

Meum athamanticum (Jacq.)

Spiguel

Meum athamanticum is an umbellifer with white flowers, oval fruits with prominent ridges, and 3-4 pinnate leaves with minutely pointed hair-like lobes. When crushed, the leaves give off a strong, sweet, aromatic smell. It is a plant of neutral or mildly acid soils of low fertility, occurring in hay meadows, woodland clearings, grassy banks and roadside verges, riverbanks and drumlins. Its British stronghold is in Scotland, where it reaches its northern range limit. It is uncommon in north-west England, very rare in Wales, and absent as a native from Ireland. *M. athamanticum* is assessed as Near Threatened in Great Britain and Vulnerable in Wales.



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IDENTIFICATION

A glabrous perennial with compound umbels, white (occasionally pink-tinged) flowers, and ovoid-elliptical fruits (5-7 (10) mm) that are <2x as long as wide, with prominent ridges (Tutin 1980; Poland & Clement 2009).

Most leaves are basal, 3-4(5) pinnate, roughly triangular in outline, and have hair-like lobes that have a minute sharp point. When crushed, the leaves give off a strong, sweet aromatic smell. Petioles are slender, laterally flattened, narrowly channeled and form a dense sheath of fibrous remains at the base of the hollow striate stems (up to 60 cm tall and to 3 mm diameter) (Stace 2010).

SIMILAR SPECIES

Vegetative plants may be confused with *Carum verticillatum*,



Close-up of fruits of *Meum athamanticum*, photographed at Keltneyburn, Mid-Perthshire. ©Pete Stroh.

but this species is more frequently encountered in damper habitats and can easily be separated from *M. athamanticum* from its more slender appearance and in particular by its whorled, bristle-like leaflets.

HABITATS

Meum athamanticum occurs in unimproved upland hay meadows, grassy banks and roadside verges, woodland clearings, riverbanks and drumlins that have neutral or mildly acidic deep brown-earth soils (Watson 2002).

In upland hay meadows, *M. athamanticum* is a locally uncommon associate of NVC MG3c *Anthoxanthum odoratum*-*Geranium sylvaticum* grassland, *Arrhenatherum elatius* sub-community (Rodwell 1992). However, recent proposed additions to the NVC (JNCC 2011) suggest that where *Fillipendula ulmaria* is dominant within this sub-community, alongside frequent *Geranium sylvaticum*, *Cirsium heterophyllum*, *Conopodium majus* and local *Meum athamanticum* and *Trollius europaeus*, a new sub-community of M27 *Fillipendula ulmaria*-*Angelica sylvestris* mire should be recognised.

In the low mountainous regions of Western Europe, *M. athamanticum* is a characteristic component of species-rich semi-natural mesic meadows allied to the *Polygono-Trisetion* with associates including *Anemone nemorosa*, *Crepis mollis* and *Phyteuma spicatum* (Waesch & Becker 2009). It is also a constituent of sub-alpine unimproved heath-grassland vegetation allied to the *Violion caninae* alongside typical associate species such as *Arnica montana*, *Hypochaeris maculata* and *Pseudorchis albida*, and a plant of montane and alpine *Genistion* communities (Schnitzler & Muller 1998). In the southern Italian Apennines, *M. athamanticum* has

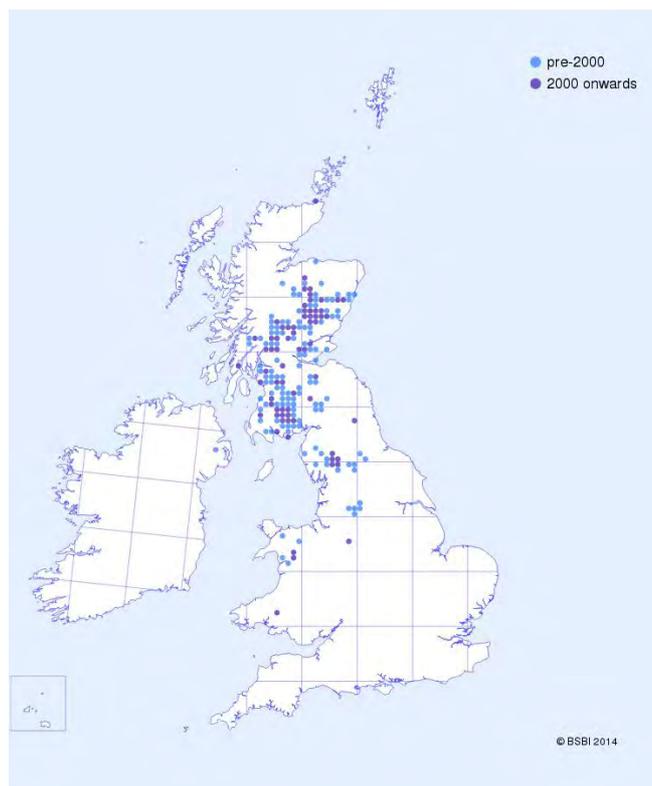
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been recorded as a dominant constituent of intensively grazed secondary pasture derived from degraded *Fagus sylvatica* woodland, with dominance thought to relate to its unpalatable taste (Redecker et al. 2002).

