GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Chromolaena odorata***

Chromolaena odorata 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Asterales	Asteraceae

Common name

rumput belalang (Indonesian Bahasa, Indonesia), Siam-Kraut (German), rumput putih (Indonesian Bahasa, Indonesia), rumput golkar (Indonesian Bahasa, Indonesia), chromolaena (English), ngesngesil (English, Palau), jack in the bush (English), Siam weed (English), triffid weed (English), bitter bush (English), herbe du Laos (French), kesengesil (Chamorro, Guam), masigsig (Chamorro, Guam), otuot (English, Chuuk), wisolmatenrehwei (English, Pohnpei), mahsrihsrihk (English, Kosrae), hagonoy (English, Philippines), agonoi (English, Philippines), huluhagonoi (English, Philippines)

Synonym

Eupatorium odoratum , L.
Osmia odorata , (L.) Schultz-Bip.
Eupatorium conyzoides ,M. Vahl
Osmia conyzoides , (Vahl) Sch.-Bip.
Eupatorium floribundum , Kunth
Osmia floribunda , (Kunth) Schultz-Bip.
Eupatorium brachiatum , Wikstrom
Eupatorium divergens , Less.
Osmia divergens , (Less.) Schultz-Bip.
Eupatorium affine , Hook & Arn.
Eupatorium clematitis , DC.
Eupatorium graciliflorum , DC.
Osmia graciliflora , (DC.) Sch.-Bip.
Eupatorium stigmatosum , Meyen & Walp.
Eupatorium sabeanum , Buckley

Similar species

Summary

Chromolaena odorata is a fast-growing perennial shrub, native to South America and Central America. It has been introduced into the tropical regions of Asia, Africa and the Pacific, where it is an invasive weed. Also known as Siam weed, it forms dense stands that prevent the establishment of other plant species. It is an aggressive competitor and may have allelopathic effects. It is also a nuisance weed in agricultural land and commercial plantations.

view this species on IUCN Red List

Species Description
Chromolaena odorata is an herbaceous perennial that forms dense tangled bushes 1.5-2.0m in height. It occasionally reaches its maximum height of 6m (as a climber on other plants). Its stems branch freely, with lateral branches developing in pairs from the axillary buds. The older stems are brown and woody near the base; tips and young shoots are green and succulent. The root system is fibrous and does not penetrate beyond 20-30cm in most soils. The flowerheads are borne in terminal corymbs of 20 to 60 heads on all stems and branches. The flowers are white or pale bluish-lilac, and form masses covering the whole surface of the bush (Cruttwell and McFadyen 1989).\r\n
C. odorata is a big bushy herb with long rambling (but not twining) branches; stems terete, pubescent; leaves opposite, flaccid-membranous, velvety-pubescent, deltoid-ovate, acute, 3-nerved, very coarsely toothed, each margin with 1-5 teeth, or entire in youngest leaves; base obtuse or subtruncate but shortly decurrent; petiole slender, 1-1.5cm long; blade mostly 5-12cm long, 3-6cm wide, capitula in sub-corymbose axillary and terminal clusters; peduncles 1-3cm long, bracteate; bracts slender, 10-12mm long; involucre of about 4-5 series of bracts, pale with green nerves, acute, the lowest ones about 2mm long, upper ones 8-9mm long, all acute, distally ciliate, flat, appressed except the extreme divergent tip; florets all alike (disc-florets), pale purple to dull off-white, the styles extending about 4mm beyond the apex of the involucre, spreading radiately; receptacle very narrow; florets about 20-30 or a few more, 10-12mm long; ovarian portion 4mm long; corolla slender trumpet form; pappus of dull white hairs 5mm long; achenes glabrous or nearly so (Stone 1970). The seeds of Siam weed are small (3-5mm long, ~1mm wide, and weigh about 2.5mg seed-1 (Vanderwoude *et al*. 2005).

Notes
The University of Guam publishes a newsletter on *Chromolaena odorata*. *C. odorata* is on the State of Hawaii noxious weed list. Subject of an eradication programme in Queensland, Australia. A declared noxious weed in South Africa.

Uses
Chromolaena odorata is an ornamental plant that is sometimes encouraged for use in shifting slash-and-burn agriculture to compete with *Imperata cylindrica* (alang alang or cogon grass), which is harder to control.

