

Taxon: <i>Porcelia macrocarpa</i> R.E.Fr.	Family: Annonaceae
Common Name(s): monkey banana	Synonym(s): <i>Porcelia goyazensis</i> R.E.Fr. <i>Uvaria macrocarpa</i> Warm.

Assessor: Chuck Chimera	Status: Approved	End Date: 1 Aug 2023
WRA Score: -2.0	Designation: L	Rating: Low Risk

Keywords: Tropical Tree, Edible Fruit, Rarely Cultivated, Beetle-Pollinated, 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	n
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	y = 1*multiplier (see Appendix 2), n = 0	n
303	Agricultural/forestry/horticultural weed	y = 2*multiplier (see Appendix 2), n = 0	n
304	Environmental weed	y = 2*multiplier (see Appendix 2), n = 0	n
305	Congeneric weed	y = 1*multiplier (see Appendix 2), n = 0	n
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
409	Is a shade tolerant plant at some stage of its life cycle		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		
411	Climbing or smothering growth habit	y = 1, n = 0	n

Qsn #	Question	Answer Option	Answer
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		
605	Requires specialist pollinators	y = -1, n = 0	y
606	Reproduction by vegetative fragmentation	y = 1, n = -1	n
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y = 1, n = -1	n
702	Propagules dispersed intentionally by people	y = 1, n = -1	y
703	Propagules likely to disperse as a produce contaminant	y = 1, n = -1	n
704	Propagules adapted to wind dispersal	y = 1, n = -1	n
705	Propagules water dispersed	y = 1, n = -1	n
706	Propagules bird dispersed		
707	Propagules dispersed by other animals (externally)		
708	Propagules survive passage through the gut	y = 1, n = -1	y
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
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
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	[No evidence] "Distribution (Fig. 30). Southeastern Brazil, extending from coastal Santa Catarina north to southwestern Minas Gerais, and possibly to Goias; in forests; 0- 400 m. Cultivated in the city of Sao Paulo and at 600 min Paraopeba, Minas Gerais."
102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	NA
103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2023). 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
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Distribution (Fig. 30). Southeastern Brazil, extending from coastal Santa Catarina north to southwestern Minas Gerais, and possibly to Goias; in forests; 0-400 m. Cultivated in the city of Sao Paulo and at 600 min Paraopeba, Minas Gerais."
202	Quality of climate match data	High
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Distribution (Fig. 30). Southeastern Brazil, extending from coastal Santa Catarina north to southwestern Minas Gerais, and possibly to Goias; in forests; 0-400 m. Cultivated in the city of Sao Paulo and at 600 min Paraopeba, Minas Gerais."
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Distribution (Fig. 30). Southeastern Brazil, extending from coastal Santa Catarina north to southwestern Minas Gerais, and possibly to Goias; in forests; 0-400 m. Cultivated in the city of Sao Paulo and at 600 min Paraopeba, Minas Gerais."
	Trade Winds Fruit. (2023). <i>Porcelia macrocarpa</i> - Monkey Banana. https://www.tradewindsfruit.com/content/monkey-banana.htm . [Accessed 31 Jul 2023]	"Hardiness - Frost hardy to 25F. Growing Environment - Grows best in wet, humid climates. Will tolerate some cool temperatures but should generally be kept in a freeze-free environment."

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Distribution (Fig. 30). Southeastern Brazil, extending from coastal Santa Catarina north to southwestern Minas Gerais, and possibly to Goiás; in forests; 0-400 m. Cultivated in the city of Sao Paulo and at 600 min Parapoeba, Minas Gerais."

