V., Narkhede, M. S., & Dongarwar, N. M. (2015). Preliminary survey of fodder plants used by goats Gadchiroli District of Maharashtra State. International Journal of Advanced Research, 3(12), 1157-1167	"Table 1 – Plants preferred by Goats as fodder." [Includes Phyllanthus amarus - leaves, flowers & fruit consumed]

405	Toxic to animals	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Useful Tropical Plants Database. 2017. Phyllanthus amarus. http://tropical.theferns.info/viewtropical.php?id=Phyllanthus+amarus. [Accessed 23 Feb 2017]	"Known Hazards None known"
	Setiya, A. V., Narkhede, M. S., & Dongarwar, N. M. (2015). Preliminary survey of fodder plants used by goats Gadchiroli District of Maharashtra State. International Journal of Advanced Research, 3(12), 1157-1167	[No evidence] "Table 1 – Plants preferred by Goats as fodder." [Includes Phyllanthus amarus - leaves, flowers & fruit 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**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Diseases and pests: In India the commercial cultivation of Phyllanthus amarus has led to the outbreak of stem blight caused by Corynespora cassiicola. Phytoplasma-induced yellowing, small leaf development, proliferation of axillary shoots and overall retarded growth of infected plants were found in experimental fields in 1999–2000."
	McMillan Jr, R. T., Borek, M., & Graves, W. R. (1997). Web blight of dwarf Hawaiian snowbush. Proc. Fla. State Hort. Soc. 110: 370	"Table 1. Alternate host reaction to the Thanatephorus cucumeris isolate from Breynia distichia (Snowbush)." [Phyllanthus amarus - Infection = Yes]

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	Useful Tropical Plants Database. 2017. Phyllanthus amarus. http://tropical.theferns.info/viewtropical.php?id=Phyllanthus+amarus. [Accessed 23 Feb 2017]	"Known Hazards None known"

Qsn #	Question	Answer
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	[Medicinal uses] "Used in Ayurveda and Sidha. Whole plant paste along with Amaranthus spinosus juice mixed in goat milk taken against jaundice and liver-related diseases; whole plant of Andrographis paniculata with Phyllanthus amarus dried and powdered and taken to cure jaundice; whole plant ground into paste mixed with Phyllanthus emblica fruit paste and given to improve fertility in women; dried plant powder taken for diabetes and dysentery; plant juice given in abdominal pain and jaundice; whole plant in jaundice and dysuria; plant paste mixed with curd given orally for liver ailments, as hepatoprotective, hepatic stimulant; stem bark of Ficus racemosa ground with that of Artocarpus heterophyllus and leaves of Phyllanthus amarus given to promote fertility. An infusion of aerial parts drunk to cure persistent cough; raw branchlets and leaves eaten for curing jaundice. Fruits eaten to cure asthma. Leaves diuretic, used to treat kidney complaints, stomachache, urinary and venereal diseases, colds, skin diseases, fever, malaria, jaundice; leaf paste mixed with milk or curd given for jaundice; leaf extract dropped in eyes to cure cataract; chewed as a cough remedy; boiled to cure diarrhea, dysentery. Leaf paste applied to the bites of centipedes and snakes. Roots to treat fever; root extract taken orally for stomachache. Veterinary medicine, plant given in ephemeral fever. Magico-religious beliefs, spiritual, emotional, ritual, superstitions, talisman, the root as love charm, to attract the wanted person."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	[No evidence among impacts] "Phyllanthus amarus occurs in open localities, waste ground, grassy scrub vegetation and dry deciduous forest, usually on humid, sandy soils, from sea-level up to 1000 m altitude. It is reported as a troublesome weed in pulses, soya bean, groundnut, cereals, sugar cane, cassava, taro, sesame, sunflower and cotton."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	**Notes**
	Patel, J. R., Tripathi, P., Sharma, V., Chauhan, N. S., & Dixit, V. K. (2011). Phyllanthus amarus: ethnomedicinal uses, phytochemistry and pharmacology: a review. Journal of Ethnopharmacology, 13 (2), 286-313	"P. amarus is a common pantropical weed that grows well in moist, shady and sunny places (Cabieses, 1993; Nanden, 1998)."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"usually on humid, sandy soils, from sea-level up to 1000 m altitude. "

Qsn #	Question	Answer
411	**Climbing or smothering growth habit**	**n**
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Monoecious, annual, erect, glabrous herb up to 60 cm tall"

412	**Forms dense thickets**	**n**
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"It is reported as a troublesome weed in pulses, soya bean, groundnut, cereals, sugar cane, cassava, taro, sesame, sunflower and cotton."

501	**Aquatic**	**n**
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	[Terrestrial] "Phyllanthus amarus occurs in open localities, waste ground, grassy scrub vegetation and dry deciduous forest, usually on humid, sandy soils, from sea-level up to 1000 m altitude."

