

## *Silene nutans* L.

### Nottingham Catchfly

*Silene nutans* is a glandular-hairy plant with a lax, nodding inflorescence and creamy-white flowers with deeply bifid, inrolled petals. The petals unfurl at night, with flowers giving off a sweet-smelling fragrance to attract pollinators. It is associated with shallow, infertile soils on calcareous substrates throughout much of its range, but also occurs on acidic soils overlying shingle. Mainly a plant of coastal grasslands and cliffs in southern England, it becomes much rarer in Wales and eastern Scotland. Native inland populations occur on limestone outcrops and steep grassy slopes in the Peak District. It is nationally scarce and Near Threatened in GB.



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#### IDENTIFICATION

The lax, nodding inflorescence and upper parts of the erect green stems of *S. nutans* have glandular hairs sticky to the touch. Stems (1-10) vary in height from 15-115 cm depending on exposure to the elements (Hepper 1956). The numerous narrowly elliptic, tongue- or spoon-shaped basal leaves are cuneate at the base, grading into a long and slender petiole. Basal leaves are fringed with small hairs and are sparsely pubescent on both sides (Poland & Clement 2009). Upper stem leaves are also ciliate, narrowly lanceolate,  $\pm$  sessile and decrease in size up the stem at each node (Hepper 1956).

Flowers hang on pedicels 5-25 mm long and the anthers release their pollen before the stigma of the same flower is receptive (i.e. protandrous). The glandular-pubescent calyx (9-12 mm) is bell-shaped, has 10 fairly broad purple veins, and acute teeth 2-3 mm long (Jonsell 2001). Petals are creamy



Close-up of *Silene nutans*, photographed in the early evening when the perianth lobes unfurl and fragrance is produced in order to attract pollinators. ©John Crellin.

white (rarely pink), deeply bifid, reflexed and later inrolled, with narrow and acute coronal scales (Hepper 1956; Stace 2010). Flowers can be inconspicuous in the daytime because the perianth lobes are rolled inwards, but at dusk the lobes unfurl and exude a sweet-smelling fragrance to attract pollinators.

The fruiting capsule is ovoid with 6 spreading or reflexed teeth and has a tiny stalk that bears the fruit (carpophore) that is  $< \frac{1}{2}$  as long as the capsule (Stace 2010) with a dense covering of very soft, short hairs (Hepper 1956).

#### SIMILAR SPECIES

*S. italic* resembles *S. nutans*, but the former has a larger calyx (14-21 mm), a carpophore that is  $\pm$  as long as the capsule, and a knob-like scale at base of the petal-limb (Stace 2010). In addition, whereas *S. nutans* has a green stem, *S. italic* has green stems that are purplish at the base (Poland & Clement 2009).

#### HABITATS

*S. nutans* is a plant of calcareous rocky outcrops, slightly basilophilous or siliceous well-drained, shallow soils and, more rarely, of acidic soils overlying shingle (Lusby 2002). It is characteristic of dry, grassy or bare places such as unimproved short chalk grassland, steep coastal and inland cliffs, sandbanks, shingle ridges and the fissures of limestone crags and outcrops (Akeroyd 1994). In Britain it is also known from road verges, cultivated arable margins, old quarries and sea walls.

*S. nutans* occurs throughout the mapped extent of NVC CG2 *Festuca ovina*-*Avenula pratensis* grassland, where it is

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especially associated with rocky sites and slumping cliffs. Although open conditions are preferred, plants are capable of tolerating partial or full shade in thin woodland or scrub (Hepper 1956; Jonsell 2001). *S. nutans* is also one of the few national rarities to occur within MG1 *Arrhenatherum elatius* grassland, where it is occasionally found within the *Pimpinella saxifraga* variant of the *Centaureo-Arrhenatheretum* (Rodwell 1992).

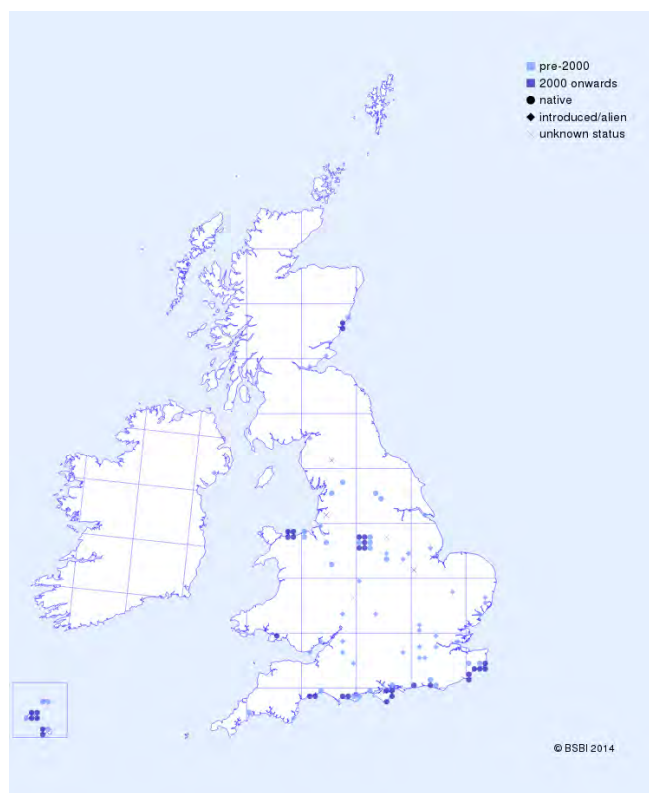
Outside of Britain, *S. nutans* is also found in Sub-Atlantic xerophile *Anthericum* oak-hornbeam forests, western white cinquefoil sessile oak woods and Pannonian-Balkan turkey oak –sessile oak forests.