Habitat Description
Chromolaena odorata grows on a wide range of soils and grows in a range of vegetation types, e.g. forests (annual rainfall 1500mm), grassland and arid bushveld (annual rainfall less than 500mm) (Goodall and Erasmus 1996, in Vanderwoude *et al*. 2005). In arid areas, it is restricted to riverbanks and it will only become invasive in the frost-free areas of medium to arid woodland which are not water-stressed in the growing season (Honu and Dang, 2002 in Vanderwoude *et al*. 2005). For good growth of Siam weed seedlings, the relative humidity should be in the range of 60 – 70%; at values higher than 80% the growth performance was poor (Ambika 2002, in Vanderwoude *et al*. 2005). Experiments show that Siam weed seedlings grew well at 30°C and even better on mulched soils at 25°C (Ambika 2002, in Vanderwoude *et al*. 2005). In heavy shade, Siam weed will not seed. It has a negative relationship with tree canopy cover and appears to be most abundant on the edge of forested areas (Feleke 2003, Luwum 2002, in Vanderwoude *et al*. 2005). Witkowski (2002) reports that in north-eastern India, Siam weed is regarded as a nutrient-demanding early successional species (Ramakrishnan 1992, in Vanderwoude *et al*. 2005). It takes advantage of the flush of soil that becomes available after a disturbance, such as fire or land clearing for agriculture, and exhibits relatively high foliar N, P and K contents (Saxena and Ramakrishnan 1983, in Vanderwoude *et al*. 2005).

Reproduction
Sexual reproduction. Although the plant may resprout from the root crown following fire or death of old stems it is not known to reproduce vegetatively.\r\nSeed production is prolific with estimates up to 260,000 m-2 (Witkowski 2002) with about 20–46% of seeds produced being viable (Witkowski and Wilson 2001, in Vanderwoude *et al*. 2005). Some seed survives for up to 5 years, whether these are located on the surface of the soil or buried; three month-old seed that has been buried has a viability of about 50% compared with about 6% when on the soil surface (M. Setter, pers. comm. in Vanderwoude *et al*. 2005). Plants can germinate and set seed within a 12-month period.

General Impacts
Chromolaena odorata forms dense stands preventing establishment of other species, both due to competition and allelopathic effects. When dry, *C. odorata* becomes a fuel which may promote wild bushfires (PIER 2003). *C. odorata* may also cause skin complaints and asthma in allergy-prone people. It is a major weed in plantations and croplands, including plantations of rubber, oil palm, forestry and coffee plants.
\r\n*C. odorata* is also a weed of national parks. In the Greater St. Lucia Wetland Park, a recently acclaimed World Heritage Site in South Africa, it is reported to interfere with natural ecosystem processes. Nesting Nile crocodiles (see *Crocodylus niloticus* in IUCN Red List of Threatened Species) require open, sunny, sandy areas in which to deposit their eggs. *C. odorata* shades and overtakes nesting sites creating fibrous root mats unsuitable for egg chamber and nest construction. As well as altering this natural habitat, *C. odorata* produces shade resulting in colder temperatures in any nests that do get constructed, an effect that produces a female-biased sex ratio in the offspring, as well as perhaps preventing embryonic development altogether (Leslie and Spotila 2001).

Management Info

Preventative measures: A Risk assessment of *Chromolaena odorata* for the Pacific region was prepared by Pacific Island Ecosystems at Risk (PIER) using the Australian risk assessment system (Pheloung, 1995). The result is a score of 34 and a recommendation of: reject the plant for import (Australia) or species likely to be of high risk (Pacific). \r\n \r\n

Using a revised climate model (Kriticos *et al*. 2005) of the estimated potential distribution of *C. odorata* it was predicted that mediterranean, semi-arid and temperate climates are unsuitable for its establishment. Much of tropical Africa, the north-eastern coast of Australia and most Pacific islands are at risk of invasion. The distribution of *C. odorata* in South Africa extends further south than predicted by the model based on Asian and American distribution records, supporting the claim that the South African variety of *C. odorata* has different climatic requirements to the varieties elsewhere (EPPO 2005). \r\n

Physical: Manual slashing and use of bush-cutter or tractor-drawn implements are commonly used methods of control. Slashing causes regeneration unless followed by other control methods. Manual weeding is labour intensive. The use of tractor drawn equipment is limited to areas that are accessible (Ecoport). \r\n

Chemical: Chemical control using herbicides applied at the seedling stage or on regrowth has given encouraging results. Triclopyr has proven to be the most effective. However, problems in herbicide use include the high cost of the chemicals and their application, ecological concerns and, non-compatibility in many cropping and other environmental situations (Ecoport). Removing seed and flower heads and spraying with 2,4-D Amine plus Picloram (Tordon in Australia) kills top growth and (picloram kills the root system is recommended (Rod Randall, pers. comm. 2000). \r\n

