

## Conservation of Britain's biodiversity: *Hieracium radyrense* (Asteraceae), Radyr Hawkweed

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### ABSTRACT

*Hieracium radyrense* (Pugsley) P. D. Sell & C. West (Asteraceae), Radyr Hawkweed is a very rare endemic species restricted to Radyr, Glamorgan (v.c. 41), Wales. It was first found in 1907, and was described as a variety in 1948 and as a species in 1955, and belongs to *Hieracium* Section *Vulgata*. It has been seen only a few times since it was first found. Surveys between 1998 and 2004 indicate that only one population with 20–25 plants survives, and it is extinct in two other sites. Neither the species nor the site has any legal protection, and it is under significant threat of extinction. Seed has been deposited in the Millennium Seed Bank, and it is being grown in cultivation.

KEYWORDS: Compositae, endemic, rare species, Wales.

### INTRODUCTION

*Hieracium radyrense* (Pugsley) P. D. Sell & C. West (Asteraceae), Radyr Hawkweed, or Heboglys Radyr in Welsh, is a very rare, endemic plant, restricted to Radyr in Glamorgan (v.c. 41), South Wales. It is included in the 3rd edition of the national vascular plant Red Data Book (Wigginton 1999), and it is a Red Data Book species and a Local Biodiversity Action Plan species in Cardiff (Cardiff County Council 1996, 2001). It has been seen only a few times since it was first found, and little is known about its distribution or ecology. In 1998 a joint project was set up between Cardiff County Council and the National Museums & Galleries of Wales to establish its current status and determine its needs for conservation. The project is summarised here; fuller details are given in Hutchinson & Rich (1998, 2003).

### TAXONOMY AND IDENTIFICATION

The history of *H. radyrense* was set out by Pugsley (1948). Plants which were eventually named *H. radyrense* were collected from Radyr Quarry in 1910 but were originally determined as *H. cacuminatum* Dahlst. Initial comments by H. J. Riddelsdell, J. A. Wheldon and E. S. Marshall that some of the plants at Radyr could be a distinct taxon were published in 1912 (Wheldon 1912), where the plant was referred to as *Hieracium sciaphilum* Uechtr. forma *paucifolia* Ley. Roffey (1925) referred the Radyr plants to *Hieracium paucifoliatum* Jord., but as this was not known as a British species Pugsley (1948) named it *H. lachenalii* Gmelin var. *radyrense* Pugsley. Sell and West (1955) subsequently raised it to species level as *Hieracium radyrense*, its currently accepted rank (Sell & Murrell 2005).

The main identification features are the broadly ovate-lanceolate, acute basal rosette leaves, with sharp, spreading, unequal teeth interspersed with fine teeth with the lowest teeth longest and spreading out from the subtruncate base, with simple hairs on the surfaces and margins. There are 2–3(–5), ovate-lanceolate, acuminate stem leaves which are irregularly and sharply toothed and sometimes lacinate-dentate towards the base. The involucre bracts are linear-lanceolate, acute, and have dense stellate hairs and unequal glandular hairs and rarely a few long simple eglandular hairs. The ligules are hairy at the apex. The styles are yellowish becoming fuscous (brownish). P. D. Sell considers the diagnostic characters to be the marked teeth on the rosette leaves and the dense stellate hairs on the involucre bracts (a few simple hairs present or not). The plant is illustrated in Figure 1.

