GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: ***Hypericum perforatum***

Hypericum perforatum 简体中文 正體中文 **System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Theales	Clusiaceae

Common name

Johannesblöda (English, Sweden), castellas (English, South America, Spain), hierba de San Juan (English, South America, Spain), klamathweed (English, USA, UK), corazoncillo (English, South America, Spain), common St Johnswort (English, USA, UK), common St. John's wort (English, USA, UK), herbe De Saint-Jean (English, France), racecourse weed (English, Australia), perforate St. John's wort (English, USA, UK), goatweed (English, USA, UK), Hartheu (English, Germany), lulemaji (English, Albania), St. John's wort (English, USA, UK), lulebasan (English, Albania), herbe de St. Jean (English, France), millepertuis perfore (English, France), lule gjaku (English, Albania), todabuena (English, South America, Spain), millepertuis (English, France), bassant (English, France), casse-diable (English, France), randpirk (English, Sweden), mansblod (English, Sweden), Gemeines Johanniskraut (English, Germany), amber (English, USA, UK), tipton weed (English, USA, UK), touch and heal (English, USA, UK), iperico (English, Italy), Johanneskruid (English), Echtes Johanniskraut (English, Germany), herb john (English, USA, UK), goatsbeard (English, USA, UK), St. John's grass (English, USA, UK), gammock (English, USA, UK), Blutkraut (English, Germany), penny john (English, USA, UK), Johanniskraut (English, Germany), rosin rose (English, USA, UK), hipérico (English, South America, Spain), eala bhuidhe (English, Ireland), binbirdelikotu (English, Turkey), Y fendigedig (English, Wales), Unserer Frauen Bettstroh (English, Germany), mäkikuisma (English, Finland), Tüpfel-Hartheu (English, Germany), Tüpfel-Johanniskraut (English, Germany), äkta johannesört (English, Sweden), äkta mannablod (English, Sweden), Johannesört (English, Sweden), läpikuisma (English, Finland)

Synonym

Hypericum officinale , (Gater)
Hypericum vulgare , (Bauhin)
Hypericum veronense
Hypericum perforatum , var. *angustifolium*
Hypericum perforatum , var. *perforatum*
Hypericum perforatum , var. *veronense*
Hypericum perforatum , var. *microphyllum*

Similar species

Hypericum canariense, Hypericum mutilum, Hypericum spp.

Summary

Hypericum perforatum, more commonly known as St. John's wort, is a native flowering perennial plant of Eurasia. It has been widely introduced, mainly by human vectors, to North and South America, parts of Africa, Australia and New Zealand. St. John's wort can survive in a wide range of environments and has the ability to store reserves in its root crown and compensate during harsh times, which makes this plant difficult for management control. In recent years Hypericum perforatum has gained media attention for its use in alternative medicine, mainly for treating depression.

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Species Description
St. John's wort is a perennial herb with two distinct growth phases, a fall/winter prostrate or basal growth, and a spring/summer erect woody stem growth (Gordon & Kluge, 1991). St. John's wort has an underground rhizomatous stem and deep taproot with many lateral roots (Krueger & Sheley, 2002). The erect vegetative growth has opposite, sessile, entire (ANHP, 2005), linear to elliptical leaves 10-30mm long and 3-16mm wide, with translucent glands located on the undersides of the leaf and black glands located along the leaf margins (PIER, 2003). The flowers are numerous, paniculate cymes with 5 yellow petals, 5-8mm long, black dotted along the margins as well (PIER, 2003). Multiple stamens cluster into three groups, with three styles present (PIER, 2003). The capsules are 7-8mm long, dark brown ovoid, three chambered (ANHP, 2005), holding thousands of small, pitted cylindrical seeds (PIER, 2003).

Lifecycle Stages
St. John's wort initiates new erect stem growth and seed germination in spring (Tisdale *et al*.1959). Mean germination temperature needs to be above 11°C and access to light and adequate precipitation (Tisdale *et al*. 1959). Seed exhibits dormancy from exudation from the leaves and capsules (Tisdale *et al*. 1959), with a time of 4-6 months after harvest before germination (ANHP, 2005). Seed can remain viable in the soil between 6-10 years (Tisdale *et al*. 1959). Flower production occurs in the summer with leaves beginning to shed near the end of the flowering period, late summer to fall (Tisdale *et al*. 1959). Seeds are shed in fall and shoots begin to dieback in the winter (Fox *et al*. 1999); however basal growth can occur during the winter as well (Tisdale *et al*. 1959). The plant is a perennial reaching maturity in two seasons, with the first years growth directed mainly to establishment of the root system (Tisdale *et al*.1959).

