

Key Words: High Risk, Naturalized, Shrub/Small Tree, Self-Compatible, Bird-dispersed

Family: *Myrsinaceae*

Taxon: *Ardisia sieboldii*

Synonym: *Ardisia formosana* Rolfe
Bladhia sieboldii (Miq.) Nakai
Tinus sieboldii (Miq.) Kuntze

Common Name: Duo Zhi Zi Jin Niu

Questionnaire :	current 20090513	Assessor:	Chuck Chimera	Designation:	H(HPWRA)
Status:	Assessor Approved	Data Entry Person:	Chuck Chimera	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		
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		y
302	Garden/amenity/disturbance weed		n=0, y = 1*multiplier (see Appendix 2)		
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)		y
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		n
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	y
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	n
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	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	

Designation: H(HPWRA)

WRA Score 7

Supporting Data:

101	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Is the species highly domesticated? No] No evidence
102	2012. WRA Specialist. Personal Communication.	NA
103	2012. WRA Specialist. Personal Communication.	NA
201	1997. Pascarella, J.B.. Breeding Systems of <i>Ardisia</i> Sw. (Myrsinaceae). <i>Brittonia</i> . 49(1): 45-53.	[Species suited to tropical or subtropical climate(s) 2-High] " <i>Ardisia sieboldii</i> Miq. (subgen. <i>Akosmos</i>) is a small tree native to subtropical forests in China, Japan, the Bonin, and Ryukyu islands (Mez, 1902; Shimizu, 1994)."
202	1997. Pascarella, J.B.. Breeding Systems of <i>Ardisia</i> Sw. (Myrsinaceae). <i>Brittonia</i> . 49(1): 45-53.	[Quality of climate match data 2-High]
203	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Broad climate suitability (environmental versatility)? Unknown] "Mixed forests, thickets, mountains, hillsides; 100–600 m. Fujian, Taiwan, Zhejiang [S Japan]."
203	2012. My Garden. <i>Ardisia sieboldii</i> . http://www.mygarden.net.au/gardening/ardisia-sieboldii/3630/1	[Broad climate suitability (environmental versatility)? Unknown] "...a zone hardy plant that has medicinal uses"
204	1997. Pascarella, J.B.. Breeding Systems of <i>Ardisia</i> Sw. (Myrsinaceae). <i>Brittonia</i> . 49(1): 45-53.	[Native or naturalized in regions with tropical or subtropical climates? Yes] " <i>Ardisia sieboldii</i> Miq. (subgen. <i>Akosmos</i>) is a small tree native to subtropical forests in China, Japan, the Bonin, and Ryukyu islands (Mez, 1902; Shimizu, 1994)."
205	2012. WRA Specialist. Personal Communication.	[Does the species have a history of repeated introductions outside its natural range? No evidence]
301	2006. Daehler, C. C./Baker, R. F.. New Records of Naturalized and Naturalizing Plants Around Lyon Arboretum, Mānoa Valley, O'ahu. Bishop Museum Occasional Papers. 87: 3-18.	[Naturalized beyond native range? Yes] "Species Showing Signs of Naturalization" ... "Four <i>A. sieboldii</i> were planted near the <i>A. virens</i> in Haukulu in 1979. They have yet to be eliminated. Seedlings occur in the vicinity of the plantings, but they do not seem to be spreading nearly as aggressively as <i>A. virens</i> . <i>Ardisia sieboldii</i> , from Japan, can become a small tree. The leaves are dark green with a lighter midrib and no marginal crenulations. The new growth is green (whereas the new growth of <i>A. elliptica</i> is reddish). Material examined: O'AHU: Cultivated with seedlings nearby, Haukulu, Lyon Arboretum 24 May 2005, C. Daehler 1210 (HAW)."
302	2006. Daehler, C. C./Baker, R. F.. New Records of Naturalized and Naturalizing Plants Around Lyon Arboretum, Mānoa Valley, O'ahu. Bishop Museum Occasional Papers. 87: 3-18.	[Garden/amenity/disturbance weed? Targeted for eradication in Lyon Arboretum] "Four <i>A. sieboldii</i> were planted near the <i>A. virens</i> in Haukulu in 1979. They have yet to be eliminated. Seedlings occur in the vicinity of the plantings, but they do not seem to be spreading nearly as aggressively as <i>A. virens</i> . <i>Ardisia sieboldii</i> , from Japan, can become a small tree. The leaves are dark green with a lighter midrib and no marginal crenulations. The new growth is green (whereas the new growth of <i>A. elliptica</i> is reddish). Material examined: O'AHU: Cultivated with seedlings nearby, Haukulu, Lyon Arboretum 24 May 2005, C. Daehler 1210 (HAW)."
303	2007. Randall, R.P.. Global Compendium of Weeds - Index. http://www.hear.org/gcw/	[Agricultural/forestry/horticultural weed? No evidence to date]
304	2007. Randall, R.P.. Global Compendium of Weeds - Index. http://www.hear.org/gcw/	[Environmental weed No evidence to date]
305	2003. Weber, E.. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK	[Congeneric weed? Yes] <i>Ardisia crenata</i> : "Where invasive, it becomes dominant in the understorey and forms dense stands...". <i>Ardisia elliptica</i> : "The shrub is shade-tolerant and forms dense monotypic stands..."
305	2006. Kitajima, K./Fox, A.M./Sato, T./Nagamatsu, D.. Cultivar selection prior to introduction may increase invasiveness: evidence from <i>Ardisia crenata</i> . <i>Biological Invasions</i> . 8: 1471-1482.	[Congeneric weed? Yes] " <i>Ardisia crenata</i> (Myrsinaceae), an evergreen shrub with attractive red fruits introduced from Japan to the USA for ornamental purpose, invades the understory of mesic hardwood forests, forming dense patches (up to 300 stems per m ²), and competitively displaces native understory plants by creating dense local shade."

