

Taxon: <i>Garcinia intermedia</i> (Pittier) Hammel	Family: Clusiaceae
Common Name(s): cherry mangosteen lemon drop mangosteen monkey fruit wild-lemon rheedia	Synonym(s): Calophyllum edule Seem. Rheedia edulis (Seem.) Planch. & Rheedia intermedia Pittier

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 1 Feb 2017
WRA Score: -4.0	Designation: L	Rating: Low Risk

Keywords: Tropical Tree, Edible Fruit, Shade-Tolerant, Dioecious, Animal-Dispersed

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	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		
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
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

Qsn #	Question	Answer Option	Answer
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	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	n
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic	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)	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	n
706	Propagules bird dispersed		
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 ²)	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		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
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
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	No evidence of domestication

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

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 27 Jan 2017]	"Native: Northern America Southern Mexico: Mexico - Jalisco, - Michoacan, - Oaxaca, - Veracruz Southern America Central America: Belize; Costa Rica; El Salvador; Honduras; Nicaragua; Panama Western South America: Ecuador"

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 27 Jan 2017]	"Native: Northern America Southern Mexico: Mexico - Jalisco, - Michoacan, - Oaxaca, - Veracruz Southern America Central America: Belize; Costa Rica; El Salvador; Honduras; Nicaragua; Panama Western South America: Ecuador"

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"The tree is very adaptable, growing well in different soils and environments from near sea level to 1,220 m elevation." [Elevation range exceeds 1000 m, demonstrating environmental versatility]

204	Native or naturalized in regions with tropical or subtropical climates	y
	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 27 Jan 2017]	"Native: Northern America Southern Mexico: Mexico - Jalisco, - Michoacan, - Oaxaca, - Veracruz Southern America Central America: Belize; Costa Rica; El Salvador; Honduras; Nicaragua; Panama Western South America: Ecuador"
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"The species is native to Mexico (Jalisco, Michoacan, Oaxaca, Veracruz) and Central America (Belize, Costa Rica, El Salvador; Honduras, Nicaragua, Panama). It is also found in Ecuador and Columbia. It is cultivated sporadically throughout the tropics including in Australia."

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	Useful Tropical Plants Database. 2017. <i>Garcinia intermedia</i> . http://tropical.theferns.info/viewtropical.php?id=Garcinia+intermedia . [Accessed 27 Jan 2017]	"It has also been grown as a fruit crop in Brazil, the Philippines, Puerto Rico and California"
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"It is cultivated sporadically throughout the tropics including in Australia." ... "The species has been introduced into Indonesia and Sabah, Malaysia."
	Imada, C.T., Staples, G.W. & Herbst, D.R. 2005. Annotated Checklist of Cultivated Plants of Hawai'i. http://www2.bishopmuseum.org/HBS/botany/cultivatedplants/ . [Accessed 27 Jan 2017]	"Locations: Harold L. Lyon Arboretum Ho'omaluhia Botanical Garden"
	Dave's Garden. 2017. Lemon Drop Mangosteen - <i>Garcinia intermedia</i> . http://davesgarden.com/guides/pf/go/188302/ . [Accessed 27 Jan 2017]	"Regional This plant has been said to grow in the following regions: Sarasota, Florida"

301	Naturalized beyond native range	n
	Source(s)	Notes

Qsn #	Question	Answer
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence
	Wagner, W.L., Herbst, D.R. & Lorence, D.H. 2017. Flora of the Hawaiian Islands. Smithsonian Institution, Washington, D.C. http://botany.si.edu/ . [Accessed 27 Jan 2017]	No evidence to date

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No evidence

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

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

305	Congeneric weed	
	Source(s)	Notes
	Maui Invasive Species Committee. 2010. Quarterly Report to the MISC Committee FY 2010, Fourth Quarter April 1 to June 30, 2010. http://mauiinvasive.org/ . [Accessed]	"Gourka (<i>Garcinia xanthochymus</i>): an early detection control of five juvenile and 20 mature gourka (false mangosteen) was completed. The trees were detected during a Hälawa Valley survey for gooseberry. A specimen was sent to and identified by Bishop Museum." [Controlled as an early detection target. Impacts unspecified]
	Imada, C.T., Staples, G.W. & Herbst, D.R. 2005. Annotated Checklist of Cultivated Plants of Hawai'i. http://www2.bishopmuseum.org/HBS/botany/cultivatedplants/ . [Accessed 27 Jan 2017]	"Locations: Harold L. Lyon Arboretum Ho'omaluhia Botanical Garden"
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	<i>Garcinia dulcis</i> , <i>Garcinia mangostana</i> and <i>Garcinia ponapensis</i> listed as naturalized or weeds of unspecified impacts

