

**Family:** *Arecaceae*

**Taxon:** *Aiphanes horrida*

**Synonym:** *Aiphanes aculeata* Willd. **Common Name:** ruffle palm  
*Aiphanes caryotifolia* (Kunth) H. Wendl spine palm  
*Aiphanes truncata* (Brongn. ex Mart.) H. Wen  
*Caryota horrida* Jacq. (basionym)  
*Martinezia caryotifolia* Kunth  
*Martinezia truncata* Brongn. ex Mart.  
*Tilimia caryotifolia* (Kunth) O. F. Cook

Questionnaire :	current 20090513	Assessor:	Patti Clifford	Designation:	H(HPWRA)
Status:	Assessor Approved	Data Entry Person:	Patti Clifford	WRA Score	7
101	Is the species highly domesticated?		y=-3, n=0		n
102	Has the species become naturalized where grown?		y=1, n=-1		
103	Does the species have weedy races?		y=1, n=-1		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"		(0-low; 1-intermediate; 2-high) (See Appendix 2)		High
202	Quality of climate match data		(0-low; 1-intermediate; 2-high) (See Appendix 2)		High
203	Broad climate suitability (environmental versatility)		y=1, n=0		y
204	Native or naturalized in regions with tropical or subtropical climates		y=1, n=0		y
205	Does the species have a history of repeated introductions outside its natural range?		y=-2, ?=-1, n=0		y
301	Naturalized beyond native range		y = 1*multiplier (see Appendix 2), n= question 205		y
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		y=1, n=0		
403	Parasitic		y=1, n=0		n
404	Unpalatable to grazing animals		y=1, n=-1		
405	Toxic to animals		y=1, n=0		n
406	Host for recognized pests and pathogens		y=1, n=0		
407	Causes allergies or is otherwise toxic to humans		y=1, n=0		n
408	Creates a fire hazard in natural ecosystems		y=1, n=0		n

409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	
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	y=1, n=-1	
604	Self-compatible or apomictic	y=1, n=-1	
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed	y=1, n=-1	
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/m2)	y=1, n=-1	
802	Evidence that a persistent propagule bank is formed (>1 yr)	y=1, n=-1	
803	Well controlled by herbicides	y=-1, n=1	
804	Tolerates, or benefits from, mutilation, cultivation, or fire	y=1, n=-1	
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score **7**