### BIOGEOGRAPHY

*S. nutans* has a Eurosiberian Temperate distribution, being widespread across most of Europe with southern limits from southern Spain across to Calabria and Macedonia, and its northern range extending to Finland and Sweden. In Central Asia it is found through Siberia as far east as Lake Baikal (Akeroyd 1994).

In Britain, there are post-1987 records scattered along the coastlines of southern and south-east England, along a short stretch of the north Wales coastline from the Great Orme to Colwyn Bay, at Penrhynwyn, Carmarthenshire, and from the northeast coastlines of Angus and Kincardineshire.

Since the first *Atlas* (Perring & Walters 1962) it has declined inland and unfortunately is now extinct from both the walls of Nottingham Castle where it was first found by Thomas



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

Willisell in c.1669 (Clarke 2004), and Nottinghamshire. Native inland populations are now almost exclusively confined to the Peak District (Staffordshire and Derbyshire).

### ECOLOGY

A long-lived rosette-forming perennial hemicryptophyte, commonly found on thin soils, flowering from May to August. Plants can be extremely variable and robust British plants have been called subsp. *smithiana*, although Stace and others suggests that subsp. *smithiana* might not be worthy of subspecies status. Jonsell (2001) states that *S. nutans* plants can be either pubescent or glabrous, but plants intermediate in hairiness are rare. Glabrous plants are not given separate taxonomic recognition in *Flora Nordica*.

A tough taproot and fairly thick and creeping rhizomes and subterranean ascending branches produce tufted shoots and rosette leaves (Jonsell 2001). The taproot is c.5 cm long and has thinner roots branching off this main root for a further c.20-25 cm into cracks in the rock substratum (Hepper 1956), anchoring the plant in exposed situations.

New leaves are arranged with one half of the leaf wrapped around half of another leaf (i.e. obvolvate; Poland 2006). Flowering stems are brittle at the nodes, vary in size depending on aspect, location and exposure to sun and wind and wither directly after flowering (Hepper 1956).

*S. nutans* is a gynodioecious species, although flowers are usually hermaphrodite. Solitary female flowers tend to be smaller with more obviously rolled petals. Plants flower at dusk, open on three successive evenings and are pollinated by a number of different insect species, especially night-flying moths. Day-flying *Bombus* spp. have also been observed obtaining nectar by perforating the calyx.

Seeds are very small (0.7-1 x 0.5 – 0.6 mm), black, irregularly kidney-shaped (Jonsell 2001) and disperse via a simple censer mechanism, although the main mode of regeneration and short-distance dispersal is vegetative via rhizomatous spread, with fallen stems also able to root readily at the nodes (Hepper 1956). Where it occurs, *S. nutans* can therefore be locally abundant.

### THREATS

Threats include prolonged cessation of grazing leading to a dense build-up of litter and vegetation, loss of habitat, the use of broad-spectrum herbicide and, near to well-used coastal footpaths, excessive trampling of plants (Hepper 1956).

### MANAGEMENT

Management for *S. nutans* requires the maintenance of an open sward through either prescribed grazing or a suitable cutting regime.

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### REFERENCES

- Akeroyd, J.R. 1994. *Silene nutans* L.. In: Stewart, A, Pearman, D.A, & Preston, C.D. *Scarce plants in Britain*. pp. 387. JNCC, Peterborough.
- Clarke, W.A. 2004. *First Records of British Flowering Plants*. Reprint of 2<sup>nd</sup> edition. Trollius Publications, Cumbria.
- Hepper, F.N. 1956. *Silene nutans* L.. *Journal of Ecology* 44: 693-700.
- Lusby, P.S. 2002. *Silene nutans*. In: Preston, C.D., Pearman, D.A. & Dines, T.D. (eds & comps). *New Atlas of the British and Irish Flora*. pp. 175. Oxford University Press, Oxford.
- Perring, F.H. & Walters, S.M. 1962. *Atlas of the British Flora*. Thomas Nelson & Sons, London.
- Poland, J. 2006. Turning over a new leaf. *BSBI News* 102: 17-20.
- Poland, J. & Clement, E. 2009. *The Vegetative Key to the British Flora*. Botanical Society of the British Isles (BSBI), London
- Rodwell, J.S. 1992. *British Plant Communities. Volume 3. Grassland and montane communities*. Cambridge University Press, Cambridge.
- Stace, C.A. 2010. *New Flora of the British Isles*, third edition. Cambridge University Press, Cambridge .

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