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[No evidence] "A small, evergreen, dioecious tree with a straight, dark brown trunk of 20 cm girth, growing to 5–6 m high and yellow latex. The upper half of the tree is thickly covered with thin, horizontal branches oriented at right angles to the bole. The young branchlets have smooth, green bark. Leaves are opposite, simple, entire, leathery, elliptic-lanceolate, 7.5–13 cm long by 2.5–5 cm wide, with tapering base and acute apex, glossy green above and paler green below with a distinct mid-rib and fine, parallel secondary veins (Plates 1, 2, 4). Leaf petiole is green and 0.8–1 cm long."

402	Allelopathic	
	Source(s)	Notes
	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. <i>Weed Biology and Management</i> , 3(4): 233-241	"Table 1. Screening of leaf litter of 239 medicinal plant species under different families using the sandwich method" [Unknown for <i>G. intermedia</i> . <i>Garcinia xanthochymus</i> was tested and did not show significant inhibitory effects]

403	Parasitic	n
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"A small, evergreen, dioecious tree with a straight, dark brown trunk of 20 cm girth, growing to 5–6 m high and yellow latex." [Clusiaceae / Guttiferae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"The white, aromatic pulp from ripe fruit is edible, pleasantly acid-sweet and is consumed fresh and made into juices, jams and jellies." [Fruit palatable to humans & animals. Palatability of foliage unknown]

405	Toxic to animals	n
	Source(s)	Notes
	Useful Tropical Plants Database. 2017. <i>Garcinia intermedia</i> . http://tropical.theferns.info/viewtropical.php?id=Garcinia+intermedia . [Accessed 27 Jan 2017]	"Known Hazards None known"
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"The white, aromatic pulp from ripe fruit is edible, pleasantly acid-sweet and is consumed fresh and made into juices, jams and jellies." [No evidence]

406	Host for recognized pests and pathogens	
	Source(s)	Notes

Qsn #	Question	Answer
	Jenkins, D. A., & Goenaga, R. (2008). Host breadth and parasitoids of fruit flies (<i>Anastrepha</i> spp.)(Diptera: Tephritidae) in Puerto Rico. <i>Environmental Entomology</i> , 37(1), 110-120	" <i>Garcinia intermedia</i> is native to Asia and typically fruits once a year in the summer, but we did observe the tree to fruit in January 2007. The duration of fruit availability was drastically different for both years of the study. This is the first report of this species as a host of <i>A. suspensa</i> . This species is probably extremely rare on the island."
	Howard, F.W., Pemberton, R.W., Hodges, G.S., Steinberg, B., McLean, D. & Liu, H. 2006. Host Plant Range of Lobate Lac Scale, <i>Paratachardina lobata</i> , in Florida. <i>Proceedings of the Florida State Horticultural Society</i> 119: 398-408	"Table 1. The host range of lobate lac scale, <i>Paratachardina lobata</i> , in southern Florida, species based on observations during 2002-2006, arranged in alphabetical order. *Indicates species native to Florida" [Includes <i>Rheedia edulis</i> = <i>Garcinia intermedia</i>]

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Lim, T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 2, Fruits. Springer, New York	"The white, aromatic pulp from ripe fruit is edible, pleasantly acid-sweet and is consumed fresh and made into juices, jams and jellies." [No evidence]

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Lim, T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 2, Fruits. Springer, New York	"In its native range, it occurs as an evergreen understory tree in most primary forest habitats, excluding the extreme coastal zone." [No evidence]

