

**Family:** *Rubiaceae*

**Taxon:** *Psychotria carthagenensis*

**Synonym:** *Uragoga carthagenensis* (Jacq.) Kuntze

**Common Name:** Amyruca  
cafecillo

**Questionnaire :** current 20090513  
**Status:** Assessor Approved

**Assessor:** Chuck Chimera  
**Data Entry Person:** Chuck Chimera

**Designation:** H(HPWRA)

**WRA Score 2**

101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?	y=1, n=-1	
103	Does the species have weedy races?	y=1, n=-1	
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	n
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	n
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	
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)	
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic	y=1, n=0	
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	
405	Toxic to animals	y=1, n=0	
406	Host for recognized pests and pathogens	y=1, n=0	
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	
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
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	
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	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	n
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	2
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	
706	Propagules bird dispersed	y=1, n=-1	y
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	y
801	Prolific seed production (>1000/m <sup>2</sup> )	y=1, n=-1	n
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score **2**

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**Supporting Data:**

101	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. Annals of the Missouri Botanical Garden. 76(1): 67-111.	[Is the species highly domesticated?? No evidence]
101	2000. Zappi, D./Nunes, T.S.. Notes on the Rubiaceae of Northeastern Brazil. I. Erithalis, Psychotria and Rudgea. Kew Bulletin. 55(3): 655-668.	[Is the species highly domesticated?? No evidence] "Unlike the other species of Psychotria treated here, the characterization of <i>P. carthagenensis</i> is not straightforward. Apart from its entire, rounded to obtuse terminal stipules and its brown to dull blackish colour when dry, this plant is extremely variable in the rest of its characters, such as leaf, inflorescence and flower shape and size.."
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. Annals of the Missouri Botanical Garden. 76(1): 67-111.	[Species suited to tropical or subtropical climate(s) 2-High] "Common throughout Mexico and Central America, occurring also in Florida (cultivated), Cuba, Colombia, Venezuela, the Guianas, Ecuador, Peru, Brazil, Bolivia, Paraguay, Argentina, and Uruguay."
202	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. Annals of the Missouri Botanical Garden. 76(1): 67-111.	[Quality of climate match data 2-High]
203	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. Annals of the Missouri Botanical Garden. 76(1): 67-111.	[Broad climate suitability (environmental versatility)? Yes. Elevation range exceeds 1000 m] "In Central America it is found mostly in Pacific coastal lowlands at elevations of 0-1,400 m, mostly under 400 m, in tropical moist to premontane moist and wet forest with equatorial to tropical climates."
204	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. Annals of the Missouri Botanical Garden. 76(1): 67-111.	[Native or naturalized in regions with tropical or subtropical climates? Yes] "Common throughout Mexico and Central America, occurring also in Florida (cultivated), Cuba, Colombia, Venezuela, the Guianas, Ecuador, Peru, Brazil, Bolivia, Paraguay, Argentina, and Uruguay."
205	1980. Woodson, Jr., R.E./Schery, R.W./Dwyer, J.D.. Flora of Panama. Part IX. Family 179. Rubiaceae. Part 2. Annals of the Missouri Botanical Garden. 67(2): 257-522.	[Does the species have a history of repeated introductions outside its natural range? No evidence. Widespread natural distribution] "Psychotria carthagenensis is a common species throughout Central America and South America, and it also occurs in Trinidad and Tobago. I have reduced <i>P. alba</i> Ruiz & Pavon to synonymy following L. B. Smith's recommendation (1958). The Panamanian material heretofore identified as <i>P. alba</i> is poor."
205	2012. WRA Specialist. Personal Communication.	[Does the species have a history of repeated introductions outside its natural range? No evidence found]
301	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Naturalized beyond native range? No evidence]
302	1979. Holm, L. G./Pancho, J.V./Herberger, J.P./Plucknett, D.L.. A Geographical Atlas of World Weeds. John Wiley and Sons, New York, NY	[Garden/amenity/disturbance weed? Possibly] Listed as a weed of unspecified impact in Peru, under the synonym <i>P. alba</i> . No further information was found to corroborate this reference.
303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No evidence]
304	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No evidence]
305	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Congeneric weed? Possibly] <i>Psychotria barbiflora</i> (Rubiaceae) [listed as a weed]; <i>Psychotria curviflora</i> [listed as an agricultural weed]; <i>Psychotria nervosa</i> [listed as an agricultural weed]; <i>Psychotria pubescens</i> [listed as an agricultural weed]; <i>Psychotria punctata</i> [listed as a weed]; <i>Psychotria ruelliaefolia</i> [listed as a weed] [no further information on impacts or control efforts on any of the preceding species was found]

