

GLOBAL INVASIVE SPECIES DATABASE

Senecio squalidus

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Asterales	Asteraceae
Common name	oxford ragwort (English)			
Synonym				
Similar species				
Summary	Oxford ragwort <i>Senecio squalidus</i> is a short-lived perennial herb derived from plant material introduced to Britain from Mount Etna (Sicily) at the beginning of the eighteenth century. It appears to have spread rapidly through a large part of the British Isles across an ecological gradient involving large changes in temperature and rainfall.			
C REP	view this species on IUCN Red List			

Species Description

Senecio squalidus is an annual or short-lived perennial plant that normally flowers in its first year of growth (Stace 1997, in Allan & Pannell 2009).

Notes

A survey of randomly amplified polymorphic DNA marker variation demonstrated that *S. squalidus* is a diploid hybrid derivative of *S. aethnensis* and *S. chrysanthemifolius* that grow at high and low altitudes, respectively, on Mount Etna (Sicily) and that form a hybrid zone at intermediate altitudes (James & Abbott 2005). A particularly interesting finding in recent years has been the importance of hybridisation in plant invasions. It has been suggested that hybridisation may promote the evolution of invasiveness by increasing genetic variability or introducing novel genes that allow invasion of new habitats (Abbott 1992, Abbott *et al.* 2003, Ellstrand & Schierenbeck 2006, Rieseberg *et al.* 2007, in Allan & Pannell 2009). Many invasive species are the result of hybridisation events (Ellstrand and Schierenbeck 2006, in Allan and Pannell 2009), and hybridisation has also been shown to allow range expansion in native species (Rieseberg *et al.* 2007, in Allan & Pannell 2009). In this case, the fact that *S. squalidus* is of hybrid origin may have meant that it had sufficient genetic variation to expand its range in Britain, following introduction, by adapting to the different climatic conditions encountered there (Allan and Pannell 2009).

Habitat Description

Senecio squalidus is now a common sight in most urban areas of the British Isles south of the Great Glen, and is still spreading (Harris 2002). More recently, the species has spread along motorway verges in Britain, and it is now ubiquitous on waste-ground especially in urban areas (James & Abbott 2005). This species is typical of nutrient-rich soils and waste grounds, walls, paths and graves (Botham *et al.* 2009).

Several different experiments suggest that local adaptation has occurred in the introduced species *S. squalidus* across its new range. The results of these experiments indicate that adaptation may have occurred for a range of traits, allowing *S. squalidus* to survive in the cooler and wetter north of its British range (Allan & Pannell 2009). Drought experiments by Allan & Pannell (2009) suggest that southern populations of *S. squalidus* in Britain are better able to cope with drought stress than northern ones.



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: Senecio squalidus

Reproduction

Senecio squalidus is an annual or short-lived perennial plant that normally flowers in its first year of growth (Stace 1997, in Allan & Pannell 2009).

General Impacts

Senecio squalidus is a sleeper weed. A sleeper weed is defined as a sub-group of invasive plant species for which their population sizes has increased significantly more than 50 years after becoming naturalised (Groves 2006). S. squalidus has had important influences on the evolution of the British Senecio flora including hybridisation of native flora with the introduced weed (Abbott 1992, in Harris 2002). \n S. squalidus is an excellent model for studying many aspects of the ecology, genetics, and evolution of an invasive diploid plant species (Abbott et al. 2009). S. squalidus exhibits sporophytic self incompatibility (Hiscock 2000a, b, in Abbott et al. 2009) and has hybridised with a native United Kingdom species to give rise to three new Senecio taxa within the last 70 years (Abbott 1992, Ingram & Noltie 1993, Lowe & Abbott 2003, in Brennan et al. 2005): two new self-fertile hybrid species and one stabilised introgressant form of a native self-fertile taxon (Abbott et al. 2009). Two new polyploid species of Senecio have originated in the British Isles in recent times following hybridization between native S. vulgaris (2n = 40) and introduced S. squalidus (2n = 20). One of these is the allohexaploid S. cambrensis (2n = 60), the other is the recombinant tetraploid S. eboracensis (2n = 60)40) (Abbott & Lowe 2004). Currently, Abbott and colleagues (2009) are using a number of approaches, including genomic screens and microarray analysis to isolate genes that may have been important in adapting S. squalidus to conditions in the British Isles. The isolation of such genes in this and other invasive plant species will lead to a greatly improved understanding of the genetic basis of invasiveness in plants.