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	Notes
	Lim, T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 2, Fruits. Springer, New York	"It grows well in full sun or shade, but fruits better in full sun. It flowers and fruits sporadically throughout the year."
	Dave's Garden. 2017. Lemon Drop Mangosteen - <i>Garcinia intermedia</i> . http://davesgarden.com/guides/pf/go/188302/ . [Accessed 27 Jan 2017]	"Sun Exposure: Full Sun Sun to Partial Shade Light Shade Partial to Full Shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Lim, T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 2, Fruits. Springer, New York	"The tree is very adaptable, growing well in different soils and environments from near sea level to 1,220 m elevation."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Lim, T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 2, Fruits. Springer, New York	"A small, evergreen, dioecious tree with a straight, dark brown trunk of 20 cm girth, growing to 5–6 m high and yellow latex."

412	Forms dense thickets	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Condit, R., Pérez, R. & Daguerre, N. 2010. Trees of Panama and Costa Rica. Princeton University Press, Princeton, NJ	"Distribution: Widespread in wet to moist forest and also lower montane and even fairly dry sites, only inside mature forest. Common in old growth at Barro Colorado I."
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"In its native range, it occurs as an evergreen understory tree in most primary forest habitats, excluding the extreme coastal zone." [No evidence]

501	Aquatic	n
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[Terrestrial] "In its native range, it occurs as an evergreen understory tree in most primary forest habitats, excluding the extreme coastal zone. The tree is very adaptable, growing well in different soils and environments from near sea level to 1,220 m elevation."

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 27 Jan 2017]	Family: Clusiaceae (alt.Guttiferae)

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 27 Jan 2017]	Family: Clusiaceae (alt.Guttiferae)

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"A small, evergreen, dioecious tree with a straight, dark brown trunk of 20 cm girth, growing to 5–6 m high and yellow latex."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[No evidence] "The species is native to Mexico (Jalisco, Michoacan, Oaxaca, Veracruz) and Central America (Belize, Costa Rica, El Salvador; Honduras, Nicaragua, Panama). It is also found in Ecuador and Columbia. It is cultivated sporadically throughout the tropics including in Australia."

Qsn #	Question	Answer
602	Produces viable seed	y
	Source(s)	Notes
	Useful Tropical Plants Database. 2017. <i>Garcinia intermedia</i> . http://tropical.theferns.info/viewtropical.php?id=Garcinia+intermedia . [Accessed 27 Jan 2017]	"Propagation Seed - it has a short viability and should not be allowed to dry out[377]. Sow the seed fresh in a partially shaded position in a nursery seedbed. Seeds do not germinate immediately, waiting instead for several months - often well into the rainy season - before initiating growth[510]."
	Lim, T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 2, Fruits. Springer, New York	"The fruit has a thin peel and pulpy, sub-acid-sweet white aril enclosing 1–2, large, laterally flattened, almond-shaped seeds 1.5–1.8 cm long."

603	Hybridizes naturally	
	Source(s)	Notes
	Kubitzki, K., Bayer, C. 7 Stevens, P.F. 2007. <i>The families and genera of vascular plants: Volume IX. Flowering Plants. Eudicots</i> . Springer-Verlag, Berlin, Heidelberg, New York	[Unknown] "There is little information about hybridization in Clusiaceae (for <i>Calophyllum</i> , see Stevens 1980); fairly extensive artificial crosses have been made in <i>Clusia</i> (V. Bittrich, pers. comm.)."

604	Self-compatible or apomictic	n
	Source(s)	Notes
	Lim, T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 2, Fruits. Springer, New York	[Dioecious] [A small, evergreen, dioecious tree with a straight, dark brown trunk of 20 cm girth, growing to 5–6 m high and yellow latex.]

