

**Family:** *Rubiaceae*

**Taxon:** *Mitragyna speciosa*

**Synonym:** **Common Name:** kratom

<b>Questionnaire :</b>	current 20090513	<b>Assessor:</b>	Patti Clifford	<b>Designation:</b> L
<b>Status:</b>	Assessor Approved	<b>Data Entry Person:</b>	Patti Clifford	<b>WRA Score</b> 0
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	n
204	Native or naturalized in regions with tropical or subtropical climates		y=1, n=0	n
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)	n
303	Agricultural/forestry/horticultural weed		n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)	n
401	Produces spines, thorns or burrs		y=1, n=0	n
402	Allelopathic		y=1, n=0	
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	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	
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	
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	y
604	Self-compatible or apomictic	y=1, n=-1	
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	
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	y
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	
801	Prolific seed production (>1000/m2)	y=1, n=-1	
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: L

WRA Score 0

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**Supporting Data:**

101	2010. WRA Specialist. Personal Communication.	No evidence.
201	2010. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	Native: Thailand; Borneo; Indonesia - Irian Jaya, Kalimantan, Sumatra; Malaysia; Papua New Guinea; Phillipines - Luzon, Mindanao, Mindoro
202	2010. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	Native: Thailand; Borneo; Indonesia - Irian Jaya, Kalimantan, Sumatra; Malaysia; Papua New Guinea; Phillipines - Luzon, Mindanao, Mindoro
203	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"Mostly in lowland evergreen forest, often in moist to wet places along streams; occasionally also in swamp forest. Altitude: <50–200 m."
204	2010. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Online Database Index]. National Germplasm Resources Laboratory, Beltsville, Maryland <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	Native: Thailand; Borneo; Indonesia - Irian Jaya, Kalimantan, Sumatra; Malaysia; Papua New Guinea; Phillipines - Luzon, Mindanao, Mindoro
205	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	Propagules are recently available on the internet.
205	2010. WRA Specialist. Personal Communication.	No evidence of repeated introductions.
301	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence of naturalization.
302	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence of weediness.
303	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence.
304	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence.
305	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence of invasive species in this genus.
401	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	No spines, thorns, or burrs.
402	2010. WRA Specialist. Personal Communication.	Unknown.
403	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	Rubiaceae.
404	2010. WRA Specialist. Personal Communication.	Unknown.
405	2010. WRA Specialist. Personal Communication.	Unknown.

406	2008. Gustina, K.. How to grow kratom: cultivation tips for <i>Mitragyna speciosa</i> . <a href="http://www.suite101.com">www.suite101.com</a> , <a href="http://www.suite101.com/content/how-to-grow-kratom-a63539">http://www.suite101.com/content/how-to-grow-kratom-a63539</a>	"Outdoors, kratom may find itself covered with pests for short periods. A light spray from a garden hose can often be the best way to deal with this.  Inside, kratom is a magnet for all pests. Natural pest control such as ladybugs may need to be applied more often than with any other typical houseplant. Foliar pesticides have damaging effects on the leaves, including all but the weakest form of neem oil."
406	2010. WRA Specialist. Personal Communication.	Unknown.
407	2010. Drug Enforcement Administration Office of Diversion Control. Drugs and chemicals of concern KRATOM ( <i>Mitragyna speciosa</i> korth) (Street Names: Thang, Kakuam, Thom, Ketum, Biak). U.S. Department of Justice, <a href="http://www.deadiversion.usdoj.gov/drugs_">http://www.deadiversion.usdoj.gov/drugs_</a>	"Kratom has been used by natives of Thailand and other regions of Southeast Asia as an herbal drug for decades. Traditionally, kratom was mostly used as a stimulant by Thai and Malaysian laborers and farmers to overcome the burdens of hard work. They chewed the leaves to make them work harder and provide energy and relief from muscle strains."
407	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"U s e s.— Various traditional uses: to treat diarrhea; as a stimulant; as an opium substitute. In recent years Kratom has gained popularity as recreational drug, due to its narcotic-like effects, producing feelings of euphoria similar to heroin. Typically, fresh leaves are chewed, but dried leaves are sometimes smoked or made into powder and drunk as tea."
408	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"Mostly in lowland evergreen forest, often in moist to wet places along streams; occasionally also in swamp forest." [unlikely]
409	2008. Gustina, K.. How to grow kratom: cultivation tips for <i>Mitragyna speciosa</i> . <a href="http://www.suite101.com">www.suite101.com</a> , <a href="http://www.suite101.com/content/how-to-grow-kratom-a63539">http://www.suite101.com/content/how-to-grow-kratom-a63539</a>	"Supply as much light as possible, although limit the amount of direct sun. Older kratom trees will tolerate longer direct sunlight exposure than immature ones. Until it has reached a height of three feet it should be limited to filtered sunlight similar to a sheer curtain when inside – or an amount equal to a sapling under a canopy of trees growing outdoors."
409	2010. Treetop Herbals. <i>Mitragyna speciosa</i> . Treetop Herbals, <a href="http://www.treetopherbals.com/category_s/26.htm">http://www.treetopherbals.com/category_s/26.htm</a>	"The kratom tree grows best in wet, humid, fertile soil, with medium to full sun exposure, and an area protected from strong winds."
410	2010. <i>Mitragyna.com</i> . <i>Mitragyna speciosa</i> . <i>Mitragyna.com</i> , <a href="http://www.mitragyna.com/en/">http://www.mitragyna.com/en/</a>	Kratom prefers wet, humus-rich soils in a protected position. Being a heavy feeder, it requires very rich, fertile soil.
411	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	Tree to 25 m.
412	2010. WRA Specialist. Personal Communication.	No evidence of species forming dense thickets.
501	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	Terrestrial.
502	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	Rubiaceae.
503	2010. WRA Specialist. Personal Communication.	Unknown.
504	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	Tree.
601	2010. WRA Specialist. Personal Communication.	No evidence.
602	2010. <i>Mitragyna.com</i> . <i>Mitragyna speciosa</i> . <i>Mitragyna.com</i> , <a href="http://www.mitragyna.com/en/">http://www.mitragyna.com/en/</a>	Propagation is by very fresh seed or cuttings.

