

Family: *Verbenaceae*

Taxon: *Clerodendrum chinense*

Synonym: *Clerodendrum fragrans* Willd.
Clerodendrum philippinum Schauer
Cryptanthus chinensis Osbeck (basionym)

Common Name: Chinese glory bower
fragrant clerodendrum
fragrant glory bower

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| Questionnaire : | current 20090513 | Assessor: | Chuck Chimera | Designation: H(HPWRA) |
| Status: | Assessor Approved | Data Entry Person: | Chuck Chimera | WRA Score 18 |
| 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 | 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) | y |
| 303 | Agricultural/forestry/horticultural weed | | n=0, y = 2*multiplier (see Appendix 2) | y |
| 304 | Environmental weed | | n=0, y = 2*multiplier (see Appendix 2) | y |
| 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 | y |
| 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 | 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 |

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| 411 | Climbing or smothering growth habit | y=1, n=0 | n |
| 412 | Forms dense thickets | y=1, n=0 | y |
| 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 | |
| 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 | y |
| 607 | Minimum generative time (years) | 1 year = 1, 2 or 3 years = 0, 4+ years = -1 | 1 |
| 701 | Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas) | y=1, n=-1 | y |
| 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 | 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 | n |
| 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 | y |
| 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 | n |

Designation: H(HPWRA)

WRA Score **18**

Supporting Data:

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| 101 | 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 | [Is the species highly domesticated? No] "A single-flowered form grows wild in China, although the double-flowered form is more often cultivated." [No evidence that cultivation has reduced competitive ability] |
| 102 | 2011. WRA Specialist. Personal Communication. | NA |
| 103 | 2011. WRA Specialist. Personal Communication. | NA |
| 201 | 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 | [Species suited to tropical or subtropical climate(s)? 2-high] "A species native to subtropical China, and now widespread in the tropical Pacific Basin, Africa, and the Americas, <i>C. chinense</i> is also grown in greenhouses in temperate regions." |
| 202 | 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 | [Quality of climate match data? 2-high] "A species native to subtropical China, and now widespread in the tropical Pacific Basin, Africa, and the Americas, <i>C. chinense</i> is also grown in greenhouses in temperate regions." |
| 203 | 1998. Riffle, R.L.. The Tropical Look - An Encyclopedia of Dramatic Landscape Plants. Timber Press, Portland, OR | [Broad climate suitability (environmental versatility)? Yes] "...adaptable to zones 9 through 11 although marginal in zone 9a." |
| 203 | 2002. Iremonger, S.. A guide to plants in the Blue Mountains of Jamaica. University of the West Indies Press, Kingston, Jamaica | [Broad climate suitability (environmental versatility)? Yes] "120 to 1,280 m (400 to 4,200 ft). Introduced and naturalized, native of China." [elevation range >1000 m demonstrates environmental versatility] |
