

Family: Rutaceae

Taxon: Chloroxylon swietenia

Synonym: Swietenia chloroxylon Roxb.

Common Name East Indian satinwood  
Ceylon Satinwood  
Buruta

Questionnaire :	current 20090513	Assessor:	Chuck Chimera	Designation: L
Status:	Assessor Approved	Data Entry Person:	Chuck Chimera	WRA Score -3
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	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	n
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	
406	Host for recognized pests and pathogens		y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans		y=1, n=0	y
408	Creates a fire hazard in natural ecosystems		y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle		y=1, n=0	n
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)		y=1, n=0	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	n
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	
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	n
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	n
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed	y=1, n=-1	n
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
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	y
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	y=-1, n=1	
<b>Designation: L</b>		<b>WRA Score</b>	<b>-3</b>

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**Supporting Data:**

101	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	" Little work has been carried out on the genetic improvement and mass propagation of the species." [No evidence that the species highly domesticated]
102	2011. WRA Specialist. Personal Communication.	NA
103	2011. WRA Specialist. Personal Communication.	NA
201	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"C. swietenia is a slow-growing deciduous tree of medium size (maximum height 32 m and maximum diameter 2.7 m), occurring naturally in the dry, lowland, deciduous forests of Sri Lanka and the southern Indian peninsula."
202	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"...occurring naturally in the dry, lowland, deciduous forests of Sri Lanka and the southern Indian peninsula."
203	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"Climatic amplitude (estimates) - Altitude range: 0 - 250 m - Mean annual rainfall: 750 - 1500 mm - Rainfall regime: bimodal - Dry season duration: 3 - 4 months - Mean annual temperature: 20 - 38°C - Mean maximum temperature of hottest month: 35 - 48°C - Mean minimum temperature of coldest month: 3 - 18°C - Absolute minimum temperature: > 2°C"
204	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"...occurring naturally in the dry, lowland, deciduous forests of Sri Lanka and the southern Indian peninsula."
205	1989. Keay, R.W.J.. Trees of Nigeria. Clarendon Press, Oxford, UK	"...sometimes cultivated..."
205	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"Africa - Nigeria, planted"
205	2008. Louppe, D./Oteng-Amoako, A.A./Brink, M.. Timbers 1: volume 7 of plant resources of tropical Africa. PROTA, Wageningen, Netherlands	"In Africa cultivation has been tried in e.g. Nigeria and Madagascar."
301	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence of naturalization
302	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence
303	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence
304	2007. Randall, R.P.. Global Compendium of Weeds [Online Database]. <a href="http://www.hear.org/gcw/">http://www.hear.org/gcw/</a>	No evidence
305	2008. Asouti, E./Fuller, D.Q.. Trees and woodlands of south India: archaeological perspectives. Left Coast Press, Walnut Creek, CA	"This is a monotypic genus endemic to South India."
401	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	No spines, thorns, or burrs
402	2011. World Agroforestry Center. Agroforestry Tree Database - Albizia amara. PROSEA, <a href="http://www.worldagroforestrycentre.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SplD=1735">http://www.worldagroforestrycentre.org/sea/Products/AFDbases/af/asp/SpeciesInfo.asp?SplD=1735</a>	"The most common associates met are xerophytic species such as <i>Annogeissus latifolia</i> , <i>Boswellia serrata</i> , <i>Chloroxylon swietenia</i> , <i>Dalbergia paniculata</i> and <i>Ziziphus mauritiana</i> ." [co-occurs with several other species, with no mention of or evidence of allelopathy]
403	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	Not parasitic
404	1985. Dittus, W.P.J.. The Influence of Cyclones on the Dry Evergreen Forest of Sri Lanka. Biotropica. 17(1): 1-14.	"The leaves and leaf-shoots of <i>Walsura piscidia</i> , <i>Alangium salviifolium</i> and <i>Chloroxylon swietenia</i> were highly preferred food items for both langurs at Polonnaruwa before and after the cyclone (Hladik and Hladik 1972 and personal observation)"
404	1985. Dittus, W.P.J.. The Influence of Leaf-Monkeys on their Feeding Trees in a Cyclone-Disturbed Environment. Biotropica. 17(2): 100-106.	"Three of the lost tree species, <i>Walsura piscidia</i> , <i>Chloroxylon swietenia</i> , and <i>Alangium salviifolium</i> , were preferentially browsed by the langurs. Hence, it is possible that overbrowsing by langurs contributed to the change in floristic composition of the forest"