605	Requires specialist pollinators	n
	Source(s)	Notes
	Zomlefer, W.B. 1994. <i>Guide to Flowering Plant Families</i> . The University of North Carolina Press, Chapel Hill & London	"Clusiaceae ... The showy flowers with numerous stamens usually lack nectariferous structures and probably are visited by insects (various bees) for the copious pollen."
	Lim, T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 2, Fruits. Springer, New York	"Flowers are small, 5 mm across, greenish-white, imperfect with male and female flowers occurring in axillary clusters of 1–15 in separate trees. Each flower consists of five pale, greenish-white petals that are folded back around the pedicel and either a central, globular cluster of about 20 short stamens (male) or a globular green ovary topped with a brown stigma (female). Several vestigial staminate appendages are also present in the female flower."
	Useful Tropical Plants Database. 2017. <i>Garcinia intermedia</i> . http://tropical.theferns.info/viewtropical.php?id=Garcinia+intermedia . [Accessed 27 Jan 2017]	"Pollinators: Insects"

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Montoso Gardens. 2007. <i>Garcinia intermedia</i> (Clusiaceae). http://www.montosogardens.com/garcinia_intermedia.htm . [Accessed 27 Jan 2017]	"Lemon drop mangosteen is usually propagated by seed, which loses viability rapidly if allowed to dry out." [No evidence]

Qsn #	Question	Answer
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	[No evidence of vegetative spread] "In its native range, it occurs as an evergreen understory tree in most primary forest habitats, excluding the extreme coastal zone. The tree is very adaptable, growing well in different soils and environments from near sea level to 1,220 m elevation. It grows well in full sun or shade, but fruits better in full sun. It flowers and fruits sporadically throughout the year."

607	Minimum generative time (years)	2
	Source(s)	Notes
	Useful Tropical Plants Database. 2017. <i>Garcinia intermedia</i> . http://tropical.theferns.info/viewtropical.php?id=Garcinia+intermedia . [Accessed 27 Jan 2017]	"Growth Rate: Medium" ... "A fairly fast-growing plant, it can commence flowering and fruiting when only 2 - 3 years old from seed"

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"Fruit globose to sub-globose- ovoid, 2.5 cm in diameter, green (Plates 2 and 3) turning to deep yellow to orange when ripe (Plates 1 , 4 , 5). The fruit has a thin peel and pulpy, sub-acid-sweet white aril enclosing 1–2, large, laterally flattened, almond-shaped seeds 1.5–1.8 cm long." [Unlikely. Fruits & seeds lack means of external attachment]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"It is cultivated sporadically throughout the tropics including in Australia."

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"Fruit globose to sub-globose- ovoid, 2.5 cm in diameter, green (Plates 2 and 3) turning to deep yellow to orange when ripe (Plates 1 , 4 , 5). The fruit has a thin peel and pulpy, sub-acid-sweet white aril enclosing 1–2, large, laterally flattened, almond-shaped seeds 1.5–1.8 cm long." [No evidence. Unlikely. Fruits & seeds relatively large, and fruit are harvested as a product]

Qsn #	Question	Answer
704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Lim, T.K. 2012. Edible Medicinal and Non-Medicinal Plants. Volume 2, Fruits. Springer, New York	"Fruit globose to sub-globose- ovoid, 2.5 cm in diameter, green (Plates 2 and 3) turning to deep yellow to orange when ripe (Plates 1 , 4 , 5). The fruit has a thin peel and pulpy, sub-acid-sweet white aril enclosing 1–2, large, laterally flattened, almond-shaped seeds 1.5–1.8 cm long."

705	Propagules water dispersed	n
	Source(s)	Notes
	Nadkarni, N.M. & Wheelwright, N.T. 2000. Monteverde: Ecology and Conservation of a Tropical Cloud Forest. Oxford University Press, New York	"Appendix 1 Vascular Plants of Monteverde" ... "Garcinia intermedia - Seed dispersal (Seed) = AM = arboreal mammal" [Buoyancy of fruits & seeds unknown, but primarily adapted for zoochorous dispersal]

706	Propagules bird dispersed	
	Source(s)	Notes
	Nadkarni, N.M. & Wheelwright, N.T. 2000. Monteverde: Ecology and Conservation of a Tropical Cloud Forest. Oxford University Press, New York	"Appendix 1 Vascular Plants of Monteverde" ... "Garcinia intermedia - Seed dispersal (Seed) = AM = arboreal mammal" [Fleshy-fruited, but primarily dispersed by monkeys, and bats. Possible that birds may move seed]
	García-Estrada, C., Damon, A., Sánchez-Hernández, C., Soto Pinto, L., & Ibarra-Núñez, G. (2012). Diets of frugivorous bats in montane rain forest and coffee plantations in southeastern Chiapas, Mexico. Biotropica, 44(3), 394-401	"TABLE 1. Diets obtained from fecal samples of (*), and fruits carried by (+), and Niche breadth of six more abundant bat species (A. j. = Artibeus jamaicensis, A. i. = A. intermedius, S. lu. = Sturnira ludovici, D. t. = Dermanura tolteca, S. li. = S. lilium, D. p. = D. phaeotis)." [Garcinia intermedia - bat dispersed]

