

Key Words: Low Risk, Naturalized, Tropical Tree, Ornamental, Explosive Dispersal

Family: *Calophyllaceae*

Taxon: *Mesua ferrea*

Synonym: *Calophyllum nagassarium* Burm.f.
Mesua nagassarium (Burm. f.) Kosterm.

Common Name: Ceylon iron wood
Indian rose chestnut
nagasari gede
nanga
nagchampa

Questionnaire :	current 20090513	Assessor:	HPWRA OrgData	Designation:	L
Status:	Assessor Approved	Data Entry Person:	HPWRA OrgData	WRA Score	-1
101	Is the species highly domesticated?		y=-3, n=0		n
102	Has the species become naturalized where grown?		y=1, n=-1		
103	Does the species have weedy races?		y=1, n=-1		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"		(0-low; 1-intermediate; 2-high) (See Appendix 2)		High
202	Quality of climate match data		(0-low; 1-intermediate; 2-high) (See Appendix 2)		High
203	Broad climate suitability (environmental versatility)		y=1, n=0		y
204	Native or naturalized in regions with tropical or subtropical climates		y=1, n=0		y
205	Does the species have a history of repeated introductions outside its natural range?		y=-2, ?=-1, n=0		?
301	Naturalized beyond native range		y = 1*multiplier (see Appendix 2), n= question 205		y
302	Garden/amenity/disturbance weed		n=0, y = 1*multiplier (see Appendix 2)		n
303	Agricultural/forestry/horticultural weed		n=0, y = 2*multiplier (see Appendix 2)		n
304	Environmental weed		n=0, y = 2*multiplier (see Appendix 2)		n
305	Congeneric weed		n=0, y = 1*multiplier (see Appendix 2)		n
401	Produces spines, thorns or burrs		y=1, n=0		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		
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	n
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	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	
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	
Designation: L		WRA Score -1	

Supporting Data:

101	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Is the species highly domesticated?? No evidence]
102	2013. WRA Specialist. Personal Communication.	NA
103	2013. WRA Specialist. Personal Communication.	NA
201	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Species suited to tropical or subtropical climate(s) - 2-High] "M. ferrea is recorded in Bangladesh, Bhutan, Cambodia, India, Indo-China, Myanmar, Peninsular Malaysia, Singapore, Sri Lanka, Thailand and Vietnam."
202	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Quality of climate match data 2-High]
203	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Broad climate suitability (environmental versatility)?] "It usually occurs scattered but is occasionally gregarious and is found in a wide variety of habitats, such as lowland and hill areas in the evergreen and semi-evergreen forests, up to altitudes of 900m (Troup, 1975; Lemmens et al., 1995)." ... "M. ferrea occurs in tropical and semi-tropical moist warm climates with a total rainfall of 1500-5000 mm and an absolute minimum temperature of about 4°C." ... 'M. ferrea is planted as an ornamental or shade tree in Malaysia and Indonesia. It has been recorded as planted up to 1300 m." Climatic amplitude (estimates) - Altitude range: 20 - 900 m - Mean annual rainfall: 1500 - 5000 mm - Rainfall regime: bimodal; uniform - Dry season duration: 0 - 5 months - Mean annual temperature: 9 - 35°C - Mean maximum temperature of hottest month: 23 - 39°C - Mean minimum temperature of coldest month: 7 - 24°C - Absolute minimum temperature: > 4°C"
203	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database:a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Broad climate suitability (environmental versatility)? Yes] "Altitude: up to 2 300 m"
204	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Native or naturalized in regions with tropical or subtropical climates? Yes] "M. ferrea is recorded in Bangladesh, Bhutan, Cambodia, India, Indo-China, Myanmar, Peninsular Malaysia, Singapore, Sri Lanka, Thailand and Vietnam."
205	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Does the species have a history of repeated introductions outside its natural range? Unknown] "M. ferrea is recorded in Bangladesh, Bhutan, Cambodia, India, Indo China, Myanmar, Peninsular Malaysia, Singapore, Sri Lanka, Thailand and Vietnam." [Cultivated within natural range, but extent of planting & introductions outside native range unknown]
205	2007. Wu, Z.Y./Raven, P.H./Hong, D.Y. (eds.). Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press and Missouri Botanical Garden Press, Beijing & St. Louis	[Does the species have a history of repeated introductions outside its natural range? China] "Usually cultivated, escaped and locally naturalized in SW Yunnan (Gengma: Mengding); 500–600 m. Guangdong (Xinyi), Guangxi (Rongxian, Tengxian), S, SW, and W Yunnan [Bangladesh, India, ?Indonesia (Java), Malaysia, Sri Lanka, Thailand]."
301	2007. Wu, Z.Y./Raven, P.H./Hong, D.Y. (eds.). Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press and Missouri Botanical Garden Press, Beijing & St. Louis	[Naturalized beyond native range? Yes] "Usually cultivated, escaped and locally naturalized in SW Yunnan (Gengma: Mengding); 500–600 m. Guangdong (Xinyi), Guangxi (Rongxian, Tengxian), S, SW, and W Yunnan [Bangladesh, India, ?Indonesia (Java), Malaysia, Sri Lanka, Thailand]."
302	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Garden/amenity/disturbance weed? 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 evidence]
304	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Environmental weed? No evidence]
305	2012. Randall, R.P.. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia	[Congeneric weed? No evidence]

