

Family: *Areaceae*

Taxon: *Oenocarpus bataua Mart.*

Synonym: *Jessenia bataua* (Mart.) Burret [= *Oenocarpus*]
Jessenia polycarpa H. Karst. [= *Oenocarpus*]

Common Name: batua palm
kumbu
pataua palm
Sejepalme
pataua
pataua-branca
seje

Questionnaire :	current 20090513	Assessor:	Patti Clifford	Designation: EVALUATE
Status:	Assessor Approved	Data Entry Person:	Patti Clifford	WRA Score 2
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	
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	n
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	
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	y
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	>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/m2)	y=1, n=-1	n
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: EVALUATE

WRA Score 2

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 Resource Program. <i>Oenocarpus bataua</i> Mart. - Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland http://www.ars-grin.gov/cgi-bin/npgs/html/taxon	[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 distribution: Trinidad and Tobago - Trinidad; Panama; French Guiana; Guyana; Suriname; Venezuela - Amazonas, Bolivar; Brazil - Acre, Amazonas, Para, Rondonia; Bolivia - Beni, Pando, Santa Cruz; Columbia - Amazonas, Caqueta, Guainia, Guaviare, Meta, Putumayo, Vaupes, Vichada; Ecuador - Morona-Santiago, Napo; Peru - Huanuco, Junin, Loreto, Madre de Dios, San Martin.
202	2012. USDA, ARS, National Genetic Resource Program. <i>Oenocarpus bataua</i> Mart. - Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland http://www.ars-grin.gov/cgi-bin/npgs/html/taxon	[Quality of climate match data? 2 - high] Native distribution: Trinidad and Tobago - Trinidad; Panama; French Guiana; Guyana; Suriname; Venezuela - Amazonas, Bolivar; Brazil - Acre, Amazonas, Para, Rondonia; Bolivia - Beni, Pando, Santa Cruz; Columbia - Amazonas, Caqueta, Guainia, Guaviare, Meta, Putumayo, Vaupes, Vichada; Ecuador - Morona-Santiago, Napo; Peru - Huanuco, Junin, Loreto, Madre de Dios, San Martin.
203	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Broad climate suitability (environmental versatility)?] Usually grows in the lowlands but reaches 1000 m in the Andes.
203	2012. WRA Specialist. Personal Communication.	[Broad climate suitability (environmental versatility)? Unknown]
203	211. Gomes-Silva, D.A.P.. <i>Pataua</i> - <i>Oenocarpus bataua</i> Mart. In: Fruit trees and useful plants in Amazonian life. Food and Agriculture Organization of the United Nations, the Center for International Forestry Research and People and Plants International,	[Broad climate suitability (environmental versatility)?] The pataua occurs both in upland dry forest, swamp forests and along streams. It is found sparsely in upland dry forest, with 1–2 palms/ha,2 but in lower elevations it can become adominant species with up to 100 species/h.
204	2012. USDA, ARS, National Genetic Resource Program. <i>Oenocarpus bataua</i> Mart. - Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland http://www.ars-grin.gov/cgi-bin/npgs/html/taxon	[Native or naturalized in regions with tropical or subtropical climates? Yes] Native distribution: Trinidad and Tobago - Trinidad; Panama; French Guiana; Guyana; Suriname; Venezuela - Amazonas, Bolivar; Brazil - Acre, Amazonas, Para, Rondonia; Bolivia - Beni, Pando, Santa Cruz; Columbia - Amazonas, Caqueta, Guainia, Guaviare, Meta, Putumayo, Vaupes, Vichada; Ecuador - Morona-Santiago, Napo; Peru - Huanuco, Junin, Loreto, Madre de Dios, San Martin.
205	2012. WRA Specialist. Personal Communication.	[Does the species have a history of repeated introductions outside its natural range? No] No evidence of repeated introductions.
301	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Naturalized beyond native range? No] No evidence.
302	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? No] No evidence.
303	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Agricultural/forestry/horticultural weed? No] No evidence.
304	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No] No evidence.
305	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Congeneric weed? No] No evidence.
401	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Produces spines, thorns or burrs? No] "Stems solitary, 4-26m tall and 15-45 cm diameter. Leaves rather erect and very long; leaf sheaths with numerous soft fibers interspersed with long, rigid, black fibers, leaflets numerous."
402	2012. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]