401	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Produces spines, thorns or burrs? No] "Shrubs or rarely small trees to 10 m tall. Branchlets terete 2–3 mm in diam., sparsely brown scaly when young, finely wrinkled. Petiole marginate, 5–10 mm; leaf blade obovate to oblanceolate, 7–14 x 2–4 cm, leathery, dull adaxially, glabrous or sometimes minutely brown scaly abaxially, base cuneate, margin entire, usually revolute, apex broadly to narrowly acute; lateral veins 14–25 on each side of midrib, inconspicuous, marginal vein obscure. Inflorescences axillary, near ends of branches, paniculate, branches subumbellate or cymose, 3–4(–7) cm, glabrous."
402	2003. Fujii, Y./Parvez, S. S./Parvez, M.M./Ohmae, Y./Iida, O.. Screening of 239 medicinal plant species for allelopathic activity using the sandwich method. Weed Biology and Management. 3: 233–241.	[Allelopathic? Unknown] "Table 1. Screening of leaf litter of 239 medicinal plant species under different families using the sandwich method" [Unknown for <i>A. sieboldii</i> . A related species, <i>Ardisia lurida</i> , did not have statistically significant inhibitory effects in laboratory trials]
403	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Parasitic? No] "Shrubs or rarely small trees to 10 m tall."
404	2004. Tsujino, R./Yumoto, T.. Effects of sika deer on tree seedlings in a warm temperate forest on Yakushima Island, Japan. Ecological Research. 19: 291–300.	[Unpalatable to grazing animals? No] "Table 3 No. individuals (height ≥ 30 cm, d.b.h. < 1 cm) in the study plot (2500 m ²) and ratios of deer preference of each species (= no. herbivored individuals over total no. species)" [<i>Ardisia sieboldii</i> browsed by sika deer]
404	2011. Agetsuma, N./Agetsuma-Yanagihara, Y./Takafumi, H.. Food habits of Japanese deer in an evergreen forest : Litterfeeding deer. Mammalian Biology. 76(2): 201-207.	[Unpalatable to grazing animals? No] "Identified food species and part of Japanese sika deer in a warm temperate broad leaved forest" [Includes fallen leaves, branches, fruits, and living leaves of <i>Ardisia sieboldii</i>]
405	2004. Tsujino, R./Yumoto, T.. Effects of sika deer on tree seedlings in a warm temperate forest on Yakushima Island, Japan. Ecological Research. 19: 291–300.	[Toxic to animals? No evidence] Browsed by sika deer
406	1988. Hamon, A.B.. <i>Lepidosaphes laterochitinosus</i> Green. Entomology Circular No. 304. Fla. Dept. Agric. & Consumer Serv. Division of Plant Industry, Gainesville, FL	[Host for recognized pests and pathogens? Possibly] " <i>Lepidosaphes laterochitinosus</i> , an armored scale insect, was intercepted twice in Florida during 1987 on <i>Aglaonema</i> spp. from the Philippine Islands. In both cases the insects were alive. This scale insect is not known to occur in Florida; therefore, steps were taken to insure that it did not become established." ... "The economic importance is unknown, but with all scale insects there is potential economic impact when they are introduced into areas without their natural enemies." [<i>Ardisia sieboldii</i> listed among host plants]
