

**Taxon:** Pachypodium geayi Costantin & Bois

**Family:** Apocynaceae

**Common Name(s):** Madagascar palm

**Synonym(s):**

**Assessor:** Chuck Chimera

**Status:** Assessor Approved

**End Date:** 4 Jan 2017

**WRA Score:** -3.0

**Designation:** L

**Rating:** Low Risk

**Keywords:** Succulent, Tree, Spiny, Sandy Soil, Wind-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	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	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	y=1, n=0	y
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans		
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	n

Qsn #	Question	Answer Option	Answer
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		
605	Requires specialist pollinators	y=-1, n=0	y
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	>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	y
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	n
801	Prolific seed production (>1000/m <sup>2</sup> )		
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	y=1, n=-1	y
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
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	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]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 4 Jan 2017]	"Native: Africa Western Indian Ocean: Madagascar"
202	Quality of climate match data	High
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 4 Jan 2017]	
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"DISTRIBUTION. Morombe to Fort-Dauphin. HABIT. Tree up to 7 m high, with thick trunk, branching from 3 m height or more. ECOLOGY. On sand in low dry forest. Alt. 0-100 m."
	Dave's Garden. 2017. Madagascar Palm - <i>Pachypodium geayi</i> . <a href="http://davesgarden.com/guides/pf/go/55760/">http://davesgarden.com/guides/pf/go/55760/</a> . [Accessed 4 Jan 2017]	"Hardiness: USDA Zone 9b: to -3.8 °C (25 °F) USDA Zone 10a: to -1.1 °C (30 °F) USDA Zone 10b: to 1.7 °C (35 °F) USDA Zone 11: above 4.5 °C (40 °F)"

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"DISTRIBUTION. Morombe to Fort-Dauphin. HABIT. Tree up to 7 m high, with thick trunk, branching from 3 m height or more. ECOLOGY. On sand in low dry forest. Alt. 0-100 m."
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 4 Jan 2017]	"Native: Africa Western Indian Ocean: Madagascar"

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 4 Jan 2017]	"Cultivated: . also cult."
	Rau, E. 2016. President, Sustainable Bioresources, LLC. Personal Communication. 29 December	" <i>P. gaeyei</i> (common/ready for sale)"
	Dave's Garden. 2017. Madagascar Palm - <i>Pachypodium geayi</i> . <a href="http://davesgarden.com/guides/pf/go/55760/">http://davesgarden.com/guides/pf/go/55760/</a> . [Accessed 4 Jan 2017]	"Regional This plant has been said to grow in the following regions: Grenoble, Gilbert, Arizona Goodyear, Arizona Brentwood, California Clayton, California Hayward, California Huntington Beach, California Rancho Mirage, California Reseda, California Rosedale, California San Diego, California San Leandro, California Simi Valley, California Thousand Oaks, California Upland, California Denver, Colorado Big Pine Key, Florida Melbourne Beach, Florida Miami, Florida Naples, Florida Orlando, Florida Zephyrhills, Florida Plainfield, Indiana Kenner, Louisiana Saint Louis, Missouri Las Vegas, Nevada Oklahoma City, Oklahoma Houston, Texas Kent, Washington"

301	Naturalized beyond native range	n
	Source(s)	Notes
	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. <a href="http://botany.si.edu/">http://botany.si.edu/</a> . [Accessed 4 Jan 2017]	No evidence to date

Qsn #	Question	Answer
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	n
	Source(s)	Notes
	Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	No species listed as weed. One species, <i>P. saundersii</i> , with an unconfirmed report of naturalization

401	Produces spines, thorns or burrs	y
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"branchlets 2.5-3 cm in diameter, often with white-pubescent apex covered with groups of 3 subequal straight spines, 1.5-20(-50) mm long, 1-3 mm in diameter at the base,"

402	Allelopathic	
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	[Unknown. Grows with other vegetation] "ECOLOGY. On sand in low dry forest. Alt. 0-100 m. Accompanied by <i>Pachypodium meridionale</i> , <i>Uncarina stellulifera</i> , <i>Didiereaceae</i> , <i>Delonix</i> sp., <i>Moringa hildebrandtii</i> , <i>Commiphora</i> sp. and <i>Operculicarya pachypus</i> ."