401	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Produces spines, thorns or burrs? No] "Shrub (0.5-)1-3(-6) m tall; young stems glabrous, the bark smooth to irregularly furrowed; stipules sheathing, ovate, 6-8 X 3 5 mm (Fig. 2), irregularly fringed, glabrous, caducous, leaving a pale ridge usually with red-brown fringe (Fig. 1). Leaves sessile to petiolate; petioles to 5(- 10) mm long, glabrous, flat above; blades membranous, obovate or rarely elliptic, the apex acuminate, the base attenuate, (6-)7.5-13(-16) x (2-)2.5 5.5 (-6) cm, glabrous above and below, drying red brown to red-gray; secondary veins 7-10 pairs, diverging 60°-70°(-75°), eucamptodromous (Fig. 3), constantly arcuate, prominent below, glabrous, the axils lacking domatia or hairs; tertiary veins inconspicuous, orthogonal reticulate."
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Parasitic? No] "Shrub (0.5-)1-3(-6) m tall..." [Rubiaceae]
404	2012. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals? Unknown] Palatability of foliage to browsing and grazing animals unknown, although references to potential toxicity suggest cattle may ingest the plant.
405	1996. Leal, M.B./Elisabetsky, E.. Absence of alkaloids in <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae). <i>Journal of Ethnopharmacology</i> . 54: 37-40.	[Toxic to animals? Potentially Yes, but apparently does not contain alkaloids as found in <i>P. viridis</i> ] "The data indicate that <i>P. carthagenensis</i> does have bioactive compound(s), possibly active at the central nervous system, but unlikely to be tryptamine alkaloids as in the case of <i>P. viridis</i> . Therefore, if <i>P. carthagenensis</i> is indeed used by ayahuasqueros, its chemical and pharmacological significance have yet to be elucidated." ... "The genus <i>Psychotria</i> is very closely allied to <i>Palicourea</i> (Rubiaceae) (Schultes and Rauffauf, 1990). Several species of <i>Psychotria</i> and <i>Palicourea</i> are reported as fairly to highly toxic, usually affecting cattle." ... "The Makuna Indians do consider <i>Psychotria carthagenensis</i> as a toxic species (Schultes and Rauffauf, 1990). Our study showed that body temperature decreased after the administration of <i>P. carthagenensis</i> ethanol extract. The ability to decrease body temperature can be interpreted as an indication of central activity. In addition, the decrease in spontaneous activity and ptoses observed during toxicity evaluation are common to central nervous system depressors (Contar et al., 1985). Nevertheless, lethality was not observed even with higher doses."
406	2012. WRA Specialist. Personal Communication.	[Host for recognized pests and pathogens? Unknown] No information on pests or pathogens found, but because native <i>Psychotria</i> species occur throughout the Hawaiian Islands, the possibility does warrant some concern
407	1996. Leal, M.B./Elisabetsky, E.. Absence of alkaloids in <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae). <i>Journal of Ethnopharmacology</i> . 54: 37-40.	[Causes allergies or is otherwise toxic to humans? Potentially Yes, but apparently does not contain alkaloids as found in <i>P. viridis</i> ] "The data indicate that <i>P. carthagenensis</i> does have bioactive compound(s), possibly active at the central nervous system, but unlikely to be tryptamine alkaloids as in the case of <i>P. viridis</i> . Therefore, if <i>P. carthagenensis</i> is indeed used by ayahuasqueros, its chemical and pharmacological significance have yet to be elucidated." ... "The genus <i>Psychotria</i> is very closely allied to <i>Palicourea</i> (Rubiaceae) (Schultes and Rauffauf, 1990). Several species of <i>Psychotria</i> and <i>Palicourea</i> are reported as fairly to highly toxic, usually affecting cattle." ... "The Makuna Indians do consider <i>Psychotria carthagenensis</i> as a toxic species (Schultes and Rauffauf, 1990). Our study showed that body temperature decreased after the administration of <i>P. carthagenensis</i> ethanol extract. The ability to decrease body temperature can be interpreted as an indication of central activity. In addition, the decrease in spontaneous activity and ptoses observed during toxicity evaluation are common to central nervous system depressors (Contar et al., 1985). Nevertheless, lethality was not observed even with higher doses."
408	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Creates a fire hazard in natural ecosystems? No evidence] "In Central America it is found mostly in Pacific coastal lowlands at elevations of 0-1,400 m, mostly under 400 m, in tropical moist to premontane moist and wet forest with equatorial to tropical climates."
408	2011. Consolaro, H./Silva, S.C.S./Oliveira, P.E.. Breakdown of distyly and pin-monomorphism in <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae). <i>Plant Species Biology</i> . 26: 24-32.	[Creates a fire hazard in natural ecosystems? No evidence] " <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae) is a sub-canopy shrub occurring at Pantanal in flooding vegetation areas..." [Unlikely in this habitat]