406	2006. Howard, F.W./Pemberton, R.W./Hodges, G.S./Steinberg, B./McLean, D./Liu, H.. Host Plant Range of Lobate Lac Scale, <i>Paratachardina lobata</i> , in Florida. Proceedings of the Florida State Horticultural Society. 119: 398-408.	[Host for recognized pests and pathogens? Potentially] "A list of host plant species of lobate lac scale, <i>Paratachardina lobata</i> (Chamberlin) (Hemiptera: Coccoidea: Kerriidae), in southern Florida was compiled from the authors' observations and records of the Florida State Collection of Arthropods." [<i>Ardisia sieboldii</i> listed among host plants]
407	2008. Wagstaff, D.J.. International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	[Causes allergies or is otherwise toxic to humans? Probably No] No evidence
407	2012. Plants for a Future Database. <i>Ardisia sieboldii</i> . http://www.pfaf.org/user/Plant.aspx?LatinName=Ardisia+sieboldii	[Causes allergies or is otherwise toxic to humans? No evidence] "Known Hazards: None known" ... "Fruit - cooked. A famine food used when all else fails[177]."
408	1998. Hsieh, C.F./Chen, Z.S./Hsu, Y.M./Yang, K.C./Hsieh, T.H.. Altitudinal Zonation of Evergreen Broad-Leaved Forest on Mount Lopei, Taiwan. Journal of Vegetation Science. 9(2): 201-212.	[Creates a fire hazard in natural ecosystems? No evidence from Taiwan] "Fire and large-scale geomorphic disturbance such as landslides are important determinants of forest composition in the central mountains of Taiwan (Chen et al. 1986; Hsieh et al. 1989). However, in the very humid climate and relatively stable land forms of the Lopei forests their roles are very minor."
408	2009. Fujii, S./Kubota, Y./Enoki, T.. Resilience of stand structure and tree species diversity in subtropical forest degraded by clear logging. Journal of Forest Research. 14: 373-387.	[Creates a fire hazard in natural ecosystems? No] "The study was conducted in a subtropical forest in the northern mountainous region on Okinawa Island, southern Japan. This region is located between the warm-temperate and tropical zones (Miyawaki 1980)." [Fire not frequent in this community]
409	1998. Hsieh, C.F./Chen, Z.S./Hsu, Y.M./Yang, K.C./Hsieh, T.H.. Altitudinal Zonation of Evergreen Broad-Leaved Forest on Mount Lopei, Taiwan. Journal of Vegetation Science. 9(2): 201-212.	[Is a shade tolerant plant at some stage of its life cycle? Presumably Yes] "The major canopy trees (see type name) are accompanied by <i>Ardisia sieboldii</i> and <i>Turpinia formosana</i> as main subcanopy trees" [Subcanopy Tree]