401	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Produces spines, thorns or burrs? No] "M. ferrea is a medium-size tree reaching heights of up to 30 m, with a diameter at breast height of up to 70 cm. The crown is dense, narrowly conical when growing in the open, with flushes of bright red leaves. The stem is straight or slightly fluted, unbranched up to 20 m, with small buttresses. The bark is irregularly fissured and scaly, light brown to grey, with a purplish tinge. The inner bark is reddish brown or pinkish, with sparse droplets of whitish to pale yellow latex which darkens on exposure."
402	2013. WRA Specialist. Personal Communication.	[Allelopathic? Unknown]
403	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Parasitic? No] "M. ferrea is a medium-size tree reaching heights of up to 30 m, with a diameter at breast height of up to 70 cm." [Calophyllaceae. Also placed in: Clusiaceae]
404	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Unpalatable to grazing animals? Palatability of foliage not specified] "Fodder: Decorticated seed kernel meal can be incorporated up to the 10% level to replace maize in the feed of poultry without adverse effects on their performance. M. ferrea seed meal is a good source of protein and energy, and its use as a feed ingredient for cattle is proposed. Seed meal contains 12.8% digestible crude protein and 87.3% total digestible nitrogen on a DM basis."
405	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Toxic to animals? No evidence]
405	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Toxic to animals? Seed meal non-toxic] "Fodder: Decorticated seed kernel meal can be incorporated up to the 10% level to replace maize in the feed of poultry without adverse effects on their performance. M. ferrea seed meal is a good source of protein and energy, and its use as a feed ingredient for cattle is proposed. Seed meal contains 12.8% digestible crude protein and 87.3% total digestible nitrogen on a DM basis."
406	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Host for recognized pests and pathogens?] "The larvae of the insects Phenacaspis dilatata [Pseudaulacaspis cockerelli] and Toxoptera aurantii feed on the sap of M. ferrea leaves but do not cause serious injury. The buprestid borer Chrysochroa sp., which attacks living trees and forms large galleries in the heartwood, and a cerambycid borer can both cause serious damage (Mathur, 1953; Lemmens et al., 1995). Ganoderma lucidum, causing root and butt rot, has been recorded on M. ferrea."
406	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Host for recognized pests and pathogens?] "Wood liable to termite attack. The fungus Ganoderma lucidum causes root and butt rot. The larvae of the insects Phenacaspis dilatata and Toxoptera aurantii feed on the sap of leaves."
407	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Causes allergies or is otherwise toxic to humans? No evidence] "In Malaysia and India, M. ferrea seeds are used in traditional medicines. A mixture of pounded kernels and seed oil is used for poulticing wounds. Seed oil is used for treating skin itches and eruptions, dandruff and rheumatism. A decoction of the flowers is drunk as a tonic by women in Java after childbirth. The fragrant flowers are used in some cosmetic products and are used to stuff pillows and cushions (Troup, 1975; Burkill, 1966). The oily seeds can be strung like beads in split bamboo and burnt as candles. Descriptors: oils; medicinal products; green manures"
408	1998. Sahni, K.C.. The Book of Indian Trees. Bombay Natural History Society & Oxford University Press, Oxford, UK	[Creates a fire hazard in natural ecosystems? No evidence] "Evergreen and semi-evergreen forests of NE India, Western Ghats, Andamans, Sri Lanka, Bangladesh and Myanmar..." [No evidence that this tree increases fire frequency within its native range]
408	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Creates a fire hazard in natural ecosystems? No evidence]
409	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Is a shade tolerant plant at some stage of its life cycle? Yes] "M. ferrea is shade-tolerant. When grown in the open, M. ferrea is seriously affected by drought; the seedlings are very sensitive to drought and suffer severely in exposed situations."
410	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Tolerates a wide range of soil conditions? No] "Soil and physiography M. ferrea grows mainly on fairly rich, well drained, fertile soils. In India, M. ferrea has been reported growing on soils such as sandy loams, sandstone soils, recent alluvial soils and deep loam soils. Soil descriptors - Soil texture: medium; heavy - Soil drainage: free - Soil reaction: neutral - Soil types: alluvial soils; sandstone soils; sandy soils; tropical soils"

