

A reconsideration of *Orobanche maritima* Pugsley (Orobanchaceae) and related taxa in southern England and the Channel Islands

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ABSTRACT

Sub-specific status is considered more appropriate for the plant currently known as *O. minor* var. *maritima*. Its distribution in south-east England is reviewed and revised. The distinctive yellow coastal taxon described from Jersey, originally as a form of *O. ritro* (= *O. elatior*), is recognised here as a variant of *O. minor* subsp. *maritima* and the necessary new combination made.

KEYWORDS: *Orobanche*, Taxonomy, Broomrape, British Isles.

INTRODUCTION

Orobanche minor Sm. is throughout much of its British range a rather ephemeral species clearly often introduced in seed mixes and undeniably neophytic. Intra-populational variation tends to be low and inter-populational differences great but without any geographical structure as one might expect of an inbreeding species which is routinely and randomly introduced. Populations in coastal situations in southern England have greater claims to native status and pose a more complex series of taxonomic and nomenclatural problems. Among the most distinctive of these plants, and that with the most coherent distribution and tightly defined host range, is the taxon described by Pugsley (1940) as *O. maritima* Pugsley. This is currently recognised as *O. minor* Sm. var. *maritima* (Pugsley) Rumsey & Jury. Material ascribable to this taxon was first (incorrectly) recorded in the British Isles under the name *O. amethystea* Thuill. by the Rev. W. S. Hore (Hore 1845). The title of his paper indicates that he clearly had some doubts about its identity, not least because of apparent differences in the lower lip of the corolla and the smaller sepals of his plant, but ultimately he seems to have become convinced that this was the correct determination. This view was clearly not shared by Borrer (see Pugsley 1940) but the plant was treated under this name as a

possible sub-species of *O. minor* by Syme (1866). He described its diagnostic features as a “corolla bent back into a quadrant in the lower third, the upper two thirds of the back nearly straight; [the] lower lip with the middle segment conspicuously larger than the others.” Its host range and distribution were reported as “parasitical on *Daucus* in Whitesand Bay, Cornwall; near Plymouth, Devon; on the undercliff, S.E. of St. Margaret’s Bay, S. Kent; on *Eryngium maritimum*, near Cobo, Guernsey and St. Ouen’s Bay, Jersey.”

One probable outcome though of this account was that *Eryngium maritimum* became fixed in the botanical public’s consciousness as a host to *O. amethystea* auct. Angl. non Thuill., or *O. maritima* as it was to become (Pugsley 1940) and maritime examples of the *O. minor* aggregate occurring on this host were uncritically accepted as being of this taxon. This confusion has been further perpetuated by the similarity in host to the true continental *O. amethystea*, a large reddish-brown plant closely allied to *O. minor*, primarily parasitic on *Eryngium campestre*, which has erroneously but understandably been recorded as British subsequently, eg. Philp (1982).

Pugsley (1940) neatly summarised much of the earlier confusion when recognising *O. maritima* as a good species and he added several new distinguishing characters: the dark purplish colouration, an often bulbous stem-base, dense short pubescence, short broad-based bracts, shorter less acuminate sepals which were somewhat contiguous, i.e. fused beneath the corolla, and a less deeply lobed stigma. He considered the host range of his new species to include *Plantago coronopus* and *Ononis repens* as well as *Daucus*, and first made the linkage of this taxon with the coastal form of the wild carrot, “*D. gummifer*” now regarded as *D. carota* subsp. *gummifer* (Syme) Hook. f., while deliberately excluding material from the Isle of Wight and Channel Islands parasitic on *Eryngium maritimum*.

