

Family: *Sapindaceae*

Taxon: *Filicium decipiens*

Synonym: *Jurighas decipiens* (Wight & Arn.) Kuntze
Pteridophyllum decipiens (Wight & Arn.) Thunberg
Rhus decipiens Wight & Arn.

Common Name: Fern tree
Fern-leaf

Questionnaire :	current 20090513	Assessor:	Chuck Chimera	Designation:	EVALUATE
Status:	Assessor Approved	Data Entry Person:	Chuck Chimera	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	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	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)	
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	n
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	
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	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	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	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	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	n
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	2011. WRA Specialist. Personal Communication.	No evidence that species is highly domesticated.
102	2011. WRA Specialist. Personal Communication.	NA
103	2011. WRA Specialist. Personal Communication.	NA
201	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	" <i>Filicium decipiens</i> , fern tree, sometimes called fernleaf tree, is probably native to southeastern Africa but was long ago introduced to India."
202	2011. WRA Specialist. Personal Communication.	Highly suited to tropical and subtropical climates
203	1998. Riffle, R. L.. The Tropical Look - An Encyclopedia of Dramatic Landscape Plants. Timber Press, Portland, OR	"Zones 10 and 11; marginal in zone 10a"
204	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"India; natural; Sri Lanka: natural"
205	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"probably native to southeastern Africa, but was long ago introduced to India, where it is widely cultivated. It is also grown elsewhere in the tropics as a shade or street tree."
301	2003. Oppenheimer, H.L.. New plant records from Maui and Hawai'i Counties. Bishop Museum Occasional Papers. 73: 3-30.	" <i>Filicium</i> has also been observed to be sparingly naturalized along the lower portions of Iao Stream...Material examined: MAUI: West Maui, Lahaina Dist, Honokōwai Valley, 91 m, 24 Mar 2001, Oppenheimer H30134. HAWAII: S. Hilo Dist, Hilo, common in secondary, alien forest near Waiākea Stream, 37 m, 31 Jul 2001, Oppenheimer H70139."
301	2004. Starr, F./Starr, K./Loope, Lloyd L.. New plant records from the Hawaiian Archipelago. Bishop Museum Occasional Papers. 79: 20-30.	"A common tree that has escaped cultivation on O'ahu, West Maui, and Hawai'i (Staples et al., 2002; Oppenheimer, 2003), <i>F. decipiens</i> is now also known from East Maui, where it is locally established in Kīhei. This collection represents a range extension to East Maui. Material examined: MAUI: East Maui, Kīhei, Kama'ole, Liholo Pl., seedling under trees and nearby, spreading from plantings, 140 ft [42 m], 17 Jun 2002, Starr & Starr 020617-2."
301	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"Although fern tree is attractive and easy to grow, it has several drawbacks...the fruit is eaten by birds and, which disperse the seeds into vacant lots, hedgerows, and secondary forests. Fern tree is naturalized, at least on Oahu, and its continued use as a landscape ornamental should be discouraged."
301	2008. Mascaro, J./Becklund, K.K./Hughes, R.F./Schnitzer, S.A.. Limited native plant regeneration in novel, exotic-dominated forests on Hawai'i. Forest Ecology and Management. 256: 593-606.	"Novel forests also lacked some structural elements common to Hawaiian forests, notably understory tree ferns (Palmer, 2002). Some sites included a minor component of escaped agricultural species, such as <i>Macadamia integrifolia</i> (Macadamia nut), <i>Musa X paradisiaca</i> (banana), and <i>Coffea arabica</i> (coffee), as well as escaped ornamentals (e.g., <i>Filicium decipiens</i> [fern tree])."
301	2010. Lau, J-W.. Botanical Survey of unmaintained areas surrounding McBryde Garden, National Tropical Botanical Garden, Kaua'i. Kaua'i Community College, Lihue, HI	"Distribution: Established in vacant lots, hedgerows, and secondary forests on O'ahu, and also naturalized on Maui and the island of Hawai'i, one immature twelve foot tall <i>F. decipiens</i> was detected in the unmanaged <i>L. leucocephala</i> forest behind the Ficus Area in Middle Valley." [Kauai]
302	2007. Randall, R.P.. Global Compendium of Weeds - <i>Filicium decipiens</i> [Online Database]. Hawaii Ecosystems at Risk Project (HEAR), http://www.hear.org/gcw/species/filicium_decipiens/	No evidence
303	2007. Randall, R.P.. Global Compendium of Weeds - <i>Filicium decipiens</i> [Online Database]. Hawaii Ecosystems at Risk Project (HEAR), http://www.hear.org/gcw/species/filicium_decipiens/	No evidence
304	1999. Motooka, P.. Herbicides for Weed Control Workshop. Hawai'i Forestry News. 1(1): http://www2.ctahr.hawaii.edu/forestry/Newsletter_Pages/renewable_resources_extension__h.htm	"Basal bark application of a ready to use solution of Pathfinder II (trichlopyr), streaking the bottom 12 inches of trunk, caused defoliation of <i>Psidium cattleianum</i> (strawberry guava), <i>Schinus terebinthifolius</i> (Christmas berry), and <i>Filicium decipiens</i> (fern tree) after six weeks." [inclusion of <i>Filicium</i> in these herbicide trials implies that it is being considered as a target for control]
305	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. http://www.hear.org/gcw/	No evidence of congeneric weeds