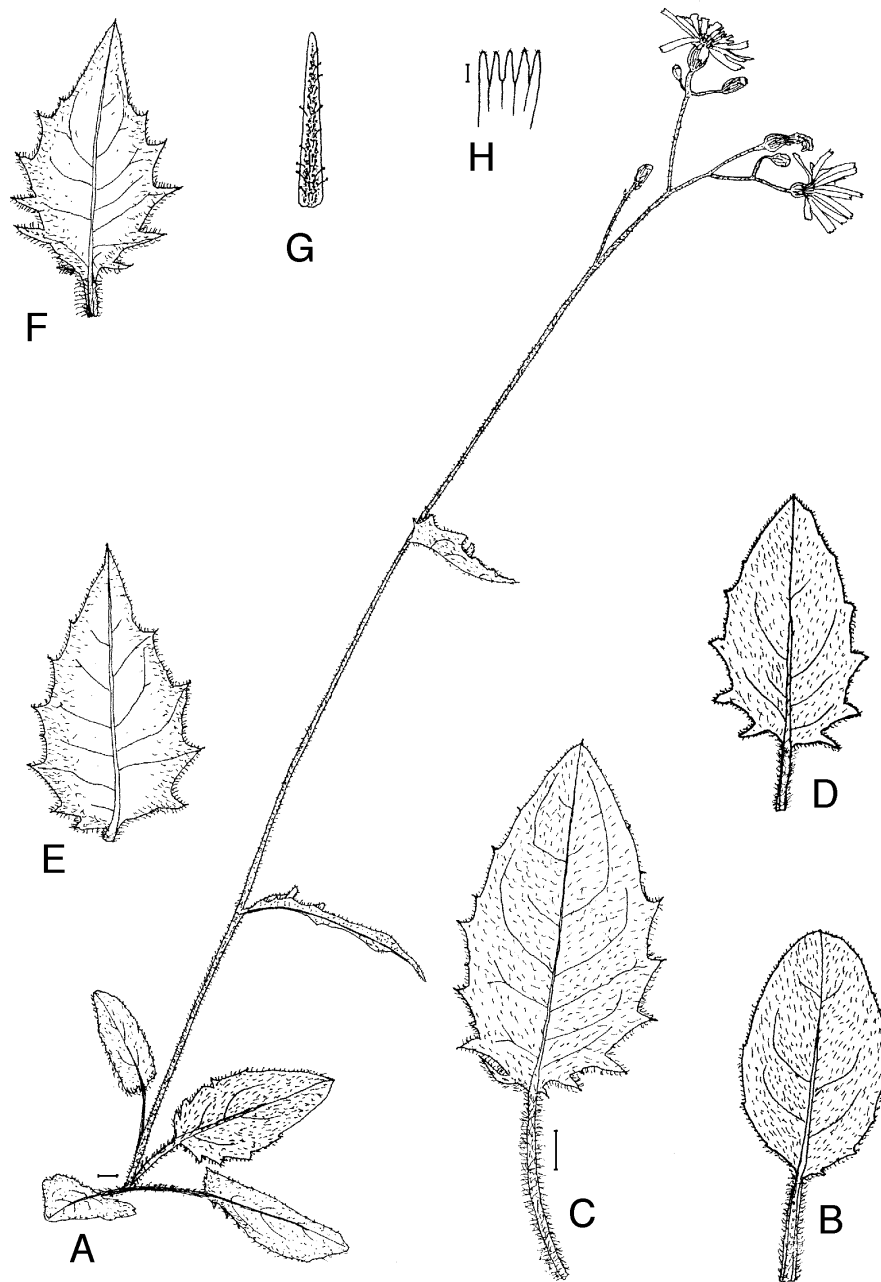


FIGURE 1. *Hieracium radyrense* (del. TCGR). A, plant. B, outer rosette leaf. C-D, inner rosette leaves. E-F, stem leaves. G, involucral bract. H, pilose ligule tips. Scale bars A-F 1 cm, G-H, 1 mm.

*Hieracium radyrense* belongs to Section *Vulgata* (Griseb.) Willk. & Lange, and it is reasonably closely related to other species in the Section. It is presumably a neoendemic which may have evolved from another extant member or extinct member of the Section since the last Ice Age.

## DISTRIBUTION AND POPULATION SIZE

Locality and habitat information in the archives at the National Museums & Galleries of Wales, the literature and herbaria (**BEL**, **BIRM**, **BM**, **CGE**, **LIV**, **MANCH**, **OXF** and **NMW**) has been compiled. Field surveys were carried out between 1998 and 2004.