| 204 | 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 | [Native or naturalized in regions with tropical or subtropical climates? Yes] "A species native to subtropical China, and now widespread in the tropical Pacific Basin, Africa, and the Americas, <i>C. chinense</i> is also grown in greenhouses in temperate regions." |
| 205 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Does the species have a history of repeated introductions outside its natural range? Yes] " <i>C. chinense</i> is an important horticultural plant in many tropical and subtropical areas of the world. It is one of the most commonly cultivated, garden escaped, and naturalised species of <i>Clerodendrum</i> ." |
| 205 | 1998. Csurhes, S./Edwards, R.. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia | [Does the species have a history of repeated introductions outside its natural range? Yes] " <i>C. chinense</i> is native to southern Asia. It also exists in Mexico (at Chiapas) and Nicaragua (at Matagalpa, at an altitude of some 1400m) (Rueda 1993). In Queensland, cultivated specimens were recorded in Ipswich in 1976 and in the Brisbane Botanical Gardens (Mt Coot-tha) in 1995 (Queensland herbarium). <i>C. philippinum</i> var <i>pleniflorum</i> is currently growing in the Brisbane Botanical Gardens, Mt Coot-tha (Cameron pers. comm.). It was grown in the Flecker Botanical Gardens in Cairns in the late 1980's but is no longer present (Wilmington pers. comm.). It is not known in the Queensland nursery trade (Lawson 1996)." |
| 205 | 1999. Wiersema, J.H./León, B.. World Economic Plants: A Standard Reference. CRC Press, Boca Raton, FL | [Does the species have a history of repeated introductions outside its natural range? Yes] "Econ. Environ. (ornamental)...Dist: China; widely cult. In tropics & subtropics" |
| 205 | 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 | [Does the species have a history of repeated introductions outside its natural range? Yes] "A species native to subtropical China, and now widespread in the tropical Pacific Basin, Africa, and the Americas, <i>C. chinense</i> is also grown in greenhouses in temperate regions." |
| 301 | 1991. Smith, A.C.. Flora Vitiensis Nova - A New Flora of Fiji (Spermatophytes Only). Volume 5. National Tropical Botanical Garden, Lawai, HI | [Naturalized beyond native range? Yes] "sparingly cultivated from near sea level to an elevation of about 900 m; it is more commonly seen naturalized in thickets, fields, and coconut plantations and along roadsides" [Fiji] |
| 301 | 1995. Liogier, H.A.. Descriptive flora of Puerto Rico and adjacent islands: Spermatophyta, Volume IV. Melastomataceae to Lentibulariaceae. La Editorial, UPR, San Juan, Puerto Rico | [Naturalized beyond native range? Yes] "Roadsides and wastegrounds, escaped from cultivation, at lower and middle elevations, PR; southern United States, Bermuda, Bahamas, West Indies, Central America to Argentina and Chile..." |
| 301 | 1998. Csurhes, S./Edwards, R.. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia | [Naturalized beyond native range? Yes] " <i>C. chinense</i> is a weed in West Polynesia, Hawaii, Puerto Rico, Fiji and the United States (Holm et al. 1979). It is also a weed in the Cook Islands, in Niue, Pohnpei and the Federated States of Micronesia. It is spreading and becoming a weed of importance in Fiji (MacFarlane, South Pacific Commission Plant Protection Service, Fiji, pers. comm.). Five other species of <i>Clerodendrum</i> have been recorded as weeds (Holm et al. 1979)." |