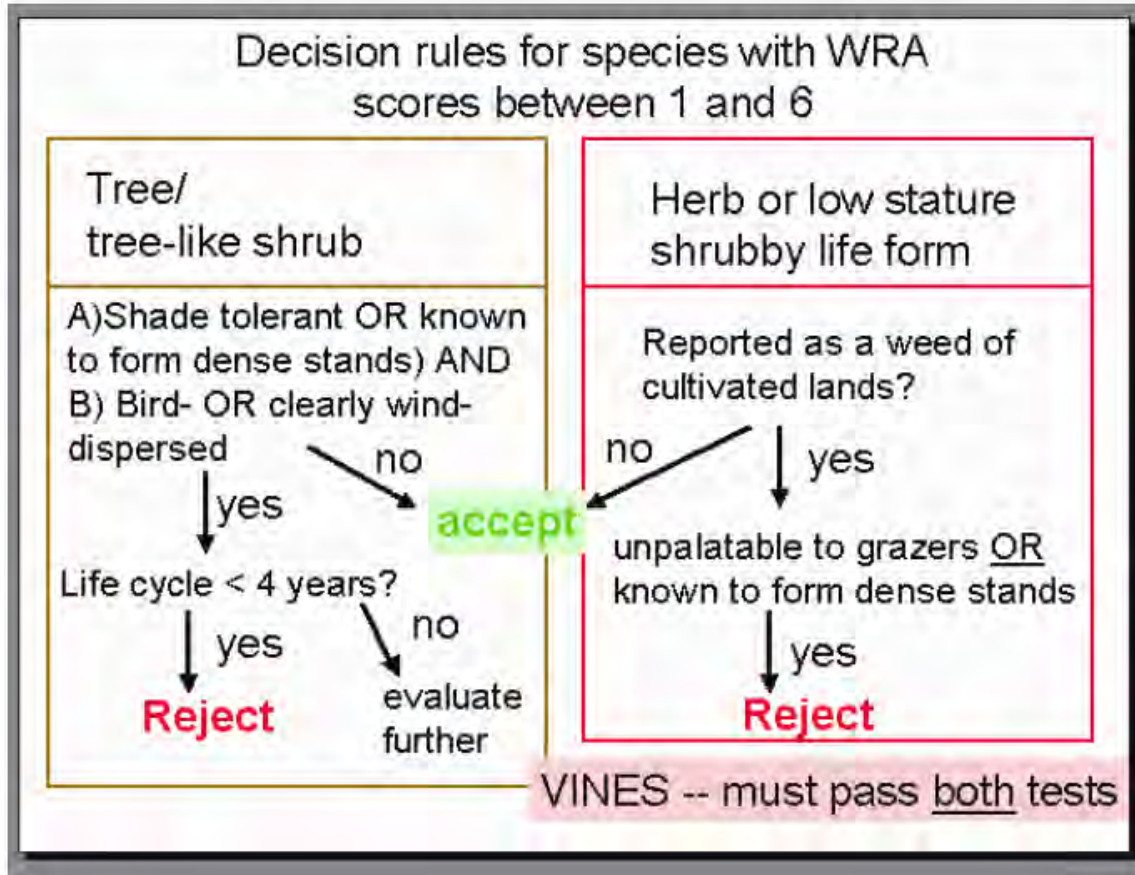
409	2000. Fujisaka, S./Escobar, G./Veneklaas, E.J.. Weedy fields and forests: interactions between land use and the composition of plant communities in the Peruvian Amazon. <i>Agriculture, Ecosystems and Environment</i> . 78: 175-186.	[Is a shade tolerant plant at some stage of its life cycle? Yes] "With regard to shrubs and herbaceous plants, only few forest species appear in fallow, possibly because they thrive best in deeper shade (e.g., <i>Psychotria carthagenensis</i> Jacq., Araceae vines, and <i>M. plurispicatum</i> )."
409	2003. Aragón, R./Morales, J.M.. Species Composition and Invasion in NW Argentinian Secondary Forests: Effects of Land Use History, Environment and Landscape. <i>Journal of Vegetation Science</i> . 14(2): 195-204.	[Is a shade tolerant plant at some stage of its life cycle? Yes. Understory] "In most of the forest patches it is possible to distinguish three vertical strata. The canopy of ca. 15-20 m is frequently dominated by <i>Blepharocalyx salicifolius</i> (Myrtaceae) and <i>Cinnamomum orphyria</i> (Lauraceae). The subcanopy (5-9 m) is composed mainly of <i>Eugenia uniflora</i> (Myrtaceae), <i>Piper tucumanum</i> (Piperaceae) and <i>Allophylus edulis</i> (Sapindaceae) (Grau & Brown 1998). The most abundant shrub in the understory is <i>Psychotria carthagenensis</i> (Rubiaceae)."
410	2004. Lichstein, J.W./Grau, H.R./Aragón, R.. Recruitment Limitation in Secondary Forests Dominated by an Exotic Tree. <i>Journal of Vegetation Science</i> . 15(6): 721-728.	[Tolerates a wide range of soil conditions?] "Soils are typically Hapludoll with an AC profile (Zucardi et al. 1968) and pH 5.5 - 6.8"
410	2008. Faria, R.R./Lima, T.N.. Spiders associated with <i>Psychotria carthagenensis</i> Jacquin. (Rubiaceae): vegetative branches versus inflorescences, and the influence of <i>Crematogaster</i> sp. (Hymenoptera, Formicidae), in South-Pantanal, Brazil. <i>Brazilian Journal</i>	[Tolerates a wide range of soil conditions?] " <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae) is a sub-canopy shrub occurring at Pantanal in flooding vegetation areas, "cambarazal", "capão de vazante", sand or clay soils (Pott and Pott, 1994)."