BIOGEOGRAPHY

Meum athamanticum is a Boreal-montane Temperate species with its main distribution in the central and southern European mountains and central and northern European uplands. Its range extends southwards to the Sierra Nevada and central Bulgaria (Tutin 1980), and its northern range limit is at Dunnet Head, Sutherland where it was discovered in 2000 (Preston 2007; Butler 2011). In the central European highlands, *M. athamanticum* grows at an altitude of between 550 m and 1000 m, whilst in the Alps it is found in the montane-subalpine zone between 1500 m and 2000 m, and in south European high mountain ranges it is present in the alpine zone between 1400 m and 2900 m (Huck et al. 2009).

In Britain, *M. athamanticum* is not usually found above 300 m, reaching its altitudinal limit of 610 m at White Coomb, Dumfriesshire and Fealar, east Perthshire (Stewart 1994). *M. athamanticum* has its British stronghold in Scotland where it is known from 26 vice-counties. English populations are restricted to south-east Westmoreland and north-west Yorkshire around the Lune Gorge, with single sites in south Northumberland and Cheshire (Kay 2006). In Wales, *M. athamanticum* is present in low numbers across a small number of scattered locations within Snowdonia National Park. The species is absent as a native from Ireland, but has



Distribution of *Meum athamanticum* in Great Britain and Ireland.

been recorded as a casual from County Antrim.

ECOLOGY

A light-loving, glabrous and long-lived herbaceous perennial, flowering from late May to early August.

M. athamanticum has deeply rooting rhizomes and protandrous flowers that suggest that the species is predominantly outcrossing (Huck et al. 2012). Clonal spread appears to be very restricted, and the relatively large seeds survive in the seed bank for less than a year (Waesch & Becker 2009). Seeds probably require vernalisation and germinate in the spring. Experimental studies aimed at understanding the abiotic and biotic conditions required for the *in situ* germination and establishment of viable seed are necessary to further our understanding of the ecology of this species.

Phylogeographic studies indicate that the species survived in multiple refugia during the last glaciation rather than dispersing north of the Alps from southern locations (Huck et al. 2009). Future changes to climate have the potential to influence the productivity and long-term survival of extant populations. For example, experimental warming of montane meadow species translocated to lower altitudes demonstrated a significant effect on *M. athamanticum*, with plants producing no flowering shoots in the year following translocation and the loss of all plants in the second year (Bruelheide 2003). Decline was associated with very low phenotypical plasticity and the increased loss of carbohydrates in roots during the winter at warmer temperatures, resulting in less vigorous growth in the following year (Bruelheide & Lieberum 2001).

The rust fungus *Nyssopsora echinata*, a UK Priority Species, is host-specific to *M. athamanticum* leaves and stems and has been recorded from plants in Renfrewshire and Perthshire

THREATS

The 'improvement' of semi-natural habitat through herbicide application, eutrophication or the loss of habitat by ploughing continues to represent the main threat to populations.

Plants appear capable of persisting in an intensively grazed sward, although severe overgrazing over extended periods of time may result in a decline in numbers and eventual loss of populations (Ratcliffe 1977). The seeds have a strong curry flavour that, if grazed by cattle, can influence the taste of milk products, and dairy farmers have in the past targeted the removal of *M. athamanticum* (Stewart 1994).

MANAGEMENT

Meum athamanticum requires open conditions that may be achieved by extensive livestock grazing or via a cutting regime. A late annual cut (i.e. post-flowering and fruiting) followed by the removal of cut material has been demonstrated to result in a significant increase in the cover of *M. athamanticum* (Pavlu et al. 2011).

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AUTHOR VERSION

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SUGGESTED CITATION

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