403	2010. Nickrent, D.. The parasitic plant connection. Department of Plant Biology, Southern Illinois University, Carbondale http://www.parasiticplants.siu.edu/index.html	[Parasitic? No] Arecaceae.
404	2012. WRA Specialist. Personal Communication.	[Unpalatable to grazing animals? Unknown]
405	2012. National Center for Biotechnology Information. PubMed. http://www.ncbi.nlm.nih.gov/sites/entrez	[Toxic to animals? No] No evidence of toxicity.
405	2012. Specialized Information Services, U.S. National Library of Medicine. TOXNET toxicology data network [online database]. National Institutes of Health, http://toxnet.nlm.nih.gov/	[Toxic to animals? No] No evidence of toxicity.
406	2012. WRA Specialist. Personal Communication.	[Host for recognized pests and pathogens? Unknown]
407	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Causes allergies or is otherwise toxic to humans? No] A beverage is prepared from the fruits. Oil is also obtained from the fruits. The trunks are used in construction; the leaves are woven for baskets and leaf sheath fibers are used for blowgun darts. There are many other minor uses.
407	211. Gomes-Silva, D.A.P.. Pataua - Oenocarpus bataua Mart. In: Fruit trees and useful plants in Amazonian life. Food and Agriculture Organization of the United Nations, the Center for International Forestry Research and People and Plants International,	[Causes allergies or is otherwise toxic to humans? No] Pataua is most loved by caboclo communities, who use it to make juice and oil. The juice is consumed with game meat and farinha, and the oil is used to fry fish. Only the juice is sold in cities, but if you find the delicate and delicious pataua oil, it can be used instead of olive oil in salads and sautés, as its scent and flavour are similar. The seeds are used for necklaces, bracelets and earrings. Leaves are used for construction and the trunks are used for bridges and fences.
408	2012. WRA Specialist. Personal Communication.	[Creates a fire hazard in natural ecosystems? No] No evidence of biomass accumulation.
409	2012. Hawaiian Tropical Nursery, LLC. Oenocarpus bataua [Accessed October 10 2012]. http://www.store.hawaiiantropicalplants.com/main.sc;jsessionid=C0FED956049075641F35968B122D2A96.qscstrfrmt01	[Is a shade tolerant plant at some stage of its life cycle? Yes] Full sun to light shade.
409	211. Gomes-Silva, D.A.P.. Pataua - Oenocarpus bataua Mart. In: Fruit trees and useful plants in Amazonian life. Food and Agriculture Organization of the United Nations, the Center for International Forestry Research and People and Plants International,	[Is a shade tolerant plant at some stage of its life cycle? Yes] The tree can grow for many years in the shade of the forest. It needs light as an adult.
410	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)?] Known from flooded swamps and uplands of terra firma rainforests.
410	2012. WRA Specialist. Personal Communication.	[Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)? Unknown]
411	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Climbing or smothering growth habit? No] Palm.
412	2010. Cifuentes, L./Moreno, F./Arango, D.A.. Fenología reproductiva y productividad de Oenocarpus bataua (Mart.) en bosques inundables del Choco Biogeográfico, Columbia [online] Reproductive phenology and fruit productivity of Oenocarpus bataua (Mart.) in	[Forms dense thickets?] Oenocarpus bataua (Mart.) is a palm species forming highly dense stands in flooded forests of the Chocó Biogeographic region, Columbia. [unclear if the stands limit access or compete with other vegetation]
501	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Aquatic? No] Terrestrial; palm.
502	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Grass? No] Palm.
503	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Nitrogen fixing woody plant? No] Arecaceae.

504	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] Palm.
601	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Evidence of substantial reproductive failure in native habitat? No] <i>Oenocarpus bataua</i> is one of the most familiar palms of South American lowland forests.
602	2002. Stevenson, P.R./Castellanos, M.C./Pizarro, J.C./Garavito, M.. Effects of Seed Dispersal by Three Ateline Monkey Species on Seed Germination at Tinigua National Park, Colombia. International Journal of Primatology. 23(6): 1187-1204.	[Produces viable seed? Yes] Seeds of <i>Oenocarpus bataua</i> germinated after passing through the digestive system of ateline primates: woolly monkeys, <i>Lagothrix lagothericha</i> ; spider monkeys, <i>Ateles belzebuth</i> ; and, red howler, <i>Alouatta seniculus</i> > The seeds also germinated from the control group that were not ingested.
603	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Hybridizes naturally? Yes] Hybrids are common in the genus. <i>Oenocarpus bataua</i> has hybridized with <i>Oenocarpus mapora</i> and <i>Oenocarpus bacaba</i> .
604	2012. WRA Specialist. Personal Communication.	[Self-compatible or apomictic? Unknown]
605	2001. Listabarth, C.. Palm pollination by bees, beetles and flies: why pollinator taxonomy does not matter. The case of <i>Hyospathe elegans</i> (Arecaceae, Arecoideae, Areceae, Euterpeinae). Plant Species Biology. 16: 165-181.	[Requires specialist pollinators? No] "The most derived genus <i>Oenocarpus</i> differs from all other genera in inflorescence morphology and shows a specialized cantharophilous pollination system that involves pollinator reproduction in the flowers.
606	2012. WRA Specialist. Personal Communication.	[Reproduction by vegetative fragmentation? Unknown]
607	2008. Janick, J./Paull, R.E.. The Encyclopedia of Fruit & Nuts. Cabi Publishing, Wallingford, UK	[Minimum generative time (years)? >4] <i>Oenocarpus</i> takes 10-15 years to produce fruit.
607	211. Gomes-Silva, D.A.P.. Pataua - <i>Oenocarpus bataua</i> Mart. In: Fruit trees and useful plants in Amazonian life. Food and Agriculture Organization of the United Nations, the Center for International Forestry Research and People and Plants International,	[Minimum generative time (years)? >4] The <i>Oenocarpus bataua</i> takes 8-15 years to produce fruit.
701	2012. WRA Specialist. Personal Communication.	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] No evidence.
702	2012. Hawaiian Tropical Nursery, LLC. <i>Oenocarpus bataua</i> [Accessed October 10 2012]. http://www.store.hawaiiantropicalplants.com/main.sc?jsessionid=C0FED956049075641F35968B122D2A96.qscstrfrmt01	[Propagules dispersed intentionally by people? Yes] Hawaiian Tropical Plant Nursery, LLC on Hawaii has <i>Oenocarpus bataua</i> for sale.
703	2012. WRA Specialist. Personal Communication.	[Propagules likely to disperse as a produce contaminant? No] No evidence.
704	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Propagules adapted to wind dispersal? No] Fruits ellipsoid, 2.5-4.5 cm long and 2.2-2.5 cm. diameter.
705	2010. Cifuentes, L./Moreno, F./Arango, D.A.. Fenologia reproductiva y productividad de <i>Oenocarpus bataua</i> (Mart.) en bosques inundables del Choco Biogeografico, Columbia [online] Reproductive phenology and fruit productivity of <i>Oenocarpus bataua</i> (Mart.) in	[Propagules water dispersed?] <i>Oenocarpus bataua</i> (Mart.) is a palm species forming highly dense stands in flooded forests of the Chocó Biogeographic region, Columbia. [possibly]
705	211. Gomes-Silva, D.A.P.. Pataua - <i>Oenocarpus bataua</i> Mart. In: Fruit trees and useful plants in Amazonian life. Food and Agriculture Organization of the United Nations, the Center for International Forestry Research and People and Plants International,	[Propagules water dispersed? Yes] The patauá occurs both in upland dry forest, swamp forests and along streams. It is found sparsely in upland dry forest, with 1–2 palms/ha,2 but in lower elevations it can become adominant species with up to 100 species/h.