401	1976. Woodson, Jr., R. E./Schery, R. W./Croat, T.B. Flora of Panama. Part VI. Family 108. Sapindaceae. Annals of the Missouri Botanical Garden. 63(3): 419-540.	"Small or medium-sized, polygamous trees; younger branches weakly sulcate with lepidote scales." [no evidence of spines, thorns or burrs]
402	2001. De Costa, W.A.J.M./Hitinayake, H.M.G.S.B./Dharmawardena, I.U.. A physiological investigation into the invasive behaviour of some plant species in a mid-country forest reserve in Sri Lanka. J. Natn. Sci. Foundation Sri Lanka. 29(1 & 2): 35-50.	"The vegetation structure of Udawattakelle displays the typical canopy layers of a wet tropical rainforest. The most common tree species which form the canopy are <i>Swietenia macrophylla</i> (Mahogany), <i>Michelia champaca</i> (Gini-sapu) and <i>Mesua ferrea</i> (Na). The sub-canopy is formed by tree species such as <i>Filicium decipiens</i> (Pihimbiya) and <i>Euphorbia longana</i> (Mora). The forest floor has several plant species belonging to different growth- and plant forms including seedlings of trees and shrubs, herbaceous erect plants, vines and ferns. The forest contained areas of almost completely closed canopy cover as well as canopy gaps and open areas." [co-exists with other species with no evidence of allelopathy reported]
403	1976. Woodson, Jr., R. E./Schery, R. W./Croat, T.B. Flora of Panama. Part VI. Family 108. Sapindaceae. Annals of the Missouri Botanical Garden. 63(3): 419-540.	"Small or medium-sized, polygamous trees" [not parasitic]
404	2011. WRA Specialist. Personal Communication.	Palatability of foliage unknown
405	2011. WRA Specialist. Personal Communication.	No evidence of toxicity to animals
406	2008. Hodges, G.S./Hodges, A.C./Unruh, C.M.. A new exotic pest for Florida's natural areas: (<i>Crypticerya genistae</i> (Hemiptera: Monophlebidae). Florida Entomologist. 91(2): 335-337.	"We report for the first time the presence in Florida and the Continental United States of <i>Crypticerya genistae</i> (Hempel) (Hemiptera: Monophlebidae) (Figs. 1 and 2), an invasive scale insect native to Brazil. <i>Crypticerya genistae</i> was described by Hempel (1912) (as <i>Icerya genistae</i>) from specimens collected on <i>Genista scoparia</i> (L.) Lam., <i>Lespedeza striata</i> (Thunb.) Hook. & Arn., and <i>Fragaria L.</i> species from Brazil. There is very little information available on the biology of this insect. It is reported as a pest of vegetable crops including peppers, tomatoes, eggplants and peanuts (Barbados Ministry of Agriculture (http://barbados.gov.bb))." [host of pest in Florida, but unknown from Hawaii]
407	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"Some people appear to be allergic to fern trees in flower."
408	2002. Dharani, N.. Field guide to common trees & shrubs of East Africa. Struik Publishers, Cape Town, South Africa	"...occurs in riverine forest and swampy sites in forests " [no evidence of and unlikely to create fire hazards in natural ecosystems]
409	1995. Matthew, K. M.. An excursion flora of Central Tamilnadu, India. CRC Press, Boca Raton, FL	"in moist ravines/shady floor of sholas; copious regeneration."
409	1998. Riffle, R. L.. The Tropical Look - An Encyclopedia of Dramatic Landscape Plants. Timber Press, Portland, OR	"Sun to partial shade"
410	1998. Riffle, R. L.. The Tropical Look - An Encyclopedia of Dramatic Landscape Plants. Timber Press, Portland, OR	"Average well-drained soil...not fussy about soil or watering..."
411	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Tree to 12 m high" [not climbing or smothering]
412	1999. Lovett, J.C.. Tanzanian Forest Tree Plot Diversity and Elevation. Journal of Tropical Ecology. 15(5): 689-694.	"Anthropic disturbance for cultivation is associated with low species richness. Three low diversity plots from the Southern Udzungwa mountains at around 750-1025 m elevation in the Kihansi Gorge are dominated by <i>Filicium decipiens</i> (Wight & Arn.) Thw. (Sapindaceae), a tree that occurs throughout eastern Africa and in Asia. The <i>Filicium</i> forest is adjacent to species rich forest at the same elevation (Lovett et al. 1997). The <i>Filicium</i> forest plots are significantly less diverse than the other plots (mean species per plot = 3 + 15, two-tailed t-test, P < 0.0001)." [low species diversity, but no evidence of monotypic thickets forming]
501	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	Terrestrial
502	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	Sapindaceae