411	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Climbing or smothering growth habit? No] "M. ferrea is a medium-size tree reaching heights of up to 30 m, with a diameter at breast height of up to 70 cm."
412	1997. Fangliang, H./Legendre, P./LaFrankie, J.V.. Distribution Patterns of Tree Species in a Malaysian Tropical Rain Forest. Journal of Vegetation Science. 8(1): 105-114.	[Forms dense thickets? No evidence] "Sparse overstory- A - D as above: Canarium littorale var. rufa, Mesua ferrea, Pimelodendron griffithianum"
412	2003. Arunachalam, A./Khan, M.L./Singh, N.D.. Germination, Growth and Biomass Accumulation as Influenced by Seed Size in Mesua ferrea L.. Turkish Journal of Botany. 27: 343-348.	[Forms dense thickets? No evidence] "In addition, the species distribution is patchy in forest ecosystems and that could mainly be due to the low viability of seeds produced in larger numbers."
412	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Forms dense thickets? No evidence] "It usually occurs scattered but is occasionally gregarious and is found in a wide variety of habitats, such as lowland and hill areas in the evergreen and semi-evergreen forests, up to altitudes of 900m (Troup, 1975; Lemmens et al., 1995)." [Gregarious, but not documented to form thickets]
412	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Forms dense thickets? No evidence] "M. ferrea is a canopy component in lowland forest, but commonly features as an understorey tree in montane evergreen or semi-evergreen forest. In Borneo, the species is associated with dipterocarps."
501	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Aquatic? No] "M. ferrea is a canopy component in lowland forest, but commonly features as an understorey tree in montane evergreen or semi-evergreen forest. In Borneo, the species is associated with dipterocarps."
502	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Grass? No] "Family: Calophyllaceae. Also placed in: Clusiaceae"
503	2013. USDA ARS National Genetic Resources Program. Germplasm Resources Information Network - (GRIN). http://www.ars-grin.gov/cgi-bin/npgs/html/index.pl	[Nitrogen fixing woody plant? No] "Family: Calophyllaceae. Also placed in: Clusiaceae"
504	2009. Orwa, C./Mutua, A./Kindt, R./Jamnadass, R./Simons, A.. Agroforestry Database: a tree reference and selection guide version 4.0. World Agroforestry Centre, (http://www.worldagroforestry.org/af/treedb/)	[Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Mesua ferrea is a medium-sized or fairly large evergreen tree up to 36 m tall. Bole cylindrical to poorly shaped, up to 95 cm in diameter, often fluted at base. Bark surface is smooth to adherent scaly, sometimes somewhat diphled, ochrous-brown revealing a bright orange layer below."
601	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Evidence of substantial reproductive failure in native habitat? No evidence] "Due to the wide geographical distribution of M. ferrea, there are considerable variations in the periodicity of flowering and leaf flushing. In southern India, two forms are reported, one growing at low altitudes having a rough, non peeling bark, while the other form grows at higher altitudes and has a fluted stem and peeling bark."
602	1999. Khan, M.L./Bhuyan, P./Shankar, U./Todaria, N.P.. Seed germination and seedling fitness in Mesua ferrea L. in relation to fruit size and seed number per fruit. Acta Oecologica. 20(6): 599-606.	[Produces viable seed? Yes] "It has poor coppicing power and reproduces mainly through seeds. The seeds germinate mostly in microsites with adequate moisture. Seeds reach maturity and fall from September through December. Seed germination takes place between October and May. The ovary houses four ovules, two each in two locules. Thus, an ovary may produce 1, 2, 3 or 4 seeds. The fruits vary in size and seediness (number of seeds in a fruit). The seeds also vary in size, and the seed size is driven by the seediness."
603	2013. WRA Specialist. Personal Communication.	[Hybridizes naturally? Unknown]
604	2007. Wu, Z.Y./Raven, P.H./Hong, D.Y. (eds.). Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press and Missouri Botanical Garden Press, Beijing & St. Louis	[Self-compatible or apomictic? Unknown] "Flowers bisexual, solitary, axillary, 5-8.5 cm in diam. Sepals (outer 2 slightly larger than inner 2) orbicular, convex, margin membranous and sometimes white ciliate." [Potentially, as plant possessed perfect flowers]
605	2002. Saha, J.C.. Beekeeping for Rural Development, Beekeeping Against Poverty, Achieving Beekeeping Extension: A Bangladesh Perspective. Apiacta. 4: 1-5.	[Requires specialist pollinators? No] "Of course there must be more than sixty semi major bee plants are found in different areas of Bangladesh." [Includes M. ferrea]