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	Notes
	Trade Winds Fruit. (2023). <i>Porcelia macrocarpa</i> - Monkey Banana. https://www.tradewindsfruit.com/content/monkey-banana.htm . [Accessed 1 Aug 2023]	"A strange and rare <i>Annona</i> relative with vaguely banana-appearing fruits that have minimal but tasty pulp. Fruits form in radiating clusters much like a clump of banana's. Skin is yellow-brown, with thin white flesh surrounding several large seeds." ... "Very rare in the wild and not cultivated."
	GBIF Secretariat (2023). <i>Porcelia macrocarpa</i> (Warm.) R.E.Fr. GBIF Backbone Taxonomy. Checklist dataset. https://www.gbif.org/species/3156220 . [Accessed 1 Aug 2023]	No evidence of collection or introduction outside of its native range

301	Naturalized beyond native range	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. https://www.cabidigitallibrary.org/product/qi . [Accessed 31 Jul 2023]	No evidence
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. http://www.plantsofhawaii.org.. [Accessed 31 Jul 2023]	No evidence

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. https://www.cabidigitallibrary.org/product/qi . [Accessed 31 Jul 2023]	No evidence
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. http://www.plantsofhawaii.org.. [Accessed 31 Jul 2023]	No evidence

Qsn #	Question	Answer
303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. https://www.cabidigitallibrary.org/product/qi . [Accessed 31 Jul 2023]	No evidence
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. http://www.plantsofhawaii.org.. [Accessed 31 Jul 2023]	No evidence

304	Environmental weed	n
	Source(s)	Notes
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. https://www.cabidigitallibrary.org/product/qi . [Accessed 31 Jul 2023]	No evidence
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. http://www.plantsofhawaii.org.. [Accessed 31 Jul 2023]	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	CABI. (2023). Invasive Species Compendium. Wallingford, UK: CAB International. https://www.cabidigitallibrary.org/product/qi . [Accessed 31 Jul 2023]	No evidence
	Gallaher, T.J., Brock, K., Kennedy, B.H., Imada, C.T., Imada, K., & Walvoord, N. (2023). Plants of Hawai'i. http://www.plantsofhawaii.org.. [Accessed 31 Jul 2023]	No evidence

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). <i>Systematic Botany Monographs</i> , 40, 1-121	[No evidence] "Trees 10-25 m tall. Twigs sparsely pubescent, soon glabrate. Lamina of larger leaves 7.5-14.5 cm long, 1.8-3.2 cm wide, chartaceous, elliptic, oblong or lanceolate, inequilateral; base acute, cuneate, or rounded, strongly inequilateral, decurrent; apex attenuate to acute, the tip blunt; adaxial surface laevigate, dull, olivaceous, at first sparsely pubescent or with pubescence confined to midrib and margin on both surfaces, then glabrate; midrib becoming flattened to canaliculate toward the base adaxially; secondary veins 9-15 per side, at 30-45° to the midrib; secondary and higher-order veins slightly raised on both surfaces of the blade. Petiole 5-9 mm long, 0.8-1.8 mm wide, sparsely pubescent to glabrate. Flowers terminal on short shoots bearing 2-5 small leaves, less frequently at ends of long shoots; leaves of short shoots 2-14 mm long, 1.5-17 mm wide."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown. No evidence found.

Qsn #	Question	Answer
403	Parasitic	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Trees 10-25 m tall." [Annonaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	Trade Winds Fruit. (2023). <i>Porcelia macrocarpa</i> - Monkey Banana. https://www.tradewindsfruit.com/content/monkey-banana.htm . [Accessed]	"A strange and rare <i>Annona</i> relative with vaguely banana-appearing fruits that have minimal but tasty pulp." [Edible fruit. Palatability of foliage unknown.]
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	[Edible fruit. Palatability of foliage unknown] "Fruit and seed dispersal. The indehiscent monocarps have a thick brown, yellow, or green rind and a sweet and juicy but fibrous pulp. They sometimes fall from the tree when ripe. Their morphology is in accord with adaptations associated with dispersal by mammals (Janson 1983). I was told that the fruits are eaten by lapas (pacas) in Venezuela and by monkeys near Moyobamba, Peru. A common name for the fruit in Brazil is banana do macaco, or "monkey banana."

