

<b>Taxon:</b> <i>Raphia vinifera</i> P. Beauv.	<b>Family:</b> Arecaceae
<b>Common Name(s):</b> bamboo palm king bamboo palm king raphia West African bass fibre West African piassava palm	<b>Synonym(s):</b> <i>Metroxylon viniferum</i> (P.Beauv.) <i>Raphia diasticha</i> Burret <i>Sagus vinifera</i> (P.Beauv.) Pers.

<b>Assessor:</b> Chuck Chimera	<b>Status:</b> Assessor Approved	<b>End Date:</b> 15 Sep 2020
<b>WRA Score:</b> 4.0	<b>Designation:</b> EVALUATE	<b>Rating:</b> Evaluate

**Keywords:** Monocarpic Palm, Spiny Leaflets, Dense Stands, Swampy Habitat, 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	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	y
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals		
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
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	n
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	y
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	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	>3
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	y
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)		
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
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	[No evidence] "Genetic resources and breeding No germplasm collections or breeding programmes of <i>Raphia vinifera</i> , are known."
102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	NA
103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2020). 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, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 14 Sep 2020]	"Native Africa WEST-CENTRAL TROPICAL AFRICA: Cameroon, Democratic Republic of the Congo, Gabon, Equatorial Guinea [Bioko] WEST TROPICAL AFRICA: Benin, Ghana, Nigeria"
202	Quality of climate match data	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 14 Sep 2020]	
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	" <i>Raphia vinifera</i> is distributed from Benin eastwards to DR Congo." ... " <i>Raphia vinifera</i> is found in swamps and other moist locations, especially on the edges of creeks."
	Plants for a Future. (2020). <i>Raphia vinifera</i> . <a href="https://pfaf.org">https://pfaf.org</a> . [Accessed 14 Sep 2020]	"USDA hardiness 10-12"

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 14 Sep 2020]	"Native Africa WEST-CENTRAL TROPICAL AFRICA: Cameroon, Democratic Republic of the Congo, Gabon, Equatorial Guinea [Bioko] WEST TROPICAL AFRICA: Benin, Ghana, Nigeria"

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	Notes
	Steentoft, M. 1988. Flowering Plants in West Africa. Cambridge University Press, Cambridge, UK	"Raphia occurs in the tropics of both Africa and America, though West African species are seldom found anywhere else."

301	Naturalized beyond native range	n
	Source(s)	Notes
	Herrera, K., Lorence, D. H., Flynn, T., & Balick, M. J. (2010). Checklist of the Vascular Plants of Pohnpei, Federated States of Micronesia with Local Names and Uses. <i>Allertonia</i> , 10, 1-192	"Status: C" [Cultivated]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Cited as naturalized in Dahl, C. (1997). Flora List for Pohnpei. College of Micronesia-FSM Botany 250 URL: <a href="http://www.geocities.com/TheTropics/Cabana/4705/Botany.html">http://www.geocities.com/TheTropics/Cabana/4705/Botany.html</a> . A more recent publication lists it as cultivated only. See Herrera et al. (2010)
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

Qsn #	Question	Answer
304	Environmental weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	n
	Source(s)	Notes
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	Raphia farinifera reported to be naturalized outside native range

401	Produces spines, thorns or burrs	y
	Source(s)	Notes
	Russell, T. A. (1965). The Raphia Palms of West Africa. Kew Bulletin, 19(2), 173-196	"Terminal leaflets of the frond are linear and tend to end rather abruptly in a ragged or blunt tip. Mid-veins are spiny above, with fine brown spines at intervals of 1-2 cm., and similar, but less frequent, spines are on the margins of the segments."
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	[Margins and main veins of leaflets are spiny] "Monoecious tree with a stout trunk up to 5 m tall. Leaves pinnately compound, arching, up to 13 m long, sheathing at the base; sheath unarmed, splitting opposite the petiole; petiole channeled above, unarmed; rachis stout, unarmed, pale brown to orange; leaflets linear, up to 150 cm long, single-fold, bright green and shiny above, fairly glaucous and waxy below, margins and main veins spiny."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"Monoecious tree with a stout trunk up to 5 m tall." [Arecaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown

