GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Heracleum mantegazzianum***

Heracleum mantegazzianum 简体中文 正體中文

System: Freshwater

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Apiales	Apiaceae

Common name

barszcz mantegazyjski (Polish), Herkulesstaude (German), barszcz mantegazziego (English), cartwheel flower (English), hiid-karuputk (English), berce de Mantegazzi (French), kjempebjonnkjeks (Norwegian), kaukasianjattiputki (Finnish), wild rhubarb (English), jättebjörnloka (English), kaukasisk jättefloka (English), kæmpe-bjørneklo (Danish), bjarnarkló (English), mantegaci latvanis (English), giant cow parsnip (English), berce de caucase (English), giant cow persicum (English), berce du caucase (French), Riesenbarenklau (German), giant hogweed (English), Kaukasischer Barenklau (German), kaukasisk jattefloka (Swedish), mantegaco barštis (English), tröllahvönn (English), jättefloka (English)

Synonym

Heracleum asperum , M. Bieb.
Heracleum giganteum , Fischer ex Hornem.
Heracleum lehmannianum , Bunge
Heracleum persicum , Desf. Ex Fischer
Heracleum sibricum , Sphalm
Heracleum stevenii , Manden
Heracleum villosum , Fischer ex Sprengel

Similar species

Heracleum lanatum, Heracleum maximum

Summary

Heracleum mantegazzianum is native to Asia and has been introduced into Europe and North America. It is characterised by its size and may grow to 4.5 to 6 metres in height. It is most common along roadsides, vacant lots, streams and rivers, and can be considered an invasive freshwater weed. It forms a dense canopy, out-competing native riparian species and results in an increase in soil erosion along the stream banks where it occurs. Heracleum mantegazzianum germinates from early spring throughout the growing season, after exposure to winter temperatures. *H. mantegazzianum* exudes a clear watery sap that sensitises the skin to ultraviolet radiation which can result in severe burns. Populations in urban and suburban areas represent an increasing public health hazard. Glyphosate is considered the most effective herbicide.

view this species on IUCN Red List

Species Description
Heracleum mantegazzianum, or giant hogweed, is a perennial, monocarpic herb in the carrot and parsley family, Apiaceae (Krinke, *et al*, 2005). It is very tall, typically growing to 3-4 meters in height and may exceed 5 meters (Page *et al*, 2006). Its inflorescences are white, sometimes pinkish, compound umbels up to 80 cm across with 30-150 rays (Neilson *et al*, 2005; EPPO, 2006). Individual flowers are on pedicels 10-20 mm long and have petals up 12 mm long (EPPO, 2006). Terminal umbels are the largest and are surrounded by satellite umbels and additional umbels may occur on auxiliary stems (Krinke *et al*, 2005). Stems are rigid, stout, and typically 5-10 cm in diameter. Stems and leaf stalks are either completely or spotted dark reddish-purple in color, hollow, and produce postulate bristles that produce phototoxic sap (Neilson *et al*, 2005; EPPO, 2006). *H. mantegazzianum* has a thick, yellow branching taproot 15 cm in diameter and up to 60 cm long (Page *et al*, 2006; EPPO, 2006). Leaves are alternate with lower leaves 1-2.5 meters long, compound, irregularly shaped in ternate or pinnate segments, deeply lobed, and irregularly toothed. Upper leaves are smaller and sometimes not divided with longer petioles and more inflated sheaths. Leaves are usually pubescent on the underside when young and glabrous above (Page *et al*, 2006). Fruits are dry schizocarps consisting of two mericarp seeds 6-18 mm long, 4-10 mm wide and about 1 mm thick, which are joined until ripening. Mericarps are elliptical, flattened, and emarginate at the apex with thin low dorsal ridges and broadly winged lateral ridges (Page *et al*, 2006; Tiley *et al*, 1996). The endosperm is oily and mature fruits have a strong resinous smell (Tiley *et al*, 1996).

Notes
The sap of *Heracleum mantegazzianum* causes a skin reaction that sensitizes skin to sunlight that results in severe swelling in blisters. Contact of skin to the plant should be avoided (Westbrooks, 1991).

Lifecycle Stages
The seeds of giant hogweed germinate from early spring and continue throughout the growing season. Cold winter temperatures are necessary to break dormancy (EPPO, 2006). Seedlings initiate a vegetative rosette pattern of growth for the first season that may last 3-4 years (PBPI, undated; Pergl & Perglova, 2006). This phase allows rapid growth and dense development to outgrow and shade out competitive vegetation. *H. mantegazzianum* may postpone flowering until conditions are favorable and sufficient reserves are stored. When it does flower it flowers early and in great abundance (Neilson *et al*, 2005). Seedlings reach high densities of several thousand/m2 (Klingenstein 2007), and seed banks reach densities of up to 12,000/m2 (Neilson *et al*, 2005). On average only 10% of plants flower each year while remainders survive in the rosette stage to the next year (Klingenstein, 2007). In winter foliage dies back and re-grows from the stem and taproot in the spring (Pysek, 1991; PBPI, undated).

