GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Dioscorea bulbifera***

Dioscorea bulbifera 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Liliopsida	Liliales	Dioscoreaceae

Common name

Yamswurzel (German), pousse en l'air (French), papa voladora (Spanish), Brotwurzel (German), hoei-oepas (English, India), igname bulbifère (French), inhame (Portuguese, Brazil), hoi (Hawaiian, Hawaiian Islands), potato yam (English), yam (English), kaile (Fijian, Fiji Islands), belloi (Palauan, Palau Islands), air yam (English), hoi (Tongan, Tonga Islands), hoi (Niuean, Niue Island), cheeky yam (English), wild yam (English), magnaheugo (Chamorro, Guam Island), pureka (English, Namoluk -Nómwunuuk- Atoll), kaile manu (Fijian, Fiji Islands), kaile ndranu (Fijian, Fiji Islands), soi (Samoan, American Samoa Islands), mata (Marshallese, Marshall Islands), sarau (Fijian, Fiji Islands), yoi (Yapese, Yap (Waqab) Island), bitter yam (English), ellal (English, Kosrae Island), dau kwasi (English, Solomon Islands), dau fasia (English, Solomon Islands), hoi (English, Tahiti Island), rook (Yapese, Yap -Waqab- Island), ápwereka (English, Chuuk Islands), air-potato (English), puruka (English, Satawan Atoll), palai (English, Pohnpei Island), pwereka (English, Chuuk Islands), pwer (English, Satawan Atoll), aerial yam (English), 'oi (English, Cook Islands), ñame de gunda (Spanish), pwerh (English, Puluwat -Pwonowót- Atoll), pi'oi (Hawaiian, Kaua'i Island)

Synonym

Dioscorea hoffa , Cordem.
Dioscorea tamnifolia , Salisb.
Helmia bulbifera , (L.) Kunth
Dioscorea bulbifera , L. var. *vera*Prain & Burkill
Dioscorea crispata , Roxb.
Dioscorea dicranandra , Donn.Sm.
Dioscorea heterophylla , Roxb.
Dioscorea pulchella , Roxb.
Dioscorea tenuiflora , Schltdl.
Smilax decipiens , Spreng.

Similar species

Dioscorea alata, Dioscorea sansibarensis

Summary

Dioscorea bulbifera is a highly invasive plant and presents a management problem in many parts of the world. Despite some medicinal and agricultural uses, *D. bulbifera* is widely characterized as an organism that outcompetes and smothers native vegetation.

view this species on IUCN Red List

Species Description
Dioscorea bulbifera is a monocotyledonus, dioecious, herbaceous perennial vine. Its annual stems, which arise from tubers, twine counterclockwise (Schultz, 1992). Langeland (undated) writes that \"stems are round or slightly angled in cross section...[and] leaves are long petioled [with] blades to 8 in or more long.\" *D. bulbifera* has simple, alternate, obvate leaves, characterized by their distinct heart shape and veined pattern. Aerial tubers, or bulbils, arise from the axils of the plant and are usually smooth and subspherical. *D. bulbifera* is identifiable especially by its aggressively climbing, twining stems, which reaching lengths of 60 feet or more, and its \"large heart shaped leaves...and potato like aerial tubers from the leaf stems\" (Schultz, 1992).

Notes
In an analysis of 4 wild Nepalese yam species, including *Dioscorea bulbifera*, Bahndari and Kawabata (2004) found that constituent chemicals in the yams \"tend to imply that...wild yams may present a health hazard potential, which in turn demands propor processing before consumption to eliminate the effects of the antinutrients.\" Another study, by Beck *et al* (1984), evaluated traditional preparation methods of wild yams by Australian aboriginals. The process of baking, slicing, and leaching the yams overnight in running water removed the bitter compound diosbulbin D, making the yams palatable.
Plant microfossil analysis from the Me' Aure' Cave in Moindou, New Caldaonia, and the Yuku rock sheltor in Papua New Guinea suggests that *D. bulbifera* or a closely related precursor was present in these regions between 2700-18000 YBP (Horrocks*et al*, 2007a;Horrocks*et al*, 2007b).

Lifecycle Stages
Morisawa (1999) writes that tubers and bulbers of *Dioscorea bulbifera* usually sprout during spring, using dead vegetation from the previous years' growth to gain access to the canopy. Bulbils, which can lie dormant for up to a year, are produced in mid-summer and drop to the ground in the late summer/early fall (Schultz, 1992). Stems begin to die back in the early fall. Morisawa (1999) notes that \"raccoons, wild hogs and other animals do not seem to feed upon the bulbils,\" a factor which contributes to *D. bulbifera*'s rampant growth.

Uses
Schultz (1992) notes that \"*Dioscorea bulbifera* is one of the most common and widespread food yams and can be found in every hot, humid tropical region of the world.\" *D. bulbifera* is high in diosgenin, and is collected in the wild for steroidal drug hormones. Chemicals derived from *D. bulbifera* are also used in contraceptive pills. (University of Wisconsin-Madison, 1999).

Habitat Description
*Dioscorea bulbifera*demonstrates aggressive growth in a variety of mesic habitats, especially thickets, disturbed areas, fence rows, and hardwood hammocks. *D. bulbifera* does not inhabit coastal areas due to its salt intolerance, and it is rarely found in pinelands (Morisawa, 1999). In tropical hammocks, *D. bulbifera*'s growth is most concentrated in canopy gaps (Shultz, 1992).