405	Toxic to animals	
	Source(s)	Notes

Qsn #	Question	Answer
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"Ethanollic and aqueous extracts of the fruit have shown toxicity to fish in experiments with the African catfish ( <i>Clarias gariepinus</i> )."
	Plants for a Future. (2020). <i>Raphia vinifera</i> . <a href="https://pfaf.org">https://pfaf.org</a> . [Accessed 15 Sep 2020]	"Known Hazards None known"
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"Fruit rot, caused by <i>Thielaviopsis paradoxa</i> (synonym: <i>Chalara paradoxa</i> ) affects <i>Raphia vinifera</i> in Nigeria, causing dark brown rot of the mesocarp. It is a weak pathogen entering fruit via wounds, sometimes killing the embryo, and leading to loss of planting material. The aphid <i>Cerataphis palmae</i> may cause considerable damage to <i>Raphia vinifera</i> , e.g. in Nigeria."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Plants for a Future. (2020). <i>Raphia vinifera</i> . <a href="https://pfaf.org">https://pfaf.org</a> . [Accessed 15 Sep 2020]	"Known Hazards None known"
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	[No evidence of toxicity to people] "The mesocarp of fruits collected in Nigeria contained 3.6% moisture, 4.4% crude protein, 29.1% fat, 53.4% carbohydrates, 5.6% crude fibre and 4.1% ash. The oil yield of the mesocarp was 28.5%, while the seed yielded only 0.9%. The major fatty acids in the mesocarp oil and the seed lipids of <i>Raphia vinifera</i> are palmitic acid, oleic acid and linoleic acid. The mesocarp oil resembles that of oil palm in colour, taste, odour and chemical composition, except that it contains more linoleic acid, giving it a higher unsaturated acid content. Ethanollic and aqueous extracts of the fruit have shown toxicity to fish in experiments with the African catfish ( <i>Clarias gariepinus</i> ). "
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	" <i>Raphia vinifera</i> is found in swamps and other moist locations, especially on the edges of creeks." [No evidence. Does not occur in fire prone habitat]
	Russell, T. A. (1965). The <i>Raphia</i> Palms of West Africa. Kew Bulletin, 19(2), 173-196	"This palm occurs in swamps and creeks from Dahomey eastwards to Calabar and Fernando Po, perhaps also in Cameroun and Gabon. Its abundance along the waterways of Southern Nigeria is picturesquely described by Moloney ( 1891, 1895)."

Qsn #	Question	Answer
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	"Wet and swampy areas of central western Africa are the natural habitat of this palm." [No evidence. Unlikely given habitat]

<b>409</b>	<b>Is a shade tolerant plant at some stage of its life cycle</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Plants for a Future. (2020). <i>Raphia vinifera</i> . <a href="https://pfaf.org">https://pfaf.org</a> . [Accessed 15 Sep 2020]	"It cannot grow in the shade."

<b>410</b>	<b>Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Plants for a Future. (2020). <i>Raphia vinifera</i> . <a href="https://pfaf.org">https://pfaf.org</a> . [Accessed 15 Sep 2020]	"Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: acid, neutral and basic (alkaline) soils. It cannot grow in the shade. It prefers moist soil."

<b>411</b>	<b>Climbing or smothering growth habit</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Achigan-Dako, E.G. 2012. <i>Fibres</i> . Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"Monoecious tree with a stout trunk up to 5 m tall."

<b>412</b>	<b>Forms dense thickets</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Achigan-Dako, E.G. 2012. <i>Fibres</i> . Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	" <i>Raphia vinifera</i> is found in swamps and other moist locations, especially on the edges of creeks."
	Royal Botanic Gardens, Kew. (1891). West African Bass Fibre. <i>Raphia vinifera</i> , P. de Beauv. Bulletin of Miscellaneous Information 49: 1-5	"The "llambo" palm, or <i>Raphia vinifera</i> , is perhaps the commonest tree in the swamps and low lands which line the waterways of the colony. Dense thickets of these palms, traversed only by the palm wine gatherer or the bamboo cutter, push their way into the lagoons, and extend over the flood grounds, and even to a distance of from 15 to 20 miles up the river valleys into the interior."
	Brink, M. and Escobin, R.P. (eds.). (2003). <i>Plant Resources of South-East Asia No 17. Fibre plants</i> . Backhuys Publishers, Leiden, The Netherlands	[Some species may form dense stands] "Most raphia palms occur in swampy parts of lowland forest, where they may form dense, almost pure stands. In its natural distribution area <i>R. farinifera</i> is widespread in gallery forest and freshwater swamp-forest up to 2500 m altitude. It is common near villages at the edge of water courses. <i>R. hookeri</i> occurs in freshwater swamps and on river banks. It generally does not tolerate saline conditions and is said to prefer less wet conditions than <i>R. vinifera</i> . <i>R. vinifera</i> is also found in moist locations, especially on the edges of creeks."

Qsn #	Question	Answer
501	<b>Aquatic</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	[Terrestrial, but near aquatic habitats] " <i>Raphia vinifera</i> is found in swamps and other moist locations, especially on the edges of creeks."