Qsn #	Question	Answer
403	Parasitic	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Candelabrum-shaped tree, 4-7 m high;" [Apocynaceae. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown, but spines, and potential toxicity, might deter browsing

405	Toxic to animals	y
	Source(s)	Notes
	Dave's Garden. 2017. Madagascar Palm - <i>Pachypodium geayi</i> . <a href="http://davesgarden.com/guides/pf/go/55760/">http://davesgarden.com/guides/pf/go/55760/</a> . [Accessed 4 Jan 2017]	"Danger: All parts of plant are poisonous if ingested Plant has spines or sharp edges; use extreme caution when handling"
	Stiles, D. (1998). The Mikea Hunter-Gatherers of Southwest Madagascar: Ecology and Socioeconomics. <i>African Study Monographs</i> 19(3): 127-148	" <i>Pachypodium geayi</i> ... Soak sapwood in water as bush pig poison; bark cloth"

406	Host for recognized pests and pathogens	n
	Source(s)	Notes
	PATSP. 2008. Tin Woodsman ( <i>Pachypodium geayi</i> and <i>P. lamerei</i> ). <a href="http://plantsarethe strangestpeople.blogspot.com">http://plantsarethe strangestpeople.blogspot.com</a> . [Accessed 4 Jan 2017]	"PESTS: I've never had a problem with pests on mine, or the ones at work. Rot can be a big problem, even on well-established plants, particularly if the plant has been injured. Mealybugs are not unheard of, and spider mites are a problem for everything else in the Apocynaceae, so I wouldn't be surprised by spider mites. None of these are particularly likely, persistent, or damaging, but they are contagious, so it's good to keep an eye out anyway."

407	Causes allergies or is otherwise toxic to humans	
	Source(s)	Notes
	PATSP. 2008. Tin Woodsman ( <i>Pachypodium geayi</i> and <i>P. lamerei</i> ). <a href="http://plantsarethe strangestpeople.blogspot.com">http://plantsarethe strangestpeople.blogspot.com</a> . [Accessed 4 Jan 2017]	"Another common feature of the Apocynaceae is poison. <sup>6</sup> All parts of <i>Pachypodiums</i> are poisonous, though I've never had any reactions as extreme as the one described here, which describes pain, numbness and swelling as the result of being stabbed by a thorn. I've heard rumors that the entire plant may not be poisonous: plantzafrica.com claims that the pith at the center of <i>P. geayi</i> can be strained through a cloth to yield a really unpleasant-sounding but technically edible sap. (Don't try this yourself, obviously.) I didn't see this confirmed anywhere else, though, so I'm kind of still skeptical about it being true."
	Dave's Garden. 2017. Madagascar Palm - <i>Pachypodium geayi</i> . <a href="http://davesgarden.com/guides/pf/go/55760/">http://davesgarden.com/guides/pf/go/55760/</a> . [Accessed 4 Jan 2017]	"Danger: All parts of plant are poisonous if ingested"

Qsn #	Question	Answer
	Bester, S. P. 2007. <i>Pachypodium</i> Lindl. PlantZAfrica. SANBI. <a href="https://www.plantzafrica.com/plantnop/pachypodium.htm">https://www.plantzafrica.com/plantnop/pachypodium.htm</a> . [Accessed 4 Jan 2017]	[Possible. Contradictory evidence] " <i>Pachypodium</i> falls in a group of the Apocynaceae notorious for poisonous properties and for yielding potent poisons that have been used most effectively in arrow poison since ancient times. The active principles in these poisons are usually glucosides with a digitalis-like action that stimulates the heart, and their effect is well known to hunters who often control and administer them with great skill." ... "The pith from the centre of <i>P. geayi</i> is squeezed through a cloth to give a slimy, bitter, but drinkable sap." ... "In times of shortage, the soft stems of <i>P. geayi</i> are mashed up to produce a sugary sap that is consumed as food."

