

Euphrasia cambrica & *E. rivularis*



Status

E. cambrica:

Red Data Book species.

IUCN threat category: Vulnerable, endemic (2005).

UK Biodiversity Action Plan Priority Species.

E. rivularis:

Red Data Book species.

IUCN threat category: Vulnerable, endemic (2005).

UK Biodiversity Action Plan Priority Species.

Taxonomy

Magnoliopsida: Scrophulariaceae

Scientific name:

Euphrasia cambrica Pugsley

Common names:

Welsh Eyebright, Coreffros Cymraeg

Scientific name:

Euphrasia rivularis Pugsley

Common names:

Snowdon Eyebright, Effros yr Wyddfa

Euphrasia is a critical genus with 21 species described for the British Isles. The species are often confused and hybridization is common. The most detailed account is that of Yeo (1978) on which these accounts are based. See also Stace (1997) and the helpful accounts with illustrations given by Silverside (1990-1991) and his revised notes in Rich & Jermy (1998).

Euphrasia cambrica and *E. rivularis* were first described briefly by Pugsley (1929), with further detail the following year (Pugsley 1930).

Biology & Distribution

Euphrasia cambrica is an annual herb of the well-drained, sheep-grazed grassland of mountain slopes, more rarely growing in and around wetter, base-enriched flush, where it can occur with *E. rivularis*. It is endemic to the uplands of Wales in Caernarfonshire and Merioneth reaching 880 m altitude on Cader Idris (Merioneth).

It has been confused with *E. ostenfeldii*, which can replace it on adjacent cliffs, and with which it forms a hybrid, as in a large population at Cwm Idwal (Caerns.).



Figure 1. *Euphrasia rivularis* (Snowdonia)



Figure 2. *Euphrasia rivularis* showing glandular hairs, Carmarthenshire. Photo R. D. Pryce © 2003

Euphrasia rivularis is an annual of damp mountain pastures and streamsides. It is an endemic with a very restricted range in Snowdonia and Carmarthenshire in Wales and in the English Lake District. In 2003 it was confirmed for Carmarthenshire by A. J. Silverside (Cottingham & Pryce, 2004), where it was found in base-rich, Old Red Sandstone flushes with, for example, *Briza media* (Quaking Grass) and *Linum catharticum* (Fairy Flax). Here, *E. confusa* plants were in drier, more acidic grassland. It grows to c. 750 m altitude on Snowdon (Caerns.).

Euphrasia rivularis is a diploid closely related to *E. rostkoviana* from which it has probably arisen through hybridisation with *E. micrantha*. Its distribution appears to be stable in the Lake District, but it has declined in Wales where recent searches have failed to find it in many known sites. Recent surveys of both species in Snowdonia have been carried by McCarthy (1999) with limited success.

Identification & Field Survey of *Euphrasia*

Euphrasia are annual species with mostly conspicuously toothed, opposite leaves attached to the nodes on the stem. The calyx is not inflated and has four entire lobes. The corolla varies from white to purple, usually with darker veins and yellow blotch on the lower lip, which forms a lobed platform. The upper lip is hooded. Flowers are generally produced from June to August, with fruit from late July to September.

The corolla length refers to the length of the detached corolla from the base of the tube to the tip of the upper lip. There are stem leaves and floral leaves (bracts), the latter associated with flowers or capsules. When counting the number of the nodes up the stem where the flowers begin, it is important to include any lower nodes where the leaves have become detached.

The presence of glandular hairs with globose heads is important (x10 lens, but preferably higher magnification). The globose heads are noticeably wider than their stalks and can be one sixth or more the length of the stalk (*E. arctica* ssp. *borealis*, and rarely *E. confusa*), and in other species one tenth or less the length of the stalk ('*E. rostkoviana* group'). Glandular hairs, if present, will be found at least on the underside of the bracts. The midrib is a good place to look as the bract is often turned upwards along it or can be folded upwards along it, then the bract held up to the light to see if there are any projecting glandular hairs in silhouette. Many species have both glandular and eglandular hairs. Also note the height of the plant and the number of pairs of branches on the main stem.

For a reasonable chance of correct identification at least five or six well-grown (not stunted) specimens should be examined, preferably with some bearing fruit.