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| 301 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Naturalized beyond native range? Yes] "...in Hawaii naturalized in open, wet, partly shaded, disturbed areas at the edges of mesic and wet forests, taro paddies, or streams, 50-670 m" |
| 301 | 2002. Iremonger, S.. A guide to plants in the Blue Mountains of Jamaica. University of the West Indies Press, Kingston, Jamaica | [Naturalized beyond native range? Yes] "Introduced and naturalized, native of China." [Jamaica] |
| 301 | 2008. Dawson, W./Mndolwa, A.S./Burslem, D.F.R.P./Hulme, P.E.. Assessing the risks of plant invasions arising from collections in tropical botanical gardens. Biodiversity and Conservation. 17: 1979-1995. | [Naturalized beyond native range? Yes] "Table 6 Naturalised alien plant species at Amani that have unclear planting history (planting locations and effort are unknown)" [Tanzania. List includes <i>Clerodendrum chinense</i>] |
| 301 | 2010. Wu, S.-H./Yang, T.Y.A./Teng, Y.-C./Chang, C.-Y./Yang, K.-C./Hsieh, C.-F.. Insights of the Latest Naturalized Flora of Taiwan: Change in the Past Eight Years. Taiwan: 139-159. | [Naturalized beyond native range? Yes] "Appendix 1. List of naturalized species of Taiwan." [Includes <i>Clerodendrum chinense</i>] |
| 301 | 2011. Center for Aquatic and Invasive Plants. Glory tree, stickbush - <i>Clerodendrum chinense</i> . University of Florida, http://plants.ifas.ufl.edu/node/106 | [Naturalized beyond native range? Yes] " <i>Clerodendrum chinense</i> is occasionally found growing in disturbed sites along the central and southern peninsula of Florida and Escambia county. Glory tree is native to Asia but escaped cultivation. It blooms in the summer and fall. Seven non-native species of <i>Clerodendrum</i> have escaped from cultivation into natural Florida (Wunderlin, 2003)." |
| 302 | 1997. Swarbrick, J.T.. Weeds of the Pacific Islands. Technical paper no. 209. South Pacific Commission, Noumea, New Caledonia | [Garden/amenity/disturbance weed? Yes] "A major weed of roadsides and gardens in towns and villages and rapidly invades pastures and plantations wherever it is planted. It only thrives where the soil and air are moist and fertile, but it can tolerate shade" |
| 302 | 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 | [Garden/amenity/disturbance weed? Yes] " <i>Clerodendrum chinense</i> tends to escape from cultivation and become weedy in suitable climates; by 1917 it was already considered a garden weed in Hawaii." |
| 303 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Agricultural/forestry/horticultural weed? Yes] "C. chinense occurs in both Rarotonga and Aitutaki (P. Samuel pers. comm. 1989). It was first collected in 1929 (Whistler pers. comm. 1989), grows to 0.9 to 1.5 m and is common in lowlands and moist places away from the sea (Wilder 1931), but is not a major pest in agricultural lands (P. Samuel pers. comm. 1989) ... <i>Clerodendrum chinense</i> var. simplex is present in Rabaul. It is troublesome when preparing ground for planting cocoa, but is not regarded as an important weed. It is fertile, but also spreads by root suckers (P.D. Turner, pers. comm. 1989) ... It is not known when C. chinense was brought to American Samoa but it is rapidly becoming a major weed. Until recently it was common along roadsides and on the borders of plantations. Now, on Tutuila, it has started penetrating into coconut and banana plantations and into taro (<i>Alocasia</i>) fields. On the Manua islands it still occurs only along roadsides (A. Vargo pers. comm. 1989)...The weed status of C. chinense is greatest in Western Samoa, where it is a major weed of roadsides and village gardens (Plate 2, Fig. 1). It also invades pastures, plantations and national parks and dominates all but tall vegetation. Surveys in Upolo recorded C. chinense in 7% and 2% of taro fields with an average cover of 22.9% and 6.6% respectively (Kiirschner 1986, Sauerborn 1982), figures that are probably not significantly different. It spreads rapidly by root suckers which emerge to form such dense thickets that all underlying plants are smothered (Plate 2, Fig. 2). By 1989 Honolulu rose was growing in dense clumps of up to several hundred metres in diameter. In one such clump, having 11 stems per m ² in shaded areas and up to 30 in newly infested open areas, the stem height ranged from 1 to 3 m and the ground cover up to 90%. In open areas the rate of outward clump expansion was 6 to 8 m per annum, but less than 2 m in forested areas. Although about 90% of the ground was under cultivation in a sampling area of 24.5 ha, C. chinense covered some 50% of the area, with an average stem height of 1.5 m. Even in areas of intensive cropping, such as in taro or bananas under coconut-, patches of C. chinense were present. Indeed, 20 to 40% (and up to 70%) cover occurred in banana plantations and up to 80% ground cover in areas temporarily left uncropped (Iosefa 1989). It is little wonder that Honolulu rose is regarded as an extremely serious weed in Western Samoa." |
| 303 | 2003. Motooka, P./Castro, L./Nelson, D./Nagai, G./Ching, L.. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI http://www.ctahr.hawaii.edu/invweed/weedsHi.htm | [Agricultural/forestry/horticultural weed? Possibly] "Forms dense canopies in pastures, along streams, and along forest edges, shading out the understory" [invades pastures, but impacts to ranching or agriculture unknown] |