503	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	Sapindaceae [not nitrogen fixing]
504	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Tree to 12 m high" [not a geophyte]
601	2011. WRA Specialist. Personal Communication.	No evidence of substantial reproductive failure in native habitat
602	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Propagate by seeds, the technique most used."
603	2011. WRA Specialist. Personal Communication.	Ability to hybridize unknown
604	2011. Kubitzki, K. (ed.). The Families and Genera of Vascular Plants. Vol. X. Flowering Plants. Eudicots: Sapindales, Cucurbitales, Myrtaceae. Springer, New York	"Falsely polygamous trees...Flowers actinomorphic, functionally unisexual..." [self-compatibility unknown]
605	1976. Woodson, Jr., R. E./Schery, R. W./Croat, T.B.. Flora of Panama. Part VI. Family 108. Sapindaceae. Annals of the Missouri Botanical Garden. 63(3): 419-540.	"Flowers with the sepals narrowly ovate, to 5 mm long, narrowly rounded at the apex, glabrate on the outer surface, villous along the margins and on the inner surface; petals ovate, 1.5 mm long, glabrous on the surfaces, ciliolate; disc plate shaped, woolly on the upper surface; stamens exserted, the filaments flattened, glabrous; staminate flowers with the stamens ca. 2.5 mm long, the anthers ovoid, ca. 0.5 mm long, the pistil ovoid, minute, glabrous; pistillate flowers not seen." [flowers unspecialized]
605	1994. Zomlefer, W.B.. Guide to Flowering Plant Families. The University of North Carolina Press, Chapel Hill & London	"Generally, the small flowers are aggregated into conspicuous inflorescences, and bees (as well as other insects and hummingbirds) visit for the copious nectar produced by the disc. However, a few species (e.g., in Acer and Dodonaea) are anemophilous." [Family description]
606	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Propagate by seeds, the technique most used." [No evidence of reproduction by vegetative fragmentation]
607	1986. Randhawa, G.S./Mukhopadhyay, A.. Floriculture in India. Allied Publishers, New Delhi, India	"The plant is slow growing" [and reaches reproductive maturity in 4+ years, R. Criley, CTAHR, UH Manoa, pers. Comm.]
701	1976. Woodson, Jr., R. E./Schery, R. W./Croat, T.B.. Flora of Panama. Part VI. Family 108. Sapindaceae. Annals of the Missouri Botanical Garden. 63(3): 419-540.	"Fruit drupaceous, ovoid, 1-1.5 cm long, smooth, dark purple...seeds 1-2; embryo curved." [no evidence, and no means of external attachment]
702	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"It is also grown elsewhere in the tropics as a shade or street tree."
702	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"widely planted around Honolulu as a street tree" [ornamental & landscaping]
703	1976. Woodson, Jr., R. E./Schery, R. W./Croat, T.B.. Flora of Panama. Part VI. Family 108. Sapindaceae. Annals of the Missouri Botanical Garden. 63(3): 419-540.	"seeds 1-2; embryo curved." [No evidence that trees are grown with or seeds contaminate produce]
704	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Fruit a shiny purple ovoid drupe." [no adaptations for wind dispersal]
705	1993. Lovett, J.C./Pócs, T.. Assessment of the condition of the Catchment Forest Reserves, a botanical appraisal. Morogoro Region. Eastern Arc Mountains Conservation Endowment Fund, Morogoro, Tanzania http://www.easternarc.or.tz/links	"In depressions and along streamlets on travertine banks swamp forest occurs with Pandanus cf. engleri and an undergrowth of Cremaspora triflora, Filicium decipiens, Justicia interrupta, Pavetta sp., and Psychotria schliebenii." [suggests possible water dispersal]
705	2002. Dharani, N.. Field guide to common trees & shrubs of East Africa. Struik Publishers, Cape Town, South Africa	"...occurs in riverine forest and swampy sites in forests " [unknown if water dispersed, but distribution along rivers suggests possibility of water dispersal]