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THE TAXONOMIC STATUS OF *OROBANCHE MARITIMA*

Of the additional characters cited by Pugsley (1940) when recognising this taxon at specific rank many are discontinuously variable and highly plastic; intensity of colouration is at least partially influenced by the nutrient status of the plant, itself controlled by the nature, i.e. both the species and the vigour, of its host. Stem bulbosity is again dictated by the nature of the haustorial interface and this too is host-specific. Bract and sepal shape are highly and continuously variable and therefore not characters that can be used in isolation. Corolla shape (curvature of the back) is also difficult to quantify, highly variable, and fails to correlate with other supposedly diagnostic characters. The fusion of the stigma lobes is a condition which may be demonstrated by plants which show few or none of the other “*maritima*” characteristics and apparently may not always be shown by those that do (see Syme 1866, Plate MXVII). Likewise the degree of fusion of the sepals, a character that consistently defines such taxa as *O. elatior* and continental species such as *O. clausonis* Pomel, is variable within a single spike and the majority of the sepals examined on the holotype (Seacombe, Dorset, Pugsley 587 (BM)) are un-fused. The sole remaining defining character is that of the shape of the lower lip of the corolla, with its pronounced rounded, less erose-edged, central lobe with large basal bosses; a feature difficult to see in herbarium material. Quantification and therefore identification of intermediates with the typical *O. minor* state is accordingly difficult. That said, on balance most material can be assigned to a taxon on the overall balance of the characters. This becomes increasingly difficult, however, at the southern and western end of *O. maritima*'s range in Cornwall, the Scillies and Channel Islands, where it apparently exhibits a broader host and habitat range, and at the disjunct eastern end of its range on the chalk cliffs and dunes of Kent. It is perhaps revealing that its primary host *Daucus carota* subsp. *gummifer* shows a similar if less marked eastward disjunction (Preston *et al.* 2002) and likewise intergrades morphologically with its more common inland counterpart in this area. It is accordingly tempting to suggest a closely linked co-evolutionary history for these taxa (Rumsey 1994).

The areas in which we have the most difficulty discriminating taxa are those contact zones between var. *maritima* and other closely related plants. In the Purbeck limestone area of

the Dorset coast from which the taxon was described by Pugsley, the plant is essentially isolated by habitat, but on lower coastal cliffs in proximity to dune grasslands and vegetated shingles to the west (Devon, Cornwall, the Channel Islands) there exists ever greater opportunity for gene flow from *O. minor s. s.*

Confusion is also possible in south-east Kent with the extremely rare *O. picridis* F. W. Schultz, which occupies a similar ecological niche, if different host(s). It is clear from the error in Sitwell (1984) that this species is mistaken for *O. minor* var. *maritima*. Webb and Chater (1972) clearly regarded *O. maritima* as possessing some similarity to *O. picridis*: characters such as the straighter corolla back, more hirsute filaments, usually entire, not bidentate, calyx segments, etc. are common to both. On some well filled Victorian herbarium sheets from the St. Margaret's area some individuals which otherwise appear to be *O. picridis* have shorter, more highly pigmented corollas, and shorter, if still filiform sepals (eg. St. Margaret's, 1875, Bennett (BM)). A similar example, but more closely approaching *O. minor s.l.*, was photographed by Philip Chantler near St. Margarets in June 2004. The narrow strip of coastal grassland abutting onto cultivated land east of St. Margaret's also currently supports *O. minor s. s.* in arable margins and associated trackways and intermediate plants between this and *O. picridis*, and others which more closely approach var. *maritima*, are currently being investigated by C. Thorogood as part of his doctoral research.

The pattern of distribution, degree of morphological separation and the potential gene-flow under sympatry, etc. demonstrated by this taxon, I now consider is best recognised by according it sub-specific level under *O. minor*.

***Orobanche minor* Sm. subsp. *maritima* (Pugsley) Rumsey, stat. nov.**

Basionym: *O. maritima* Pugsley 1940 *J. Bot., Lond.* **78**: 110.

HOLOTYPE: Seacombe, Dorset. Pugsley 587, BM

PARATYPES: Dover to Folkestone, 1882, Bennett (BM); Downderry, East Cornwall, 1876, Briggs (BM).

[syn.: *O. minor* var. *maritima* (Pugsley) Rumsey & Jury].

O. minor subsp. *maritima* can best be distinguished from subsp. *minor* by the pronounced yellowish bosses on the lower corolla lip, which has the middle lobe larger than the laterals and rather reniform in shape.