502	<b>Grass</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 14 Sep 2020]	Family: Arecaceae Subfamily: Calamoideae Tribe: Lepidocaryeae Subtribe: Raphiinae

503	<b>Nitrogen fixing woody plant</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed 14 Sep 2020]	Family: Arecaceae Subfamily: Calamoideae Tribe: Lepidocaryeae Subtribe: Raphiinae

504	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"Monoecious tree with a stout trunk up to 5 m tall. Leaves pinnately compound, arching, up to 13 m long, sheathing at the base; sheath unarmed, splitting opposite the petiole; petiole channeled above, unarmed; rachis stout, unarmed, pale brown to orange; leaflets linear, up to 150 cm long, single-fold, bright green and shiny above, fairly glaucous and waxy below, margins and main veins spiny."

601	<b>Evidence of substantial reproductive failure in native habitat</b>	n
	<b>Source(s)</b>	<b>Notes</b>
	USDA, Agricultural Research Service, National Plant Germplasm System. (2020). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. <a href="https://npgsweb.ars-grin.gov/">https://npgsweb.ars-grin.gov/</a> . [Accessed ]	[No evidence. Widely distributed] "Native Africa WEST-CENTRAL TROPICAL AFRICA: Cameroon, Democratic Republic of the Congo, Gabon, Equatorial Guinea [Bioko] WEST TROPICAL AFRICA: Benin, Ghana, Nigeria"

602	<b>Produces viable seed</b>	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Achigan-Dako, E.G. 2012. <i>Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands</i>	"Raphia palms are generally propagated by seed. In nurseries, a spacing of 30 cm × 30 cm is recommended. Seedlings may be collected from the wild and raised in a nursery before being planted out in the field."
	Ellison, D. & Ellison, A. 2001. <i>Cultivated Palms of the World. UNSW Press, Sydney, Australia</i>	"The large, scaly fruits are brown at maturity and seed, which requires soaking before sowing, germinates erratically, taking up to 8 months to sprout."

603	Hybridizes naturally	
	<b>Source(s)</b>	<b>Notes</b>
	Russell, T. A. (1965). <i>The Raphia Palms of West Africa. Kew Bulletin, 19(2), 173-196</i>	Unknown. No hybrids documented in the publication

604	Self-compatible or apomictic	
	<b>Source(s)</b>	<b>Notes</b>
	Tomlinson, P. B. (1979). <i>Systematics and ecology of the Palmae. Annual Review of Ecology and Systematics, 10, 85-107</i>	[Unknown] "Palms with perfect flowers are in a minority, and this condition may be associated with polygamy (e.g. Pseudophoenix, some coryphoid palms). Selfing is possible and indeed may be an essential feature of reproductive strategy. Thus Corypha has perfect flowers, but is evidently self-compatible, as indicated by the abundant fruit set of isolated cultivated individuals (73). Abundant seeding would seem to be important in this monocarpic species. Outcrossing in natural populations could then only occur between synchronously flowering individuals, but even this is minimized by the short flowering period (3 weeks). We lack detailed information about other monocarpic palms like Raphia and Metroxylon."

605	Requires specialist pollinators	n
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U. (2017). <i>CRC World Dictionary of Palms: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL</i>	"Pollination either by wind or insects."
	Brink, M. & Achigan-Dako, E.G. 2012. <i>Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands</i>	[Not specialized] "Flowers unisexual; male flowers at apex of inflorescence branchlets, female flowers at base; male flowers curved, 8 mm long, bracteole sharply 2-keeled and enclosing the calyx, calyx almost cup-shaped, 3-lobed, corolla c. 3 times as long as calyx, splitting into 3 segments, slightly thickened at the apex, stamens (6–)9, inserted on the corolla, filaments thick, free or connate for half their length; female flowers with outer bracteole slightly longer than calyx, calyx cup-shaped, 3-toothed, corolla one third longer than calyx, divided halfway into 3 pointed segments, staminodial ring fused to corolla, with 9 sterile anthers, ovary superior, 3-celled."

606	Reproduction by vegetative fragmentation	y
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Qsn #	Question	Answer
	<b>Source(s)</b>	<b>Notes</b>
	Quattrocchi, U. (2017). CRC World Dictionary of Palms: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	"freely and profusely suckering from base, monoecious,"
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"Raphia vinifera is also propagated by suckers."
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	"The broad, clumping stems are topped by very long, finely divided feather leaves. Unfortunately, the palm trunk dies at the completion of the seeding cycle, but new suckers will replace it."