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| 304 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Environmental weed? Yes] "It has been naturalised for some 150 years in Central and South America, but is regarded there as. At most, a minor weed. It has been naturalised for almost as long in the eastern Pacific, without becoming an important weed but, following its more recent introduction to the southwest Pacific, it is already a serious weed in Western and American Samoa and is rapidly becoming so in Niue and Fiji. In the southwest Pacific it grows vigorously to about 2.5 m in rich moist soils, both in sunshine and in shade, outcompeting and smothering all underlying vegetation...FIJI: <i>C. chinense</i> was first collected as a roadside shrub by Degener and Ordenez during their 1940-1941 expedition (Smith 1942). It was probably introduced as an ornamental but, by 1958, had already become naturalised and common, forming large roadside patches in the wet zones of Viti Levu, Vanua Levu and Taveuni (parham 1959, 1972). It also occurs now on Rotuma Is (M. Nagatalevu, pcrs. comm. 1989). It is spreading steadily along roads in the wetter areas, rapidly becoming a serious weed and is now numbered high amongst the top 10 weeds...WESTERN SAMOA Whistler (1983) records the first collection of <i>C. chinense</i> in 1955. It was not mentioned in lists of plants of Western and American Samoa published in the thirties (Christopherson 1935, L10yd and Aiken 1934). It is present on Upolu and Savaii, but not on Apolima or Manono (A. Peters pers. comm. 1989). Stems are said to have been used as pegs during a survey of some of the roads leading out of Apia, which may account for its widespread distribution along roadsides. Since it is such a conspicuous plant, absence of records earlier than 1955 suggests that, if present much before then, it must have been uncommon or perhaps still only a garden plant. In 1992 it was rated number 2 amongst the country's worst weeds CA. Hill pers. comm. 1992)." |
| 304 | 1998. Csurhes, S./Edwards, R.. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia | [Environmental weed? Potential in Australia. Recommended for eradication] "Under favourable conditions, <i>Clerodendrum chinense</i> can form dense thickets that exclude most other plant species. It has a history as a weed in West Polynesia, Hawaii, Puerto Rico, Fiji and the United States. There are no records of naturalised specimens in Australia and the plant appears to exist only in several botanical gardens. Eradication appears to be feasible and is recommended..." <i>C. chinense</i> has the potential to form dense thickets that might prevent regeneration of native plant species. There is no information available regarding its impact on native ecosystems in other countries, but it is known to be a highly invasive weed of disturbed areas. The plant appears best suited to high rainfall (> 1000mm per annum), tropical and sub tropical climates and may become invasive in coastal regions of northern and eastern Australia." |
| 304 | 2003. Motoooka, P./Castro, L./Nelson, D./Nagai, G./Ching, L.. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI http://www.ctahr.hawaii.edu/invweed/weedsHi.html | [Environmental weed? Yes] "Forms dense canopies in pastures, along streams, and along forest edges, shading out the understory" |
| 304 | 2003. Shine, C./Reaser, J.K./Gutierrez, A.T. (eds.). Invasive alien species in the Austral Pacific Region: National Reports & Directory of Resources. Global Invasive Species Programme, Cape Town, South Africa | [Environmental weed? Yes] "The following list includes ten IAS categorised and prioritised as the most noxious invasive species on Niue. ⇒ Singapore daisy, <i>Wedelia</i> (<i>Wedelia</i> (=Sphagneticola) <i>trilobata</i>) Singapore daisy, <i>Wedelia</i> (<i>Wedelia</i> (=Sphagneticola) <i>trilobata</i>) ⇒ Chain of hearts/chain of love (<i>Antigonon leptopus</i>) ⇒ Lantana (<i>Lantana camara</i>) ⇒ Honolulu rose (<i>Clerodendrum chinense</i>) ⇒ Feral pigs (<i>Sus scrofa</i>), ⇒ Money plant/pothos (<i>Scindapsus aureus</i>) ⇒ Wood rose (<i>Merremia tuberosa</i>) ⇒ African tulip tree (<i>Spathodea campanulata</i>) ⇒ Crown of thorns starfish (<i>Acanthaster planci</i>) ⇒ Rats" |
| 305 | 2011. Center for Aquatic and Invasive Plants. Glory tree, stickbush - <i>Clerodendrum chinense</i> . University of Florida, http://plants.ifas.ufl.edu/node/106 | [Congeneric weed? Yes] "Seven non-native species of <i>Clerodendrum</i> have escaped from cultivation into natural Florida (Wunderlin, 2003)." |
| 305 | 2011. Florida. <i>Clerodendrum bungei</i> . http://www.floridata.com/ref/c/cler_bun.cfm | [Congeneric weed? Yes] " <i>Clerodendrum bungei</i> is invasive in Florida and other regions." |
| 401 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Produces spines, thorns or burrs? No] "Scented subshrubs up to 2 m tall; branches quadrangular, densely strigose. Leaves membranous, broadly ovate, 6-29 cm long, 5-28 cm wide, both surfaces sparsely to moderately strigillose, margins coarsely and irregularly dentate, sometimes weakly 1-3 lobed, apex acute, base cordate to truncate, petioles 2-23 cm long." |