Reproduction
Dioscorea bulbifera is vegetatively propagated. By producing an abundance of bulbils (aerial tubers) in its leaf axils, *D. bulbifera* assures its continuation, especially since soil contact is not necessary for stem production (Morisawa, 1999).

General Impacts
As an invasive plant, *Dioscorea bulbifera* has a variety of negative impacts. *D. bulbifera* interrupts natural ecosystem function by forming a mat of vines impenetrable by other plants or sunlight. *D. bulbifera* can smother both seedlings as well as full grown trees (Shultz, 1992) *D. bulbifera* also impacts wildlife species dependant on native vegetation. Economically, extra taxes and fees sometimes must be levied to help pay for control and eradication efforts. (Invasive.org, 2002).

Management Info
Management of *Dioscorea bulbifera* is generally labor intensive, expensive, and requires multiple visits to control sites. Horvitz and Koop (2001) participated in a study which investigated the relationship between native and non-native vine behaviour in the Miami-Dade area. Their intensive control program for *D. bulbifera* included: pruning native vines for better access to non-natives; cutting non-native vines; hand application of herbicide to non-native vines; hand pulling non-native seedlings/tubers; and positioning and pruning native species to facilitate growth and canopy access. Sites were revisited within 6 months for recutting, reapplication of herbicides, and \"hand removal of seedlings or other regenerative organs\" (Horvitz and Koop, 2001). Horvitz and Koop (2001) note that \"management significantly reduced seedling recruitment by non-native vines.\" Other researchers cite similar active management techniques for *D. bulbifera*, whose bulbils/tuber system is notoriously difficult to eradicate. Shultz (1992) notes the importance of disposing removed plant material in a secure location to avoid re-germination.
Preventative measures: *D. bulbifera* should not be recommended as an ornamental plant. It is classified as a Class A Noxious Weed in Alabama and as a noxious weed in Florida (NRCS, 2007).
Chemical: Morisawa (1999) writes that \"RoundUp, a nonselective herbicide, will kill the vines but the tuber will most likely resprout...Garlon 4 applied at a 10% concentration provides good control when applied with the basal application method. Completely encircle the lowest 30-61cm of the stem or trunk with the herbicide and form a band at least 15cm wide. Garlon 4 (10% concentration) and Garlon 3A (50% concentration) provide excellent control when applied to a cut surface.\" Wound vines with a hatchet and apply herbicide during the growing season (Morisawa, 1999).
Biological: An ongoing study by Sambura and Pemberton (ARS, 2007) seeks to identify natural insect herbivores of *D. bulbifera* in Nepal. So far the researchers' have identified a possible biological control agent in the Nepalese air potato beetle, *Liliocerus* spp.

Pathway

Principal source: Schultz, 1992;
Morisawa, 1999;
Horvitz and Koop, 2001.

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

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ALIEN RANGE

[5] AMERICAN SAMOA
[7] FRENCH POLYNESIA
[1] MEXICO
[1] NIUE
[7] TONGA
[1] WALLIS AND FUTUNA
[4] FIJI
[1] GUATEMALA
[1] NICARAGUA
[4] PALAU
[14] UNITED STATES

BIBLIOGRAPHY
18 references found for **Dioscorea bulbifera**

Managment information
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Summary: This source provides information on possible biological control agents for *D. bulbifera*.
Available from: http://www.ars.usda.gov/research/projects/projects.htm?accn_no=407144 [Accessed 16 May 2007]

Horvitz, C. and Koop, A., 2001. Removal of Nonnative Vines and Post-Hurricane Recruitment in Tropical Hardwood Forests of Florida. Biotropica.
Summary: This article details a exhaustive management scheme for removal of non-native vines in Florida. It encompasses mechanical and chemical control methods.
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Invasive.org (Invasive and Exotic Species). Online database *Dioscorea bulbifera*
Summary: Provides detailed list of impacts of invasive species, including *D. bulbifera*. Also provides identification clues and a summary of management techniques.
Available from: http://www.invasive.org/library/FLFSNoxWeeds/airpotato.html [Accessed 15 May 2007].
ISB (Institute for Systematic Botany). 2007. Online database. *Dioscorea bulbifera*
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Langeland, K., Undated. Natural Area Weeds: Air Potato (*Dioscorea bulbifera*). UF/IFAS.
Summary: Detailed account of species physical appearance and habits in Florida habitats. Provides some management information and Florida distribution.
Available from: http://edis.ifas.ufl.edu/AG112 [Accessed 15 May 2007]
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Summary: This paper provides management information for Pacific Island locations as well as distribution information.
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General information

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Summary: This article presents a plant microfossil analysis of remnants found in the Me Aure Cave.
Horrocks, M.; S. Bulmer and R.O. Gardner., 2008. Plant microfossils in prehistoric archaeological deposits from Yuku rock shelter, Western Highlands, Papua New Guinea. Journal of Archaeological Science, Volume 35, Issue 2, February 2008, Pages 290-301
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ITIS (Integrated Taxonomic Information System), 2005. Online Database *Diocorea bulbifera*
Summary: Detailed taxonomic information and useful links to other sites. An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.
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Summary: This database provides information about the species including distribution, noxious weed classifications, taxonomy, as well as links to related sites.
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Summary: This site provides extensive information about *D. bulbifera* s habitat, ecology, distribution, and common names.
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