Management Info

<u>Preventative measures</u>: The European horticultural trade and botanic gardens are increasingly working in partnership on some issues and invasive ornamental species is a highly appropriate topic for working out joint policies (Heywood & Brunel 2008). Various other Codes or guidelines exist that are aimed specifically at botanic gardens such as the German-Austrian Code of Conduct for the cultivation and management of invasive alien plants in Botanic Gardens, or the International Plant Exchange Network (IPEN) Code of Conduct and, in the United States, the *Chicago Botanic Garden Invasive Plant Policy Synopsis* and the *Missouri Botanical Garden Code of Conduct* (Heywood & Brunel 2008).

Pathway

The spread of the species from Oxford, United Kingdom, was initially aided by the exchange of seeds between botanic gardens (Abbott *et al.* 2009).

Principal source:

Compiler: IUCN SSC Invasive Species Specialist Group (ISSG) with support from the Overseas Territories Environmental Programme (OTEP) project XOT603, a joint project with the Cayman Islands Government - Department of Environment

Review:

Pubblication date: 2010-06-08

ALIEN RANGE

[1] FALKLAND ISLANDS (MALVINAS)[2] UNITED KINGDOM

[1] IRELAND[1] UNITED STATES

BIBLIOGRAPHY

26 references found for Senecio squalidus



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: Senecio squalidus

Managment information

Heywood, Vernon & Sarah Brunel, 2008. Code of conduct on horticulture and invasive alien plants. Convention on the Conservation of European Wildlife and Natural Habitats. Standing Committee 28th meeting Strasbourg, 24-27 November 2008

Summary: Available from: http://www.plantnetwork.org/aliens/code_of_conduct_aliens_eu.pdf [Accessed 26 July 2010]

IUCN/SSC Invasive Species Specialist Group (ISSG)., 2010. A Compilation of Information Sources for Conservation Managers. **Summary:** This compilation of information sources can be sorted on keywords for example: Baits & Lures, Non Target Species, Eradication, Monitoring, Risk Assessment, Weeds, Herbicides etc. This compilation is at present in Excel format, this will be web-enabled as a searchable database shortly. This version of the database has been developed by the IUCN SSC ISSG as part of an Overseas Territories Environmental Programme funded project XOT603 in partnership with the Cayman Islands Government - Department of Environment. The compilation is a work under progress, the ISSG will manage, maintain and enhance the database with current and newly published information, reports, journal articles etc.

Otley H, Munro G, Clausen A and Ingham B. 2008. Falkland Islands State of the Environment Report 2008. Falkland Islands Government and Falklands Conservation, Stanley.

Williamson, Mark; Petr Pysek; Vojtech Jarosik & Karel Prach, 2005. On the rates and patterns of spread of alien plants in the Czech Republic, Britain, and Ireland. Ecoscience 12 (3): 424-433 (2005)

General information

Abbott, Richard J., 1992. Plant Invasions, Interspecific Hybridization and the Evolution of New Plant Taxa. TREE vol. 7, no. 12, December 1992

Abbott, Richard J.; Brennan, Adrian C.; James, Juliet K.; Forbes, David G.; Hegarty, Matthew J.; Hiscock, Simon J., 2009. Recent hybrid origin and invasion of the British Isles by a self-incompatible species, Oxford ragwort (*Senecio squalidus* L., Asteraceae). Biological Invasions. 11(5). MAY 2009. 1145-1158.

Abbott, Richard J.; Ireland, Helen E.; Joseph, Latha; Davies, M. Stuart; Rogers, Hilary J., 2003. Recent plant speciation in Britain and Ireland: Origins, establishment and evolution of four new hybrid species. Biology & Environment. 105B(3, Sp. Iss. SI). NOV 2005. 173-183.

Abbott, Richard J.; James, Juliet K.; Milne, Richard I.; Gillies, Amanda C. M., 2003. Plant introductions, hybridization and gene flow. Philosophical Transactions of the Royal Society of London B Biological Sciences. 358(1434). 29 June. 2003. 1123-1132.