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| 402 | 2011. WRA Specialist. Personal Communication. | [Allelopathic? Unknown] |
| 403 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Parasitic? No] "Scented subshrubs up to 2 m tall; branches quadrangular, densely strigose." [Verbenaceae, or Lamiaceae] |
| 404 | 1997. Swarbrick, J.T.. Weeds of the Pacific Islands. Technical paper no. 209. South Pacific Commission, Noumea, New Caledonia | [Unpalatable to grazing animals? Yes] "Apparently unpalatable to stock" |
| 405 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Toxic to animals? Unknown] "Many species of <i>Clerodendrum</i> contain chemicals that have toxic, antifeedant (Kato et al. 1972) or other pharmacological effects, but extracts that have been tested in various ways for insecticidal properties have displayed only moderate activity. A chemical examination of the aerial parts of <i>C. chinense</i> was reported by Nair et al. (1974) and two very rare steroids were identified in the leaves and stems by Akihisa et al. (1988). The antifeeding effects of extracts of six species of <i>Clerodendrum</i> , including <i>C. chinense</i> , for larvae of the cluster caterpillar <i>Spodoptera litura</i> were examined by Hosozawa et al. (1974) who reported the presence of the antifeeding diterpenes, clerodendrin A and B." [evidence uncertain] |
| 406 | 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 | [Host for recognized pests and pathogens? No] "It thrives in conditions from full sun to deep shade, tolerates poor soil, and is susceptible to few pests other than a leaf fungus." |
| 407 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Causes allergies or is otherwise toxic to humans? No] "In Malaysia, some species of <i>Clerodendrum</i> are associated with sorcery or are used medicinally because of their supposed or actual curative powers (Neal 1965). Thus <i>C. chinense</i> is reported to be used topically, either in a fomentation for rheumatism and ague or, with other substances, for skin diseases (Burkill 1935, Quisumbing 1951). It is still used for medicinal purposes in Vietnam, alone or mixed with other herbs for the control of diseases including dysentery and venereal diseases (Jolivet 1983, T.T. Gian pers. comm. 1989)." |
| 407 | 2002. Manandhar, N.P.. Plants and people of Nepal. Timber Press, Portland, OR | [Causes allergies or is otherwise toxic to humans? No] "Juice of the plant is applied to cuts and wounds. Juice of the bark is applied to burns. Juice of the leaf is used to alleviate boils and pimples." [Syn. <i>C. philippinum</i> . Used medicinally with no evidence or warnings about inadvertent toxicity or allergenic properties] |
| 408 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Creates a fire hazard in natural ecosystems? No] No evidence |
| 408 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Creates a fire hazard in natural ecosystems? No] "Naturalised on open, wet, partly shaded, disturbed areas at the edges of mesic and wet forest, taro paddies, or streams' at elevations from 50 to 670 m" [no evidence, and invaded wet habitat in Hawaiian Islands is similar to habit of other invaded ecosystems. Unlikely to create fire hazards in these areas.] |
| 409 | 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 | [Is a shade tolerant plant at some stage of its life cycle? Yes] "It thrives in conditions from full sun to deep shade, tolerates poor soil, and is susceptible to few pests other than a leaf fungus." |
| 410 | 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 | [Tolerates a wide range of soil conditions? Probably yes] "It thrives in conditions from full sun to deep shade, tolerates poor soil, and is susceptible to few pests other than a leaf fungus." |
| 411 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Climbing or smothering growth habit? No] "Scented subshrubs up to 2 m tall; branches quadrangular, densely strigose." |
| 412 | 1998. Csurhes, S./Edwards, R.. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia | [Forms dense thickets? Yes] "Under favourable conditions, <i>Clerodendrum chinense</i> can form dense thickets that exclude most other plant species." |