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"HABIT. Tree up to 7 m high, with thick trunk, branching from 3 m height or more. ECOLOGY. On sand in low dry forest. Alt. 0-100 m." [No evidence. Unlikely given succulent trunk]

409	Is a shade tolerant plant at some stage of its life cycle	n
	Source(s)	Notes
	Learn 2 Grow. 2017. <i>Pachypodium geayi</i> . <a href="http://www.learn2grow.com/plants/pachypodium-geayi/">http://www.learn2grow.com/plants/pachypodium-geayi/</a> . [Accessed 4 Jan 2017]	"Sun Exposure Full Sun"
	Dave's Garden. 2017. Madagascar Palm - <i>Pachypodium geayi</i> . <a href="http://davesgarden.com/guides/pf/go/55760/">http://davesgarden.com/guides/pf/go/55760/</a> . [Accessed 4 Jan 2017]	"Sun Exposure: Full Sun Sun to Partial Shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	" <i>P. geayi</i> grows on Tertiary calcareous rocks, sand (dunes) and schists. The soil on the calcareous rock has a pH of 7."
	Learn 2 Grow. 2017. <i>Pachypodium geayi</i> . <a href="http://www.learn2grow.com/plants/pachypodium-geayi/">http://www.learn2grow.com/plants/pachypodium-geayi/</a> . [Accessed 4 Jan 2017]	"Soil type Sand"

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Candelabrum-shaped tree, 4-7 m high;"

412	Forms dense thickets	n
	Source(s)	Notes

Qsn #	Question	Answer
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	[No evidence] "ECOLOGY. On sand in low dry forest. Alt. 0-100 m. Accompanied by <i>Pachypodium meridionale</i> , <i>Uncarina stellulifera</i> , <i>Didiereaceae</i> , <i>Delonix</i> sp., <i>Moringa hildebrandtii</i> , <i>Commiphora</i> sp. and <i>Operculicarya pachypus</i> ."
<b>501</b>	<b>Aquatic</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	[Terrestrial] "LOW open deciduous, dry, southern forest and scrubland on Tertiary calcareous rocks, sand (dune) and schists. Alt. 2-300 m."
<b>502</b>	<b>Grass</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 4 Jan 2017]	Family: Apocynaceae Subfamily: Apocynoideae Tribe: Malouetieae
<b>503</b>	<b>Nitrogen fixing woody plant</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 4 Jan 2017]	Family: Apocynaceae Subfamily: Apocynoideae Tribe: Malouetieae
<b>504</b>	<b>Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"Candelabrum-shaped tree, 4-7 m high;"
<b>601</b>	<b>Evidence of substantial reproductive failure in native habitat</b>	<b>n</b>
	<b>Source(s)</b>	<b>Notes</b>
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	No evidence
<b>602</b>	<b>Produces viable seed</b>	<b>y</b>
	<b>Source(s)</b>	<b>Notes</b>
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"REPRODUCTION. By seeds."



Qsn #	Question	Answer
	Dave's Garden. 2017. Madagascar Palm - <i>Pachypodium geayi</i> . <a href="http://davesgarden.com/guides/pf/go/55760/">http://davesgarden.com/guides/pf/go/55760/</a> . [Accessed 4 Jan 2017]	"Seed Collecting: Bag seedheads to capture ripening seed Allow pods to dry on plant; break open to collect seeds Allow seedheads to dry on plants; remove and collect seeds Seed does not store well; sow as soon as possible"

603	Hybridizes naturally	
	Source(s)	Notes
	Eggl, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	[Unknown] "Occasional wild hybrids have been reported, and garden hybrids have been created, but none so fare between Madagascar and African species."