410	2012. Faria, R.R./Ferrero, V./Navarro, L./Araujo, A.C.. Flexible mating system in distylous populations of <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae) in Brazilian Cerrado. <i>Plant Syst Evol</i> . DOI 10.1007/s00606-011-0571-7: .	[Tolerates a wide range of soil conditions?] "In all areas, <i>P. carthagenensis</i> is present in moist soils and near to small watercourses."
411	1989. Hamilton, C.W.. A Revision of Mesoamerican <i>Psychotria</i> Subgenus <i>Psychotria</i> (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Climbing or smothering growth habit? No] "Shrub (0.5-1-3(-6) m tall..."
412	1989. Hamilton, C.W.. A Revision of Mesoamerican <i>Psychotria</i> Subgenus <i>Psychotria</i> (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Forms dense thickets? No evidence] "In Central America it is found mostly in Pacific coastal lowlands at elevations of 0 1,400 m, mostly under 400 m, in tropical moist to premontane moist and wet forest with equatorial to tropical climates"
412	2012. Blendinger, P.G. Et al.. Fine-tuning the fruit-tracking hypothesis: spatiotemporal links between fruit availability and fruit consumption by birds in Andean mountain forests. <i>Journal of Animal Ecology</i> . doi: 10.1111/j.1365-2656.2012.02011.x: .	[Forms dense thickets? A component of dense vegetation] "Vegetation features emergent trees 25–30 m in height of <i>Cinnamomum porphyrium</i> (Lauraceae) and <i>Blepharocalyx salicifolius</i> (Myrtaceae); an upper canopy layer composed mainly of <i>Parapiptadenia excelsa</i> (Fabaceae), <i>Myrcianthes pungens</i> (Myrtaceae), <i>Pisonia zapallo</i> (Nyctaginaceae) and <i>Terminalia triflora</i> (Combretaceae); a lower canopy dominated by 5- to 12- m-height small trees of <i>Piper tucumanum</i> (Piperaceae), <i>Eugenia uniflora</i> (Myrtaceae), <i>Allophylus edulis</i> (Sapindaceae) and <i>Solanum riparium</i> (Solanaceae); and a dense understory dominated by the shrub <i>Psychotria carthagenensis</i> (Rubiaceae) (Blendinger & Villegas 2011)."
501	1989. Hamilton, C.W.. A Revision of Mesoamerican <i>Psychotria</i> Subgenus <i>Psychotria</i> (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Aquatic? No] "Shrub (0.5-1-3(-6) m tall..."
502	1989. Hamilton, C.W.. A Revision of Mesoamerican <i>Psychotria</i> Subgenus <i>Psychotria</i> (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Grass? No] Rubiaceae
503	1989. Hamilton, C.W.. A Revision of Mesoamerican <i>Psychotria</i> Subgenus <i>Psychotria</i> (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Nitrogen fixing woody plant? No] Rubiaceae