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| 412 | 2003. Motoooka, P./Castro, L./Nelson, D./Nagai, G./Ching, L.. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI http://www.ctahr.hawaii.edu/invweed/weedsHi.htm | [Forms dense thickets? Yes] "Forms dense canopies in pastures, along streams, and along forest edges, shading out the understory" |
| 501 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Aquatic? No] "Scented subshrubs up to 2 m tall; branches quadrangular, densely strigose." |
| 502 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Grass? No] Verbenaceae, or Lamiaceae |
| 503 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Nitrogen fixing woody plant? No] Verbenaceae, or Lamiaceae |
| 504 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)? No] "Scented subshrubs up to 2 m tall; branches quadrangular, densely strigose." |
| 601 | 2003. Leeratiwong, C./Chantaranonthai, P.. Notes on Clerodendrum (Lamiaceae). THAI Forestry Bulletin. 31: 44– 46. | [Evidence of substantial reproductive failure in native habitat? No] "The species is widespread from India, Myanmar and Thailand (except the peninsular part) to China." |
| 602 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Produces viable seed? Possibly at times] "although Wagner et al. (1990) state that fruit are unknown, seed production was recorded by Haselwood and Motter (1966) and Neal (1929). Thus the low weed status of the plant in Hawaii is not obviously connected with peculiarities in the mode of reproduction, and the situation might well repay study....It is fertile, but also spreads by root suckers (P.D. Turner, pers. comm. 1989)...MALAYSIA The earliest specimens in the herbaria in Malaysia and Singapore were collected in 1885 and have double or semi-double flowers. Plants growing in 1989 in the Kuala Lumpur Botanic Gardens have semi-double flowers and are surrounded by young seedlings; hence the flowers are fertile (M.H. Julien pers. comm. 1989)...There is clear evidence that flower type of <i>C. chinense</i> and its varieties vary over its distribution, but no information is available as to the significance of this in relation to potential weediness. All that can be said at this stage is that the seriously weedy form reported only in the Pacific is one that has double, sterile flowers. Since this form only propagates vegetatively (by suckers), all may well be derived from a single clone and possibly as a mutation from <i>C. chinense</i> var. <i>simplex</i> . This clone may, however, differ in weediness from the non-seeding stocks of the species introduced last century to French Polynesia and Hawaii. Studies employing electrophoresis and molecular techniques are necessary to throw light on this aspect." |
| 602 | 1998. Csurhes, S./Edwards, R.. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia | [Produces viable seed? No] "The flowers are fragrant and often sterile." |
| 602 | 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 | [Produces viable seed? No] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." |
| 603 | 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 | [Hybridizes naturally? No] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." [incapable of hybridization] |
| 604 | 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 | [Self-compatible or apomictic? Not applicable] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." |
| 605 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Requires specialist pollinators? No] "A number of other insects (but rarely Lepidoptera) sought nectar from the flowers and many ants, but fewer beetles, were attracted to the extra-floral nectaries. Ants and beetles were the main pollinators." |