706	2000. Staples, G.W./Herbst, D.R/Imada, C.T.. Survey of invasive or potentially invasive cultivated plants in Hawai'i. Bishop Museum Occasional Papers. 65: 1-35.	"Among the best-known bird-dispersed plants, mostly woody perennials, are the octopus tree (<i>Schefflera actinophylla</i>), the two species of fiddlewood (<i>Citharexylum caudatum</i> , <i>C. spinosum</i>), Chinese banyan (<i>Ficus microcarpa</i>), fern tree (<i>Filicium decipiens</i>), miconia (<i>Miconia calvescens</i>), ivy gourd (<i>Coccoloba grandis</i>), Fukien tea or Philippine tea (<i>Carmona retusa</i>), various members of the grape family (<i>Cissus</i> spp., <i>Tetrastigma</i> spp.), several species of asparagus (<i>Asparagus</i> spp.), two ardisias (<i>Ardisia crenata</i> , <i>A. elliptica</i>), at least three firethorns (<i>Pyracantha</i> spp.), and lantana (<i>Lantana camara</i>)."
706	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Fruit a shiny purple ovoid drupe." [fleshy-fruits adapted for bird dispersal]
706	2002. Dharani, N.. Field guide to common trees & shrubs of East Africa. Struik Publishers, Cape Town, South Africa	"Ripe fruit are eaten by birds."
706	2005. Staples, G. W./Herbst, D. R.. A Tropical Garden Flora - Plants Cultivated in the Hawaiian Islands and Other Tropical Places. Bishop Museum Press, Honolulu, HI.	"Although fern tree is attractive and easy to grow, it has several drawbacks...the fruit is eaten by birds and, which disperse the seeds into vacant lots, hedgerows, and secondary forests."
708	2000. Whistler, W.A.. Tropical Ornamentals: A Guide. Timber Press, Portland, OR	"Fruit a shiny purple ovoid drupe."
708	2010. Mudappa, D./Kumar, A./Chellam, R.. Diet and fruit choice of the brown palm civet <i>Paradoxurus jerdoni</i> , a viverrid endemic to the Western Ghats rainforest, India. <i>Tropical Conservation Science</i> . 3 (3): 282-300.	"Appendix 1. The percent occurrence of seeds and other remains in scats (percentage of items, Fi) of the brown palm civet in the tropical rainforest of Kalakad-Mundanthurai Tiger Reserve, 1996–1999 (number of scats in parentheses)." [includes viable <i>F. decipiens</i> seeds]
801	2011. WRA Specialist. Personal Communication.	Unknown
802	1986. Randhawa, G.S./Mukhopadhyay, A.. Floriculture in India. Allied Publishers, New Delhi, India	"It is propagate from freshly harvested seeds."
802	1999. Macmillan, H.F.. Tropical planting and gardening with special reference to Ceylon. Asian Educational Services, New Delhi, India	"Produces in March-April quantities of soft fleshy seed, which are of short vitality."
803	1999. Motooka, P.. Herbicides for Weed Control Workshop. Hawai'i Forestry News. 1(1): http://www2.ctahr.hawaii.edu/forestry/Newsletter_Pages/renewable_resources_extension__h.htm	"Basal bark application of a ready to use solution of Pathfinder II (trichlopyr), streaking the bottom 12 inches of trunk, caused defoliation of <i>Psidium cattleianum</i> (strawberry guava), <i>Schinus terebinthifolius</i> (Christmas berry), and <i>Filicium decipiens</i> (fern tree) after six weeks." [no indication if herbicides effectively control species]
804	2011. WRA Specialist. Personal Communication.	Unknown
805	2011. WRA Specialist. Personal Communication.	Unknown