409	2000. Yamashita, N./Ishida, A./Kushima, H./Tanaka, N.. Acclimation to Sudden Increase in Light Favoring an Invasive over Native Trees in Subtropical Islands, Japan. <i>Oecologia</i> . 125(3): 412-419.	[Is a shade tolerant plant at some stage of its life cycle? Yes] "The late-successional <i>A. sieboldii</i> showed a limited ability to respond to increasing light in both Amax and new leaf production (Figs. 3, 4). This species grows mostly in the shaded understory throughout its life span."
410	2012. My Garden. <i>Ardisia sieboldii</i> . http://www.mygarden.net.au/gardening/ardisia-sieboldii/3630/1	[Tolerates a wide range of soil conditions? Unknown] "The plant prefers a well-drained humus rich soil in partial shade in a position sheltered from cold drying winds."
410	2012. Plants for a Future Database. <i>Ardisia sieboldii</i> . http://www.pfaf.org/user/Plant.aspx?LatinName=Ardisia+sieboldii	[Tolerates a wide range of soil conditions? Yes] "The plant prefers light (sandy), medium (loamy) and heavy (clay) soils and requires well-drained soil. The plant prefers acid, neutral and basic (alkaline) soils."
411	1996. Wu, Z.Y./Raven, P.H. (eds.). <i>Flora of China</i> . Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Climbing or smothering growth habit? No] "Shrubs or rarely small trees to 10 m tall."
412	1996. Wu, Z.Y./Raven, P.H. (eds.). <i>Flora of China</i> . Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Forms dense thickets? Unknown] "Mixed forests, thickets, mountains, hillsides; 100–600 m. Fujian, Taiwan, Zhejiang [S Japan]."
412	1998. Pascarella, J.B.. Resiliency and Response to Hurricane Disturbance in a Tropical Shrub, <i>Ardisia escallonioides</i> (Myrsinaceae), in South Florida. <i>American Journal of Botany</i> . 85(9): 1207-1215.	[Forms dense thickets? Possibly. Density unknown] "Compared to other species, <i>A. sieboldii</i> had a very high capacity for resprouting, which allowed it to dominate the subcanopy following severe hurricane disturbance (Shimizu, 1994)."
412	2010. Kawakami, K./Okochi, I.. Restoring the Oceanic Island Ecosystem: Impact and Management of Invasive Alien Species in the Bonin Islands. Springer, New York	[Forms dense thickets? Possibly] " <i>Ardisia sieboldii</i> is shade tolerant and occurs at high density, but its maximum size is much less than that of <i>B. javanica</i> ."
501	1996. Wu, Z.Y./Raven, P.H. (eds.). <i>Flora of China</i> . Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Aquatic? No] "Shrubs or rarely small trees to 10 m tall." [Terrestrial]
502	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Grass? No] Family: Primulaceae subfamily: Myrsinoideae. Also placed in: Myrsinaceae
503	2012. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Nitrogen fixing woody plant? No] Family: Primulaceae subfamily: Myrsinoideae. Also placed in: Myrsinaceae
504	1996. Wu, Z.Y./Raven, P.H. (eds.). <i>Flora of China</i> . Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Shrubs or rarely small trees to 10 m tall. Branchlets terete 2–3 mm in diam., sparsely brown scaly when young, finely wrinkled."
601	1996. Wu, Z.Y./Raven, P.H. (eds.). <i>Flora of China</i> . Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Evidence of substantial reproductive failure in native habitat? No] No evidence
601	2008. Weerasinghe, U.R./Akiko, S./Palitha, J./Seiki, T.. The Role of the Soil Seed Bank in Vegetation Recovery on an Oceanic Island Severely Damaged by Introduced Goats. <i>Applied Vegetation Science</i> . 11: 355-364.	[Evidence of substantial reproductive failure in native habitat? No] No evidence
602	1997. Pascarella, J.B.. Breeding Systems of <i>Ardisia</i> Sw. (Myrsinaceae). <i>Brittonia</i> . 49(1): 45-53.	[Produces viable seed? Yes] " <i>Ardisia elliptica</i> , <i>A. wallichii</i> , and <i>A. sieboldii</i> produced viable seeds with endosperm and embryos regardless of pollination treatment except for the agamospermy treatment."
603	1997. Pascarella, J.B.. Breeding Systems of <i>Ardisia</i> Sw. (Myrsinaceae). <i>Brittonia</i> . 49(1): 45-53.	[Hybridizes naturally? Unknown]