## Supporting Data:

101	2012. WRA Specialist. Personal Communication.	[Is the species highly domesticated? No] No evidence of domestication that reduces invasive traits.
102	2012. WRA Specialist. Personal Communication.	[Has the species become naturalized where grown? NA]
103	2012. WRA Specialist. Personal Communication.	[Does the species have weedy races? NA]
201	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"? 2 - High] Native region: Trinidad; Venezuela - Barinas, Miranda, Sucre, Brazil - Acre; Bolivia - Beni, La Paz, Pando, Santa Cruz; Colombia - Antioquia, Caldas, Casanare, Cundinamarca, Meta, Quindio, Tolima, Valle; Peru - Cuzco, Huanuco, Madre de Dios.
202	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Quality of climate match data? 2 - High] Native region: Trinidad; Venezuela - Barinas, Miranda, Sucre, Brazil - Acre; Bolivia - Beni, La Paz, Pando, Santa Cruz; Colombia - Antioquia, Caldas, Casanare, Cundinamarca, Meta, Quindio, Tolima, Valle; Peru - Cuzco, Huanuco, Madre de Dios.
203	1996. Borchsenius, F./Bernal, R.. <i>Aiphanes</i> (Palmae). <i>Flora Neotropica</i> . 70: 1-94.	[Broad climate suitability (environmental versatility)? Yes] <i>Aiphanes aculeata</i> (horrida) has a wide elevational range (0-1700 m).
203	2012. Palmpedia. <i>Aiphanes horrida</i> - Palmpedia [Accessed 13 November 2012]. <a href="http://www.palmpedia.net/wiki/Aiphanes_horrida">http://www.palmpedia.net/wiki/Aiphanes_horrida</a>	[Broad climate suitability (environmental versatility)? Yes] Native range is in dry forests between sea level and 1700 m (5600') above sea level in Bolivia, Brazil, Colombia, Peru, Trinidad and Tobago and Venezuela.
204	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl">http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl</a>	[Native or naturalized in regions with tropical or subtropical climates? Yes] Native region: Trinidad; Venezuela - Barinas, Miranda, Sucre, Brazil - Acre; Bolivia - Beni, La Paz, Pando, Santa Cruz; Colombia - Antioquia, Caldas, Casanare, Cundinamarca, Meta, Quindio, Tolima, Valle; Peru - Cuzco, Huanuco, Madre de Dios.
205	2012. Amazonia Files. <a href="http://www.amazonia-online.com/Palm_Species/Palm_Species/Entradas/2008/2/15_Aiphanes_aculeata.html">http://www.amazonia-online.com/Palm_Species/Palm_Species/Entradas/2008/2/15_Aiphanes_aculeata.html</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] Amazonia has seed for sale.
205	2012. Dave's Garden. PlantFiles: <i>Aiphanes aculeata</i> [Accessed 13 November 2012]. <a href="http://davesgarden.com/guides/pf/go/60808/">http://davesgarden.com/guides/pf/go/60808/</a>	[Does the species have a history of repeated introductions outside its natural range? Yes] Dave's Garden has seed for sale.
205	2012. Palmpedia. <i>Aiphanes horrida</i> - Palmpedia [Accessed 13 November 2012]. <a href="http://www.palmpedia.net/wiki/Aiphanes_horrida">http://www.palmpedia.net/wiki/Aiphanes_horrida</a>	[Does the species have a history of repeated introductions outside its natural range? ] Cultivated as an ornamental throughout the tropics.
301	2002. Svenning, J.C.. Non-native ornamental palms invade a secondary tropical forest in Panama. <i>Palms</i> . 46(2): 81-86.	[Naturalized beyond native range? Yes] Naturalized in a secondary forest (40-60 years old) in Panama. Common as immature and adults in most of the forest.
302	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? No] No evidence. [naturalized]
303	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No] No evidence. [naturalized]
304	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No] No evidence. [naturalized]
305	2012. Randall, R.P.. <i>A Global Compendium of Weeds</i> . 2nd Edition. Department of Agriculture and Food, Western Australia	[Congeneric weed? No] No evidence of another species in this genus as invasive.
401	2008. Renuka, C.. KFRRI Palmetum (Final report of the project KFRRI 444/04-Strengthening and enriching the Palmetum). Kerala Forest Research Institute, Kerala	[Produces spines, thorns or burrs? Yes] "This is a solitary, slender palm. Stem is highly prickly outside, dull grey in colour, about 5 m long and 5 cm in diameter. Leaves are pinnate and leaf sheath is triangular. The slender petiole along with the sheath is covered with black needle like spines."
401	2012. Palmpedia. <i>Aiphanes horrida</i> - Palmpedia [Accessed 13 November 2012]. <a href="http://www.palmpedia.net/wiki/Aiphanes_horrida">http://www.palmpedia.net/wiki/Aiphanes_horrida</a>	[Produces spines, thorns or burrs? Yes] " A solitary palm with pinnate leaves, armed with long sharp spines on nearly all parts, even the leaf surfaces."
402	2012. Palmpedia. <i>Aiphanes horrida</i> - Palmpedia [Accessed 13 November 2012]. <a href="http://www.palmpedia.net/wiki/Aiphanes_horrida">http://www.palmpedia.net/wiki/Aiphanes_horrida</a>	[Allelopathic? Unknown]