The corolla is straight backed with a sharply inflected base, has short, often entire sepals and a broad-based rather triangular bract that does not exceed the flower. The plant is short, rarely exceeding 30 cm., the stem is puberulent, strongly pigmented and always bulbous at its base.

DISTRIBUTION OF *OROBANCHE MINOR* SUBSP.
MARITIMA IN KENT

The distribution of *O. minor* subsp. *maritima* in Kent has been made uncertain due to confusion with other maritime forms of *O. minor*. The only reported chromosome count for *O. maritima* (Hambler 1958) actually relates to the controversial *O. minor* population on the sand dunes of Sandwich Bay. Here, plant stature (height, corolla length) and pigmentation are highly variable, variation that appears in large part to be correlated with host identity. Plants with abnormally developed flowers, pedicellate, or with very reduced corollas and fused stigmatic surfaces, have also been seen here by the author. The records for this hectad (TR36) given by Stewart *et al.* (1994) are therefore suspect. High chalk sea cliffs and the undercliff ledge/talus slope habitat do not extend northwards of TR34 and I have seen no unequivocal material that I would assign to subsp. *maritima* from TR35 or TR36.

Hanbury and Marshall (1899) listed Syme's record from St. Margaret's (TR34); from the Undercliff at Lydden Spout, west of Dover (TR23), where found by Hanbury and a further record from the Dover area by Walton, that they thought perhaps referred to a different station. Hanbury and Marshall also note that "Mr. Druce finds a specimen from Dover Cliffs in herb. Dillenius which he is disposed to place here". In more recent times Philp (1982) only knew of a single small colony in tetrad TR23Z, presumably Hanbury's Lydden locality.

Since the year 2000, plants clearly referable to *maritima* have been seen on cliff ledges and cliff-tops in three separate hectads in E. Kent, v.c. 15, at the following locations: Lydden Spout (TR2939), Samphire Hoe (TR3039), Lighthouse Down, west of St. Margaret's Bay (TR3644), and between Monument and St. Margaret's Bay (TR3744).

All populations are small and the total annual counts in recent years have not exceeded 60 plants and are often much lower. Cliff erosion in the St. Margaret's area threatens the plants' long-term survival immediately west of the

Bay and the dense shading by trees of ledges immediately behind the bay is posing an additional threat.

THE STATUS OF *OROBANCHE MINOR* VAR *FLAVA*

The first recognition of what has come to be called *O. minor* var. *flava* E. Regel in British floras was made by Syme (1866). He noted after discussing "*O. amethystea*" "there are several other forms of *O. minor* which possibly deserve to be considered as sub-species; one occurs near Grand Havre, Guernsey [but see Druce's (1911) comment], on *Leontodon autumnale*, which has the corolla curved like *O. amethystea*, but much shorter and denser spike, and the whole plant, including the flowers, is yellow". As Syme correctly pointed out, the yellow-flowered taxon once present on coastal dunes in Jersey and Alderney (Pugsley 1940) is morphologically closer to subsp. *maritima* than to subsp. *minor*.

Examples lacking anthocyanin are known in many *Orobanche* species and it has been suggested these may result from a single gene mutation (Rumsey & Jury 1991). These are best treated taxonomically as *formae*. The Channel Island plant, however, had subtle but distinct morphological differences, a different preferred host range (Asteraceae-tribe Lactuceae) and a discrete distribution. The rank of variety therefore seems appropriate but must be newly combined under subsp. *maritima*.

The question then follows as to whether the name by which we have known this plant since Pugsley (1940) is correct. I consider that this taxon is not synonymous with *O. minor* Sm. var. *flava* Regel, or the later var. *lutea* Tourlet, both of which from their published descriptions (and geography) are almost certainly forms of *O. minor* subsp. *minor* which lack purple pigmentation. The earliest available epithet for the distinctive Channel Island plant would seem to be Beck's "hypochoeridis", a name with a troubled history. Material sent by Druce to Beck was apparently named by the latter as a form of *O. ritro* Gren. & Godr.; this name Druce then published without formal description, or citation of type, as forma *hypochaeroides* Beck (Druce 1907). Druce revised his opinion as to the rank of this taxon, recognising it as a variety (Druce 1911) but it still remained as a *nomina nuda*. This was appreciated by Beck (1922) who upon transfer of *O. ritro* into his *O. major* (= *O. elatior* Sutton) arguably validated

the name as *O. major* f. *hypochoeridis*, the authority for which was inaccurately cited by him as "(Druce) Beck".