604	1997. Pascarella, J.B.. Breeding Systems of <i>Ardisia</i> Sw. (Myrsinaceae). <i>Brittonia</i> . 49(1): 45-53.	[Self-compatible or apomictic? Yes] "Five species (<i>A. escallonioides</i> Schldl. & Cham., <i>A. hirtella</i> Lundell, <i>A. elliptica</i> Thunb., <i>A. sieboldii</i> Miq., and <i>A. wallichii</i> A. DC.) from three subgenera in the genus <i>Ardisia</i> (Myrsinaceae) were examined for self compatibility, agamospermy, and autogamy using hand-pollination and pollinator exclusion experiments on both garden plants and wild populations. All five species are self compatible but not agamospermous."
605	1994. Zomlefer, W.B.. Guide to Flowering Plant Families. The University of North Carolina Press, Chapel Hill & London	[Requires specialist pollinators? No evidence] "Little has been reported on the pollination biology of the flowers of the family, which are entomophilous."
605	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Requires specialist pollinators? No evidence] "Inflorescences axillary, near ends of branches, paniculate, branches subumbellate or cymose, 3–4(–7) cm, glabrous. Flowers membranous, white, ca. 3 mm. Pedicel ca. 5 mm, brown scaly. Sepals ovate, 1–1.5 mm, sparsely punctate, margin entire, ciliate, apex acute. Petals nearly free, broadly ovate, inconspicuously punctate, glabrous, apex acute. Stamens ca. 3/4 as long as petals; filaments equal to anther length; anthers ovate, prominently black or inconspicuous pellucid punctate dorsally, dehiscent by pores opening into large longitudinal slits, apex apiculate. Pistil ca. as long as petals; ovary glabrous, punctate; ovules numerous, multiseriate."
605	1997. Pascarella, J.B.. Breeding Systems of <i>Ardisia</i> Sw. (Myrsinaceae). <i>Brittonia</i> . 49(1): 45-53.	[Requires specialist pollinators? No] "Protogyny is associated with selection for increased outcrossing (Webb, 1981). Both <i>Ardisia sieboldii</i> and <i>A. escallonioides</i> are protogynous, as the stigma extends beyond the unopened corolla bud one day before flower opening. In both species, stigmas are receptive at this stage. Bees frequently contact these stigmas in bud flowers while visiting adjacent open flowers (Pascarella, 1996)." ... "Flowering phenology in <i>Ardisia</i> species is related to inflorescence position. Species with terminal panicles, such as <i>A. escallonioides</i> and <i>A. sieboldii</i> , are characterized by the synchronized production of many inflorescences with many small flowers during single or multiple flowering episodes (Pascarella, 1995). Synchronized mass flowering may be needed to attract sufficient pollinators (Janzen, 1966; Opler et al., 1980) if pollinators are generalist bees such as halictids (Eickwort, 1989; Pascarella, 1996)."
606	1998. Pascarella, J.B.. Resiliency and Response to Hurricane Disturbance in a Tropical Shrub, <i>Ardisia escallonioides</i> (Myrsinaceae), in South Florida. <i>American Journal of Botany</i> . 85(9): 1207-1215.	[Reproduction by vegetative fragmentation? Possibly] "Following a typhoon in the Bonin Islands of Japan, <i>Ardisia sieboldii</i> resprouted extensively from bent over stems. Compared to other species, <i>A. sieboldii</i> had a very high capacity for resprouting, which allowed it to dominate the subcanopy following severe hurricane disturbance (Shimizu, 1994)." [Unknown if stem or other fragments will resprout and allow for vegetative spread]
607	2000. Yamashita, N./Ishida, A./Kushima, H./Tanaka, N.. Acclimation to Sudden Increase in Light Favoring an Invasive over Native Trees in Subtropical Islands, Japan. <i>Oecologia</i> . 125(3): 412-419.	[Minimum generative time (years)? Unknown] The late-successional <i>A. sieboldii</i> showed a limited ability to respond to increasing light in both Amax and new leaf production (Figs. 3, 4). This species grows mostly in the shaded understorey throughout its life span." [Late successional tree may have a slower growth rate]
701	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Propagules likely to be dispersed unintentionally? No] "Fruit globose, red to blackish, ca. 7 mm in diam., somewhat fleshy." [No evidence, and seeds lack means of external attachment]
702	2012. Plants for a Future Database. <i>Ardisia sieboldii</i> . http://www.pfaf.org/user/Plant.aspx?LatinName=Ardisia+sieboldii	[Propagules dispersed intentionally by people? Yes] Ornamental uses
703	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Propagules likely to disperse as a produce contaminant? No] "Fruit globose, red to blackish, ca. 7 mm in diam., somewhat fleshy." [No evidence, and unlikely vector of spread]
704	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Propagules adapted to wind dispersal? No] "Fruit globose, red to blackish, ca. 7 mm in diam., somewhat fleshy."
705	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Propagules water dispersed? No] "Fruit globose, red to blackish, ca. 7 mm in diam., somewhat fleshy." ... "Mixed forests, thickets, mountains, hillsides; 100–600 m. Fujian, Taiwan, Zhejiang [S Japan]." [Although possible, fruit morphology and habitat suggest water is not a likely dispersal vector]
706	1996. Nakanishi, H.. Fruit Color and Fruit Size of Bird-Disseminated Plants in Japan. <i>Vegetatio</i> . 123(2): 207-218.	[Propagules bird dispersed? Yes] "Appendix 1. Ripe season, color and size of bird disseminated fruits in warm-temperate and cool-temperate Japan" [<i>Ardisia sieboldii</i> : Ripe Season = Winter; Color = Black; Length = 7.2 ± 0.2; Width = 8.3 ± 0.3]