<b>607</b>	<b>Minimum generative time (years)</b>	<b>&gt;3</b>
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"The time from planting to flowering in <i>Raphia vinifera</i> is about 8 years."

<b>701</b>	<b>Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"Fruit cylindrical-ellipsoid, 5–9 cm × 3–4 cm, with a sharp beak 3–5 mm long, covered with scales in (8–)9 rows, usually 1-seeded; scales rhomboid, c. 20 mm × 20 mm, flat or concave towards the point, yellow-brown. Seed ovoid to ellipsoid; mesocarp oily; endosperm deeply ruminant." [No evidence, and no means of external attachment]
	Steentoft, M. 1988. Flowering Plants in West Africa. Cambridge University Press, Cambridge, UK	[Generic description] "Dispersal Mammals and birds are undoubtedly the effective dispersal agents. The palm nut vulture ( <i>Gryphierax angolensis</i> ), rodents and birds are the distributors of oil palm, and the red berries of rattans and <i>Raphia</i> are also attractive to birds."

<b>702</b>	<b>Propagules dispersed intentionally by people</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Plants for a Future. (2020). <i>Raphia vinifera</i> . <a href="https://pfaf.org">https://pfaf.org</a> . [Accessed 15 Sep 2020]	Cultivated as an ornamental

<b>703</b>	<b>Propagules likely to disperse as a produce contaminant</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"Fruit cylindrical-ellipsoid, 5–9 cm × 3–4 cm, with a sharp beak 3–5 mm long, covered with scales in (8–)9 rows, usually 1-seeded; scales rhomboid, c. 20 mm × 20 mm, flat or concave towards the point, yellow-brown. Seed ovoid to ellipsoid; mesocarp oily; endosperm deeply ruminant." [No evidence. Unlikely given large size of fruit and seeds]

Qsn #	Question	Answer
704	Propagules adapted to wind dispersal	n
	Source(s)	Notes
	Steenft, M. 1988. Flowering Plants in West Africa. Cambridge University Press, Cambridge, UK	[Generic description] "Dispersal Mammals and birds are undoubtedly the effective dispersal agents. The palm nut vulture ( <i>Gryphierax angolensis</i> ), rodents and birds are the distributors of oil palm, and the red berries of rattans and <i>Raphia</i> are also attractive to birds."

705	Propagules water dispersed	y
	Source(s)	Notes
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	" <i>Raphia vinifera</i> is found in swamps and other moist locations, especially on the edges of creeks." [Presence near aquatic habitats suggest water likely moves seeds]

706	Propagules bird dispersed	y
	Source(s)	Notes
	Pérez-Méndez, N., & Rodríguez, A. (2018). Raptors as Seed Dispersers. In <i>Birds of Prey</i> (pp. 139-158). Springer, Cham.	"Table 6.1 Evidence of frugivory or seed dispersal by raptors (Accipitriformes, Cathartiformes, and Falconiformes)" [Species - <i>Gypohierax angolensis</i> ; Fruits recorded - <i>Elaeis guineensis</i> , <i>Raphia vinifera</i> , <i>R. farinifera</i> , <i>Phoenix reclinata</i> , <i>Antiaris Africana</i> , other fruits, <i>Acacia</i> seeds and cereals; Seed ingestion - Y]
	Steenft, M. 1988. Flowering Plants in West Africa. Cambridge University Press, Cambridge, UK	[Generic description] "Dispersal Mammals and birds are undoubtedly the effective dispersal agents. The palm nut vulture ( <i>Gryphierax angolensis</i> ), rodents and birds are the distributors of oil palm, and the red berries of rattans and <i>Raphia</i> are also attractive to birds."
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	[Presumably adapted for bird dispersal, but lack of larger, avian frugivores in the Hawaiian Islands may limit long distance dispersal] "Fruit cylindrical-ellipsoid, 5–9 cm × 3–4 cm, with a sharp beak 3–5 mm long, covered with scales in (8–)9 rows, usually 1-seeded; scales rhomboid, c. 20 mm × 20 mm, flat or concave towards the point, yellow-brown. Seed ovoid to ellipsoid; mesocarp oily; endosperm deeply ruminant."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Steenft, M. 1988. Flowering Plants in West Africa. Cambridge University Press, Cambridge, UK	[Generic description] "Dispersal Mammals and birds are undoubtedly the effective dispersal agents. The palm nut vulture ( <i>Gryphierax angolensis</i> ), rodents and birds are the distributors of oil palm, and the red berries of rattans and <i>Raphia</i> are also attractive to birds."