## RADYR (ST17-ST18)

*Hieracium radyrense* was first collected from Radyr by H. J. Riddelsdell in 20 July 1907 (**BM**). Nearly all roadsides around Radyr were searched in 1998 and 1999, but the area is now one of the suburbs of Cardiff and no surviving plants could be found.

## RADYR QUARRY (ST1379-ST1479)

H. J. Riddelsdell collected *H. radyrense* at Radyr Quarry on 18 July 1910 and again on 3 June 1911 (**BEL**, **BM** (holotype), **CGE**, **LIV**, **OXF**, **NMW**). It was recorded again by C. West in June 1955 (**CGE**). The BSBI *Hieracium* Group saw one plant nearly in flower on the densely tree-covered quarry-face on 8 June 1985 (Bevan 1985). No plants were found in 1998 or 1999.

The quarry was active by 1844 but had ceased by the 1930s, and it was then commandeered as a rubbish tip and in-filled (Radyr and Morgantown New Horizons History group 1991, 1993). *Hieracium radyrense* survived on the quarry cliffs until the 1980s, presumably shade from colonising trees causing the decline.

## DANYBRYN, RADYR (ST130806)

The earliest *H. radyrense* record for this site is Radyr (drive), 4 July 1953, C. Andrews, C. West and 'J. C.' (**BIRM**), and it is probably also the site seen by B. A. Miles on 7 July 1955 with a slightly inaccurate grid reference (**CGE**). The BSBI *Hieracium* Group saw it on 8 June 1985 (**BM**, Bevan 1985).

Nine flowering plants were found at Danybryn on 24 July 1998 (**NMW**). On 6 July 1999, 13 flowering plants and 12 possible rosettes were counted. On 20 June 2003, 12 flowering plants with at least seven vegetative rosettes were counted (photographs in **NMW**).

## QUARRY NORTH OF MORGANSTOWN, RADYR (ST127822)

A specimen collected on 18 August 1965 by J. N. Mills from the disused quarry north of Morganstown, Radyr is labelled *H. radyrense* (**MANCH**), but lacks a basal rosette. The quarry was searched in 2003 and 2004 but only *H. cinderella* (Ley) Ley (det. D. McCosh) could be found; this looks very similar to *H. radyrense* but differs in having weakly toothed rosette leaves, one stem leaf and sparse stellate hairs on the phyllaries. It is likely that the **MANCH** material is also *H. cinderella*.

## COURT COLMAN, BRIDGEND (SS8881)

Cultivated material originating from a wall at Court Colman, Bridgend collected by H. J. Riddelsdell on 1 July 1915 is held in **CGE** and was named *H. radyrense* and reconfirmed by P. D. Sell in 1998 (this specimen is the basis of the record in Perring (1968) and Ellis (1983) which was rejected by Wade *et al.* (1994)). Searches of the area in 1998 and 2003 revealed only one population of a similar-looking plant which when cultivated was found to clearly differ from *H. radyrense* in leaf shape and tooting. Re-examination of the 1915 specimen in **CGE** in 2000 showed it to consist of one inflorescence with one detached leaf (probably from a stem) lacking a basal rosette, and in all probability is the same as the plant still present; the 1915 specimen is considered by T. Rich to be inadequate for identification, and the record is not accepted.

There are also a number of erroneous records for the Radyr and Cardiff area, and some material in herbaria is incorrectly named as *H. radyrense*. We have seen no other material to support Roffey's (1925) claim to have seen it elsewhere in South Wales. An updated distribution map is given in Figure 2.

