

Ophrys insectifera L.

Fly Orchid

A slender orchid of woodland edges, calcareous fens and other open habitats, *Ophrys insectifera* has distinctive flowers that lure pollinators by mimicry and the release of pheromones. Flowers have a velvety, purplish-brown labellum with an iridescent blue patch and a broad terminal lobe with two shining ‘pseudoeyes’, and very narrow petals resembling a pair of antennae. Its British strongholds are in the south and east of England. Elsewhere it is scattered across the Midlands, northern England and southern Ireland, rare in Wales, and absent from Scotland. Substantial declines throughout its range have led to an assessment of Vulnerable in Great Britain.



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IDENTIFICATION

Ophrys insectifera stems can reach 60 cm in height but are often difficult to spot amid the surrounding vegetation. Three yellow-green sepals contrast with the much smaller (less than half as long) vertical, slender purplish-brown labellum which has a velvety texture (Stace 2010) due to short, fine, downy hairs.

The labellum has two narrow side lobes spreading outwards and a broad terminal lobe which is notched at the tip and has two shining ‘pseudoeyes’ (Harrap & Harrap 2009). Flowers also have a distinctive iridescent blue patch on the speculum, located just below the two narrow lobes. The very thin petals are of a similar colour to the labellum, and project out like a tiny pair of antennae.

There are typically 1-10(-20) flowers on a single spike, with long green bracts curving upwards behind each flower (Devlin



Recording *Ophrys insectifera* in limestone vegetation at Mullagh More, Burren, County Clare. ©Kevin Walker

2011). The (2-5) unspotted elliptic-oblong leaves from which the flowering spike arises have a shiny, bluish-green appearance.

SIMILAR SPECIES

The distinctive lateral lobes, filiform petals, and slender appearance of the labellum should readily separate it from other *Ophrys* species. In rare instances, individuals of *O. insectifera* lack normal pigmentation (e.g. white sepals; greenish-yellow patterning on the labellum). Natural hybridization between *O. insectifera* and other *Ophrys* is rare, but current sites for the hybrid with *O. apifera* are known from Somerset and West Sussex. Hybridisation between *O. insectifera* and *O. sphegodes* is infrequently recorded from one location in east Kent.

HABITATS

In Britain *O. insectifera* is associated with damp, unimproved calcareous soils in open, occasionally lightly shaded areas (Hill et al. 2004). In the south of England, it is most commonly found in open deciduous woodland and scrub, although it may also occur in denser shade within beech woods, and is included in NVC W12 *Fagus sylvatica* – *Mercurialis perennis* woodland (Rodwell 1991). More rarely, but increasingly further north, *O. insectifera* is found on the thin calcareous soils of limestone pavement, chalk pits, disused railways and spoil heaps and, rarely, unstable cliffs (Carey & Dies 2002).

In Ireland it is a rare plant of limestone grassland (see photo opposite) and wet calcareous meadows, with populations largely confined to open calcareous flushes and fens attributed to M13 *Schoenus nigricans*–*Juncus subnodulosus* mire

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vegetation. It is found in similar species-rich fen vegetation at Cors Bodeillio, Anglesey, where it grows on *Schoenus nigricans* tussocks (Roberts 1959).

BIOGEOGRAPHY

Ophrys insectifera has a European Temperate distribution, extending from Ireland and the uplands of northern Spain east to the Apennines, Romania, northern Greece and the Ukraine, with outlier populations in Norway and Russia (Rankou 2011). Its altitudinal range varies from sea level to 1,700m (Delforge 1995).

In the British Isles it is still widespread in the south and south-east of England, despite substantial losses, particularly in East Anglia, but becomes more scattered and restricted in the Midlands, Cumbria and the north-east. The species reaches its northerly limit at the head of the Eden Valley, Cumbria, and formerly at Dalton Dene, South Northumberland.

It is a rare species in Wales, now found only in the Anglesey fens at Cors Bodeillio and Cors Erddreiniog and at a woodland site in Coed Abergele, Denbighshire. In Ireland *O. insectifera* is found along a central band running from County Kildare to County Clare, and most common in the west. It is absent from Scotland. Its British altitudinal range is from sea-level to 390m at Helbeck Wood, Westmorland.