504	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Shrub (0.5-)1-3(-6) m tall; young stems glabrous, the bark smooth to irregularly furrowed; stipules sheathing, ovate, 6-8 X 3-5 mm"
601	2000. Zappi, D./Nunes, T.S.. Notes on the Rubiaceae of Northeastern Brazil. I. Erithalis, Psychotria and Rudgea. <i>Kew Bulletin</i> . 55(3): 655-668.	[Evidence of substantial reproductive failure in native habitat? No] "Analysis of large amounts of material makes it obvious that <i>P. carthagenensis</i> is one of the most widespread and variable neotropical members of the genus."
601	2004. Lichstein, J.W./Grau, H.R./Aragón, R.. Recruitment Limitation in Secondary Forests Dominated by an Exotic Tree. <i>Journal of Vegetation Science</i> . 15(6): 721-728.	[Evidence of substantial reproductive failure in native habitat? No evidence] "Conclusions: Native tree recruitment appears to be limited primarily by sapling mortality in patches dominated by the invasive <i>Ligustrum</i> . <i>Ligustrum</i> does not appear to be dispersal limited in our study area and is likely to continue spreading. Invaded patches may persist for hundreds of years." ... "Psychotria comprised 96 - 99% of native shrubs in the four size classes. Psychotria SC2 abundance was positively correlated with <i>Ligustrum</i> dominance" [Psychotria carthagenensis benefits from <i>Ligustrum</i> invasion]
601	2011. Consolaro, H./Silva, S.C.S./Oliveira, P.E.. Breakdown of distyly and pin-monomorphism in Psychotria carthagenensis Jacq. (Rubiaceae). <i>Plant Species Biology</i> . 26: 24-32.	[Evidence of substantial reproductive failure in native habitat? No] "Psychotria carthagenensis flowered annually and presented a single blooming episode in the study area (sensu Bawa 1983). Flowering began during the period of highest rainfall and warmest temperatures, a phenological pattern observed for other understory plants in central Brazil (Oliveira & Paula 2001; Freitas & Oliveira 2002) and for many Psychotria species in Central America (Hamilton 1990)."
602	2011. Consolaro, H./Silva, S.C.S./Oliveira, P.E.. Breakdown of distyly and pin-monomorphism in Psychotria carthagenensis Jacq. (Rubiaceae). <i>Plant Species Biology</i> . 26: 24-32.	[Produces viable seed? Yes] "The fruit set for the open pollination treatment was, actually, relatively high when compared with other plants in the region (Oliveira & Gibbs 2002). However, complementary observations indicated that the fruit set in the <i>P. carthagenensis</i> PES population during 2002 and 2003 was lower than that in other areas in the region where the species also occurs (Clube Caça and Pesca Itororó of Uberlândia and River Uberabinha)."
603	1989. Hamilton, C.W.. A Revision of Mesoamerican Psychotria Subgenus Psychotria (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Hybridizes naturally? Unknown] No evidence
603	2012. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2011. Consolaro, H./Silva, S.C.S./Oliveira, P.E.. Breakdown of distyly and pin-monomorphism in Psychotria carthagenensis Jacq. (Rubiaceae). <i>Plant Species Biology</i> . 26: 24-32.	[Self-compatible or apomictic? Yes] "Hand pollinations at the Panga Ecological Station showed self-compatibility and intramorph compatibility. Typical distyly and isoplethy were found in other areas and both morphs appeared in herbarium material. However, pin-monomorphism was also observed elsewhere in Brazil. Typical distyly, pin-monomorphism and homostyly observed concurrently in Brazilian populations of <i>P. carthagenensis</i> indicate that alternative reproductive strategies, probably favoring selfing, appear to have developed independently in this species."
604	2012. Faria, R.R./Ferrero, V./Navarro, L./Araujo, A.C.. Flexible mating system in distylous populations of Psychotria carthagenensis Jacq. (Rubiaceae) in Brazilian Cerrado. <i>Plant Syst Evol</i> . DOI 10.1007/s00606-011-0571-7: .	[Self-compatible or apomictic? Yes] "Regarding breeding system, flowers of <i>P. carthagenensis</i> were self compatible and compatible within plants of the same morph, and there was no pollen limitation in the populations in any case. In only one of the populations were there differences in the extent of compatibility between morphs, with the long-styled morph being more self-compatible than the short-styled morph. The reproductive strategy of these populations can be advantageous in case of fluctuation of pollinator activity."
605	1981. Haber, W.A./Frankie, G.W./Baker, H.G./Baker, I./Koptur, S.. Ants Like Flower Nectar. <i>Biotropica</i> . 13(3): 211-214.	[Requires specialist pollinators? No] "Table 1. Plant species visited by ants for nectar. Flowers have exposed (E) or hidden (H) nectar. (LDF = Lowland dry forest, Guanacaste Prov., elevation 100-200 m, MEF = Mid elevation forest, Puntarenas Prov., elevation 1400-1600 m.)" [Psychotria carthagenensis - Pollinator = bee, butterfly]
605	2008. Faria, R.R./Lima, T.N.. Spiders associated with Psychotria carthagenensis Jacquin. (Rubiaceae): vegetative branches versus inflorescences, and the influence of Crematogaster sp. (Hymenoptera, Formicidae), in South-Pantanal, Brazil. <i>Brazilian Journal</i>	[Requires specialist pollinators? No] "This species presents small white flowers with tubular corolla, gathered in cymose terminal inflorescences; has diurnal anthesis and is commonly pollinated by bees and butterflies, and nectar is the main resource offered (Consolaro, 2004)."