405	Toxic to animals	n
	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	"Antifungal from the branches." [No evidence]
	Tropical Plants Database, Ken Fern. (2023). <i>Porcelia macrocarpa</i> . https://tropical.theferns.info/viewtropical.php?id=Porcelia+macrocarpa . [Accessed 1 Aug 2023]	"Known Hazards None known"

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown

407	Causes allergies or is otherwise toxic to humans	n
	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	"Antifungal from the branches." [No evidence]
	Tropical Plants Database, Ken Fern. (2023). <i>Porcelia macrocarpa</i> . https://tropical.theferns.info/viewtropical.php?id=Porcelia+macrocarpa . [Accessed 1 Aug 2023]	"Known Hazards None known"

Qsn #	Question	Answer
408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2023). <i>Porcelia macrocarpa</i> . https://tropical.theferns.info/viewtropical.php?id=Porcelia+macrocarpa . [Accessed 1 Aug 2023]	"Grows best in wet, humid climates. Will tolerate some cool temperatures but should generally be kept in a freeze-free environment." [No evidence. Unlikely given growing conditions.]
409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2023). <i>Porcelia macrocarpa</i> . https://tropical.theferns.info/viewtropical.php?id=Porcelia+macrocarpa . [Accessed 1 Aug 2023]	"Succeeds in dappled shade"
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	[Soil requirements unknown] "Southeastern Brazil, extending from coastal Santa Catarina north to southwestern Minas Gerais, and possibly to Goias; in forests; 0-400 m. Cultivated in the city of Sao Paulo and at 600 m in Paraopeba, Minas Gerais. Duarte 3116 states that the plant was growing "em formacao calcarea"; perhaps suitable habitat is limited, which may explain the small number of collections of these showy plants."
411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Trees 10-25 m tall."
412	Forms dense thickets	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Southeastern Brazil, extending from coastal Santa Catarina north to southwestern Minas Gerais, and possibly to Goias; in forests; 0-400 m." [No evidence found in this or other references.]
	Trade Winds Fruit. (2023). <i>Porcelia macrocarpa</i> - Monkey Banana. https://www.tradewindsfruit.com/content/monkey-banana.htm . [Accessed 1 Aug 2023]	"Very rare in the wild and not cultivated." [No evidence]
501	Aquatic	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	[Terrestrial] "in forests; 0-400 m."

Qsn #	Question	Answer
502	Grass	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	Annonaceae
503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	Annonaceae
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Trees 10-25 m tall."
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	[No evidence] "Distribution (Fig. 30). Southeastern Brazil, extending from coastal Santa Catarina north to southwestern Minas Gerais, and possibly to Goias; in forests; 0-400 m. Cultivated in the city of Sao Paulo and at 600 m in Paraopeba, Minas Gerais. Duarte 3116 states that the plant was growing "em formacao calcarea"; perhaps suitable habitat is limited, which may explain the small number of collections of these showy plants."
	WFO (2023). World Flora Online. Published on the Internet; http://www.worldfloraonline.org . [Accessed 31 Jul 2023]	IUCN Red List Status: Least Concern
602	Produces viable seed	y
	Source(s)	Notes
	Trade Winds Fruit. (2023). <i>Porcelia macrocarpa</i> - Monkey Banana. https://www.tradewindsfruit.com/content/monkey-banana.htm . [Accessed 1 Aug 2023]	"By seeds. Seeds are very slow to germinate, taking from 4-12 months germination time."
	Tropical Plants Database, Ken Fern. (2023). <i>Porcelia macrocarpa</i> . https://tropical.theferns.info/viewtropical.php?id=Porcelia+macrocarpa . [Accessed 1 Aug 2023]	"Seed - it has a hard seedcoat and may benefit from scarification before sowing to speed up germination. This can usually be done by pouring a small amount of nearly boiling water on the seeds (being careful not to cook them!) and then soaking them for 12 - 24 hours in warm water. By this time they should have imbibed moisture and swollen - if they have not, then carefully make a nick in the seedcoat (being careful not to damage the embryo) and soak for a further 12 hours before sowing. Sow the seed in a partially shaded position in a nursery seedbed. A germination rate in excess of 50% can be expected [420]. Seedlings grow away fairly slowly [420]."
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Seeds 3-17, in two rows, at 90° to long axis of monocarp, 15-25 mm long, 10-15 mm wide, 4-8 mm thick."