708	Propagules survive passage through the gut	y
	Source(s)	Notes

Qsn #	Question	Answer
	Royal Botanic Gardens Kew. (2020) Seed Information Database (SID). Version 7.1. Available from: <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a> . [Accessed 15 Sep 2020]	"Seed Dispersal Animal; Diaspore is eaten intentionally; Direct or experimental observation; (Zona, 2001); Birds.; <i>Gypohierax angolensis</i> ; Diaspore=fruit. The fruit has an oil-rich mesocarp. Animal; Diaspore is eaten intentionally; Direct or experimental observation; (Zona & Henderson, 1989); Mammals (non-bat)."
	Steentoft, M. 1988. Flowering Plants in West Africa. Cambridge University Press, Cambridge, UK	[Generic description. Presumably yes] "Dispersal Mammals and birds are undoubtedly the effective dispersal agents. The palm nut vulture ( <i>Gryphjierax angolensis</i> ), rodents and birds are the distributors of oil palm, and the red berries of rattans and <i>Raphia</i> are also attractive to birds."
	WRA Specialist. (2020). Personal Communication	Animal dispersed seeds could possibly be moved by pigs, game birds, or other ground dwelling animals

801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes
	Brink, M. & Achigan-Dako, E.G. 2012. Fibres. Plant Resources of Tropical Africa. Volume 16. PROTA, Wageningen, Netherlands	"Inflorescence axillary, pendulous, up to 150 cm long, branched to 2 orders; bracts of peduncle and branch-bases ring-like; partial inflorescences 30–60 cm long; rachillae in 4 ranks, lax, slender, 10–15 cm long, curved, laterally compressed, tapering, with flowers in 2 rows. Flowers unisexual; male flowers at apex of inflorescence branchlets, female flowers at base; male flowers curved, 8 mm long, bracteole sharply 2-keeled and enclosing the calyx, calyx almost cup-shaped, 3-lobed, corolla c. 3 times as long as calyx, splitting into 3 segments, slightly thickened at the apex, stamens (6–9), inserted on the corolla, filaments thick, free or connate for half their length; female flowers with outer bracteole slightly longer than calyx, calyx cup shaped, 3-toothed, corolla one third longer than calyx, divided halfway into 3 pointed segments, staminodial ring fused to corolla, with 9 sterile anthers, ovary superior, 3-celled. Fruit cylindrical ellipsoid, 5–9 cm × 3–4 cm, with a sharp beak 3–5 mm long, covered with scales in (8–)9 rows, usually 1-seeded" [No evidence. Unlikely given size of one-seeded fruit]

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	Royal Botanic Gardens Kew. (2020) Seed Information Database (SID). Version 7.1. Available from: <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a> . [Accessed 15 Sep 2020]	"Storage Behaviour: No data available for species or genus. Of 124 known taxa of family ARECACEAE, 29.03% Orthodox(p/?), 33.06% Recalcitrant(?), 9.68% Intermediate(?), 28.23% Uncertain"
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	"The large, scaly fruits are brown at maturity and seed, which requires soaking before sowing, germinates erratically, taking up to 8 months to sprout."

Qsn #	Question	Answer
803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. (2020). 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
	Ellison, D. & Ellison, A. 2001. Cultivated Palms of the World. UNSW Press, Sydney, Australia	[Unknown. Cutting trunk may result in suckering] "The broad, clumping stems are topped by very long, finely divided feather leaves. Unfortunately, the palm trunk dies at the completion of the seeding cycle, but new suckers will replace it."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2020). Personal Communication	Unknown

**Summary of Risk Traits:**

## High Risk / Undesirable Traits

- Thrives in tropical climates
- Spines on leaflets
- Tolerates many soil types
- Forms dense stands in native range
- Reproduces by seeds and vegetatively by suckering
- Seeds dispersed by birds, other frugivorous animals and intentionally by people
- Proximity to aquatic habitats suggests water likely dispersed seeds in native range

## Low Risk Traits

- No confirmed reports of invasiveness or naturalization, but no evidence of widespread introduction outside native range
- Extracts reported to be toxic to fish, but otherwise not toxic to animals or people
- Grows in full sun
- Reaches maturity in 8+ years
- Relatively large fruit and seeds may limit dispersal in islands lacking larger frugivorous birds

## Second Screening Results for Tree/tree-like shrubs

(A) Shade tolerant or known to form dense stands?> Not shade tolerant, but forms dense stands in native range

(B) Bird or clearly wind-dispersed?> Dispersed by birds and other frugivorous animals

(C) Life cycle <4 years? No. Reaches maturity in 8+ years

Outcome = Evaluate