

Silene otites (L.) Wibel.

Spanish Catchfly

Silene otites is a rosette-forming plant with spoon-shaped basal leaves and a whorl-like inflorescence comprising clusters of small, yellowish-green flowers. It is restricted to infertile, shallow calcareous soils in the East Anglia Brecklands of Suffolk, and to a lesser extent Norfolk, with two outlier populations recorded in recent times from Cambridgeshire. *S. otites* is associated with a short, open sward and requires periodic soil disturbance and localised areas of bare ground for germination and seedling establishment. Substantial habitat loss and decline have led to an assessment of Endangered in Great Britain.



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IDENTIFICATION

Silene otites is a largely dioecious plant with erect stems (to 80 cm) that are sticky to the touch. The green basal leaves form rosettes and are stalked, narrow, spoon-shaped and have a mucronate tip (Stace 2010). Stem leaves are unstalked, shorter and more linear than the basal leaves. The leaf margins are fringed with very short hairs, are occasionally pubescent on the underside, but are usually glabrous above (Jonsell 2001; Poland & Clement 2009).

The inflorescence comprises whorl-like clusters of flowers in terminal cymes, with branches emanating from each node. Flowers are 3-5 mm in diameter and held on pedicels 4-5 mm long. Each petal (c. 4 mm long) is a pale yellowish honey-green colour, tongue-shaped and entire. The calyx is glabrous, bell-shaped, papery, and has 10 narrow, feint veins (Jonsell 2001).



Silene otites at Cranwich Heath, west Norfolk. ©Mark Schofield.

SIMILAR SPECIES

Although a distinctive species when in flower, vegetative plants could be confused with *S. nutans* or non-native *S. italica*. However, the leaf tips of both these species are not mucronate, but are instead acute or obtuse. In addition, *S. nutans* has basal leaves that are sparsely hairy on both sides, whilst *S. italica* has basal leaves with a velvety feel due to the presence of dense, short hairs (Poland & Clement 2009).

HABITATS

Silene otites is a plant of open, well-drained, sandy or chalky shallow soils of low fertility (Hill et al. 2004; Sanford 2010), *S. otites* is found in areas that are subject to periodic disturbance, and is recorded from grassy heathland, tracks and short grass verges, notably in the Breckland area around Lakenheath, Icklingham and Eriswell (Sanford 2010).

Where remnants of low fertility grass heath still exist, especially on chalk soils, *S. otites* can be found with *Festuca ovina*, *Galium verum*, *Koeleria macrantha*, *Plantago lanceolata* and a high number of threatened species such as *Astragalus danicus*, *Herniaria glabra*, *Hypochaeris glabra*, *Medicago minima*, *Phleum phleoides*, *Silene conica* and *Thymus serpyllum* (Beckett 1999; Beckett & Bull 1999; Preston et al. 2013; Pankhurst 2014).

It is mentioned in the typical sub-community of NVC U1 *Festuca ovina*-*Agrostis capillaris*-*Rumex acetosella* grassland along with associates such as *S. conica* and *Scleranthus perennis*. Outside of Britain *S. otites* is a species of pioneer swards in similar habitats e.g. open calcareous grasslands, steppe grassland and slightly calcareous inland sands, where it is associated with the *Koelerion glaucae*, the *Sedo-*

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Cerastium, and the *Koelerion arenariae*.

BIOGEOGRAPHY

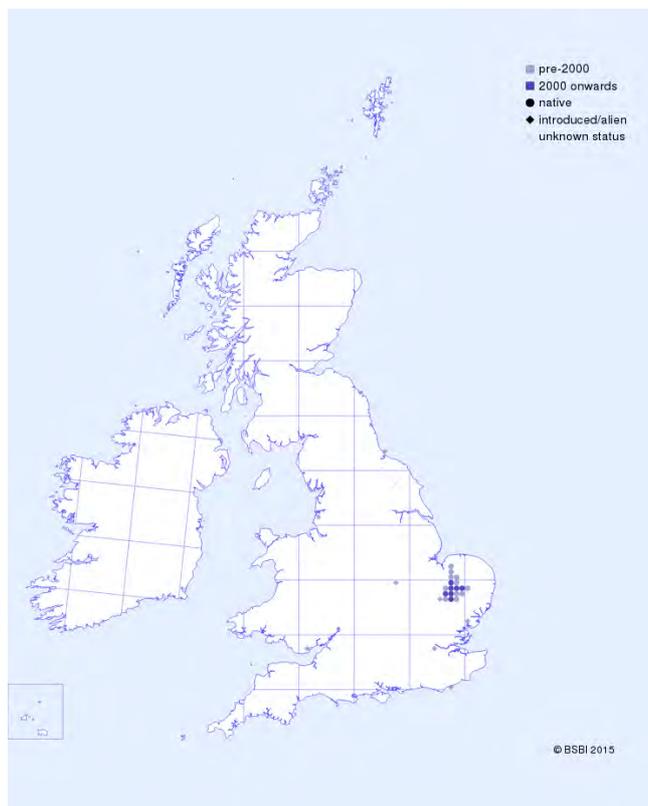
Silene otites belongs to the European Temperate element (Preston & Hill 1997) and is widespread across central and western Europe into western Asia, but is very local to the north of this range. It reaches its northern limits in Norway, with southern and eastern outliers in Turkey and central Siberia respectively.