604	Self-compatible or apomictic	
	Source(s)	Notes
	Lipow, S. R., & Wyatt, R. (1999). Floral morphology and late-acting self-incompatibility in <i>Apocynum cannabinum</i> (Apocynaceae). <i>Plant Systematics and Evolution</i> , 219(1-2): 99-109	[Unknown for <i>P. geayi</i> ] "... five species of <i>Pachypodium</i> (Anderson 1983) are self compatible."

605	Requires specialist pollinators	y
	Source(s)	Notes
	Eggl, U. 2002. Illustrated handbook of succulent plants: Dicotyledons. Springer-Verlag, Berlin - Heidelberg - New York	"Pollination is as for <i>Adenium</i> ..." "... <i>Adenium</i> .. Pollination requires a long, slender proboscis to enter the lower chamber between one of the five slits in the androecial cone. Incoming pollen lands on the stigmatic area; as the proboscis is withdrawn it is gummed by contact with the knob of the style and picks up fresh pollen from the anthers above. In cultivation a cat's whisker or horse's tail hair can be used to cross-pollinate two plants."

606	Reproduction by vegetative fragmentation	n
	Source(s)	Notes
	LLIFLE - Encyclopedia of living forms. 2017. <i>Pachypodium geayi</i> . <a href="http://www.llifle.com/">http://www.llifle.com/</a> . [Accessed 4 Jan 2017]	"Propagation: Seeds or division. Fresh seeds results in a remarkable yield of new plants, perhaps 90%, Soak seeds in warm water for 24 hours before sowing in moist sand. Seed start sprouting in just 3-4 days ( but continue to germinate erratically for about 6 month). They are also propagated by removal of t"runcheons. Carefully cut off the offshoots, they should be allowed to dry for 5 to 8 days before potting up.
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"REPRODUCTION. By seeds."

607	Minimum generative time (years)	>3
	Source(s)	Notes

Qsn #	Question	Answer
	Staples, G.W. & Herbst, D.R. 2005. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI	"Pachypodium lamerei ... Potted specimens are young plants that do not flower until they have attained a height of several feet, which for this slow growing species takes several years; flowering rarely occurs indoors in any case." [Related taxon slow-growing and reaches maturity in 3+ years]
	LLIFLE - Encyclopedia of living forms. 2017. Pachypodium geayi. <a href="http://www.llifle.com/">http://www.llifle.com/</a> . [Accessed 4 Jan 2017]	[Probably 3+ years to maturity] "Growth rate: It is a fairly slow growing plant which in 10 years it can easily outgrow its indoor location, requiring a 'pruning'."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). Pachypodium (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"The seeds of Pachypodium spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant." [No evidence]

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	USDA, ARS, Germplasm Resources Information Network. 2017. National Plant Germplasm System [Online Database]. <a href="http://www.ars-grin.gov/npgs/index.html">http://www.ars-grin.gov/npgs/index.html</a> . [Accessed 4 Jan 2017]	". also cult."
	Rau, E. 2016. President, Sustainable Bioresources, LLC. Personal Communication. 29 December	"P. gaeyei (common/ready for sale)"
	Dave's Garden. 2017. Madagascar Palm - Pachypodium geayi. <a href="http://davesgarden.com/guides/pf/go/55760/">http://davesgarden.com/guides/pf/go/55760/</a> . [Accessed 4 Jan 2017]	Cultivated as an ornamental

703	Propagules likely to disperse as a produce contaminant	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). Pachypodium (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"The seeds of Pachypodium spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant." [Unlikely. No evidence]

Qsn #	Question	Answer
704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	[Yes, but may be ineffective over long distances] "The seeds of <i>Pachypodium</i> spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant."