605	2011. Consolaro, H./Silva, S.C.S./Oliveira, P.E.. Breakdown of distyly and pin-monomorphism in <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae). <i>Plant Species Biology</i> . 26: 24-32.	[Requires specialist pollinators? No] "The flowers of <i>P. carthagenensis</i> were visited by a variety of insects, predominantly bees. Based on the behavior and on the number of visits, <i>Bombus atratus</i> (Franklin 1913), <i>Bombus morio</i> (Swederus 1787) and some species of Halictidae bees appeared to be the most effective pollinators. For nectar collection, the bees inserted their proboscis inside the corolla tube, contacting the front part of the head with the stigma (Fig. 2a,b). <i>Bombus</i> spp. Visited several flowers in each session of visits. Halictidae bees frequently visited flowers of <i>P. carthagenensis</i> , but mostly they did not contact the stigma owing to their small body size. The other observed insects (butterflies, wasps, flies and some bees) visited the flowers occasionally and often there was no contact with the stigma, and they were considered only incidental pollinators. No pollen or nectar thieves were observed visiting the flowers, but several species of ants were present on the inflorescences."
606	1998. Riffle, R.L.. <i>The Tropical Look - An Encyclopedia of Dramatic Landscape Plants</i> . Timber Press, Portland, OR	[Reproduction by vegetative fragmentation? No evidence] "Propagation by seed" [Genus description]
607	2011. The Earth Garden. <i>Psychotria carthagenensis</i> - Setting Seed! [Accessed 05 Sep 2012]. <a href="http://www.theearthgarden.org/forum/viewtopic.php?f=8&amp;t=689">http://www.theearthgarden.org/forum/viewtopic.php?f=8&amp;t=689</a>	[Minimum generative time (years)? 2+] "It flowered for me this last summer; at about 2 years old this is the first time it has flowered."
701	1989. Hamilton, C.W.. A Revision of Mesoamerican <i>Psychotria</i> Subgenus <i>Psychotria</i> (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No evidence] "Fruit when dry ellipsoidal, 4.5-5.5(-6) mm long, 3.5 4.5 mm diam., maturing red, drying red-brown; persistent calyx not evident or sometimes a beak (Fig. 9a); seed dorsal surface with 4 deep longitudinal furrows, the ventral surface with 2 deep longitudinal furrows" [No means of external attachment]
702	2012. Kadas Garden. Shade Tolerant Plants [Accessed 05 Sep 2012]. <a href="http://www.kadasgarden.com/Hort-shade.html">http://www.kadasgarden.com/Hort-shade.html</a>	[Propagules dispersed intentionally by people? Yes. Ornamental and medicinal] "Type of Plant: <i>Psychotria carthagenensis</i> , often sold as <i>P. viridis</i> mistakenly, is a beautiful ornamental of the coffee family. It is also used in the ceremonial drink Ayahuasca to give visions. Plants grow as a shrub, up to 3 meters and fairly dense/wide."
703	1980. Woodson, Jr., R.E./Schery, R.W./Dwyer, J.D.. <i>Flora of Panama</i> . Part IX. Family 179. Rubiaceae. Part 2. <i>Annals of the Missouri Botanical Garden</i> . 67(2): 257-522.	[Propagules likely to disperse as a produce contaminant? No evidence] "Fruits to 5.5 mm long, rounded at the apex and base, drying red, glabrous, the raphides abundant, 10-ribbed, the ribs rounded, 10 sulcate, the calycine cup persisting, scarcely evident; pedicels to 2 mm, oblong." [No evidence that plant is grown with or contaminates other produce]
704	2008. Gargiullo, M.B./Magnuson, B.L./Kimball, L.D.. <i>A Field Guide to Plants of Costa Rica</i> . Oxford University Press US, New York, NY	[Propagules adapted to wind dispersal? No] "Fruit fleshy, red to orange, 0.5 cm, translucent, shiny, flesh red, juicy, 2 seeds with inner sides; fruit present all year."
705	2008. Faria, R.R./Lima, T.N.. Spiders associated with <i>Psychotria carthagenensis</i> Jacquin. (Rubiaceae): vegetative branches versus inflorescences, and the influence of <i>Crematogaster</i> sp. (Hymenoptera, Formicidae), in South-Pantanal, Brazil. <i>Brazilian Journal</i>	[Propagules water dispersed? Potentially. May be dispersed by water in flooded habitats] " <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae) is a sub-canopy shrub occurring at Pantanal in flooding vegetation areas, "cambarazal", "capão de vazante", sand or clay soils (Pott and Pott, 1994). "
705	2011. Consolaro, H./Silva, S.C.S./Oliveira, P.E.. Breakdown of distyly and pin-monomorphism in <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae). <i>Plant Species Biology</i> . 26: 24-32.	[Propagules water dispersed? Potentially] " <i>Psychotria carthagenensis</i> occurs in gallery forest areas along the streams."
705	2012. Faria, R.R./Ferrero, V./Navarro, L./Araujo, A.C.. Flexible mating system in distylous populations of <i>Psychotria carthagenensis</i> Jacq. (Rubiaceae) in Brazilian Cerrado. <i>Plant Syst Evol</i> . DOI 10.1007/s00606-011-0571-7: .	[Propagules water dispersed? Potentially] "In all areas, <i>P. carthagenensis</i> is present in moist soils and near to small watercourses."
706	1989. Hamilton, C.W.. A Revision of Mesoamerican <i>Psychotria</i> Subgenus <i>Psychotria</i> (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Propagules bird dispersed? Yes] "Fruit when dry ellipsoidal, 4.5-5.5(-6) mm long, 3.5-4.5 mm diam., maturing red, drying red-brown; persistent calyx not evident or sometimes a beak (Fig. 9a); seed dorsal surface with 4 deep longitudinal furrows, the ventral surface with 2 deep longitudinal furrows"
706	2008. Chatellenaz, M.L.. Diet of the Grayish Saltator ( <i>Saltator coerulescens</i> ) in Northeastern Argentina. <i>Ornitologia Neotropical</i> . 19: 617-625.	[Propagules bird dispersed? Yes] "TABLE 1. Plant species and structures consumed by the Grayish Saltator ( <i>Saltator coerulescens</i> ) in northeastern Argentina, with mention of the months, the number of observations (n), and the types of habitats where the feeding took place." [Fruits of <i>Psychotria carthagenensis</i> are consumed]