Ranges rather than mean measurements should be taken. Damaged plants should be avoided especially if the upper portion of the main stem has been damaged, for example by grazing, as it can result in production of new excess branches in the lower part of the stem.

Identification & Field Survey of *E. cambrica* and *E. rivularis*

Euphrasia cambrica is easily overlooked because of its small size and inconspicuous flowers. It is a distinctive dwarf, compact, mountain species with a large capsule and very small corolla, being as small as any British species. It is part of the tetraploid group of *Euphrasia* Subsection *Ciliatae*, i.e. that with middle and upper leaves without glandular hairs, or with glandular hairs having the globose head one sixth or more the length of the stalk.

Euphrasia rivularis is part of the diploid group of *Euphrasia* Subsection *Ciliatae*, commonly referred to as the '*E. rostkoviana*' group, having middle and upper leaves with long glandular hairs, the globose heads of which are only one tenth or less the length of the stalk.

Key characters

Euphrasia cambrica: A minute annual, under natural conditions only 1-2(-8) cm in height, with 0-2 pairs of flexuous branches. Internodes usually shorter than leaves. Leaves only about 5 mm in length and rather sparsely clothed with relatively long hairs. Stem leaves moderately narrow and not very distinctive but the bracts frequently almost round with rather blunt teeth. Lowest flower at node 2-4. Corolla 4-5.5 mm long, with white or yellowish-white lower lip and white or lilac upper lip. Capsule 5-7 mm, slightly longer than the calyx; elliptic to obovate, and emarginate.

Euphrasia rivularis: An annual to 15 cm tall, with 0-2 pairs of short branches. Middle and upper leaves with long glandular hairs. Lowest flower usually at node (2-)3-5(-6). Corolla 6.5-9 cm long, with white or lilac lower lip and lilac upper lip. Lower bracts 3-6(-7) mm, shorter than flowers. Capsule less than twice as long as wide

Euphrasia cambrica is not easy to separate from stunted

Euphrasia cambrica & *E. rivularis*



upland forms of other species, such as *E. confusa* and *E. ostenfeldii*. It can be distinguished from *E. confusa* by its small flowers, the sparse long hairs on its leaves, the blunt teeth on the lower bracts, and the capsule shape. *Euphrasia ostenfeldii* should be more densely covered with rather shorter, eglandular

hairs, even on the exterior of its corolla, have slightly smaller, rather more straight-sided capsules and in Snowdonia being a more slender plant with narrower stem leaves shorter than the internodes. It is more a plant of rocky and gravelly places but the two species may grow near each other on turf ledges.

Differentiation from similar species

	<i>E. cambrica</i>	<i>E. confusa</i>
Corolla	small 4-5.5 mm	5-9 mm
Capsule	(4-)5-7 mm, longer than calyx, up to twice as long as wide	3.5-5.5(-6.5) mm, up to usually about as long as calyx, about 2-3 times as long as wide
Leaves	with sparse long hairs	glabrous to moderately hairy
Lower bracts	2-4 pairs of obtuse to subacute teeth; teeth about as long as wide; terminal lobe obtuse	2-6 pairs of subacute to acute teeth; teeth about as long as or much longer than wide, often incurved; terminal lobe obtuse to acute

Euphrasia rivularis: (separation from other species with long, glandular hairs)

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|---|--|---|
| 1 | Corolla less than or equal to 7 mm long | 2 |
| 1 | Corolla more than 7 mm long | 3 |
| 2 | Lowest flower at node (2-)3-5(-6); lower bracts 5-12 mm long, shorter than flowers; plant not branched or with 1-2 pairs of short branches | <i>E. rivularis</i> |
| 2 | Lowest flower at node 5-8; lower bracts 3-6(-7) mm long, often longer than flowers; plant usually with 1-4 pairs of strong branches | <i>E. anglica</i> |
| 3 | Lowest flower at node 5 or higher | <i>E. rostkoviana</i> / <i>E. anglica</i> |
| 3 | Lowest flower at node 2-5(-6) | 4 |
| 4 | Corolla up to 9 mm long; lower bracts 3-6(-7) mm long | <i>E. rivularis</i> |
| 4 | Corolla 9-12.5 mm long; lower bracts 5-12(-20) mm long | <i>E. rostkoviana</i> |

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