502	**Grass**	**n**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 23 Feb 2017]	Family: Phyllanthaceae Subfamily: Phyllanthoideae Tribe: Phyllantheae

503	**Nitrogen fixing woody plant**	**n**
	Source(s)	**Notes**
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. http://www.ars-grin.gov/npgs/index.html. [Accessed 23 Feb 2017]	Family: Phyllanthaceae Subfamily: Phyllanthoideae Tribe: Phyllantheae

504	**Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)**	**n**
	Source(s)	**Notes**

Qsn #	Question	Answer
	Webster, G. (1970). A Revision of Phyllanthus (Euphorbiaceae) in the Continental United States. Brittonia, 22(1), 44-76	"glabrous annual herbs, 1-5 dm high; main stems smooth, terete, cataphylls spirally arranged; stipules of cataphylls deltoid, acuminate, entire, not auriculate, 1.3-2.1 mm long; deciduous branchlets 4-12 cm long, subterete (not winged nor sharply angled), smooth or at most slightly thickened, elliptic-oblong or somewhat obovate, obtuse or rounded and often apiculate at tip, obtuse or rounded and sometimes slightly inequilateral at base, paler or glaucous beneath, the veinlet reticulum delicate or obscure; stipules ovate-lanceolate or lanceolate, acuminate, 0.8-1.3 mm long"

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Phyllanthus amarus is widespread and common throughout its distribution area and is therefore not threatened by genetic erosion."

602	Produces viable seed	y
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Fruit an obtusely 3-lobed capsule 2–2.5 mm in diameter, smooth, hanging, 6-seeded. Seeds c. 1 mm long, with transverse ridges." ... "Seed requires light to germinate. Germination is often less than 50%; germination of freshly harvested seeds is slower than that of older seeds. Scarification by immersion in water at 30°C for 2 hours rendered seeds inviable. Seeds dried to 8% moisture content and treated with turmeric rhizome powder under ambient conditions maintained viability for up to 6 months; untreated seeds stored poorly."

603	Hybridizes naturally	
	Source(s)	**Notes**
	Pope, G.V. (ed.). 1996. Flora Zambesiaca Vol 9 (4). Euphorbiaceae (excluding Euphorbieae). Kew Publishing and Flora Zambesiaca Managing Committee, Richmond, Surrey, UK	[Unknown. Hybridization documented in genus] "Phyllanthus reticulatus var. glaber hybridizes with P. ovalifolius to produce the hybrid P. × collium-misuku"

Qsn #	Question	Answer
604	**Self-compatible or apomictic**	
	Source(s)	**Notes**
	Webster, G. (1970). A Revision of Phyllanthus (Euphorbiaceae) in the Continental United States. Brittonia, 22(1), 44-76	"Monoecious; proximal 1 or 2 axils of branchlet with unisexual cymules of 1 or 2 & flowers, distal axils with bisexual cymules of 1 8 and 1 9 flower."
	Kawakita, A., & Kato, M. (2009). Repeated independent evolution of obligate pollination mutualism in the Phyllantheae–Epicephala association. Proceedings of the Royal Society of London B: Biological Sciences, 276(1656), 417-426	[Unknown. Possibly] "Traits possibly associated with Epicephala pollination include floral morphology, pollen to ovule ratio, nectar production, self-compatibility, extent of pollen/resource limitation and floral odor chemistry"

605	Requires specialist pollinators	n
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Flowers 1–2 in the axils of leaves, unisexual, pale green, often flushed red; male flowers at the base of branches, other leaf axils with 1 female flower and 1 male flower; pedicel c. 1 mm long; perianth lobes 5(–6), 0.5–1 mm long; male flowers with 5-lobed disk, stamens 3, filaments fused, anthers free; female flowers with cup-shaped, 5-lobed disk, ovary superior, ovoid, warty, 3-celled, styles 3, free, shallowly 2-fid at apex. "
	Kato, M., Kosaka, Y., Kawakita, A., Okuyama, Y., Kobayashi, C., Phimminith, T., & Thongphan, D. (2008). Plant–pollinator interactions in tropical monsoon forests in Southeast Asia. American Journal of Botany, 95(11), 1375-1394	"Related species of Phyllanthaceae (Breynia retusa , Phyllanthus virgatus , P. amarus , P. roseus , Sauropus quadrangularis , and S. granulosus) were pollinated not by gracillariid moths but by dipterans, small bees, or ants, mainly during the wet season."

606	Reproduction by vegetative fragmentation	n
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	[No evidence] "Seed requires light to germinate. Germination is often less than 50%; germination of freshly harvested seeds is slower than that of older seeds. Scarification by immersion in water at 30°C for 2 hours rendered seeds inviable. Seeds dried to 8% moisture content and treated with turmeric rhizome powder under ambient conditions maintained viability for up to 6 months; untreated seeds stored poorly. In-vitro propagation can be done by culturing shoot tips, and less successfully by nodal and internodal segments."