Uses
St. John's wort has become popular in the 1990s as a herbal remedy, mainly for the treatment of depression. In preliminary clinical studies 50%-80% of people suffering from mild to moderate depression showed improvement (Rey & Walter, 1998). Other potential medical applications using St. John's wort includes treatments for anxiety, sleep disorders, bacterial and viral infections, inflammatory arthritis, skin wounds, cancer, and certain respiratory conditions (Rey & Walter, 1998). The plant is collected from the wild, but with its increasing popularity, it has begun to be cultivated. In Russia the plant is also used to flavour a traditional soft drink, \"Baikal\" (Kireeva *et al*. 1999).

Habitat Description
Hypericum perforatum forms dense stands on recently disturbed sites from impacts like mining, fire, logging, construction, *etc*. (Tisdale *et al*. 1959). It also establishes itself in waste grounds, roadsides, pasture, rangeland, and open woodland (Buckley *et al*. 2003). It has adapted to a wide range of environmental conditions in its native and introduced range (Maron *et al*. 2004). *H. perforatum* can tolerate a variety of soils, from dry, rocky, shallow soils, to deep fertile soils, with it performing best in regions with greater than 760mm of precipitation a year (Buckley *et al*. 2003). Soil pH tolerance ranges from 4.3-7.6 (ANHP, 2005). It can tolerate drought and disturbance conditions by storing reserves in its root crown (Buckley *et al*. 2003).

Reproduction
Hypericum perforatum reproduces through flower and seed production, as well as vegetatively through suckers arising from an underground rhizome (Tisdale *et al*. 1959). Flower production occurs in the summer with capsules persisting from late summer to early fall when seeds are shed (Fox *et al*. 1999). Seed production is very high with an average infloresence producing 39,000 seeds (Gordon & Kluge, 1991). Suckers can arise from the parent plant typically after mechanical damage or disturbance and quickly separate previous connections to the parent plant (Tisdale *et al*. 1959).

General Impacts
St. John's wort establishes itself on recently disturbed sites (Tisdale *et al*. 1959) and displaces and inhibits the settlement and establishment of native flora (Briese & Jupp, 1995). The plant contains two primary toxic compounds hypericin and hypericum red, which can cause photosensitivity in grazing livestock, leading to loss of weight and condition, even death in rare circumstances (Tisdale *et al*. 1959). The dried stems that are present during the fall and winter can pose as a fire hazard for forest and range lands (ANHP, 2005).

Management Info
Chemical: Chemical control of St. John's wort has had mixed results depending on the management plan and location of application. In South Africa, the initial management plan was a chemical eradication, however this programme was suspended when it proved unsuccessful and too expensive (Gordon & Kluge, 1991). Similarly, a chemical control in British Colombia, Canada, also was uneffective in eradicating the plant (Gordon & Kluge, 1991). However several field studies and programmes were initiated that designed a chemical application management strategy in the foothills and pasture lands of South Australia. Several different chemical formulations were used, but the ones that proved most successful were a combination of 2,4-D + 2,2,-DPA, or a straight application of glyphosate (Campbell *et al*. 1975). Timing of the applications is crucial in the success of a chemical application, with an autumn spraying seeming to be most effective in Australia (Campbell *et al*. 1975). In addition the method of application and the composition of the infested area prerequisite the chemical used. In a study by Campbell *et al*. (1991) found that triclopyr + picloram in combination were not selective for just St. John's wort but also killed any nearby legumes. A boom and spot method for application was discovered to work best with these chemicals. For glyphosates an aerial application worked better, and was more selective to St. John's wort, however glyphosates did not perform well at warmer temperatures (Campbell *et al*. 1991). For the best coverage using an aerial application adjuvants, water carriers, and repetitive anuual sprayings are recommended (Campbell *et al*. 1991). Ammonium sulfamate has been shown in several studies to be an effective herbicide against woody stem plants and St. John's wort, with the added benefit of decomposing into a plant soluble fertilizer for native grasses (Allgaier, 1944).
Cultural: Cultural management of St. John's wort has been in the form of controlled grazing by livestock (Campbell *et al*. 1975) but only as an additional means of control to other methods like a chemical or biological programme. It also msut be taken into consideration that St. John's wort is toxic and can cause neurological and other health problems, even death, if consumed in high quantities by livestock (Buckley *et al*. 2003). Goats seem to be more tolerant to the toxic effects of St. John's wort than other types of livestock (Buckley *et al*. 2003). Ploughing and fallowing on arable lands follwed by subsequent sowing of perennial grasses and legumes is another method of control (Campbell *et al*.1975). Sowing of perennial grasses and legumes a few weeks after a chemical application can help in suppressing any reemergence (Buckley *et al*. 2003).
Physical: Mechanical removal is not recommended for this species as it can vegetatively reproduce from the rhizomatous root crown which can be quite extensive underground (Tisdale *et al*. 1959). Fire is not recommended as a means of control since the plant can persist from underground resource storage in its crown(Buckley *et al*. 2003) and then reproduce through suckers (Tisdale *et al*. 1959).