605	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Requires specialist pollinators?] "The flowers are solitary from leaf axils, large, 2.5-10.2 cm in diameter, bisexual, white, with central bunch of yellow stamens; they are very fragrant. Sepals 4, decussate, persistent, and enlarged in fruits; petals 4, white; ovary superior, 1-2 celled, each cell with 1-2 ovules, style slender with 4-lobed stigma." ... "Numerous thrips have been found visiting the flowers (Troup, 1975; Corner, 1988)."
605	2010. NParks Flora&FaunaWeb. Mesua ferrea. National Parks Board, Singapore https://florafaunaweb.nparks.gov.sg/Special-Pages/plant-detail.aspx?id=3023 [Accessed 01 feb 2013]	[Requires specialist pollinators? No] "Pollination Method(s): Biotic (Fauna) (Insects (Bee))"
606	2010. NParks Flora&FaunaWeb. Mesua ferrea. National Parks Board, Singapore https://florafaunaweb.nparks.gov.sg/Special-Pages/plant-detail.aspx?id=3023 [Accessed 01 feb 2013]	[Reproduction by vegetative fragmentation? No evidence] "Propagation Method : Seed, Stem Cutting, [Remarks] (Stem cuttings not preferred, as resulting trees lack taproot)"
607	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Minimum generative time (years)? 15+] "M. ferrea starts flowering when the trees are fairly old (15-20 years). It flowers during the dry (cold) season with the flowers often opening (3-4 am) and closing again around sunset. The flowers remain open for one day only, the petals remaining within the calyx for a week to 10 days before dropping off."
701	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? No] "Fruit a capsule, ellipsoid to globose, pointed, 2.5-6.5 cm wide and 3.5 cm long, splitting into 2-4 segments, seated on the persistent sepals, often exuding resinous droplets. Seeds 1-4, 2.5 x 1.8 cm with dark brown shining testa (Whitmore, 1972; Soejono, 1978; Dassanayake and Fosberg, 1980; Stevens, 1986; Lemmens et al., 1995)." [Seeds explosively dehisced, but lack means of external attachment and are relatively large & unlikely to become stuck in mud on tires, shoes or equipment]
702	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules dispersed intentionally by people? Yes] "M. ferrea produces a very heavy hardwood which is used for heavy construction work. However, because of its slow growth rate, it is not suitable as a plantation tree for timber production, and so is more often grown as an ornamental tree. The fragrant flowers are used in cosmetic products and the seeds are used in traditional medicines in India and Malaysia. It is considered to be a sacred tree in India."
703	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Propagules likely to disperse as a produce contaminant? No evidence] "Fruit a capsule, ellipsoid to globose, pointed, 2.5-6.5 cm wide and 3.5 cm long, splitting into 2-4 segments, seated on the persistent sepals, often exuding resinous droplets. Seeds 1-4, 2.5 x 1.8 cm with dark brown shining testa (Whitmore, 1972; Soejono, 1978; Dassanayake and Fosberg, 1980; Stevens, 1986; Lemmens et al., 1995)." [Unlikely, given relatively large seed size]
704	1999. Khan, M.L./Bhuyan, P./Shankar, U./Todaria, N.P.. Seed germination and seedling fitness in Mesua ferrea L. in relation to fruit size and seed number per fruit. Acta Oecologica. 20(6): 599-606.	[Propagules adapted to wind dispersal? No] "In M. ferrea, the unit of dispersal is the seed and the dispersal occurs through explosion of the capsule. Any of the four seeds thus exhibits a probability of equally effective dispersal. Thus, the brood reduction as a function of maternal strategy to gain dispersal advantage is unlikely in this species." [Explosive dehiscence]
705	1999. Khan, M.L./Bhuyan, P./Shankar, U./Todaria, N.P.. Seed germination and seedling fitness in Mesua ferrea L. in relation to fruit size and seed number per fruit. Acta Oecologica. 20(6): 599-606.	[Propagules water dispersed? No evidence] "In M. ferrea, the unit of dispersal is the seed and the dispersal occurs through explosion of the capsule."
706	1999. Khan, M.L./Bhuyan, P./Shankar, U./Todaria, N.P.. Seed germination and seedling fitness in Mesua ferrea L. in relation to fruit size and seed number per fruit. Acta Oecologica. 20(6): 599-606.	[Propagules bird dispersed? No] "M. ferrea, with an explosive mode of seed dispersal, is likely to disperse seeds under or near the crown edge and thus render heavy intraspecific competition for seedling growth."
707	2007. Wu, Z.Y./Raven, P.H./Hong, D.Y. (eds.). Flora of China. Vol. 13 (Clusiaceae through Araliaceae). Science Press and Missouri Botanical Garden Press, Beijing & St. Louis	[Propagules dispersed by other animals (externally)? No] "Fruit broadly ovoid or laterally depressed globose, ca. 3 x 2.5 cm, dry, longitudinally rugose, with stoutly pointed style at apex, usually dehiscent by 2 valves, with accrescent woody sepals and many persistent filaments at base; stalk robust, 0.8-1.2 cm. Seeds 1-4, ± irregular in shape; coat brown, fragile." [Explosive dehiscence. Capsules & seeds lack means of external attachment]
708	2013. WRA Specialist. Personal Communication.	[Propagules survive passage through the gut? Unknown] Probably not, as seeds are explosively dehisced and are unlikely to be adapted to survive gut passage or internal dispersal