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| 605 | 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 | [Requires specialist pollinators? No] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." [plant reproduces vegetatively, and therefore requires no pollination] |
| 606 | 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 | [Reproduction by vegetative fragmentation? Yes] "The plants sucker freely from the roots, however, and they propagate so readily by this means that they have become naturalized on all the islands except Niihau and Kahoolawe." |
| 607 | 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 | [Minimum generative time (years)? 1] "The plants sucker freely from the roots, however, and they propagate so readily by this means that they have become naturalized on all the islands except Niihau and Kahoolawe." [Ability to vegetatively reproduce demonstrates early reproductive potential, independent of time to flowering] |
| 701 | 1991. Smith, A.C.. Flora Vitiensis Nova - A New Flora of Fiji (Spermatophytes Only). Volume 5. National Tropical Botanical Garden, Lawai, HI | [Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)? Yes] "...more commonly seen naturalized in thickets, fields, and coconut plantations and along roadsides" [although common along heavily trafficked areas, the plant is likely colonizing disturbed areas.] |
| 701 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Propagules likely to be dispersed unintentionally? No] "It is believed to have been spread by tractor-mounted slashers and by suckers in rubbish thrown into the bush. It is a problem particularly in bush gardens on fertile soils (T.G. Mautama pers. comm. 1989)." |
| 702 | 1994. Chen Shou-liang/Gilbert, M.G.. Flora of China. Vol. 17. - Verbenaceae. Science Press & Missouri Botanical Garden Press, Beijing, & St. Louis | [Propagules dispersed intentionally by people? Yes] "Wild in Guangxi, Guizhou, and Yunnan [cultivated in tropical and subtropical Asia]" |
| 702 | 1999. Wiersema, J.H./León, B.. World Economic Plants: A Standard Reference. CRC Press, Boca Raton, FL | [Propagules dispersed intentionally by people? Yes] "Econ. Environ. (ornamental) ... Dist: China; widely cult. In tropics & subtropics" |
| 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 | [Propagules dispersed intentionally by people? Yes] "It is unclear to what extent <i>C. chinense</i> is cultivated in Hawaii; in former times it was widely planted along roadsides and near home sites. And these plantings formed the nucleus of naturalized populations that persist today. The fragrant, showy flowers and attractive appearance of this shrub may encourage its continued cultivation, although the foul-smelling leaves are an unpleasant feature." |
| 703 | 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 | [Propagules likely to disperse as a produce contaminant? Unlikely] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." [no evidence, and highly unlikely without fruit production] |
| 704 | 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 | [Propagules adapted to wind dispersal? No] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." |
| 705 | 1999. Wagner, W.L./Herbst, D.R./Sohmer, S.H.. Manual of the flowering plants of Hawaii. Revised edition.. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Propagules water dispersed? Possibly] "...in Hawaii naturalized in open, wet, partly shaded, disturbed areas at the edges of mesic and wet forests, taro paddies, or streams, 50-670 m" [distribution suggests vegetative fragments may be dispersed by water at times] |
| 706 | 1994. Chen Shou-liang/Gilbert, M.G.. Flora of China. Vol. 17. - Verbenaceae. Science Press & Missouri Botanical Garden Press, Beijing, & St. Louis | [Propagules bird dispersed? Yes in native range, but No in introduced range] " <i>Clerodendrum chinense</i> var. <i>simplex</i> ... Drupes enclosed by persistent inflated calyx, blue-black, 8-10 mm in diam." |
| 706 | 1998. Csurhes, S./Edwards, R.. Potential environmental weeds in Australia: Candidate species for preventative control. Biodiversity Group, Environment Australia, Canberra, Australia | [Propagules bird dispersed? No] "Unlike most species of <i>Clerodendrum</i> , which are reported to be spread by birds (Ridley 1930, Moldenke 1985), <i>C. chinense</i> reproduces primarily from root suckers." |
| 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 | [Propagules bird dispersed? No] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." |
| 707 | 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 | [Propagules dispersed by other animals (externally)? No] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." [Also no evidence that vegetative fragments can adhere to or are disseminated by animals externally] |