Pathway
Hypericum perforatum was introduced into Australia in the middle of the 19th century for its ornamental and medicinal properties (Briese & Jupp, 1995).St. John's wort was introduced into South Africa in 1942 from a contaminated batch of vetch seed (Gordon & Kluge, 1991).Seed capsules can adhere to vehicles transporting the seed long distances (Gordon & Kluge, 1991).

Principal source: Tisdale, E.W., Hironaka, M., & Pringle, W.L., Jan. 1959, Observations on the Autecology of *Hypericum perforatum*, *Ecology*, Vol. 40, No. 1, pp.54-62.;
Buckley, Y.M., Briese, D.T., & Rees, M., 2003, Demography and management of the invasive plant species *Hypericum perforatum*. I. Using multi-level mixed-effects models for characterizing growth, survival, and fecundity in a long-term data set, *Journal of Applied Ecology*, Vol. 40, pp. 481-493;
Gordon, A.J., & Kluge, R.L., 1991, Biological control of St. John's Wort, *Hypericum perforatum* (Clusiaceae), in South Africa, *Agriculture, Ecosystems, and Environment*, Vol. 37, pp.77-90.

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

Review:

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ALIEN RANGE

[1] ARGENTINA
[8] CANADA
[1] COSTA RICA
[2] MAURITIUS
[1] PAPUA NEW GUINEA
[3] SOUTH AFRICA
[1] WEST INDIES
[6] AUSTRALIA
[1] CHILE
[1] JAPAN
[1] NEW ZEALAND
[1] REUNION
[49] UNITED STATES

Red List assessed species 1: EN = 1;

Platanthera praeclara **EN**

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26 references found for **Hypericum perforatum**

Managment information

Allgaier, B.E., 1944, The Chemical Control of Klamath Weed.I. Application of Ecological Methods in Determining the Herbicidal and Fertilizing Properties of Ammonium Sulfamate and Commercial Borax, *Ecology*, Vol. 25, no. 4, pp.424-432.
Summary: An alterntaive chemical management plan which utilizes ammonium sulfamate and borax as an herbicide for the control of St. John s wort as well as a fertilizer in later stages of decomposition for native grasses. Plant description and common names also detailed.
Briese, D.T., & Jupp, P.W., 1995, Establishment , Spread and Initial Impact of *Aphis chloris* Koch (Hemiptera: Aphididae), Introduced into Australia for the Biological Control of St. John s wort, *Biocontrol Science and Technology*Vol. 5, pp.271-285.
Summary: This article discusses some of the potential biological control insects and their subsequent establishement in Australia for control of St. John s wort. The insects involved show various rates of success in controlling the plant, but no one species stands out as a possible control option.
Buckley, Y.M., Briese, D.T., & Rees, M., 2003, Demography and management of the invasive plant species *Hypericum perforatum*. I. Using multi-level mixed-effects models for characterizing growth, survival, and fecundity in a long-term data set, *Journal of Applied Ecology*, Vol. 40, pp. 481-493.
Summary: Very informative article which addresses some of the environmental and management issues when trying to form models on the invasiveness of *Hypericum perforatum*. Gives good details on history and distribution of St. John s wort in Australia and some of factors involved in its success as a species and what control options lack in containing or stabilizing the population.
Campbell, M.H., Flemons, K.F., Dellows,J.J, Dec. 1975, Control of St. John s wort (*Hypericum perforatum* var. *angustifolium*) on non-arable land, *Australian Journal of Experimental Agriculture and Animal Husbandry*, Vol. 15, pp.812-817.
Summary: Chemical and cultural control management strategies with observations and techniques of how to employ these strategies. Very informative on drawbacks and considerations landowners and agencies need to consider when employing the control of St. John s wort on non-arable rangeland.
Campbell, M.H., Milne, B.R., Dellow, J.J., & Nicol, H.I., 1991, Effect of herbicides on St. John s wort (*Hypericum perforatum* L.), *Australian Journal of Experimental Agriculture*, Vol. 31, pp.499-501.
Summary: Another article with additional emphasis on chemical and cultural control strategies in Australian rangeland management.
Gordon, A.J., & Kluge, R.L., 1991, Biological control of St. John s Wort, *Hypericum perforatum* (Clusiaceae), in South Africa, *Agriculture, Ecosystems, and Environment*, Vol. 37, pp.77-90.
Summary: Article discussing the management strategies employed by agencies in South Africa in an effort to control populations of introduced St. John s wort. It gives great information into some of the failures of control and the success of using biological controls to stablilize the plant s population in South Africa with references to other countries as well.
Tisdale, E.W., Hironaka, M., & Pringle, W.L., Jan. 1959, Observations on the Autecology of *Hypericum perforatum*, *Ecology*, Vol. 40, No. 1, pp.54-62.
Summary: An excellent source for habitat effects on *Hypericum perforatum* and on methods of dispersal, reproduction, and land management.
Wapshere, A.J., 1984, Recent work in Europe on biological control of *Hypericum perforatum* [Guttiferae] for Australia, *Entomophaga*, Vol. 29, no. 2, pp.145-156.
Summary: Another article relating success and failure of different introductions of biological control for *Hypericum perforatum*. The species tested and observed again show various levels of success, but no one species is shown to establish and effectively control the plant.