The Channel Islands plant would thus become:

Orobanche minor Sm. subsp. ***maritima*** (Pugsley) Rumsey var. ***hypochoeridis*** (Beck) Rumsey **comb. et stat. nov.**

Basionym: *O. major* L. forma *hypochoeridis* Beck in Fedde, Rep. **18**:36 (1922).

HOLOTYPE: Jersey, St. Ouen's Bay on *Hypochaeris radicata* L. and other composites, L.V. Lester-Garland in herb. G. C. Druce (**OXF**)

[syn.: *Orobanche minor* Sm. var. *flava* angl. auct. non E. Regel].

The plant was apparently last recorded in Jersey in 1951 (as *O. ritro*, A. G & F. W. Holder s.n. (**LIV!**)). More recently it has only been recorded from Newport Docks (v.c. 35)

(Rumsey & Jury 1991) but the small population there, while possessing comparatively dense, round-topped inflorescences, differs in the other distinguishing features and furthermore is parasitic on legumes. Further work is needed to establish its identity and relationships. It is thus possible that *Orobanche minor* subsp. *maritima* var. *hypochoeridis* is now extinct.

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REFERENCES

- BECK VON MANNAGETTA, G. (1922). *Orobanchae novae*. *Fedde, Repertorium specierum novarum regni vegetabilis* **18**: 33–40.
- DRUCE, G. C. (1907). Notes on the flora of the Channel Islands. *Journal of Botany, British and Foreign* **45**: 419–428.
- DRUCE, G. C. (1911). Short notes. *Orobanche ritro* Gren. & Godr. var. *hypochaeroides*. *Journal of Botany, British and Foreign* **49**: 300–301.
- HAMBLER, D. J. (1958). Chromosome numbers in some members of the family Orobanchaceae. *Botanical Journal of the Linnean Society* **55**: 772–777.
- HANBURY, F. J. & MARSHALL, E. S. (1899). *Flora of Kent*. F. J. Hanbury, London.
- HORE, W. S. (1845). Description of a species of *Orobanche* new to Great Britain, probably *Orobanche amethystea*, Thuillier. *Phytologist* **2**: 239–240.
- PHILP, E. G. (1982). *Atlas of the Kent Flora*. Kent Field Club, Maidstone.
- PRESTON, C. D., PEARMAN, D. A. & DINES, T. D. (2002). *New Atlas of the British and Irish Flora*. Oxford University Press, Oxford.
- PUGSLEY, H. W. (1940). Notes on *Orobanche* L. *Journal of Botany (London)* **78**: 105–116.
- RUMSEY, F. J. & JURY, S. L. (1991). An account of *Orobanche* L. in Britain and Ireland. *Watsonia* **18**: 257–295.
- RUMSEY, F. J. (1994). *Orobanche minor* var. *maritima*, in STEWART, A., PEARMAN, D. A. & PRESTON, C. D. *Scarce Plants in Britain*. J. N. C. C. Peterborough.
- SITWELL, N. (1984). *Shell Guides to Britain's Threatened Wildlife*. London.
- STEWART, A., PEARMAN, D. A. & PRESTON, C. D. (1994). *Scarce Plants in Britain*. J. N. C. C., Peterborough.
- SYME, J. T. B. (1866) ed., *English Botany*, 3rd ed., vol. 6., Robert Hardwicke, London.
- WEBB, D. A. & CHATER, A. O. (1972). *Orobanche*, in TUTIN, T. G., BURGESS, N. A., HEYWOOD, V. H., MOORE, D. M., VALENTINE, D. H., WALTERS, S. M. & WEBB, D. A. *Flora Europaea*, vol. 3. Cambridge University Press, Cambridge.

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