Biological: The biological control agent *Pareuchaetes pseudoinsulata* has been introduced into Guam, where it effectively defoliates pure stands. It is less successful in scattered plants and patches. It has also been introduced into Palau, Kosrae, Pohnpei, Yap and Saipan Island (Mariner Islands) where it has been effective in reducing *C. odorata*. It has also been released on Sumatra, Indonesia, where it is effective in reducing densities of the weed. Releases into other parts of Indonesia appear to have failed. \r\n
Another species, the stem gall fly *Cecidochares connexa* (originally collected from *C. odorata* in Mexico, Brazil and Bolivia Cruttwell 1974) is a suitable biological control agent for *C. odorata* (Cruttwell McFadyen Chenon and Sipayung 2003). Most gall-forming species of the tephritid genera *Cecidochares* Bezzi are highly host specific, sometimes attacking only a single plant species (Foote *et al*. 1993, in Cruttwell McFadyen Chenon and Sipayung 2003). Based on the results of host testing of *C. connexa* was granted Indonesian Government allowance for field release in 1995 and is now established on most of the larger Indonesian islands (Tijitrosemito 2002, Wilson and Widayanto 2002, in Cruttwell McFadyen Chenon and Sipayung 2003). Since then it has been released in Palau, Papau New Guinea and the Philippines (Esguerra 2002, Orapa *et al*. 2002, in Cruttwell McFadyen Chenon and Sipayung 2003; Dr. Muniappan, pers. comm.). Die-back and death of plants have been recorded at many sites within 3 to 5 years of release, especially in low altitude sites (less than 300m) with a short dry season (Cruttwell McFadyen Chenon and Sipayung 2003). At higher altitude sites (over 600m) or where cloudy conditions, cold temperatures or long dry seasons limit the number and activity of flies control is slower and less adequate (Cruttwell McFadyen Chenon and Sipayung 2003).

Pathway
Initial introduction to Southeast Asia probably occurred via introduction into the Calcutta Botanic Garden.*Chromolaena odorata* probably spread through Indonesia through live cattle shipments.The tiny seeds may contaminate imported forestry and pasture seed supplies.Sand and gravel extraction businesses operate in both the Thuringowa and Tully River catchments in Queensland, Australia. These are located within preferred Siam weed habitat and therefore present a high risk of spreading Siam weed seeds which could remain viable for a number of years post-dispersal. Sand and gravel are used in large quantities for road construction which by their nature are already favourable sites for establishment. These sites are therefore a major risk pathway. Soil, sand and gravel are rarely transported long distances as the major cost for these resources are those associated with transport. Thus, there are market barriers to long-distance dispersal by this means (Vanderwoude *et al*. 2005).Longer distance dispersal has been reported for seeds lodged in vehicle bodywork (Blackmore 1998, in Vanderwoude *et al*. 2005).Introduced to Ivory Coast in 1952 to control *Imperata* spp. following a recommendation by a famous botanist, Auguste Chevalier.Used vehicles, mining and earthmoving machinery are often transported between countries in the Asia/Pacific region including Australia. These machines have often been in contact with soil at their source and are therefore potential carriers of weed seeds

Principal source: Pacific Islands Ecosystems at Risk, (PIER)

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ALIEN RANGE

[4] AUSTRALIA
[1] BENIN
[1] CAMBODIA
[1] CENTRAL AFRICAN REPUBLIC
[1] CHINA
[1] CONGO, THE DEMOCRATIC REPUBLIC OF THE
[1] GABON
[1] GUAM
[1] INDIA
[1] LAO PEOPLE'S DEMOCRATIC REPUBLIC
[2] MALAYSIA
[1] MAURITIUS
[1] MYANMAR
[1] NEW GUINEA
[5] NORTHERN MARIANA ISLANDS
[1] PAPUA NEW GUINEA
[1] SIERRA LEONE
[2] SOUTH AFRICA
[1] SOUTHERN AFRICA
[1] SWAZILAND
[1] TIMOR-LESTE
[2] UNITED STATES
[1] BANGLADESH
[1] BHUTAN
[1] CAMEROON
[1] CHAD
[1] CONGO
[1] COTE D'IVOIRE
[1] GHANA
[1] GUINEA
[9] INDONESIA
[1] LIBERIA
[1] MARSHALL ISLANDS
[6] MICRONESIA, FEDERATED STATES OF
[1] NEPAL
[1] NIGERIA
[7] PALAU
[1] PHILIPPINES
[1] SINGAPORE
[1] SOUTH EAST ASIA
[1] SRI LANKA
[1] THAILAND
[1] TOGO
[1] VIET NAM

Red List assessed species 3: CR = 1; EN = 1; LC = 1;

Axis kuhlii **CR** Axis porcinus **EN**

Crocodylus niloticus **LC**

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