403	2010. Nickrent, D.. The parasitic plant connection. Department of Plant Biology, Southern Illinois University, Carbondale <a href="http://www.parasiticplants.siu.edu/index.html">http://www.parasiticplants.siu.edu/index.html</a>	[Parasitic? No] Arecaceae is not a parasitic family.
404	2008. Renuka, C.. KFRI Palmetum (Final report of the project KFRI 444/04-Strengthening and enriching the Palmetum). Kerala Forest Research Institute, Kerala	[Unpalatable to grazing animals"? Unknown]
405	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL <a href="http://books.google.com/books?id=h7tbd-5ZAQ8C&amp;pg=PA17&amp;lpg=PA17&amp;dq=International+poisonous+plants+checklist:+an+evidence-based+reference&amp;">http://books.google.com/books?id=h7tbd-5ZAQ8C&amp;pg=PA17&amp;lpg=PA17&amp;dq=International+poisonous+plants+checklist:+an+evidence-based+reference&amp;</a>	[Toxic to animals? No] No evidence.
405	2012. National Center for Biotechnology Information. PubMed. <a href="http://www.ncbi.nlm.nih.gov/sites/entrez">http://www.ncbi.nlm.nih.gov/sites/entrez</a>	[Toxic to animals? No] No evidence.
405	2012. Specialized Information Services, U.S. National Library of Medicine. TOXNET toxicology data network [online database]. National Institutes of Health, <a href="http://toxnet.nlm.nih.gov/">http://toxnet.nlm.nih.gov/</a>	[Toxic to animals? No] No evidence.
406	2012. WRA Specialist. Personal Communication.	[Host for recognized pests and pathogens? Unknown]
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL <a href="http://books.google.com/books?id=h7tbd-5ZAQ8C&amp;pg=PA17&amp;lpg=PA17&amp;dq=International+poisonous+plants+checklist:+an+evidence-based+reference&amp;">http://books.google.com/books?id=h7tbd-5ZAQ8C&amp;pg=PA17&amp;lpg=PA17&amp;dq=International+poisonous+plants+checklist:+an+evidence-based+reference&amp;</a>	[Causes allergies or is otherwise toxic to humans? No] No evidence.
407	2012. National Center for Biotechnology Information. PubMed. <a href="http://www.ncbi.nlm.nih.gov/sites/entrez">http://www.ncbi.nlm.nih.gov/sites/entrez</a>	[Causes allergies or is otherwise toxic to humans? No] No evidence.
407	2012. Specialized Information Services, U.S. National Library of Medicine. TOXNET toxicology data network [online database]. National Institutes of Health, <a href="http://toxnet.nlm.nih.gov/">http://toxnet.nlm.nih.gov/</a>	[Causes allergies or is otherwise toxic to humans? No] No evidence.
408	2012. WRA Specialist. Personal Communication.	[Creates a fire hazard in natural ecosystems? No] No evidence.
409	2008. Renuka, C.. KFRI Palmetum (Final report of the project KFRI 444/04-Strengthening and enriching the Palmetum). Kerala Forest Research Institute, Kerala	[Is a shade tolerant plant at some stage of its life cycle? Yes] Seedling needs partial shade. Fully grown plants can tolerate full sunlight.
409	2012. Dave's Garden. PlantFiles: <i>Aiphanes aculeata</i> [Accessed 13 November 2012]. <a href="http://davesgarden.com/guides/pf/go/60808/">http://davesgarden.com/guides/pf/go/60808/</a>	[Is a shade tolerant plant at some stage of its life cycle? Yes] Sun Exposure: Sun to Partial Shade
410	2012. Amazonia Files. <a href="http://www.amazonia-online.com/Palm_Species/Palm_Species/Entradas/2008/2/15_Aiphanes_aculeata.html">http://www.amazonia-online.com/Palm_Species/Palm_Species/Entradas/2008/2/15_Aiphanes_aculeata.html</a>	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] Can be grown on any type of soils even, calcareous.
410	2012. Dave's Garden. PlantFiles: <i>Aiphanes aculeata</i> [Accessed 13 November 2012]. <a href="http://davesgarden.com/guides/pf/go/60808/">http://davesgarden.com/guides/pf/go/60808/</a>	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? ] Soil pH requirements: 6.1 to 6.5 (mildly acidic) 6.6 to 7.5 (neutral) 7.6 to 7.8 (mildly alkaline)
410	2012. Hortipedia. <i>Aiphanes horrida</i> . <a href="http://en.hortipedia.com/wiki/Aiphanes_horrida">http://en.hortipedia.com/wiki/Aiphanes_horrida</a>	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Yes] <i>Aiphanes horrida</i> prefers a sunny site. It grows best in sandy or pebbly, loamy soil, sandy or loamy clay soil that is moist.
411	1996. Borchsenius, F./Bernal, R.. <i>Aiphanes</i> (Palmae). <i>Flora Neotropica</i> . 70: 1-94.	[Climbing or smothering growth habit? No] Palm.
412	2012. WRA Specialist. Personal Communication.	[Forms dense thickets? Unknown]
501	1996. Borchsenius, F./Bernal, R.. <i>Aiphanes</i> (Palmae). <i>Flora Neotropica</i> . 70: 1-94.	[Aquatic? No] Arecaceae; palm.