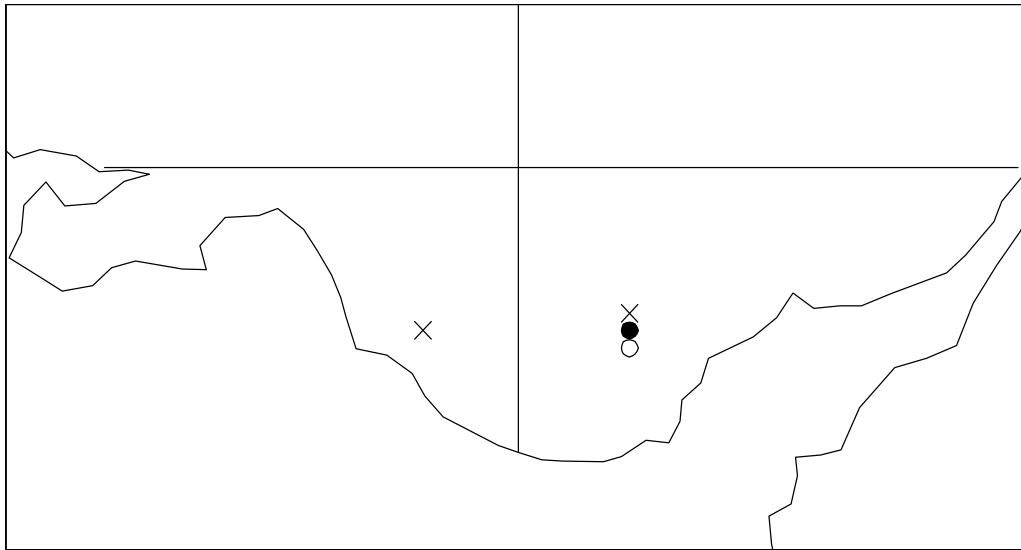


FIGURE 2. Tetrad distribution map of *Hieracium radyrense* in South Wales. ● 1998–2004. ○ Extinct. × Error.

#### BIOLOGY AND ECOLOGY

*Hieracium radyrense* is a polycarpic perennial. It is assumed to be an apomictic polyploid like most other British *Hieracium* species, but this has not been investigated. Plants vary in flowering time from late May in cultivation to early June or early July in the wild, and they usually finish flowering by August. In both cultivation and in the wild, plants have lived for at least seven years.

There appears to be nothing particularly special about the habitats from which it has been recorded. At Danybryn *H. radyrense* grows mostly on the grassy driveway bank and lawn which are cut once or twice a year, under the partial shelter and shade of trees and shrubs. The soil is probably derived from the underlying marl of the Lower Devonian Old Red Sandstone (British Geological Survey 1986) and is a fine, light brown soil, pH 7.3. At Radyr Quarry it grew on rocks of the Llanishen Conglomerate which is also part of the Lower Devonian Old Red Sandstone. It has been recorded from altitudes of c. 60–80 m.

At Danybryn the following species were recorded with DAFOR cover ratings growing with or close to *H. radyrense*: *Agrostis capillaris* L. F, *Brachypodium sylvaticum* (Hudson) P. Beauv. O, *Cornus sanguinea* L. R, *Cotoneaster horizontalis* Decne. R, *Epilobium ciliatum* Raf. O, *Fagus sylvatica* L. R, *Geranium robertianum* L. O, *Glechoma hederacea* L. O, *Hieracium diaphanum* Fries O, *Hieracium sabaudum* L. O, *Hieracium stenstroemii* (Dahlst.) Johanss. O, *H. submutabile* (Zahn) Pugsley R, *Holcus lanatus* L. O, *Hypochaeris radicata* L. F, *Ilex aquifolium* L. R, *Pinus nigra* J. F. Arnold O, *Plantago lanceolata* L. O, *Primula vulgaris* L. O, *Prunella vulgaris* Huds. O, *Quercus* × *rosacea* Bechst. R, *Senecio jacobaea* L. R, *Sequoiadendron giganteum* (Lindl.) Buchholz R, *Solidago virgaurea* L. F, *Stachys sylvatica* L. O, *Taraxacum* sp. O, *Teucrium scorodonia* L. R, *Trifolium medium* L. O, *Viburnum tinus* L. R, *Viola riviniana* Rchb. O and the bryophytes *Atrichum undulatum* (Hedw.) P. Beauv. O and *Mnium hornum* Hedw. O. The garden vegetation does not fit any recognised plant communities.

Many of the stem leaves of all the hawkweeds in the Radyr area observed during July 1998 had leaf-roll caused by toxins in the saliva of aphids feeding on the leaves (J. Deeming, pers. comm. 2004). In cultivation, the lower parts of the plant often become covered in mildew.