Qsn #	Question	Answer
603	Hybridizes naturally	
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	Unknown. No evidence found.

604	Self-compatible or apomictic	
	Source(s)	Notes
	Saunders, R. M. (2012). The diversity and evolution of pollination systems in Annonaceae. Botanical Journal of the Linnean Society, 169(1), 222-244	"Although the petals in <i>Porcelia</i> are not as fleshy as those of many <i>Cymbopetalum</i> species, all species possess a strip of tissue that is consumed by the beetles (Murray, 1993). Other information on the pollination ecology and breeding system is lacking, although Schatz (1990) provides confirmation of scarab pollination."
	Deus, F. F., Vale, V. S., Schiavini, I., & Oliveira, P. E. (2014). Diversity of reproductive ecological groups in semideciduous seasonal forests. Bioscience Journal 30 (6): 1885-1902	"Appendix 1" [<i>Porcelia macrocarpa</i> - Sexual systems = NID - not identified]

605	Requires specialist pollinators	y
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	[Beetle pollinated] "The flowers of all species have a sweet heavy scent of ripe fruit at anthesis; in fact, I cannot distinguish this scent from that of the <i>Porcelia</i> fruits. The scent seems to be present throughout anthesis, and I have no data on whether these flowers heat up above ambient temperatures, as observed in <i>Cymbopetalum</i> . It is surprising that Gottsberger (1970) reported no odor from the yellow flowers of <i>P. macrocarpa</i> ; many of the collectors of this species have commented on the fragrance of the flowers in their label data. All of the species do have a specialized strip of "beetle" tissue; I saw that it had been removed from a number of petals of a specimen of <i>P. nitidifolia</i> from which a scarab beetle was taken (Maas et al. 6027, MICH)."
	Saunders, R. M. (2012). The diversity and evolution of pollination systems in Annonaceae. Botanical Journal of the Linnean Society, 169(1), 222-244	[Beetle pollinated] "The inner and outer petals of <i>Porcelia</i> Ruiz & Pav. are imbricate at anthesis, thereby forming a loose pollination chamber. Although some species possess cymbiform inner petals as in <i>Cymbopetalum</i> , others do not; the petals of <i>Porcelia</i> also differ as they are considerably less fleshy than those of <i>Cymbopetalum</i> . Murray (1993) studied the pollination biology of four species (<i>P. magnifructa</i> (Schery) R.E.Fr., <i>P. mediocris</i> N.A.Murray, <i>P. steinbachii</i> (Diels) R.E.Fr. and <i>P. venezuelensis</i> Pittier). All species examined are visited by large scarab beetles (Scarabaeidae: Dynastinae and Melolonthinae), with a strong fruity odour acting as an attractant. Although the petals in <i>Porcelia</i> are not as fleshy as those of many <i>Cymbopetalum</i> species, all species possess a strip of tissue that is consumed by the beetles (Murray, 1993). Other information on the pollination ecology and breeding system is lacking, although Schatz (1990) provides confirmation of scarab pollination."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	Trade Winds Fruit. (2023). <i>Porcelia macrocarpa</i> - Monkey Banana. https://www.tradewindsfruit.com/content/monkey-banana.htm . [Accessed 1 Aug 2023]	"Propagation - By seeds. Seeds are very slow to germinate, taking from 4-12 months germination time." [No evidence]

Qsn #	Question	Answer
607	Minimum generative time (years)	
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Trees 10-25 m tall." [Time to maturity unknown]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Fruit and seed dispersal. The indehiscent monocarps have a thick brown, yellow, or green rind and a sweet and juicy but fibrous pulp. They sometimes fall from the tree when ripe. Their morphology is in accord with adaptations associated with dispersal by mammals (Janson 1983)." ... "Monocarps 2-3 (-12?), 2.5-8.5 cm long, 3-4.2 cm wide, ovoid to elongate-ovoid; stipe 12-28 mm long, 4-7 mm wide; wall 2.5-4.0 mm thick. Seeds 3-17, in two rows, at 90° to long axis of monocarp, 15-25 mm long, 10-15 mm wide, 4-8 mm thick." [Fruit and seeds lack means of external attachment.]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Trade Winds Fruit. (2023). <i>Porcelia macrocarpa</i> - Monkey Banana. https://www.tradewindsfruit.com/content/monkey-banana.htm . [Accessed 31 Jul 2023]	"A strange and rare <i>Annona</i> relative with vaguely banana-appearing fruits that have minimal but tasty pulp. Fruits form in radiating clusters much like a clump of banana's. Skin is yellow-brown, with thin white flesh surrounding several large seeds." [Rarely cultivated]
	WRA Specialist. (2023). Personal Communication	Cultivated in one Oahu nursery.