Uses
Heracleum mantegazzianum is a very popular ornamental. Many introductions to new locations are the result of its planting in ornamental gardens or growth for use in flower arranging. *H. mantegazzianum* is reportedly widely planted in Switzerland by beekeepers to increase food resources for bees. The dried fruits of the plant are used as a spice in Iranian cooking (Westbrooks, 1991). *H. mantegazzianum* has been cultivated for silage in Russia and has been suggested as a forage crop in Poland (EPPO, 2006).

Habitat Description
In its native range, *Heracleum mantegazzianum* is found on forest edges and glades, in riparian zones, and in mountainous areas with annual rainfall of 1000-2000 mm and a temperate continental climate of hot summers and cold winters. In nonnative locations, giant hogweed is typically introduced to ornamental gardens and spreads along river courses, roadsides, railways, vacant lots and other disturbed locations to invade sunny, moist locations (EPPO, 2006; EIAS, 2003; Pysek & Prach, 1993; Pysek & Pysek, 1995; Tiley *et al*, 1996; Washington State Department of Ecology, undated). Cold winters are required to ensure germination, but may also be necessary for flowering. It is most associated with temperate deciduous forest and mixed conifer forest vegetation zones (EPPO, 2006). Although it is generally a plant of open ground, *H. mantegazzianum* can establish and grow successfully in edges of clearings and partially shaded habitats, preferring moist conditions for much of the year, but can tolerate moderate summer droughts (Tiley *et al*, 1996). It is usually found on alkaline or only slightly acidic soils, from pH 6.0 to 8.5, and appears to be favored by soils with high nitrogen content. Occurrence of giant hogweed along riverbanks is usually associated with sandy or silty soils, but it is also recorded on a wide range of soil textures from gravels to clay and highly organic or waterlogged soils are also tolerated. (EPPO, 2006).

Reproduction
Heracleum mantegazzianum is an amphimictic perennial whose flowers are insect pollinated and self compatible (EPPO, 2006). It is also monocarpic and only reproduces once, usually in its third or fourth year (Pergl & Perglova, 2006; Page *et al*, 2006). Reproduction is done only by seeds which are copiously produced, from 5,000-100,000 per plant (EPPO, 2006). Seeds remain viable for up to 7 years and possibly longer (CEH, 2004). Flowering typically lasts from June to August. Flowers are compound umbels with 30-150 rays per flower and a total of more than 80,000 flowers can occur on a single plant (Klingenstein, 2007). Fruits are broadly winged schizocarps composed of two mericarps 6-18 mm long and 4-10 mm wide (Krinke *et al*, 2005; Tiley *et al*, 1996).

General Impacts
Heracleum mantegazzianum is considered to be one of the most problematic invasive plants in Europe (Pysek *et al*, 1998). It produces a toxic sap that causes a painful and problematic phototoxic reaction. It establishes dense monocultures that threaten natural ecosystems. It is also known to increase erosion of river and stream banks and to be a problematic weed in both agricultural and urban environments.
\r\nThe sap of *H. mantegazzianum* causes a phytotoxic reaction when in contact with the skin and exposed to sunlight (Klingenstein, 2007). Toxic furanocoumarins or psoralens are stored as biologically active aglycones in sap in the oil channels or ducts in the leaves, stems, roots, flowers and seeds. When they come in contact with the skin they cause an extreme sensitivity to sunlight called phytophotodermatitis (CEH, 2004). The phototoxic reaction is can be activated by ultraviolet radiation only 15 minutes after contact, with a sensitivity peak between 30 min and two hours (Klingenstein, 2007). It can lead to severe slow healing burns or scarring (EIAS, 2003). Blistering occur s 24-48 hours after exposure to sunlight and dense post inflammatory hyper-pigmentation is visible after 3-5 days and may persist for up to 6 years (CEH, 2004; Klingenstein, 2007). Gardeners, landscape workers, and children are at particular risk. Since the plant itself is painless workers or children in contact with the plant may continue exposure to the sap for hours (Klingenstein, 2007). Its hazard to human health causes *H. mantegazzianum* to lower the recreational value of invaded lands (Pergl & Perglova, 2006).
\r\nGiant hogweed changes species composition and reduces species diversity of native plant communities (Neilson *et al*, 2005). It establishes dense stands that displace and suppress the growth of native flora, especially in disturbed areas and riparian zones (CEH, 2004; Neilson *et al*, 2005; Page, 2006). *H. mantegazzianum* outcompetes native plants by shading them out, growing leaves above resident herbs and grasses (Thiele & Otte, 2007). It may also have allelopathic properties (Page, 2006).
\r\nIts replacement of native vegetation results in other effects to ecosystems and likely causes far reaching impacts. It displaces native riparian vegetation and then causes bank erosion in the winter it dies back (Page, 2000). Such instability of river banks caused by giant hogweed poses a serious threat to salmon spawning habits in Ireland (Caffrey, 1999). *H. mantegazzianum* is also known to hybridize with European native *Heracleum sphondylium* (Klingenstein, 2007), and be a problematic weed to agricultural and urban environments (Page , 2006).