706	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Propagules bird dispersed? Yes] "Fruit globose, red to blackish, ca. 7 mm in diam., somewhat fleshy."
706	1997. Noma, N./Yumoto, T.. Fruiting phenology of animal-dispersed plants in response to winter migration of frugivores in a warm temperate forest on Yakushima Island, Japan. Ecological Research. 12: 119-129.	[Propagules bird dispersed? Yes] "The pale thrush (<i>Turdus pallidus</i> , gape width 12.1 mm) consumed sapfruit of <i>Ardisia sieboldii</i> , which are smaller than 6.7 mm."
706	2008. Weerasinghe, U.R./Akiko, S./Palitha, J./Seiki, T.. The Role of the Soil Seed Bank in Vegetation Recovery on an Oceanic Island Severely Damaged by Introduced Goats. Applied Vegetation Science. 11: 355-364.	[Propagules bird dispersed? Yes] " <i>Ardisia sieboldii</i> trees may have once dominated the island, and this tree has small fleshy fruits. It is likely that the Bonin White Eye may have been a disperser of the seeds of this tree species as well as other fleshy-fruit bearing woody species and pioneer species."
707	1998. Yumoto, T./Noma, N./Maruhashi, T.. Cheek-pouch Dispersal of Seeds by Japanese Monkeys (<i>Macaca fuscata yakui</i>) on Yakushima Island, Japan. Primates. 39(3): 325-338.	[Propagules dispersed by other animals (externally)? No] Although monkeys spat seeds from the cheek pouch while moving, most of the seeds dispersed via cheek-pouch were deposited when monkeys rested. We observed up to 55 seeds of <i>Ardisia sieboldii</i> and 26 seeds of <i>Litsea acuminata</i> in a place where an adult male monkey rested." [Fruits and seeds lack means of external attachment, although they may be transported in native range without passage through the guts of dispersers]
708	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Propagules survive passage through the gut? Presumably Yes] "Fruit globose, red to blackish, ca. 7 mm in diam., somewhat fleshy."
708	1997. Noma, N./Yumoto, T.. Fruiting phenology of animal-dispersed plants in response to winter migration of frugivores in a warm temperate forest on Yakushima Island, Japan. Ecological Research. 12: 119-129.	[Propagules survive passage through the gut? Presumably Yes] "The pale thrush (<i>Turdus pallidus</i> , gape width 12.1 mm) consumed sapfruit of <i>Ardisia sieboldii</i> , which are smaller than 6.7 mm."
708	2010. Nakagawa, N.. The Japanese Macaques. Springer, Tokyo	[Propagules survive passage through the gut? Yes] "Table 6.1 Frequency of occurrence and number of seeds in Japanese macaques' feces collected at the western coastal area of yakushima Island." [<i>Ardisia sieboldii</i> consumed and passed by Japanese macaques]