Although *O. insectifera* is widespread throughout central Europe and is considered to be of Least Concern at a global scale, there are only scattered records from the Iberian

Peninsula, the west Mediterranean, and southern Scandinavia east towards the Urals (Hultén & Fries 1985). *O. insectifera* is listed as Critically Endangered on the Bulgarian Red List (Petrova & Vladimirov 2009) and Vulnerable on the Croatian Red List (Nikolić & Topić 2005).

ECOLOGY

A tuberous perennial usually found on chalk and limestone soils, flowering from May to July. Leaves emerge in the autumn following a period of dormancy following fruiting, but wilt and blacken soon after flowering (Foley & Clarke 2005).

O. insectifera is interfertile and depends on attracting hymenoptera for pollination. In Britain, two species of digger wasp are specifically attracted to *O. insectifera* (*Argogorytes mystaceus*, *A. fargeii*). Although the visual and tactile lures on the labellum of *O. insectifera* are important for short-range deception (Agren & Borg-Karlson 1984), the chemical mimicry of female hymenopteran sex pheromones and release of floral odour is the primary signal for pollinator attraction. This release of pheromones deceives males into attempting to mate with the labellum – a process known as pseudocopulation (see Wolff 1950). *O. insectifera* has two pollinia on each flower, narrowed downwards into long caudicles that are attached to separate spherical viscidia enclosed in two distinct pouches (Clapham et al. 1981). When the male attempts to mate with the labellum, the pouches attach to either the abdomen or head.

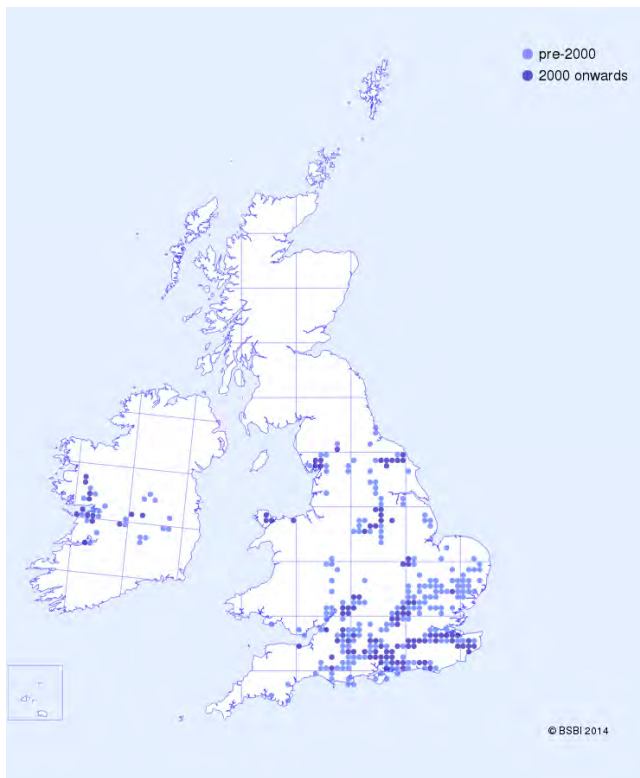
The uses of floral odor traits are thought to be crucial for maintaining reproductive isolation through the attraction of specific pollinators (Mant et al. 2007). However, such a finely tuned pollination mechanism may be particularly susceptible to changes in climate and the synchronized timings of both insect emergence and flowering, and will also be vulnerable to local declines in hymenoptera populations. It is not known why *O. insectifera* does not easily colonise new sites, but it may in part be due to the haphazard nature of pollination, with as little as 20% of flowers successfully pollinated (Foley & Clarke 2005).

THREATS

Although more research is required on the ecological niche of *O. insectifera*, threats certainly include habitat loss through the drainage of fens and coniferisation, and the loss of woodland edge habitat through abandonment of coppicing regimes. Future threats may also include shifting emergence patterns of pollinators as a result of climate change, the localised loss of pollinator populations through habitat loss, and the effect of increased Nitrogen deposition on associated grassland vegetation.

MANAGEMENT

Woodland edge populations will benefit from a cyclical coppicing regime. Fen and grassland locations should have either suitable grazing management, ensuring low levels of



Distribution of *Ophrys insectifera* in Great Britain and Ireland.

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grazing during the spring and early summer, or a cutting regime that removes biomass from the site and ensures that *O. insectifera* is not smothered by the surrounding vegetation.

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AUTHOR VERSION

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