405	2008. Asouti, E./Fuller, D.Q.. Trees and woodlands of south India: archaeological perspectives. Left Coast Press, Walnut Creek, CA	"Essential oil from the leaves and stems and several isolated compounds displayed significant mosquitocidal activity by fumigation against <i>Aedes aegypti</i> , <i>Anopheles gambiae</i> and <i>Culex quinquefasciatus</i> , as well as activity against tobacco cutworm, <i>Spodoptera litura</i> . Methanol extracts of dried leaves exhibited good analgesic activity in mice."
405	2010. Palani, S./Raja, S./Senthil Kumar, B.. Hepatoprotective and antioxidant potential of <i>Chloroxylon swietenia</i> (Rutaceae) On Acetaminophen Induced toxicity in Male Albino Rats. International Journal of PharmTech Research. 2(1): 162-170.	"Abstract: <i>Chloroxylon swietenia</i> is a folklore medicinal plant that is commonly used for antimicrobial, antifertility, analgesic, insecticidal, antifeedant activities..." [toxicity to animals unknown, but possible due to allergenic sap. Ss 4.07]
406	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"Pests recorded Insects: <i>Aeolesthes induta</i> <i>Indarbela quadrinotata</i> (bark eating caterpillar) <i>Psiloptera cupreosplendens</i> <i>Xylosandrus compactus</i> (shot-hole borer) <i>Xylosandrus discolor</i> " [pests of many species. No indication that <i>C. swietenia</i> is an important alternate host of pests or pathogens]
407	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"it is also a skin irritant containing the alkaloid chloroxylonine."
407	2011. Floracafe. Plant Database - Botany Search - <i>Chloroxylon swietenia</i> DC.. <a href="http://www.floracafe.com/Search_PhotoDetails.aspx?Photo=Top&amp;Id=742">http://www.floracafe.com/Search_PhotoDetails.aspx?Photo=Top&amp;Id=742</a>	"The bark contains powerful irritant and causes dermatitis when comes in contact with the skin. "
408	2007. Ecocrop. <i>Chloroxylon swietenia</i> . FAO, <a href="http://ecocrop.fao.org/ecocrop/srv/en/cropView?id=4516">http://ecocrop.fao.org/ecocrop/srv/en/cropView?id=4516</a>	"It is easily damaged by fire." [not adapted to fire, & no evidence that this tree increases fire risk]
408	2008. Louppe, D./Oteng-Amoako, A.A./Brink, M.. Timbers 1: volume 7 of plant resources of tropical Africa. PROTA, Wageningen, Netherlands	"In its natural habitat <i>Chloroxylon swietenia</i> occurs in dry deciduous forest on poor, well drained sandy or rocky soils, at low to medium altitudes. It occurs in regions with an annual rainfall of 750–1500 mm." [Occurs in dry areas, but no evidence of increased fire risk]
409	2006. Khurana, E./Sagar, R./Singh, J.S.. Seed size: a key trait determining species distribution and diversity of dry tropical forest in northern India. Acta Oecologica. 29: 196 -204.	"Table 1." [ <i>C. swietenia</i> listed as IT = relatively shade-intolerant]
409	2008. Asouti, E./Fuller, D.Q.. Trees and woodlands of south India: archaeological perspectives. Left Coast Press, Walnut Creek, CA	"It is shade-intolerant and colonises readily forest clearings."
410	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	" A particular advantage of this species is its ability to grow on shallow, infertile and rocky soils in areas subjected to high temperatures and drought...Soil descriptors - Soil texture: light; medium - Soil drainage: free - Soil reaction: neutral - Special soil tolerances: shallow; infertile"
410	2008. Asouti, E./Fuller, D.Q.. Trees and woodlands of south India: archaeological perspectives. Left Coast Press, Walnut Creek, CA	"It grows successfully even on poor sand and laterite soils and is found commonly on sandstone formations."
411	2008. Asouti, E./Fuller, D.Q.. Trees and woodlands of south India: archaeological perspectives. Left Coast Press, Walnut Creek, CA	"It is a moderate-size deciduous tree abounding in the dry deciduous forests of the inner peninsula." [not climbing or smothering]
412	2008. Louppe, D./Oteng-Amoako, A.A./Brink, M.. Timbers 1: volume 7 of plant resources of tropical Africa. PROTA, Wageningen, Netherlands	No evidence
501	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	" <i>C. swietenia</i> is a slow-growing deciduous tree of medium size (maximum height 32 m and maximum diameter 2.7 m), occurring naturally in the dry, lowland, deciduous forests of Sri Lanka and the southern Indian peninsula." [terrestrial]
502	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	Rutaceae
503	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	Rutaceae [not a nitrogen fixing woody plant]
504	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"...a slow-growing deciduous tree of medium size (maximum height 32 m and maximum diameter 2.7 m)..." [not a geophyte]

