European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

**EPPO Prioritization Process for Invasive Alien Plants**

13-18617 rev

# *Cardiospermum grandiflorum*

*Cardiospermum grandiflorum*, © http://www.kloofconservancy.org.za/

The prioritization process assessment for *Cardiospermum grandiflorum* has been elaborated by the EPPO Secretariat and was reviewed by the EPPO Panel on Invasive Alien Plants in 2013.

## Section A Prioritization process scheme for the elaboration of diffferent lists of invasive alien plants (pests or potential pests) for the area under assessment

**Init1 - Enter the name of the pest**
*Cardiospermum grandiflorum* Swartz

**Init2 - Indicate the taxonomic position and synonyms**
Sapindaceae

**Init3 - Clearly define the PRA area**
The EPPO region (see map at http://www.eppo.int/ABOUT_EPPO/images/clickable_map.htm).

**Init4 - Provide the reasons for performing this assessment, and report any risk analysis available for the assessed species.**
*Cardiospermum grandiflorum* (Sapindaceae) is a perenial climbing vine originating from tropical Africa and Central and South America. It is used as an ornamental plant. *C. grandiflorum* smothers other plants in riparian habitats and forests, and is considered invasive in South Africa and Australia. In the EPPO region, it is established in Canary Islands (ES), Malta, Sicily (IT), and Madeira (PT).
Considering the invasive behaviour of this species and its woldwide distribution, the Mediterranean countries may be at risk.

**A.1 - Is the plant species known to be alien in all, or a significant part, of the area under assessment?**
Yes
The species originates from Africa and Central and South America and is alien in the whole EPPO region.

**A.2 - Is the plant species established in at least a part of the area under assessment?**
Yes.
The species is established in some Mediterranean countries of the EPPO region: in the Canary Islands (ES) in Gomera, Gran Canaria, La Palma and Tenerife (Euro+Med Plantbase), Malta (Ameen, 2013), Sicily (IT) (Schicchi, 1999), and in Madeira (PT) (Euro+Med Plantbase).
It is recorded as casual (= transient) in Belgium (Verloove, 2007) where it is thought to have been accidentally introduced as a contaminant of wool in 1959, as well as in France (in the Landes and Alpes-Maritimes departments) (Tela Botanica Website).

The species is native to:

- Africa: Angola, Benin, Botswana, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Ghana, Guinea, Kenya, Liberia, Malawi, Namibia, Nigeria, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Uganda, Zaire, Zambia, Zimbabwe.
- Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Jamaica, Nicaragua, Panama.
- North America : Mexico.
- South America: Argentina, Bolivia, Brazil, Ecuador, Guyana, Paraguay, Peru, Uruguay, Venezuela.

The species has also been introduced and is established in North America in Hawaii, in South Africa (KwaZulu-Natal, Gauteng, Mpumalanga and Limpopo Provinces) as well as in Australia (New South Wales, Queensland), Cook Islands, French Polynesia and New Zealand (North Island: Auckland, Waikato) (see USDA-GRIN, 2012).

The GBIF worldwide distribution map of *C. grandiflorum* fits quite well with its known occurrences, except for its distribution in the EPPO region (see Figure 1).