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Fruit and seed dispersal. The indehiscent monocarps have a thick brown, yellow, or green rind and a sweet and juicy but fibrous pulp. They sometimes fall from the tree when ripe. Their morphology is in accord with adaptations associated with dispersal by mammals (Janson 1983)." ... "Monocarps 2-3 (-12?), 2.5-8.5 cm long, 3-4.2 cm wide, ovoid to elongate-ovoid; stipe 12-28 mm long, 4-7 mm wide; wall 2.5-4.0 mm thick. Seeds 3-17, in two rows, at 90° to long axis of monocarp, 15-25 mm long, 10-15 mm wide, 4-8 mm thick." [Fruit and seeds relatively large and unlikely to become an accidental contaminant of produce.]

704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Fruit and seed dispersal. The indehiscent monocarps have a thick brown, yellow, or green rind and a sweet and juicy but fibrous pulp. They sometimes fall from the tree when ripe. Their morphology is in accord with adaptations associated with dispersal by mammals (Janson 1983)." ... "Monocarps 2-3 (-12?), 2.5-8.5 cm long, 3-4.2 cm wide, ovoid to elongate-ovoid; stipe 12-28 mm long, 4-7 mm wide; wall 2.5-4.0 mm thick. Seeds 3-17, in two rows, at 90° to long axis of monocarp, 15-25 mm long, 10-15 mm wide, 4-8 mm thick."

Qsn #	Question	Answer
705	Propagules water dispersed	n
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Fruit and seed dispersal. The indehiscent monocarps have a thick brown, yellow, or green rind and a sweet and juicy but fibrous pulp. They sometimes fall from the tree when ripe. Their morphology is in accord with adaptations associated with dispersal by mammals (Janson 1983)." ... "Monocarps 2-3 (-12?), 2.5-8.5 cm long, 3-4.2 cm wide, ovoid to elongate-ovoid; stipe 12-28 mm long, 4-7 mm wide; wall 2.5-4.0 mm thick. Seeds 3-17, in two rows, at 90° to long axis of monocarp, 15-25 mm long, 10-15 mm wide, 4-8 mm thick." [Buoyancy of fruit unknown. Possibly dispersed if grown in proximity to riparian areas, but not identified as an important dispersal vector.]
706	Propagules bird dispersed	
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	[Gamebirds might be able to consume and disperse seeds, but the majority of frugivorous birds in the Hawaiian Islands are probably too small to effectively disperse seeds] "Warming (1873) reported that birds "attack" the fruits in Minas Gerais, Brazil." ... "Monocarps 2-3 (-12?), 2.5-8.5 cm long, 3-4.2 cm wide, ovoid to elongate-ovoid; stipe 12-28 mm long, 4-7 mm wide; wall 2.5-4.0 mm thick. Seeds 3-17, in two rows, at 90° to long axis of monocarp, 15-25 mm long, 10-15 mm wide, 4-8 mm thick."
707	Propagules dispersed by other animals (externally)	
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"The fruits of <i>P. mediocris</i> have been observed to be eaten by rodents foraging on the ground." [Unknown. It may be possible that introduced rodents in the Hawaiian Islands could disperse seeds of <i>Porcelia macrocarpa</i> by transporting fruit and/or seeds externally for consumption away from the parent tree.]
708	Propagules survive passage through the gut	y
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	[Presumably yes] "Fruit and seed dispersal. The indehiscent monocarps have a thick brown, yellow, or green rind and a sweet and juicy but fibrous pulp. They sometimes fall from the tree when ripe. Their morphology is in accord with adaptations associated with dispersal by mammals (Janson 1983). I was told that the fruits are eaten by lapas (pacas) in Venezuela and by monkeys near Moyobamba, Peru. A common name for the fruit in Brazil is banana do macaco, or "monkey banana." Warming (1873) reported that birds "attack" the fruits in Minas Gerais, Brazil. The fruits of <i>P. mediocris</i> have been observed to be eaten by rodents foraging on the ground. There is much better evidence that the fruits, although not choice, are eaten by people."
	WRA Specialist. (2023). Personal Communication	In the Hawaiian Islands, feral pigs, larger game birds, and possibly other animals that consume fruit in their diets may serve as seed dispersers.
801	Prolific seed production (>1000/m2)	