601	2011. IUCN. IUCN red list: Chloroxylon swietenia. <a href="http://www.iucnredlist.org/apps/redlist/details/33260/0">http://www.iucnredlist.org/apps/redlist/details/33260/0</a>	"It is a slow-growing species which has become very scarce in most areas because of timber exploitation." [reproductive failure due to over-exploitation]
602	1997. Murali, K.S.. Patterns of Seed Size, Germination and Seed Viability of Tropical Tree Species in Southern India. Biotropica. 29(3): 271-279.	"Appendix I: The list of species describing the time of flowering, fruiting date, seed weight (g), seed viability and day to germination. * indicate the species having seed dormancy" [Entry for Chloroxylon swietenia: Flowering time = Mar-Apr; Fruiting time = Jun-Aug; Seed weight (g) = 0.0250; Viability (d) = 180; Germination (d) = 18]
603	2008. Asouti, E./Fuller, D.Q.. Trees and woodlands of south India: archaeological perspectives. Left Coast Press, Walnut Creek, CA	"This is a monotypic genus endemic to South India." [no evidence of intergeneric hybridization]
604	1994. Zomlefer, W.B.. Guide to Flowering Plant Families. The University of North Carolina Press, Chapel Hill & London	"Cross-pollination of perfect flowers generally is reinforced by marked protandry, although some species (e.g. Citrus, Poncirus) are self-compatible (Brizicky 1962)." [Rutaceae family description. Self-compatibility of Chloroxylon swietenia unknown]
604	2008. Louppe, D./Oteng-Amoako, A.A./Brink, M.. Timbers 1: volume 7 of plant resources of tropical Africa. PROTA, Wageningen, Netherlands	"Flowers bisexual, regular, 5-merous, small: pedicel c. 5 mm long; calyx with deltoid lobes, c. 3 mm long; petals free, elliptical, up to 3.5 mm long, slightly clawed, fringed, white, spreading, short-hairy on both sides; stamens 10, free, c. 22 mm long; disk 10-lobed, thick, densely short-hairy; ovary superior, ovoid, slightly 3-lobed, sparsely to densely short-hairy, 3-celled, immersed in disk, style short, slender, stigma head-shaped, small."
605	1994. Zomlefer, W.B.. Guide to Flowering Plant Families. The University of North Carolina Press, Chapel Hill & London	"With strong scent, abundant nectar (from the discs), and often showy corollas, rutaceous flowers generally attract flies and bees as principal pollinators." [Family description]
605	2008. Louppe, D./Oteng-Amoako, A.A./Brink, M.. Timbers 1: volume 7 of plant resources of tropical Africa. PROTA, Wageningen, Netherlands	"Flowers bisexual, regular, 5-merous, small: pedicel c. 5 mm long; calyx with deltoid lobes, c. 3 mm long; petals free, elliptical, up to 3.5 mm long, slightly clawed, fringed, white, spreading, short-hairy on both sides; stamens 10, free, c. 22 mm long; disk 10-lobed, thick, densely short-hairy; ovary superior, ovoid, slightly 3-lobed, sparsely to densely short-hairy, 3-celled, immersed in disk, style short, slender, stigma head-shaped, small." [flowers not specialized]
606	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"- Vegetative propagation by tissue culture - Stand establishment using stump plants; natural regeneration; direct sowing" [no evidence of natural reproduction by vegetative fragmentation]
607	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"C. swietenia is a slow-growing deciduous tree of medium size..." [unknown, but probably >3-4 years]
701	2008. Louppe, D./Oteng-Amoako, A.A./Brink, M.. Timbers 1: volume 7 of plant resources of tropical Africa. PROTA, Wageningen, Netherlands	"Fruit an ellipsoid capsule 2.5-3 cm x c. 1.5 cm, dehiscent with 3 woody valves, up to 12-seeded. Seeds ellipsoid, laterally flattened, c. 1 cm long, with oblong wing on one side, up to 1.5 cm long." [no evidence of unintentional dispersal]
702	2008. Louppe, D./Oteng-Amoako, A.A./Brink, M.. Timbers 1: volume 7 of plant resources of tropical Africa. PROTA, Wageningen, Netherlands	"Chloroxylon swietenia provides a decorative timber, used for furniture, paneling, pattern making, interior trim, cabinet work, flooring, boxes, crates, interior joinery, carvings, toys, musical instruments and luxury goods. It is made into decorative veneer, which is, however, unsuitable for plywood manufacture because of its weight. Because of its strength it is also used for heavy construction, railway sleepers, boat building and agricultural equipment. The wood is also used as fuel wood. In India most plant parts are medicinally used. The crushed leaves are applied to treat wounds, snakebites and rheumatism. A bark extract is considered astringent and taken to treat fever, chest pain and in a mixture with other plants to treat asthma. In friction it is used to treat bruises and painful joints. A paste of the leaves and roots is taken internally to treat headache and is applied to the forehead as a balm for the same purpose. In Sri Lanka the root bark in milk is drunk to treat impotence." [cultivated for timber & medicinal purposes]
703	1998. Bedell, P.E.. Seed Science and Technology. Allied Publishers Limited, New Delhi, India	"Seeds are brown with a broad wing at one end, the whole being 1.2 to 1.6 long and 3 to 4 millimeters wide and angular." [no evidence of produce contamination, species not cultivated with produce, and seeds relatively large and unlikely to contaminate produce]
704	1998. Bedell, P.E.. Seed Science and Technology. Allied Publishers Limited, New Delhi, India	"...fruit is a capsule, oblong in shape, dark brown in colour, coriaceous, three-valved, 2.5 to 3 cm long containing a number of winged seeds which are dispersed by wind."
704	2008. Louppe, D./Oteng-Amoako, A.A./Brink, M.. Timbers 1: volume 7 of plant resources of tropical Africa. PROTA, Wageningen, Netherlands	"Fruit an ellipsoid capsule 2.5-3 cm x c. 1.5 cm, dehiscent with 3 woody valves, up to 12-seeded. Seeds ellipsoid, laterally flattened, c. 1 cm long, with oblong wing on one side, up to 1.5 cm long."