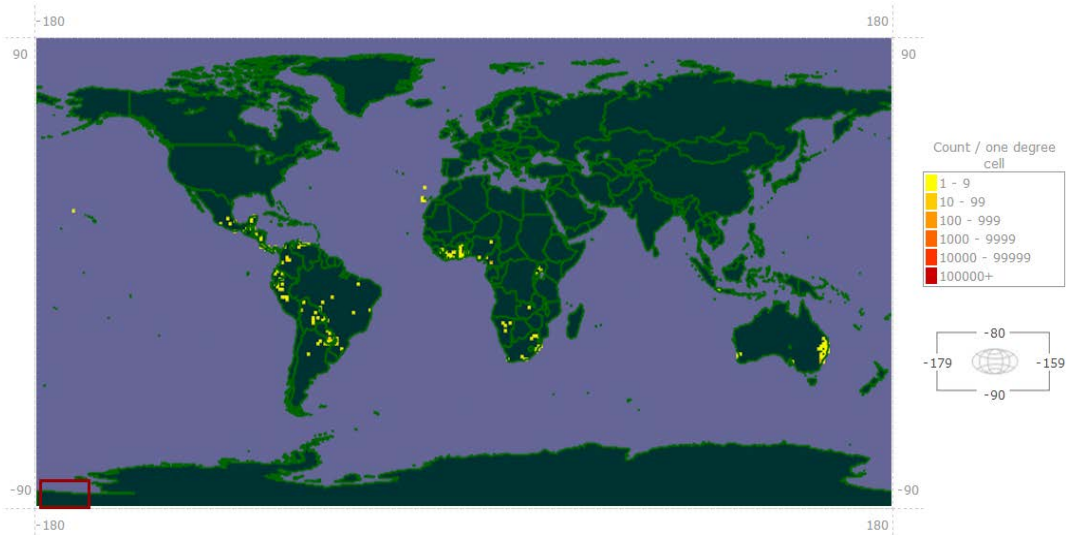

Figure 1: GBIF worldwide distribution for *Cardiospermum grandiflorum*. Records are missing in the EPPO region (e.g. Malta, Sicily).
Biodiversity occurrence data accessed through GBIF Data Portal, data.gbif.org, 2013-04-11.

The GBIF Niche Model, taking all the parameters into account, indicates that the Mediterranean rim would be suitable for *C. grandiflorum* to establish (Figure 2). This projection fits with the species' current distribution in the Canary Islands, Madeira, Malta, and Sicily. The species is also considered to be able to establish in Réunion (French Overseas department) according to the risk analysis undertaken by Le Bourgeois & Camou (2006).

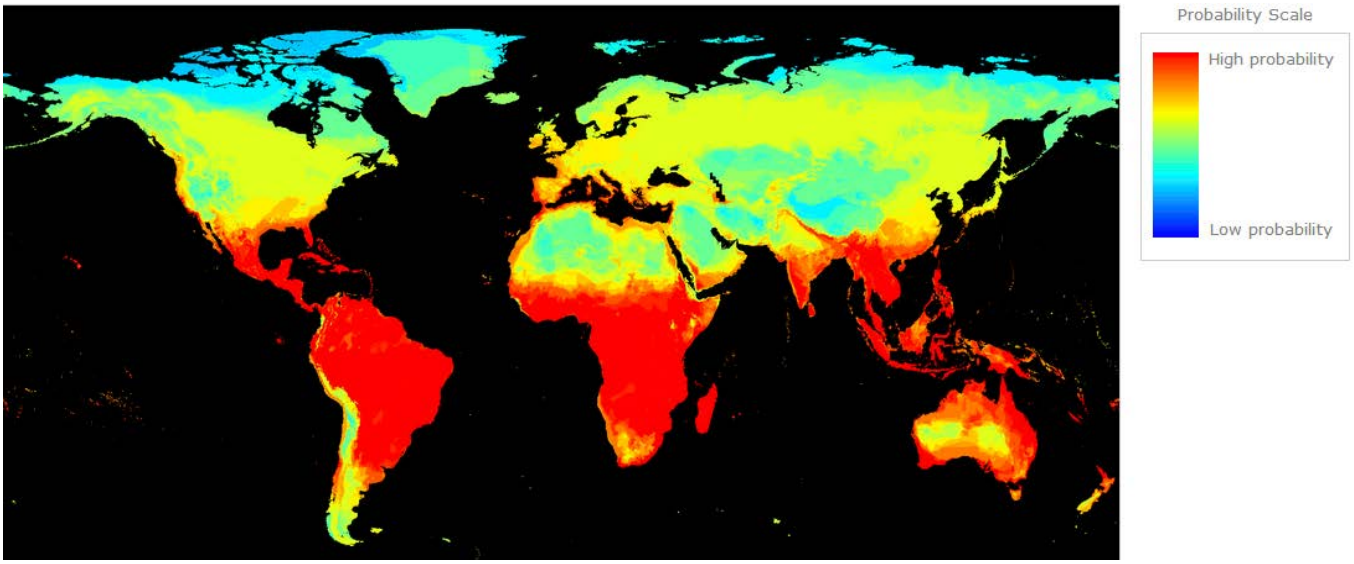


Figure 2 : Worldwide Projection of the GBIF Niche Model of *Cardiospermum grandiflorum*. Biodiversity occurrence data accessed through GBIF Data Portal, data.gbif.org, 2013-04-11.