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| 708 | 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 | [Propagules survive passage through the gut? NA] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." |
| 801 | 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 | [Prolific seed production (>1000/m ²)? No] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." |
| 802 | 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 | [Evidence that a persistent propagule bank is formed (>1 yr)? No] "No fruit is produced because all the sexual parts of the flower have been transformed into petal-like organs." |
| 803 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Well controlled by herbicides? Yes] "No detailed screening of herbicides has been carried out, although 2,4,5-T, or the more expensive Tordon 520 Brushkiller, are suggested as possible herbicides for Western Samoa. More recently a mixture of dicamba and 2,4-D has proved effective. Work carried out in Western Samoa has also shown that metsulfuron methyl ester produces effective control. It has been recommended that the plants be cut and the new growth sprayed. When herbicides were applied in Western Samoa to regrowth four weeks after it had been slashed to the ground, glyphosate partially destroyed the foliage, but complete regrowth had occurred by 4 to 6 weeks after application. Treatment with 2,4,5-T resulted in complete kill of foliage, but 5 to 15% of the plants had regrown after 8 weeks" |
| 803 | 1997. Swarbrick, J.T.. Weeds of the Pacific Islands. Technical paper no. 209. South Pacific Commission, Noumea, New Caledonia | [Well controlled by herbicides? Yes] "Probably susceptible to: 1) foliar application of arboricides such as picloram, metsulfuron methyl, glyphosate and triclopyr at standard rates and dilutions; 2) cut-stump application of the same herbicides; 3) soil application of hexazinone, karbutilate, fluroxypyr and bromacil at standard rates" |
| 803 | 2003. Motooka, P./Castro, L./Nelson, D./Nagai, G./Ching, L.. Weeds of Hawaii's Pastures and Natural Areas: An Identification and Management Guide. CTAHR, UH Manoa, Honolulu, HI http://www.ctahr.hawaii.edu/invweed/weedsHi.htm | [Well controlled by herbicides? Yes] "A little work done suggests hormone-type herbicides in timely repeat applications will control this weed" |
| 803 | 2009. Englberger, K.. Invasive weeds of Pohnpei: A guide for identification and public awareness. Conservation Society of Pohnpei, | [Well controlled by herbicides? Yes] "Young plants can be sprayed by a herbicide such as triclopyr (Garlon 4). Undiluted herbicide can be applied to the cut stems of larger plants with woody stems" |
| 804 | 1997. Swarbrick, J.T.. Weeds of the Pacific Islands. Technical paper no. 209. South Pacific Commission, Noumea, New Caledonia | [Tolerates, or benefits from, mutilation, cultivation, or fire? Yes] "Slashing will slow spread but not prevent it. Vertical barriers in the soil may prevent further spread if deep enough. Deep cultivation in dry soil should be effective, but cultivation in moist soil is probably ineffective and may spread the weed." |
| 805 | 1993. Julien, M. H.. Surveys for the native range of <i>Clerodendrum chinense</i> & its natural enemies. Pp 39-43 in Proc. Tenth Australian Weeds Conference & 14th Asian Pacific Weed Science Society Conference: Brisbane, Australia, 6-10 September 1993. | [Effective natural enemies present locally? No] "The perennial shrub <i>Clerodendrum chinense</i> has become a problem in countries of the South Pacific. In response to requests to assist in control of the weed preliminary surveys for the weed's native range and its natural enemies were conducted. The native range of <i>C. chinense</i> includes southern China and parts of the northern Vietnam border regions. The native range of the apparently closely related <i>C. chinense</i> var. <i>simplex</i> is wider and includes southern China, a large portion of northern Vietnam and northern Thailand. A wide variety of organisms including insects, fungi and mites were found on these plants. Some caused significant damage, including the leaf feeding beetle <i>Phyllocharis undulata</i> , a gall fly, stem tunneling beetles and leaf attacking fungi. I concluded that a biological control project would identify suitable control agents for release in the South Pacific." [potential biocontrol agents exists, but no evidence to date that they are present or effectively reducing <i>C. chinense</i> populations] |
| 805 | 1993. Waterhouse, D.F.. Biological control: Pacific prospects. Supplement 2. Australian Centre for International Agricultural Research, Canberra, Australia | [Effective natural enemies present locally? No] "Only very minor damage is caused to <i>C. chinense</i> in the Pacific by the few, widely polyphagous insects that attack it there. However, several of the many species of leaf-eating beetles which cause significant damage to it in southern China and northern Vietnam are clearly candidate biological control agents. Of these, the chrysomelid <i>Phyllocharis undulata</i> is particularly promising, especially if tests confirm it to be adequately host specific. Honolulu rose appears to be a promising target for a biological control project in the southwest Pacific." |