In Britain and Ireland *S. otites* is restricted to the East Anglian Brecklands of Suffolk and, to a lesser extent, Norfolk, with additional pre-2000 records at two locations in Cambridgeshire. It is a characteristic plant of the *Medicago sativa* biogeographic cluster (Preston et al. 2013), which has a large proportion of threatened plants and a predominance of Euro-siberian species.

ECOLOGY

Silene otites is a long-lived wintergreen perennial, capable of flowering from late spring through to the end of summer. Plants have a long stout taproot and a persistent, sometimes branched short stem from which leaf rosettes are formed (Jonsell 2001).

A palatable species often confined to ungrazed grassland (Watt 1957), when flower stems are eaten off rosettes are capable of reproducing via vegetative spread, and may therefore survive in dense swards for a short period of time



Distribution of *Silene otites* in Great Britain and Ireland.

(Trist 1979; Pankhurst 2014), although plants will eventually succumb to competition from the surrounding vegetation, and specifically the growth of grasses such as *Avenula pratensis*, *Festuca ovina* and *Poa pratensis* (Watt 1971).

Flowers of *S. otites* appear to be pollinated by both wind and insects. Scent-producing glands (osmophores) in the tiny petals attract a range of moths and insects. Remarkably, Dötterl et al. (2012) observed that *S. otites* has the ability to regulate the timing, intensity and composition of floral scent, effectively fine-tuning scent emission with the olfactory preferences and activity of potential pollinators, thereby luring a wide range of both day-active and nocturnal insects.

Germination occurs in the autumn, with a second event taking place in early summer the following year (Soldaat et al. 2000), although the survival of summer germinants is usually very low due to exposure to drought conditions (Beckett 1999). The plentiful seed produced by plants appears to form a semi-transient seed bank (e.g. <5 years; Matus et al. 2003) and requires bare ground for germination and seedling establishment. Seeds are small and light and are most likely dispersed by wind, as well as on the feet or coats of sheep and rabbits. It is not known if seed can also be dispersed via consumption and digestion (endozoochorously), but the size and shape of the seed points to this possibility.

Silene otites often does not flower until the second summer following germination (Soldaat et al. 2000; Pankhurst 2014). Although it is not known if the onset of flowering is triggered by plant size, plant age, and/or environmental conditions, Freeman et al. (1997) found that the energy expended in female reproduction may result in female plants reproducing at larger plant size.

Silene otites is sub-dioecious, meaning that hermaphrodite plants may sometimes be present as well as separate male and female plants, although numbers of hermaphrodite plants are often very low. Contrary to most dioecious *Silene* species, a number of studies have shown a male-bias for *S. otites*. However, male plants appear to flower earlier in the season, and so this reported bias may perhaps be due to timing of recording. Soldaat et al. (1997) also found that sex ratio was in part related to environmental conditions, with populations located in higher vegetation cover containing a higher percentage of female plants.

Silene otites is the sole larval food plant in Britain for the now extinct Viper's Bugloss Moth *Hadena irregularis*, last recorded in 1977, and with extinction linked to decline of *S. otites*.

THREATS

A decline of c.60% since 1930 (Stroh et al. 2014) has been attributed to habitat destruction, cessation of management, reduction in sheep stocking levels and rabbit numbers, increased competition from surrounding vegetation, a prolonged absence of bare ground/disturbance, and eutrophication (Dolman & Sutherland 1992; Sanford 2010).

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MANAGEMENT

Historically, fallow land throughout Breckland was subject to hard sheep grazing or rabbit farming (Crompton & Sheail 1975; Beckett & Bull 1999). This kept the vegetation short, provided localised disturbance of the soil, and also helped to reduce nutrient availability (Dolman & Sutherland 1992). The maintenance of low nutrient levels is paramount, as is grazing by sheep and rabbits, and periodic soil disturbance.

Turf stripping and rotovation have both been successful in restoring *S. otites* to areas that have become overgrown and rank, although it is likely that an extant population will have to be present nearby to provide a seed source (Pankhurst 2014).

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AUTHOR VERSION

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SUGGESTED CITATION

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