**Questions A.5, A.6, A.7 and A.8 all have to be assessed independently. The risk should be considered for the area under assessment where the species is able to establish and to cause damage. The risk should not be downgraded by making an average for the entire area under assessment, if it is different from the area of potential establishment.**

**As far as possible, evidence should be obtained from records of invasive behaviour in the area under assessment or in the EPPO region. Information on invasive behaviour elsewhere may also provide guidance.**

**It should be ensured that suitable habitats are present in the area under assessment, for instance, mangroves and some specific cropping systems are not found in the EPPO region.**

**Any impact through hybridization on native plant species, crops or wild crop relatives is also considered in this section.**

**A.5 - How high is the spread potential of the plant in the area under assessment?**

High

Level of uncertainty: Medium

*C. grandiflorum* is a perennial species reproducing mainly by seeds, but vegetative reproduction through roots is also reported. Germination can occur at any time during the year and seeds can germinate in dark conditions. It also tolerates shade. Seed longevity is estimated to be around 2 years (Vivian-Smith *et al.*, 2002), but this is still to be confirmed.

The fruits of the plants can be spread by wind and by water (ESC, 2007). Takhtajan (1981) reports that granivorous birds may spread the plant, as well as ocean currents. The plant may also be spread in dumped garden waste (Biosecurity Queensland, 2007).

The uncertainty is ranked as medium considering that all references on the spread potentiel of the species are from other continents.

**A.6 - How high is the potential negative impact of the plant on native species, habitats and ecosystems in the area under assessment?**

**List natural and semi-natural habitats where the species in known to occur. It includes all EUNIS habitat types 1 (http://eunis.eea.europa.eu/habitats-code-browser.jsp), except I (Regularly or recently cultivated agricultural, horticultural and domestic habitats) and J (Constructed, industrial and other artificial habitats).**
High
Level of uncertainty: Low
According to the Corine Land Cover nomenclature, the following natural or semi-natural habitats are invaded: Broadleaved deciduous woodland [G1], Broadleaved evergreen woodland [G2], Coniferous woodland [G3], Mixed deciduous and coniferous woodland [G4], Lines of trees, small anthropogenic woodlands, recently felled woodland, early-stage woodland and coppice [G5].

*Cardiospermum grandiflorum* is considered invasive in parts of Kenya and Uganda (A.B.R. Witt pers. obs.) and in Tanzania (BioNET-EAFRINET, 2011). The introduction and spread of *C. grandiflorum* is regulated in Réunion (FR) by the prefectural decree n°2011-01479, as it is assessed as representing an unacceptable risk according to the risk analysis undertaken by Le Bourgeois & Camou (2006).
In Australia, *Cardiospermum grandiflorum* is considered as a significant environmental weed in eastern New South Wales and South-Eastern Queensland, and is currently listed as a priority environmental weed in four Natural Resource Management Regions (Biosecurity Queensland, 2007).
In Australia, *C. grandiflorum* forms dense but localized stands which can smother other plants and reduce their ability to photosynthesise (Biosecurity Queensland, 2007). Seedlings of native shrubs and trees are unable to establish under the stands of this plant (Weber, 2003). The weight of vines can cause breakage of branches, and the dense thickets can also restrict the movement of native fauna. The presence of the vine leads to ecosystem changes of riparian zones, which is reported to contribute to the destruction of the rainforest canopy in Australia (Biosecurity Queensland, 2007).

In Malta, *C. grandiflorum* is reported to invade a Natura 2000 site 'Wied Babu' in Żurrieq and is considered to have devastating impacts on the native biodiversity of the island (Ameen, 2013).
In Macaronesia, *C. grandiflorum* is reported as invasive in Gran Canaria, La Gomera, Madeira, Tenerife. There, *C. grandiflorum* is reported to change the structure, abundance and succession in the habitats in which it occurs and to compete with other species and to facilitate invasions. It also occurs in protected areas, and vegetated sea cliffs with endemic flora of the Macaronesian coasts, thermo-Mediterranean and pre-desert scrub, siliceous rocky slopes with chasmophytic vegetation, and Macaronesian laurel forest (which is a protected habitat of the directive 92/43/EEC) (Silva *et al*., 2008). Endemic plants and plants listed in the Habitat Directive (92/43/EEC) are considered to be threatened by *C. grandiflorum* (see Silva *et al*., 2008).