706	211. Gomes-Silva, D.A.P.. Pataua - <i>Oenocarpus bataua</i> Mart. In: Fruit trees and useful plants in Amazonian life. Food and Agriculture Organization of the United Nations, the Center for International Forestry Research and People and Plants International,	[Propagules bird dispersed? Yes] Tapir, deer, white-lipped peccary, the Brazilian porcupine and various types of monkeys eat pataua. Large birds, such as white-throated toucans, aracarís, macaws, guans, curassow and larger parrots, appreciate the fruit. The seed is dispersed intact throughout the forest by some of these animals, where it germinates.
707	1997. Henderson, A./Galeano, G./Bernal, R.. Field Guide to the Palms of the Americas. Princeton University Press, Princeton, NJ	[Propagules dispersed by other animals (externally)? No] Fruits ellipsoid, 2.5-4.5 cm long and 2.2-2.5 cm. diameter [no means of external attachment]
708	2008. Rojas-Robles, R./Correa, A./Serna-Sanchez, E.. Plantulas y distribución espacial de la palma <i>Oenocarpus bataua</i> , en un bosque de los Andes Colombianos [online] Seed shadows, seedling survival and spatial distribution of the palm <i>Oenocarpus bataua</i> , in	[Propagules survive passage through the gut? Yes] Squirrels (<i>Microsciurus mimulus</i>) <i>Sciurus granatensis</i>) and agoutis (<i>Dasyprocta punctata</i>) contribute to short-distance dispersal, although to a lesser degree they performed dispersal to greater distances (53-62 m).
708	211. Gomes-Silva, D.A.P.. Pataua - <i>Oenocarpus bataua</i> Mart. In: Fruit trees and useful plants in Amazonian life. Food and Agriculture Organization of the United Nations, the Center for International Forestry Research and People and Plants International,	[Propagules survive passage through the gut? Yes] Tapir, deer, white-lipped peccary, the Brazilian porcupine and various types of monkeys eat pataua. Large birds, such as white-throated toucans, aracarís, macaws, guans, curassow and larger parrots, appreciate the fruit. The seed is dispersed intact throughout the forest by some of these animals, where it germinates.
801	211. Gomes-Silva, D.A.P.. Pataua - <i>Oenocarpus bataua</i> Mart. In: Fruit trees and useful plants in Amazonian life. Food and Agriculture Organization of the United Nations, the Center for International Forestry Research and People and Plants International,	[Prolific seed production (>1000/m ²)? No] The small white flowers and fruit are arranged in a horse tail and can have up to 350 racemes on which the fruit are attached. A study in Ecuador found that the production of pataua palms varied from approximately 500–7000 fruits biennially.
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]

Summary of Risk Traits for Invasive Potential

High Risk

- Native to tropical regions
- Shade tolerant when young (can germinate in closed native forest)
- Forms highly dense stands in flooded forest (possibly outcompetes other vegetation)
- Hybridizes with other species in the same genus
- Dispersed by animals, birds and water

Low Risk

- Not currently naturalized or a weed elsewhere (not widely cultivated)
- Doesn't have spines, thorns or burrs (assists control efforts and limits unintentional dispersal)
- Non-toxic to humans and animals
- Edible fruit and palm oil
- Not a nitrogen-fixer
- Long generative time (8-15 years)
- Is not a prolific seed producer