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Adler, G. H. (1995). Fruit and seed exploitation by Central American spiny rats, Proechimys semispinosus. Studies on Neotropical Fauna and Environment, 30(4), 237-244	"Table 1. List of native and naturalized plant species in which fruits were offered to spiny rats, with parts of the fruits that were eaten. Y denotes that the indicated fruit structure was consumed, N denotes it was not consumed, a line denotes that the fruit does not have the indicated structure, and a ? denotes that results were indeterminate, generally because seeds were minute and not readily found." [Garcinia [Rheedia] edulis seeds depredated by rats. May be externally transported, but more likely to be consumed]

708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Chapman, C. A. (1989). Primate seed dispersal: the fate of dispersed seeds. Biotropica, 21(2): 148-154	"TABLE 1. The major species of seeds occurring in the dung of the primates in Santa Rosa National Park, Costa Rica. Frequency of occurrence was calculated as the number of dung samples in which one or more seeds of a particular species was found, expressed as a percentage of all dung samples" [Includes Rheedia edulis = Garcinia intermedia]

Qsn #	Question	Answer
	Wehncke, E. V., & Dalling, J. W. (2005). PostDispersal Seed Removal and Germination Selected Tree Species Dispersed by <i>Cebus capucinus</i> on Barro Colorado Island, Panama. <i>Biotropica</i> , 37(1), 73-80	"TABLE 4. Mean time at which the 50% of defecated and control seeds germinated" [<i>R. edulis</i> = <i>Garcinia intermedia</i> - Mean 70.5% defecated seeds germinated]

801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes
	Lim, T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i> . Volume 2, Fruits. Springer, New York	"Fruit globose to sub-globose- ovoid, 2.5 cm in diameter, green (Plates 2 and 3) turning to deep yellow to orange when ripe (Plates 1 , 4 , 5). The fruit has a thin peel and pulpy, sub-acid-sweet white aril enclosing 1–2, large, laterally flattened, almond-shaped seeds 1.5–1.8 cm long." [Not likely. Fruits relatively large with few seeds per fruit]

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	Notes
	Useful Tropical Plants Database. 2017. <i>Garcinia intermedia</i> . http://tropical.theferns.info/viewtropical.php?id=Garcinia+intermedia . [Accessed 27 Jan 2017]	"Seed - it has a short viability and should not be allowed to dry out [377]. Sow the seed fresh in a partially shaded position in a nursery seedbed. Seeds do not germinate immediately, waiting instead for several months - often well into the rainy season - before initiating growth[510]."
	Cole, R. J., Holl, K. D., Keene, C. L., & Zahawi, R. A. (2011). Direct seeding of late-successional trees to restore tropical montane forest. <i>Forest Ecology and Management</i> , 261(10), 1590-1597	"Table 1 Tree species, seed weight, number of seed per treatment, common collection techniques, and seed and species characteristics." [<i>Garcinia intermedia</i> - Collect from ground or tree, seed subject to rapid desiccation, no treatment]

803	Well controlled by herbicides	n
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	n
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	n
	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
- Other *Garcinia* species may be weedy or invasive
- Shade tolerant
- Tolerates many soil types
- Reproduces by seed
- Reaches maturity in 2-3 years
- Seeds dispersed by frugivorous mammals & intentionally by people

Low Risk Traits

- No reports of invasiveness or naturalization
- Unarmed (no spines, thorns, or burrs)
- Edible fruit
- Ornamental
- Dioecious
- Not reported to spread vegetatively
- Fruit & seeds relatively large & unlikely to be accidentally dispersed
- Seeds lose viability quickly (unlikely to form persistent seed bank)