**A.7 - How high is the potential negative impact of the plant on agriculture, horticulture or forestry in the area under assessment?**

**The habitats and the situations in which the species has negative impact on agriculture, horticulture or forestry should be listed. It includes EUNIS habitat (http://eunis.eea.europa.eu/habitats-code-browser.jsp) I (Regularly or recently cultivated agricultural, horticultural and domestic habitats) and J (Constructed, industrial and other artificial habitats).**
Medium
Level of uncertainty: High

According to the Corine Land Cover nomenclature, the following habitats are invaded: [I2], Transport networks and other constructed hard-surfaced areas [J4], Highly artificial man-made waters and associated structures [J5], Waste deposit [J6].

The species is reported to invade pasture land in New Zealand, and to have negative impacts on forestry plantations in the Pacific (EW, 2007).
As there is only one record in New Zealand on potential impacts of the species on agriculture and forestry, the level of uncertainty is ranked as high.

**A.8 - How high are the potential additional impacts (e.g. on animal and human health, on infrastructures, on recreational activities, other trade related impacts such as market losses)?**
Medium
Level of uncertainty: High
Dense infestations of *C. grandiflorum* are reported to be able to impede access, and to increase the risk and intensity of fires (Biosecurity Queensland, 2007).
As there are few records, the level of uncertainty is ranked as high.

**Responses to questions on impacts (A.6, A.7 and A.8) should be reported in the matrix in Fig. 2 in order to categorize the species. The highest score should be considered; however, impacts listed in question A.8 cannot be taken on their own as the highest impacts. Only if A.6 and/or A.7 is medium and A.8 is high should the overall impact be considered high.**
**Those species that have both a high spread potential and a high impact (either on cultivated or uncultivated ecosystems) are included in the list of invasive alien plants. Species with either medium spread or impacts are included in the observation list of invasive alien plants. Species with low spread and high impact are included in the observation list of invasive alien plants. All other species are registered on the list of minor concern.**
**The conclusions of the process can be presented in a matrix (see Fig. 2).**

| | | A5 -Spread potential | | |
|---|---|---|---|---|
| | | **Low** | **Medium** | **High** |
| **Adverse impacts (maximum rating from questions A6, A7. and A.8)** | **Low** | **List of minor concern** | **List of minor concern** | **List of minor concern** |
| | **Medium** | **List of minor concern** | **Observation list of invasive alien plants** | **Observation list of invasive alien plants** |
| | **High** | **Observation list of invasive alien plants** | **Observation list of invasive alien plants** | **List of invasive alien plants** |

**Fig. 2 matrix combining spread potential and adverse impacts.**

The answer provided to question A.5 on the spread potential of the species assessed was:
**High**
The answer provided to question A.6 on negative impact on native species, habitats and ecosystems was:
**High**
The answer provided to question A.7 on negative impact on agriculture, horticulture or forestry was:
**Medium**
The answer provided to question A.8 on additional impacts was:
**Medium**

According to the ratings provided, the assessed species falls into the:
**List of invasive alien plants**

**A.9 - The overall uncertainty for Part A of the EPPO prioritization process for invasive alien plants should be summarized:**
Medium
Although some references describe the environmental impacts of the species in the EPPO region, there remains some uncertainty on agricultural and social impacts.

## Section B Prioritization process scheme for the identification of invasive alien plants for which a PRA is needed

**B.1 - Is the plant species internationally traded or are there other existing or potential international pathways?**
**List the pathway(s) as justification.**
Yes, at least one international pathway is identified.
The species is known to be used as an ornamental plant. It is thought to have escaped from a garden in Australia (BRAIN, 1997) and in Malta (Ameen, 2013). Although no internet trade could be retrieved for this species, there are 2 sellers reported in the PPP Index.
Furthermore, in Belgium, the species is thought to have been accidentally introduced as a contaminant of wool in 1959 (Verloove, 2007), but such pathway no longer exists.

**B.2 - Is the risk of introduction by these international pathways identified to be superior to natural spread?**
Yes
*C. grandiflorum* still has a limited distribution, and voluntary introduction for ornamental use and the consequent escape of the plant to unintended habitats remains superior to natural spread.

**B.3 - Does the plant species still have a significant area suitable for further spread in the area under assessment?**
Large area suitable for further spread.
The species is established in a limited number of countries in the EPPO region (Canary Islands, Madeira, Malta and Sicily) and could potentially establish in further countries of the Mediterranean rim. The species still has a large area for further spread.

**The species assessed is a high priority for PRA.**

**The guidelines on pest risk analysis of EPPO Standard PM 5/3** *Decision-support scheme for quarantine pests* **should be followed to perform of a PRA.**

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