801	1996. Wu, Z.Y./Raven,P.H. (eds.). Flora of China. Vol. 15 (Myrsinaceae through Loganiaceae). Science Press & Missouri Botanical Garden Press, Beijing & St. Louis	[Prolific seed production (>1000/m2)? Probably No] "Fruit drupaceous, 1-seeded, punctate, sometimes longitudinally ribbed, with somewhat fleshy exocarp and crusty or slightly bony endocarp. Seeds covered by membranous remnants of placenta." [Genus description] "Shrubs or rarely small trees to 10 m tall." ... "Fruit globose, red to blackish, ca. 7 mm in diam., somewhat fleshy."
802	2008. Weerasinghe, U.R./Akiko, S./Palitha, J./Seiki, T.. The Role of the Soil Seed Bank in Vegetation Recovery on an Oceanic Island Severely Damaged by Introduced Goats. Applied Vegetation Science. 11: 355-364.	[Evidence that a persistent propagule bank is formed (>1 yr)? Longevity Unknown]
803	2007. Sellers, B.A./Langeland, K.A./Ferrell, J.A./Meisenberg, M./Walter, J.. Identification and Control of Coral <i>Ardisia</i> (<i>Ardisia crenata</i>): A Potentially Poisonous Plant. SS AGR 276. University of Florida IFAS Ext., Gainesville, FL edis.ifas.ufl.edu/pdf/i	[Well controlled by herbicides? Possibly. Herbicides are used effectively on <i>Ardisia crenata</i>] "Control of coral <i>ardisia</i> can be accomplished by two methods. Low-volume foliar applications of 5% v/v of Garlon 4 or Remedy provides suppression of this plant, but complete foliar coverage is essential. Basal bark applications with an 18% v/v solution of Garlon 4 or Remedy in an oil carrier can also be utilized for suppressing this invasive weed."
804	1998. Pascarella, J.B.. Resiliency and Response to Hurricane Disturbance in a Tropical Shrub, <i>Ardisia escallonioides</i> (Myrsinaceae), in South Florida. American Journal of Botany. 85(9): 1207-1215.	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "The ability to resprout following hurricane disturbance is an important characteristic of tropical trees in hurricane-prone areas (Boucher et al., 1994; Zimmerman et al., 1994; Howard and Schokman, 1995; Slater et al., 1995)." ... "Other <i>Ardisia</i> species are also good resprouters following hurricane disturbance, suggesting this may be a widespread characteristic of the genus. Following a typhoon in the Bonin Islands of Japan, <i>Ardisia sieboldii</i> resprouted extensively from bent over stems. Compared to other species, <i>A. sieboldii</i> had a very high capacity for resprouting, which allowed it to dominate the subcanopy following severe hurricane disturbance (Shimizu, 1994)."
805	2012. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown] Given the abundance of <i>Ardisia elliptica</i> and <i>A. crenata</i> in the Hawaiian Islands, no serious pests or pathogens of <i>Ardisia</i> are present.

Summary of Risk Traits

High Risk / Undesirable Traits

- Naturalized on Oahu
- Related *Ardisia* species are highly invasive
- Shade tolerant
- Self-compatible
- Bird-dispersed
- High capacity for resprouting

Low Risk / Desirable Traits

- Palatable to deer and other browsing animals
- Non-toxic
- Landscaping and ornamental value