Qsn #	Question	Answer
	Source(s)	Notes
	Murray, N. A. (1993). Revision of <i>Cymbopetalum</i> and <i>Porcelia</i> (Annonaceae). Systematic Botany Monographs, 40, 1-121	"Monocarps 2-3 (-12?), 2.5-8.5 cm long, 3-4.2 cm wide, ovoid to elongate-ovoid; stipe 12-28 mm long, 4-7 mm wide; wall 2.5-4.0 mm thick. Seeds 3-17, in two rows, at 90° to long axis of monocarp, 15-25 mm long, 10-15 mm wide, 4-8 mm thick." [Densities unknown, but fruits and seeds relatively large and unlikely to produce such high densities.]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Tropical Plants Database, Ken Fern. (2023). <i>Porcelia macrocarpa</i> . https://tropical.theferns.info/viewtropical.php?id=Porcelia+macrocarpa . [Accessed 1 Aug 2023]	"Seed - it has a hard seedcoat and may benefit from scarification before sowing to speed up germination."
	Baskin, C.C. & Baskin, J.M. (2014). <i>Seeds Ecology, Biogeography, and Evolution of Dormancy and Germination</i> . Second Edition. Academic Press, San Francisco, CA	"Two general kinds of things must happen before seeds with MPD can germinate: (1) the embryo must grow (inside the seed) to a critical size, and (2) PD of the embryo must be broken. The secret to germinating seeds with MPD is to figure out what environmental conditions promote each event. In some species, embryo growth and dormancy break are promoted by the same environmental conditions, while in others they require different conditions." [TABLE 9.14. <i>Porcelia macrocarpa</i> - Classified as having MPD but longevity in natural conditions unknown.]
	Trade Winds Fruit. (2023). <i>Porcelia macrocarpa</i> - Monkey Banana. https://www.tradewindsfruit.com/content/monkey-banana.htm . [Accessed 1 Aug 2023]	[Unknown if a seed bank persists for over one year] "Propagation - By seeds. Seeds are very slow to germinate, taking from 4-12 months germination time."

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species.

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown

Summary of Risk Traits:

Porcelia macrocarpa (monkey banana) is a 10-25 m tall tree native to semi-deciduous Atlantic forests from Minas Gerais to Rio Grande do Sul, Brazil. The vaguely banana-appearing fruits have minimal but tasty pulp that are consumed by people, and by monkeys and rodents in the tree's native range. It is rare in both the wild and cultivation and is not known to be naturalized or invasive elsewhere in the world.

High Risk / Undesirable Traits

- Grows and could spread in regions with tropical climates
- Reproduces by seeds.
- Seeds dispersed by monkeys and rodents within its native range, and through intentional cultivation.
- Seeds slow to germinate and might persist in the soil (but seed bank longevity unknown).
- Gaps in biological and ecological information may reduce accuracy of risk prediction.

Low Risk Traits

- No reports of naturalization or invasiveness, although there is limited evidence of cultivation outside its native range.
- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Beetle pollinated (absence of pollinators may reduce seed set in cultivation).
- Not reported to spread vegetatively.
- Relatively large fruit and seeds may reduce the risk of accidental or long-distance dispersal.