607	Minimum generative time (years)	1
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	[Annual] "Monoecious, annual, erect, glabrous herb up to 60 cm tall"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y

Qsn #	Question	Answer
	Source(s)	**Notes**
	Clifford, H. (1959). Seed Dispersal by Motor Vehicles. Journal of Ecology, 47(2), 311-315	"Table 3. Species which germinated from in June and December 1957" [Includes Phyllanthus amarus]

702	Propagules dispersed intentionally by people	y
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Phyllanthus amarus is widely used in local medicine in Africa and Asia. A wealth of research findings have shown interesting antiviral, anti-HIV, anti-inflammatory, antioxidant, antibacterial and antidiabetic activities. More research is needed though, especially well-controlled clinical trials, to evaluate the extracts and the individual compounds. More research is needed as well to improve cultivation methods."

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Contaminant, Crop, Herbal, Ornamental Dispersed by: Humans, Vehicles"

704	Propagules adapted to wind dispersal	y
	Source(s)	**Notes**
	White, E., Tucker, N., Meyers, N., & Wilson, J. (2004). Seed dispersal to revegetated isolated rainforest patches in North Queensland. Forest Ecology and Management, 192 (2), 409-426	"Appendix A. Plant species colonising study sites ('new' species)" [Phyllanthus amarus - Dispersal agent(s)a = Wind]

705	Propagules water dispersed	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	Seeds dispersed as wind, attached to mud on vehicles, and probably tools or footwear, and as a crop contaminant. Rain and water may be able to move seeds, but no evidence found.

706	Propagules bird dispersed	n
	Source(s)	**Notes**
	Webster, G. (1970). A Revision of Phyllanthus (Euphorbiaceae) in the Continental United States. Brittonia, 22(1), 44-76	"Capsules 1.9-2.1 mm broad; seeds light brown, with 5-7 straight longitudinal ribs and many fine transverse striae on back, 0.9-1.0 mm long." [No evidence. Not fleshy-fruited]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	Possibly, but no direct evidence.

Qsn #	Question	Answer
708	**Propagules survive passage through the gut**	
	Source(s)	**Notes**
	Setiya, A. V., Narkhede, M. S., & Dongarwar, N. M. (2015). Preliminary survey of fodder plants used by goats Gadchiroli District of Maharashtra State. International Journal of Advanced Research, 3(12), 1157-1167	[Consumed by goats. Unknown if viable seeds survive gut passage] "Table 1 – Plants preferred by Goats as fodder." [Includes Phyllanthus amarus - leaves, flowers & fruit consumed]

801	**Prolific seed production (>1000/m2)**	**n**
	Source(s)	**Notes**
	Oladipo, O. T., & Oke, S. O. (2007). Seed bank dynamics, seedling emergence and survival of herbaceous species in successional plots in Ile-Ife, Southwestern Nigeria. Research Journal of Botany, (2), 76-85	"Table 3: Seasonal density and herbaceous species composition of the seedbank of plot SF1" [Phyllarithus amarus - Seed/m2 = 18]

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	**n**
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Germination is often less than 50%; germination of freshly harvested seeds is slower than that of older seeds. Scarification by immersion in water at 30°C for 2 hours rendered seeds inviable. Seeds dried to 8% moisture content and treated with turmeric rhizome powder under ambient conditions maintained viability for up to 6 months; untreated seeds stored poorly."

803	**Well controlled by herbicides**	**y**
	Source(s)	**Notes**
	Chikoye, D., Lum, A. F., & Udensi, U. E. (2010). Efficacy of a new glyphosate formulation for weed control in maize in southwest Nigeria. Crop Protection, 29(9), 947-952	"Table 1 % weed control based on visual ratings at 4 WAT (means of 2003 and 2004)." [Herbicides, including Touchdown forte & Roundup, provide control of P. amarus]

804	**Tolerates, or benefits from, mutilation, cultivation, or fire**	**n**
	Source(s)	**Notes**
	Oudhia, P., 2008. Phyllanthus amarus Schumach. & Thonn. In: Schmelzer, G.H. & Gurib-Fakim, A. (Editors). Prota 11 (1): Medicinal plants/Plantes médicinales 1. [CD-Rom]. PROTA, Wageningen, Netherlands	"Monoecious, annual, erect, glabrous herb up to 60 cm tall," ... "Seed requires light to germinate." [Disturbance associated with cultivation may create the conditions in which P. amarus thrives, but no evidence that the plants themselves resprout or tolerate mutilation, cultivation, or fire]

805	**Effective natural enemies present locally (e.g. introduced biocontrol agents)**	
	Source(s)	**Notes**
	WRA Specialist. 2017. Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Elevation range exceeds 1000 m, demonstrating environmental versatility
• Thrives in tropical climates
• Widely naturalized
• Crop weed of Bananas, Cereals, Cotton, Orchards & Plantations, Pastures, Vegetables
• Other Phyllanthus species have become invasive
• Shade tolerant
• Reproduces by seeds
• Seeds dispersed by wind, as a contaminant, by vehicles & intentionally by people
• Annual life cycle

Low Risk Traits
• Unarmed (no spines, thorns, or burrs)
• Provides fodder for livestock
• Edible and medicinal uses
• Not reported to spread vegetatively
• Herbicides provide effective control