502	1996. Borchsenius, F./Bernal, R.. Aiphanes (Palmae). Flora Neotropica. 70: 1-94.	[Grass? No] Arecaceae; palm.
503	2010. www.nationmaster.com. Encyclopedia Nitrogen fixation. Nationmaster.com, <a href="http://www.nationmaster.com/encyclopedia/Nitrogen-fixation">http://www.nationmaster.com/encyclopedia/Nitrogen-fixation</a>	[Nitrogen fixing woody plant? No] Arecaceae.
504	1996. Borchsenius, F./Bernal, R.. Aiphanes (Palmae). Flora Neotropica. 70: 1-94.	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Palm.
601	1996. Borchsenius, F./Bernal, R.. Aiphanes (Palmae). Flora Neotropica. 70: 1-94.	[Evidence of substantial reproductive failure in native habitat? No] Common palm in native region.
602	1996. Borchsenius, F./Bernal, R.. Aiphanes (Palmae). Flora Neotropica. 70: 1-94.	[Produces viable seed? Yes] The germination time of Aiphanes horrida in the Botanical Garden in Caracas, Venezuela is reported to be 65 days.
602	2008. Renuka, C.. KFRI Palmetum (Final report of the project KFRI 444/04-Strengthening and enriching the Palmetum). Kerala Forest Research Institute, Kerala	[Produces viable seed? Yes] Seedlings need partial shade.
602	2012. Dave's Garden. PlantFiles: Aiphanes aculeata [Accessed 13 November 2012]. <a href="http://davesgarden.com/guides/pf/go/60808/">http://davesgarden.com/guides/pf/go/60808/</a>	[Produces viable seed? Yes] Propagate from seed.
603	2012. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2012. WRA Specialist. Personal Communication.	[Self-compatible or apomictic? Unknown]
605	1996. Borchsenius, F./Bernal, R.. Aiphanes (Palmae). Flora Neotropica. 70: 1-94.	[Requires specialist pollinators? No] Pollinated by bees and beetles.
606	2012. WRA Specialist. Personal Communication.	[Reproduction by vegetative fragmentation? Unknown]
607	2012. WRA Specialist. Personal Communication.	[Minimum generative time (years)? Unknown]
701	2012. WRA Specialist. Personal Communication.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] No evidence of plants growing in heavily trafficked areas.
702	2012. Amazonia Files. <a href="http://www.amazonia-online.com/Palm_Species/Palm_Species/Entradas/2008/2/15_Aiphanes_aculeata.html">http://www.amazonia-online.com/Palm_Species/Palm_Species/Entradas/2008/2/15_Aiphanes_aculeata.html</a>	[Propagules dispersed intentionally by people? Yes] Amazonia files has seed available.
702	2012. Dave's Garden. PlantFiles: Aiphanes aculeata [Accessed 13 November 2012]. <a href="http://davesgarden.com/guides/pf/go/60808/">http://davesgarden.com/guides/pf/go/60808/</a>	[Propagules dispersed intentionally by people? Yes] One of the members of Dave's Garden have Aiphanes for sale.
702	2012. Palmpedia. Aiphanes horrida - Palmpedia [Accessed 13 November 2012]. <a href="http://www.palmpedia.net/wiki/Aiphanes_horrida">http://www.palmpedia.net/wiki/Aiphanes_horrida</a>	[Propagules dispersed intentionally by people? Yes] Cultivated as an ornamental throughout the tropics.