705	Propagules water dispersed	n
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	[Unlikely. Tufted seeds may be buoyant, but occurs in dry forest] "The seeds of <i>Pachypodium</i> spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant. In addition, it is possible that insects, birds and also small rodents may disperse the seeds." ... "ECOLOGY. On sand in low dry forest. Alt. 0-100 m."

706	Propagules bird dispersed	
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"The seeds of <i>Pachypodium</i> spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant. In addition, it is possible that insects, birds and also small rodents may disperse the seeds." [Possibly No. Primarily adapted for wind dispersal]

707	Propagules dispersed by other animals (externally)	
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"The seeds of <i>Pachypodium</i> spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant. In addition, it is possible that insects, birds and also small rodents may disperse the seeds." [Possibly. Hairs may adhere to fur or feathers, or rodents may cache and disperse seeds]

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

Qsn #	Question	Answer
	Gordon, D. R., Mitterdorfer, B., Pheloung, P. C., Ansari, S., Buddenhagen, C., Chimera, C., ... & Williams, P. A. 2010). Guidance for addressing the Australian Weed Risk Assessment questions. <i>Plant Protection Quarterly</i> , 25(2): 56-74	"Answer 'no' where the taxon is unlikely to be eaten by animals or if seeds are not viable following passage through the gut."
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"The seeds of <i>Pachypodium</i> spp. are provided with awns suggesting that dispersal is by wind. However, according to Keraudren (1963) wind dispersal may not be very effective because the awns of the seeds separate easily or even as soon as the fruit follicles open, and the seeds will fall on the ground near the mother plant. In addition, it is possible that insects, birds and also small rodents may disperse the seeds." [Probably No. Seed dispersal, if any, by animals likely to occur externally]

801	Prolific seed production (>1000/m <sup>2</sup> )	
	Source(s)	Notes
	Rapanarivo, S.H.J.V. (1999). <i>Pachypodium</i> (Apocynaceae): Taxonomy, Ecology & Cultivation. CRC Press, Boca Raton, FL	"REPRODUCTION. By seeds." [Unknown, but probably no. No description of prolific seeding]

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	Notes
	Dave's Garden. 2017. Madagascar Palm - <i>Pachypodium geayi</i> . <a href="http://davesgarden.com/guides/pf/go/55760/">http://davesgarden.com/guides/pf/go/55760/</a> . [Accessed 4 Jan 2017]	"Seed does not store well; sow as soon as possible"
	PATSP. 2008. Tin Woodsman ( <i>Pachypodium geayi</i> and <i>P. lamerei</i> ). <a href="http://plantsarethe strangest people.blogspot.com">http://plantsarethe strangest people.blogspot.com</a> . [Accessed 4 Jan 2017]	"Usually, <i>Pachypodium</i> are grown from seed, and different websites report different degrees of success getting the seeds to sprout. The seeds don't store well, and are best used as soon as possible."

803	Well controlled by herbicides	
	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	y
	Source(s)	Notes
	LLIFLE - Encyclopedia of living forms. 2017. <i>Pachypodium geayi</i> . <a href="http://www.llifle.com/">http://www.llifle.com/</a> . [Accessed 4 Jan 2017]	[Presumably Yes] "Though branching is usually a response to natural injury, or something that happens in older specimens, one can stimulate branching by cutting off its top. It has amazing regenerative properties."

Qsn #	Question	Answer
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. 2017. Personal Communication	Unknown

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**Summary of Risk Traits:**

High Risk / Undesirable Traits

- Grows in tropical climates
- Spiny
- Possibly toxic
- Seeds likely dispersed by wind and people
- Able to regenerate after cutting

Low Risk / Desirable Traits

- No reports of invasiveness or naturalization, but no evidence of widespread introduction outside native range
- Landscaping and ornamental value
- Requires sandy soils
- Specialized pollinator requirements (likely limits seed set outside native range)
- Slow rate of growth
- Seeds reported to lose viability quickly (unlikely to form persistent seed bank)
- Not reported to spread vegetatively