Management Info
The Giant Hogweed Best Practice Manual provides up to date knowledge about all relevant aspects of the biology, ecology, taxonomy and management of invasive hogweeds. Background information and management guidelines mainly refers to Giant Hogweed (*H. mantegazzianum*) but is also usable for the closely related *H. sosnowskyi* and *H. persicum*.

The manual is available in eight different languages from: English, Czech, Danish, Dutch, German, French, Latvian, and Russian
The European and Mediterranean Plant Protection Organization (EPPO) datasheet on the hogweed provides information on options available for the control of this species including regulatory status.
Please follow this link for a summary of management options available for the control of the hogweed

Pathway
H. mantegazzianum has been introduced to Europe, the United Kingdom, Canada and the United States as a garden curiosity (The Washington State Department of Ecology (UNDATED)).

Principal source: European and Mediterranean Plant Protection Organization (EPPO), 2006. EPPO data sheet on Invasive Plants *Heracleum mantegazzianum*
Centre for Ecology and Hydrology, 2004. Information Sheet 4: Giant Hogweed. Natural Environment Research Council. Centre for Aquatic Plant Management.
Nielsen, C., H.P. Ravn, W. Nentwig and M. Wade (eds.), 2005. The Giant Hogweed Best Practice Manual. Guidelines for the management and control of an invasive weed in Europe. Forest & Landscape Denmark, Hoersholm, 44 pp.

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

Review: Anon

Pubblication date: 2011-02-23

ALIEN RANGE

[1] AUSTRALIA
[1] BELGIUM
[1] CZECH REPUBLIC
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[2] GERMANY
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[1] ITALY
[1] MEDITERRANEAN AREA
[1] NEW ZEALAND
[1] POLAND
[1] SWEDEN
[1] UKRAINE
[13] UNITED STATES
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[1] IRELAND
[1] LATVIA
[1] NETHERLANDS
[1] NORWAY
[1] SLOVAKIA
[1] SWITZERLAND
[1] UNITED KINGDOM

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Summary: The manual provides information about as many relevant aspects as possible of the biology, ecology and management of tall invasive hogweeds in Europe: Taxonomy and genetics, development and phenology (seasonal changes and growth cycle), population dynamics, interactions with soil, nutrients, vegetation cover, land use change and control options.This brochure is also available in eight languages at the project homepage www.giant-alien.dk.
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Summary: The Giant Alien project under the 5th Framework Programme of the European Union has taken an integrated approach to develop just such a sustainable strategy for invasive alien weed management in Europe. The project started in January 2002 and finished in April 2005. This manual mainly refers to *Heracleum mantegazzianum* but is also usable for the closely related *H. sosnowskyi* and *H. persicum*. One overall objective of our project was to provide all European authorities (e.g. municipalities, counties, districts, highway agencies, environment agencies) and private landowners with scientifically based but simple and practical management methods to reduce the abundance and prevent further spread of the invasive hogweeds.
The manual is available in eight different languages from: English, Czech, Danish, Dutch, German, French, Latvian, and Russian
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Summary: English:
The species list sheet for the Mexican information system on invasive species currently provides information related to Scientific names, family, group and common names, as well as habitat, status of invasion in Mexico, pathways of introduction and links to other specialised websites. Some of the higher risk species already have a direct link to the alert page. It is important to notice that these lists are constantly being updated, please refer to the main page (http://www.conabio.gob.mx/invasoras/index.php/Portada), under the section Novedades for information on updates.
Invasive species - Plants is available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas [Accessed 30 July 2008]
Spanish:
La lista de especies del Sistema de informaci&#65533;n sobre especies invasoras de m&#65533;xico cuenta actualmente con informaci&#65533;n aceca de nombre cient&#65533;fico, familia, grupo y nombre com&#65533;n, as&#65533; como h&#65533;bitat, estado de la invasi&#65533;n en M&#65533;xico, rutas de introducci&#65533;n y ligas a otros sitios especializados. Algunas de las especies de mayor riesgo ya tienen una liga directa a la p&#65533;gina de alertas. Es importante resaltar que estas listas se encuentran en constante proceso de actualizaci&#65533;n, por favor consulte la portada (http://www.conabio.gob.mx/invasoras/index.php/Portada), en la secci&#65533;n novedades, para conocer los cambios.
Especies invasoras - Plantas is available from: http://www.conabio.gob.mx/invasoras/index.php/Especies_invasoras_-_Plantas [Accessed 30 July 2008]
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ITIS (Integrated Taxonomic Information System), 2005. Online Database *Heracleum mantegazzianum*
Summary: 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.
Available from:
http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Heracleum+mantegazzianum&p_format=&p_ifx=plglt&p_lang= [Accessed March 2005]
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