801	2003. Arunachalam, A ./Khan, M.L./Singh, N.D.. Germination, Growth and Biomass Accumulation as Influenced by Seed Size in <i>Mesua ferrea</i> L.. Turkish Journal of Botany. 27: 343-348.	[Prolific seed production (>1000/m2)? Unlikely if seed viability is low] "In addition, the species distribution is patchy in forest ecosystems and that could mainly be due to the low viability of seeds produced in larger numbers."
801	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Prolific seed production (>1000/m2)? Possibly for large trees] "M. ferrea produces abundant quantities of seed, and so natural regeneration can be profuse in the absence of weeds and climbers. Propagation is usually carried out from seeds, and fruits can be collected from underneath the trees or directly from the branches; 1 kg of fruits contains 300-500 seeds. A 75-90% germination success rate was recorded within 11-24 days, with germination being hypogeal."
802	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Evidence that a persistent propagule bank is formed (>1 yr)? No] "The seeds lose their viability within 2-3 months. In India, the best storage result was obtained using perforated polythene bags stored at 5°C (Bahuguna and Rawat, 1989); storage for 4 months reduced the germination success rate to 27%."
803	2013. WRA Specialist. Personal Communication.	[Well controlled by herbicides? Unknown] No information on herbicide efficacy or chemical control of this species
804	2005. CAB International. Forestry Compendium. CAB International, Wallingford, UK	[Tolerates, or benefits from, mutilation, cultivation, or fire? Yes, in dry climates] "The coppicing ability of <i>M. ferrea</i> varies depending on environmental factors; it appears to coppice better in drier climates, and good light seems to be a decisive factor in promoting coppicing (Kadambi, 1954)."
805	2013. WRA Specialist. Personal Communication.	[Effective natural enemies present locally (e.g. introduced biocontrol agents)? Unknown]

Summary of Risk Traits

High Risk / Undesirable Traits

- Escaped and locally naturalized in China
- Thrives in tropical climates
- Elevation range to 2300 m
- Shade tolerant
- Tolerates many soil conditions (and potentially able to exploit many different habitat types)
- Seeds explosively dispersed
- Tree coppices in drier conditions

Low Risk / Desirable Traits

- Despite ability to spread, no negative impacts have been documented
- Unarmed
- Fodder tree (seed meal)
- Non-toxic
- Landscaping and ornamental value
- Timber tree
- Medicinal properties
- Reaches reproductive maturity in 15-20 years
- Seeds lose viability rapidly (2-3 months)