703	2012. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence.
704	2012. Palmpedia. Aiphanes horrida - Palmpedia [Accessed 13 November 2012]. <a href="http://www.palmpedia.net/wiki/Aiphanes_horrida">http://www.palmpedia.net/wiki/Aiphanes_horrida</a>	[Propagules adapted to wind dispersal? No] Round fruits are bright red with an orange endocarp, 1-2.3 cm diameter.
705	2012. Palmpedia. Aiphanes horrida - Palmpedia [Accessed 13 November 2012]. <a href="http://www.palmpedia.net/wiki/Aiphanes_horrida">http://www.palmpedia.net/wiki/Aiphanes_horrida</a>	[Propagules water dispersed? Unknown] Round fruits are bright red with an orange endocarp, 1-2.3 cm diameter. [no information on buoyancy]
706	1996. Borchsenius, F./Bernal, R.. Aiphanes (Palmae). Flora Neotropica. 70: 1-94.	[Propagules bird dispersed? Yes] "The bright-red fruits of A. aculeata (horrida) are eaten and dispersed by the oilbird, Steatornis caripensis."
706	2012. Palmpedia. Aiphanes horrida - Palmpedia [Accessed 13 November 2012]. <a href="http://www.palmpedia.net/wiki/Aiphanes_horrida">http://www.palmpedia.net/wiki/Aiphanes_horrida</a>	[Propagules bird dispersed?] Round fruits are bright red with an orange endocarp, 1-2.3 cm diameter.
707	2012. Palmpedia. Aiphanes horrida - Palmpedia [Accessed 13 November 2012]. <a href="http://www.palmpedia.net/wiki/Aiphanes_horrida">http://www.palmpedia.net/wiki/Aiphanes_horrida</a>	[Propagules dispersed by other animals (externally)? No] Round fruits are bright red with an orange endocarp, 1-2.3 cm diameter. [No means of external attachment]
708	1996. Borchsenius, F./Bernal, R.. Aiphanes (Palmae). Flora Neotropica. 70: 1-94.	[Propagules survive passage through the gut? Yes] "The bright-red fruits of A. aculeata (horrida) are eaten and dispersed by the oilbird, Steatornis caripensis."
801	2012. WRA Specialist. Personal Communication.	[Prolific seed production (>1000/m2)? Unknown]

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802	2012. WRA Specialist. Personal Communication. [Evidence that a persistent propagule bank is formed (>1 yr)? Unknown]
803	2012. WRA Specialist. Personal Communication. [Well controlled by herbicides? Unknown]
804	2012. WRA Specialist. Personal Communication. [Tolerates, or benefits from, mutilation, cultivation, or fire? Unknown]
805	2012. WRA Specialist. Personal Communication. [Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

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## **Summary of Risk Traits**

### **High Risk / Undesirable Traits**

- Native to tropical regions
- Thrives in a diversity of climates
- Naturalized in secondary forests in Panama
- Armed (spines on nearly all parts of plant)
- Shade-tolerant (able to invade closed canopy forests)
- Tolerant of wide range of soil conditions
- Bird dispersed

### **Low Risk Desirable Traits**

- Not considered invasive (but naturalized)
- No species in the genus are considered invasive
- Non-toxic
- Limited dispersal mechanisms