General information

Alaska Natural Heritage Program, May 27 2005, Common St. John s wort, Environment and Natural Resource Institute, University of Alaska Anchorage
Summary: This article reiterates a lot of the key information found through the literature. This was referenced for its discussion of the presence of St. John s wort in Alaska and some of the habitat characteristics associated with the plants reproduction and establishment.
Available from: http://akweeds.uaa.alaska.edu/pdfs/species_bios_pdfs/Species_bios_HYPE.pdf [Accessed on 19 February 2007].
Babylon.com LTD., 1997-2007, online dictionary, defintion-wort.
Summary: This site was used to find out additional spanish common names for *Hypericum perforatum*.
Available from: http://www.babylon.com/definition/wort/Spanish [Accessed on 15 February 2007].
B&T World Seeds, *Hypericum perforatum* in profile, Paguignan, 34210 Aigues-Vives, France.
Summary: This online site is for a private seed company and was only used to reference additional global common names associated with *Hypericum perforatum*.
Available from: http://www.b-and-t-world-seeds.com/Hperfor.htm [Accessed on 15 February 2007].
California Department of Food and Agriculture, 2005, Noxious Weed Index, *Hypericum perforatum*, [online database].
Summary: Similar species to *H. perforatum* in California and the distinguishing differences in identification.
Available from: http://www.cdfa.ca.gov/phpps/ipc/weedinfo/hypericum.htm [Accessed on 19 February 2007].
Canadian Biodiveristy Information Facility, 2006, Notes on Poisonous plants: St. John s wort, [online information resource].
Summary: This site was used for the distribution of the introduction of St. John s wort in Canada.
Available from: http://www.cbif.gc.ca/pls/pp/ppack.info?p_null=Hypericum+perforatum&p_type=all&p_sci=sci [Accessed on 19 February 2007].
Fox, L.R., Ribeiro, S.P., Brown, V.K., Masters, G.J., & Clarke, I.P., 1999, Direct and indirect effects of climate change on St. John s wort, *Hypericum perforatum* L., (Hypericaceae), *Oecologia*, Vol. 120, pp.113-122.
Summary: Information regarding the effects of global temperature change in the establishment of certain invasive species, particularly St. John s wort.
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Summary: Available from: http://www.gbif.net/species/13741241/ [Accessed 15 June 2010]
ITIS (Integrated Taxonomic Information System), 2004. Online Database *Hypericum perforatum*
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.
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Summary: Additional use and medicinal information on St. John s wort.
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Summary: This article discusses the evolution of St. John s wort and potential differences in the native population versus the intorduced population and what characteristics distinguish any differences due to environment and selective pressures.
Pacific Island Ecosystems at Risk (PIER), 29 Dec. 2003, *Hypericum perforatum*, [online database]
Summary: An online database developed through Hawaiian Ecosystems at Risk and the Forest Service detailing information on the species that have impacted island ecosystems. General description and distribution on islands globally.
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Randall, R., 2001, A Global Compedium of Weeds, *Hypericum perforatum*, AgWest, USGS Hawaiian Ecosystems at Risk project (HEAR), online archive.
Summary: Online archive of the listing of plants that are considered weed species on a global perspective. This site was used for referencing common names associated with *H. perforatum*.
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Summary: This article was a great reference on some of the implications St. John s wort has for treating a variety of medical conditions, most notably depression. It also gave an interesting historical account of how the plant was introduced into Australia.
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Summary: United States distribution information.
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