603	2009. Maruyama, T./Kawamura, M./Kikura-Hanajiri, R./Takayama, H./Goda, Y.. The botanical origin of kratom ( <i>Mitragyna speciosa</i> ; Rubiaceae) available as abused drugs in the Japanese markets. <i>Journal of Natural Medicine</i> . 63: 340-344.	"In this study, we investigated the botanical origin of the commercial kratom products using the internal transcribed spacer (ITS) sequence analysis of rDNA in preparation for future regulation of this product." The study demonstrated that some of the plants used for the evaluation were natural hybrids between <i>Mitragyna speciosa</i> and <i>Mitragyna diversifolia</i> / <i>Mitragyna hirsuta</i> .
604	2010. WRA Specialist. Personal Communication.	Unknown.
605	2008. Kato, M./Kosaka, Y./Kawakita, A./Okuyama, Y./Kobayashi, C./Phimminith, T./Thongphan, D.. Plant-pollinator interactions in tropical monsoon forests in Southeast Asia. <i>American Journal of Botany</i> . 95: 1375-1394.	In this plant-pollinator study in Laos, <i>Mitragyna rotundifolia</i> was visited by butterflies and bees. [species in same genus]
606	2010. <i>Mitragyna.com</i> . Kratom <i>Mitragyna speciosa</i> . <i>Mitragyna.com</i> , <a href="http://www.mitragyna.com/en/">http://www.mitragyna.com/en/</a>	Propagation is by very fresh seed or cuttings.
607	2010. WRA Specialist. Personal Communication.	Unknown.
701	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"Mostly in lowland evergreen forest, often in moist to wet places along streams; occasionally also in swamp forest.
702	2010. Drug Enforcement Administration Office of Diversion Control. Drugs and chemicals of concern KRATOM ( <i>Mitragyna speciosa</i> korth)  (Street Names: Thang, Kakuam, Thom, Ketum, Biak). U.S. Department of Justice, <a href="http://www.deadiversion.usdoj.gov/drugs_">http://www.deadiversion.usdoj.gov/drugs_</a>	"Kratom is widely available on the Internet. There are numerous vendors within and outside of the U.S. selling kratom. Forms of kratom available through the Internet, includes leaves (whole or crushed), powder, extract, encapsulated powder and extract resin "pies" (40g pellets made from reduced extract). Seeds and whole trees are also available from some vendors through the Internet, suggesting the possibility of domestic cultivation."
703	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"Mostly in lowland evergreen forest, often in moist to wet places along streams; occasionally also in swamp forest" [not grown with produce]
704	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"Seeds small, numerous, slightly winged at both ends, the lower wing $\pm$ bifid." [genus description]
705	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"Mostly in lowland evergreen forest, often in moist to wet places along streams; occasionally also in swamp forest." [distributed along waterways]
706	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"Seeds small, numerous, slightly winged at both ends, the lower wing $\pm$ bifid." [genus description][not a berry]
707	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"Seeds small, numerous, slightly winged at both ends, the lower wing $\pm$ bifid." [genus description] [no means of external attachment]
708	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	Unknown.
801	2010. Puff, C.. Flora of Thailand Rubiaceae. unpublished [online], <a href="http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm">http://homepage.univie.ac.at/christian.puff/FTH-RUB/FTH-RUB_HOME.htm</a>	"Seeds small, numerous, slightly winged at both ends, the lower wing $\pm$ bifid." [genus description]
801	2010. WRA Specialist. Personal Communication.	Unknown.
802	2010. WRA Specialist. Personal Communication.	Unknown
803	2010. WRA Specialist. Personal Communication.	Unknown.

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804 2010. WRA Specialist. Personal Communication. Unknown.

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805 2010. WRA Specialist. Personal Communication. Unknown.

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