706	2012. Gasperin, G./Pizo, M.A.. Passage time of seeds through the guts of frugivorous birds, a first assessment in Brazil. <i>Revista Brasileira de Ornitologia</i> . 20(1): 48-51.	[Propagules bird dispersed? Yes] "Species such as <i>Psychotria carthagenensis</i> , <i>C. porphyria</i> , <i>B. salicifolius</i> , <i>Piper tucumanum</i> and <i>P. hieronymi</i> are dispersed by birds and bats and were abundant in patches originated from citrus orchards." ... "Table 2: Gut passage time (GPT) of seeds defecated or regurgitated by captive frugivorous birds. Values are means followed by standard deviations for seed species with more than three replicates with a given bird species. Dashes indicate that the seed was not tested with the respective bird. Between parentheses are sample sizes and data range." [Includes <i>P. carthagenensis</i> ]
707	2008. Gargiullo, M.B./Magnuson, B.L./Kimball, L.D.. <i>A Field Guide to Plants of Costa Rica</i> . Oxford University Press US, New York, NY	[Propagules dispersed by other animals (externally)? No evidence. Adapted for internal dispersal] "Fruit fleshy, red to orange, 0.5 cm, translucent, shiny, flesh red, juicy, 2 seeds with inner sides; fruit present all year."
708	2003. Aragón, R./Morales, J.M.. Species Composition and Invasion in NW Argentinian Secondary Forests: Effects of Land Use History, Environment and Landscape. <i>Journal of Vegetation Science</i> . 14(2): 195-204.	[Propagules survive passage through the gut? Presumably Yes] "Species such as <i>Psychotria carthagenensis</i> , <i>C. porphyria</i> , <i>B. salicifolius</i> , <i>Piper tucumanum</i> and <i>P. hieronymi</i> are dispersed by birds and bats and were abundant in patches originated from citrus orchards."
708	2003. Bravo, S.P./Sallenave, A.. Foraging Behavior and Activity Patterns of <i>Alouatta caraya</i> in the Northeastern Argentinean Flooded Forest. <i>International Journal of Primatology</i> . 24(4): 825-846.	[Propagules survive passage through the gut? Presumably Yes] "Among fruits, species consumed by black howlers form two sets. One offered fruits in greater or lesser quantities throughout the year— <i>Banara arguta</i> , <i>Psychotria carthagenensis</i> and <i>Ocotea diospyrifolia</i> ... " ... "Fruits of <i>Psychotria carthagenensis</i> were generally only eaten by juvenile black howlers."
708	2012. Bravo, S.P.. The impact of seed dispersal by black and gold howler monkeys on forest regeneration. <i>Ecological Research</i> . 27: 311-321.	[Propagules survive passage through the gut? Yes] "Short and tall saplings of studied species showed high abundance in latrines. In Brasileria Island, latrines appear to be important sites for the recruitment of at least the four most abundant species: the two laurels ( <i>O. diospyrifolia</i> and <i>N. megapotamica</i> ), <i>E. puniceifolia</i> , and <i>P. carthagenensis</i> , and for one non abundant species <i>E. burkartiana</i> . In several latrines, <i>P. carthagenensis</i> saplings reached the adult stage and produced fruits (unpublished data)"
801	1989. Hamilton, C.W.. A Revision of Mesoamerican <i>Psychotria</i> Subgenus <i>Psychotria</i> (Rubiaceae), Part I: Introduction and Species 1-16. <i>Annals of the Missouri Botanical Garden</i> . 76(1): 67-111.	[Prolific seed production (>1000/m <sup>2</sup> )? No evidence, and unlikely given small stature of plants] "Shrub (0.5-)1-3(-6) m tall; young stems glabrous, the bark smooth to irregularly furrowed; stipules sheathing, ovate, 6-8 X 3 5 mm..." ... "Fruit when dry ellipsoidal, 4.5 5.5( 6) mm long, 3.5-4.5 mm diam., maturing red, drying red-brown; persistent calyx not evident or sometimes a beak (Fig. 9a); seed dorsal surface with 4 deep longitudinal furrows, the ventral surface with 2 deep longitudinal furrows"