704	2011. Keystone Foundation. Flora of Nilgiri Biosphere (Northern Nilgiri Biosphere Reserve) - Chloroxylon swietenia. <a href="http://opendata.keystone-foundation.org/chloroxylon-swietenia-dc">http://opendata.keystone-foundation.org/chloroxylon-swietenia-dc</a>	"Fruit : A capsule, three valved, oblong. Seeds 12-15, oblong, compressed, margins angular, apically winged."
705	1998. Bedell, P.E.. Seed Science and Technology. Allied Publishers Limited, New Delhi, India	"...fruit is a capsule, oblong in shape, dark brown in colour, coriaceous, three-valved, 2.5 to 3 cm long containing a number of winged seeds which are dispersed by wind." [no evidence of seed dispersal by water]
706	2011. Keystone Foundation. Flora of Nilgiri Biosphere (Northern Nilgiri Biosphere Reserve) - Chloroxylon swietenia. <a href="http://opendata.keystone-foundation.org/chloroxylon-swietenia-dc">http://opendata.keystone-foundation.org/chloroxylon-swietenia-dc</a>	"Fruit : A capsule, three valved, oblong. Seeds 12-15, oblong, compressed, margins angular, apically winged." [no evidence of bird dispersal, & not fleshy-fruited]
707	2008. Louppe, D./Oteng-Amoako, A.A./Brink, M.. Timbers 1: volume 7 of plant resources of tropical Africa. PROTA, Wageningen, Netherlands	"Fruit an ellipsoid capsule 2.5-3 cm x c. 1.5 cm, dehiscent with 3 woody valves, up to 12-seeded. Seeds ellipsoid, laterally flattened, c. 1 cm long, with oblong wing on one side, up to 1.5 cm long." [no evidence of external animal dispersal, and no means of external attachment]
708	2011. Keystone Foundation. Flora of Nilgiri Biosphere (Northern Nilgiri Biosphere Reserve) - Chloroxylon swietenia. <a href="http://opendata.keystone-foundation.org/chloroxylon-swietenia-dc">http://opendata.keystone-foundation.org/chloroxylon-swietenia-dc</a>	"Shrews and giant squirrels eat the seeds." [act as seed predators, and not dispersers]
708	2011. WRA Specialist. Personal Communication.	Fruit a non-fleshy capsule and seeds unlikely to be ingested by birds or other animals that would pass intact seeds.
801	2011. WRA Specialist. Personal Communication.	Seed production unknown
802	1997. Murali, K.S.. Patterns of Seed Size, Germination and Seed Viability of Tropical Tree Species in Southern India. Biotropica. 29(3): 271-279.	"Appendix 1" [Chloroxylon swietenia not listed among species that have seed dormancy]
802	1998. Bedell, P.E.. Seed Science and Technology. Allied Publishers Limited, New Delhi, India	"Seeds lose viability within three to four months."
802	2008. Royal Botanic Gardens Kew. Seed Information Database (SID). Version 7.1. <a href="http://data.kew.org/sid/">http://data.kew.org/sid/</a>	"Storage Conditions: No loss in viability during 3 months, hermetic storage at room temperature, but after which time viability is reduced rapidly (Dent, 1948); viability is lost within 3 months in hermetic storage at room temperature with 13±2% mc (Kaul, 1979); viability can be maintained up to 3 months in open storage (Kandya, 1987)"
803	2011. IUCN. IUCN red list: Chloroxylon swietenia. <a href="http://www.iucnredlist.org/apps/redlist/details/33260/0">http://www.iucnredlist.org/apps/redlist/details/33260/0</a>	Listed as Vulnerable [rare species with no records of naturalization or invasiveness, and no evidence that it is being controlled anywhere]
804	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	"- Tolerates drought; fire; shade - Ability to sucker; coppice"
805	2011. WRA Specialist. Personal Communication.	Unknown