## CONSERVATION

Our 1998–2004 surveys show *H. radyrense* is now confined to one of the three sites, with a total population of about 20–25 plants.

Neither the species nor the site has any legal protection, and it is under significant threat of extinction. Under the IUCN Threat Criteria (IUCN 2001) it qualifies as Critically Endangered. Its inclusion as a Red Data Book species nationally and in Cardiff, and in the Local Biodiversity Action Plan process (Wigginton 1999, Cardiff County Council 1996, 2001) help to raise its profile but provide no long term security. The site is currently being managed with care by the owners, with grass-cutting in the immediate area of the plants being limited until at least mid-August which will allow seeds to mature, but the population is precariously small and subject to chance mismanagement.

*Hieracium radyrense* has been cultivated by T. Rich since 1998, and several batches of seed from it have been sent to the Millennium Seedbank, Wakehurst Place. Material is also in cultivation at the National Botanic Garden of Wales.

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## REFERENCES

- BEVAN, J. (1985). Reports of Meetings: Glamorgan, v.c. 41, Saturday 8th June 1985. *Botanical Society of the British Isles Hieracium Group Notes* **8**: 6.
- BRITISH GEOLOGICAL SURVEY (1986). *England and Wales, Sheet 263 Cardiff. 1:50,000 series*. Ordnance Survey, Southampton.
- CARDIFF COUNTY COUNCIL (1996). *City of Cardiff Nature Conservation Strategy. Part 1: Supplementary Planning Guidance on Nature Conservation*. Cardiff County Council, Cardiff.
- CARDIFF COUNTY COUNCIL (2001). *Wild about Cardiff. Cardiff's Local Biodiversity Action Plan*. Cardiff County Council, Cardiff.
- ELLIS, R. G. (1983). *Flowering Plants of Wales*. National Museum of Wales, Cardiff.
- HUTCHINSON, G. & RICH, T. C. G. (1998). *Distribution and conservation of Hieracium radyrense, Radyr Hawkweed, in Cardiff*. Unpublished report, National Museums & Galleries of Wales and Cardiff County Council, Cardiff.
- HUTCHINSON, G. & RICH, T. C. G. (2003). *Hieracium radyrense in 2003*. Unpublished report, National Museums & Galleries of Wales.
- IUCN (2001). *IUCN Red list categories and criteria. Version 3.1*. IUCN, Gland.
- PERRING, F. H., ed. (1968). *Critical Supplement to the Atlas of the British Flora*. T. Nelson & Sons Ltd., London.
- PUGSLEY, H. W. (1948). A Prodrum of the British *Hieracia*. *Journal of the Linnean Society of London (Botany)* **54**: 1–356.
- RADYR AND MORGANSTOWN NEW HORIZONS HISTORY GROUP (1991). *Twixt Chain and Gorge – a History of Radyr and Morganstown*. Shadowfax Publishing, Radyr.
- RADYR AND MORGANSTOWN NEW HORIZONS HISTORY GROUP (1993). *Memories of Radyr and Morganstown*. Shadowfax Publishing, Radyr.
- ROFFEY, J. (1925). The *Hieracia* of the London Catalogue. *Journal of Botany* **63**: 315–322.
- SELL, P. D. & WEST, C. (1955). Notes on British *Hieracia* – 1. *Watsonia* **3**: 233–236.
- SELL, P. D. & MURRELL, G. (2005, in press). *Flora of Great Britain and Ireland*. Volume 4. Cambridge University Press, Cambridge.
- WADE, A. E., KAY, Q. O. N. & ELLIS, R. G. (1994). *Flora of Glamorgan*. HMSO, London.
- WHELDON, J. A., ed. (1912). *H. sciaphilum* Uechtr. f. *paucifolia*. *Report of the Botanical and Exchange Club of the British Isles* **3**: 104–105.
- WIGGINTON, M. J., ed. (1999). *British Red Data Books. 1. Vascular Plants*. 3rd ed. Joint Nature Conservation Committee, Peterborough.

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