Abbott, Richard J.; Lowe, Andrew J., 2004. Origins, establishment and evolution of new polyploid species: Senecio cambrensis and S.

eboracensis in the British Isles. Biological Journal of the Linnean Society. 82(4). August 2004. 467-474.

Abbott, R. J.; James, J. K. James; D. G. Forbes and H. P. Comes, 2002. Hybrid origin of the Oxford Ragwort, *Senecio squalidus* L: morphological and allozyme differences between *S. squalidus* and *S. rupestris* Waldst. and Kit. Watsonia 24: 17-29 (2002) Alien Plants in Ireland, 2008. *Senecio squalidus* L.

Summary: Available from: http://www.biochange.ie/alienplants/result_species.php?species=882&volg=i&lang=latin&p=I [Accessed 26 July 2010]

Allan, Eric; Pannell, John R., 2009. Rapid divergence in physiological and life-history traits between northern and southern populations of the British introduced neo-species, *Senecio squalidus*. Oikos. 118(7). JUL 2009. 1053-1061.

Botham, M. S.; Rothery, P.; Hulme, P. E.; Hill, M. O.; Preston, C. D.; Roy, D. B., 2009. Do urban areas act as foci for the spread of alien plant species? An assessment of temporal trends in the UK. Diversity & Distributions. 15(2). MAR 2009. 338-345.

Brennan, Adrian C.; Harris, Stephen A.; Hiscock, Simon J., 2005. Modes and rates of selfing and associated inbreeding depression in the selfincompatible plant *Senecio squalidus* (Asteraceae): a successful colonizing species in the British Isles. New Phytologist. 168(2). NOV 2005. 475-486.

Broughton, D. A. & McAdam, J. H. 2002. The Non-Native Vascular Flora of the Falkland Islands. Botanical Journal of Scotland 54 (2) 153-190. Ellstrand, Norman C.; Schierenbeck, Kristina A., 2006. Hybridization as a stimulus for the evolution of invasiveness in plants? Euphytica. 148(1-2). MAR 2006. 35-46.

Groves, R. H., 2006. Are some weeds sleeping? Some concepts and reasons. Euphytica. 148(1-2). MAR 2006. 111-120. Harris, S. A., 2002. Introduction of Oxford ragwort, *Senecio squalidus* L. (Asteraceae), to the United Kingdom. Watsonia. 24(1). February 2003. 31-43.

Summary: Available from: http://www.watsonia.org.uk/2403Harris.pdf [Accessed 26 July 2010]

Hiscock, Simon J., 2000. Genetic control of self-incompatibility in *Senecio squalidus* L. (Asteraceae): A successful colonizing species. Heredity. 85(1). July, 2000. 10-19.

Hiscock, Simon J., 2000. Self-incompatibility in *Senecio squalidus* L. (Asteraceae). Annals of Botany (London). 85(Suppl. A). March, 2000. 181-190.

Integrated Taxonomic Information Service (ITIS), 2010. Senecio squalidus L.

Summary: Available from: http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=36186 [Accessed 26 July 2010] James, Juliet K.; Abbott, Richard J., 2005. Recent, allopatric, homoploid hybrid speciation: The origin of *Senecio squalidus* (Asteraceae) in the British Isles from a hybrid zone on Mount Etna, Sicily. Evolution. 59(12). DEC 2005. 2533-2547.

Kent, H. Douglas, 1964. Senecio squalidus L. in the British Isles: 9, Ireland. The Irish Naturalists Journal, Vol. 14, No. 9 (Jan., 1964), pp. 203-205

Reynolds, Sylvia C. P., 1994. Records of Alien and Casual Plants in Ireland 1993. The Irish Naturalists Journal, Vol. 24, No. 12 (Oct., 1994), pp. 515-517

USDA, ARS, 2010. Taxon: Senecio squalidus L.. National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland.

Summary: Available from: http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?316824 [Accessed 26 July 2010]

USDA, NRCS, 2010. Senecio squalidus L. oxford ragwort. The PLANTS Database (http://plants.usda.gov, 26 July 2010). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Summary: Available from: http://plants.usda.gov/java/profile?symbol=SESQ [Accessed 26 July 2010]