802	2008. Royal Botanic Gardens Kew. Seed Information Database (SID). Version 7.1. <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a>	[Evidence that a persistent propagule bank is formed (>1 yr)? Unknown] "Storage Behaviour: Orthodox"
802	2009. World Seed Supply. Growing <i>Psychotria viridis</i> from Seed and Cuttings. <a href="http://worldseedsupplydotnet.blogspot.com/2009/10/growing-psychotria-viridis-from-seed.html">http://worldseedsupplydotnet.blogspot.com/2009/10/growing-psychotria-viridis-from-seed.html</a>	[Evidence that a persistent propagule bank is formed (>1 yr)? Possibly No based on related species] " <i>Psychotria viridis</i> and its relatives are notoriously hard to grow from seed. The seeds are generally only viable for a few months, and germination tends to be very slow. With such a long germination period and the presence of fruit around the seeds, <i>Psychotria viridis</i> seeds are prone to rot. For the sake of freshness, it is ideal to have seeds in the berry, although seeds that have been removed are fine too. If you are starting out with your <i>Psychotria</i> seeds in the fruit, you will want to remove all of the fruit from the outside of the seed."
803	2012. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species
804	2005. Overbeck, G.. Effect of fire on vegetation dynamics and plant types in subtropical grassland in southern Brazil. PhD Dissertation. Technische Universität München, Munich	[Tolerates, or benefits from, mutilation, cultivation, or fire? Possibly Yes] "We then modified this system according to survival capacity to fire, obtaining the classification into fire-life-forms presented in Tab. 3. In this new classification, position of the buds (Raunkiaer's criterion) is joined by information on whether the plant dies (non sprouter), loses all aboveground biomass (sprouter) or manages to keep at least some aboveground biomass (resister) during a fire. No evidence of stimulation of heat germination by fire (as known for many hardseeded shrubs in Mediterranean climate regions, e.g. Keeley and Fotheringham 2000) exists for the studied region (Overbeck et al. submitted (c)); thus, it was not necessary (nor possible) to include an attribute for this in the classification." [ <i>Psychotria carthagenensis</i> listed as a sprouter, but tolerance to fires not specified]
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]





***Psychotria carthagenensis*** = Tree/tree-like shrub

A) Shade tolerant = Yes

B) Bird-dispersed = Yes

Life cycle < 4 years = Yes (2 years to maturity)

Outcome = **Reject (High Risk)**

## **Summary of Risk Traits**

### **High Risk / Undesirable Traits**

- Natural elevation range exceeds 1000 m
- Thrives in tropical climates
- Possibly toxic to animals and people
- Shade-tolerant
- Self-compatible
- May reach maturity in 2 years
- Fleshy-fruited: Fruits consumed and seeds dispersed by birds and mammals

### **Low Risk / Desirable Traits**

- No evidence of naturalization or invasiveness, but no evidence that it has been widely planted outside native range
- Unarmed (no spines, thorns or burrs)
- No evidence of vegetative spread
- Ornamental and ethnobotanical value