

WALCKENAERIA ALTICEPS (DENIS, 1952) (ARANEAE: LINYPHIIDAE) – NEW TO IRELAND FROM TWO RAISED BOGS IN CO. OFFALY

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Introduction

The first records of a spider not previously noted from Ireland, *Walckenaeria alticeps* (Denis, 1952), are detailed. *W. alticeps* is very closely related to and potentially confused with *W. antica* Wider, 1834, a species frequently reported in Ireland. An attempt is made to characterise the preferred habitat of *W. alticeps*. In addition, difficulties concerning its accurate identification are briefly discussed. All the specimens were taken from Clara and All Saints' Bogs, Co. Offaly, in 2007 and 2008 respectively. It is suggested that the woodland component present on these bogs may be of significance to the species' presence.

Site and capture details

Clara Bog, Co. Offaly (N2430), is a statutory nature reserve. Its spider fauna was investigated by the author after an award from the Heritage Council under the Wildlife Grant Scheme 2007 (WLD/2007/15538). Eight specimens of *W. alticeps* (2♂♂6♀♀) were caught in pitfall traps (n=20) set at a single station (N245304). The details are as follows:- 11 April to 3 May 2♂♂1♀; 3 May to 25 May 2♀♀; 25 May to 28 June 2♀♀; 28 June to 31 July 1♀. Traps were set in an area dominated by tracts of very wet *Sphagnum* lawn through which white beak-sedge *Rhynchosporion alba* grew abundantly. A typical bog vegetation surrounded the lawn areas, characterized by heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix*, bog asphodel *Narthecium ossifragum*, deergrass *Trichophorum caespitosus* and bog cotton *Eriophorum* spp. Other species typical of midlands raised bog were also observed viz. sundew *Drosera rotundifolia*, oblong-leaved sundew *D. anglica* (in substantial amounts), bog rosemary

Andromeda polifolia and cranberry *Vaccinium oxycocum*. More open pools had large growths of bogbean *Menyanthes trifoliata*. Clara Bog is known also for the presence of substantial birch *Betula* woodland on some areas but sampling was not carried out in this habitat.

All Saints' Bog, Co. Offaly (N0111), is a site of considerable interest in an Irish context due to the presence of the largest area of silver birch *Betula pendula* woodland on a raised bog in Ireland (Cross, 1987). The spider fauna was investigated on foot of an award from the Heritage Council under the Wildlife Grant Scheme 2008 (WLD/2008/16452). Twelve specimens of *W. alticeps* (7♂♂5♀♀) were caught in pitfall traps at three stations B1, B2 and W2 (10 traps per station). The details are as follows:- open bog (B1) 23 April to 23 May 3♂♂2♀♀; 23 May to 12 June 1♀, hummock/hollow bog close to woodland (B2) 23 April to 23 May 2♂♂; 23 May to 12 June 2♀♀, hummock/hollow formation in *Betula* woodland (W2) 25 April to 23 May 2♂♂. Station B1 was set in open bog and consisted of a low vegetative sward (circa 20cm) dominated by *C. vulgaris*, *E. cinerea* and *N. ossifragum*, with smaller amounts of other species typical of midlands raised bog e.g. *A. polifolia* and *V. oxycoccus*. *Eriophorum* grasses were present in smaller amounts as was a small quantity of *R. alba*. Some areas of the trap transect were wetter than others but no open *Sphagnum* pools were present. Station B2 was set between the main area of woodland and a substantial copse of Scots pine *Pinus sylvestris* in a relatively open area of bog. Numerous smallish (ranging to 2m) saplings of *Betula* and *Pinus* were growing in the area but some had been killed by fire. The area was wet, with some open pools dominated by *Sphagnum cuspidatum* and also some well developed moss hummocks. These were overgrown by *C. vulgaris* and *E. vaginatum*. Other plant species were *E. tetralix*, *D. rotundifolia*, *A. polifolia* and *V. oxycoccus*. Crowberry *Empetrum nigrum* was present in small amounts on the hummocks and royal fern *Osmunda regalis* was abundant locally. Station W2 was set within relatively open *Betula* woodland. Field-layer vegetation consisted of *Calluna* and some *Salix*. At ground level, the area showed good hummock/hollow formation, with *Polytrichum* moss growing in wet areas between the hummocks. Some moss hummocks were bare of other vegetation while others had a small amount of *Empetrum* or *Eriophorum* growing on them.

Raised bog and active raised bog are priority habitats under the EU Annex I habitats guide

(European Commission, 1996) and bog woodland is priority habitat under the same directive. At All Saints' Bog, the woodland is of considerable age and previously has yielded a number of interesting invertebrate finds (O'Connor and Speight, 1987; Speight, 1990). Three other spider species new to Ireland have been found at the two sites (Nolan, 2007, 2008).

The specimens of *W. alticeps* captured at Clara Bog were initially misidentified by the author as *W. antica*. It was only when *W. alticeps* had been identified (and confirmed) from All Saints' Bog that a suspicion arose about the previous identifications. Fortunately, the specimens from Clara bog had been retained and it was possible to re-examine them. *W. antica* did not appear at either site.

Identification

Wunderlich (1972) provides illustrations of the female of *W. alticeps*, separating it from *W. antica*. However using that work, males cannot be distinguished. Kronstedt (1980) provides a careful diagnosis of the distinguishing characters of the secondary genitalia of both sexes, showing that the males are also separable on morphological grounds. Roberts' (1987) illustrations of both sexes are also very clear but possibly the male features deserved a more detailed description. Females are more easily determined than the males. Through the integument, the internal structures of the genitalia appear to have three lobes in *W. alticeps* but only two in *W. antica*. When these features are not clear externally, they can be easily seen by a partial dissection of the epigyne area, showing the adnexae in dorsal view.

Kronstedt (1980) suggests that an useful feature in distinguishing males is the manner in which the embolus of *W. alticeps* tapers continuously toward its tip, including along the section from the orifice of the seminal duct (figs. 21-22) to the end-point of the embolus which is quite fine. In *W. antica*, the embolus is of nearly constant thickness along the section from the orifice of the seminal duct to the tip where it tapers quickly and has a slight kink. These features can be seen in Roberts' (1987) illustrations but he does not refer to them in the accompanying text. The orifice of the seminal duct is relatively easily seen in specimens of *W. antica* (at 80x) as a slight constriction or notch on the embolus, which then thickens to its previous width rather than

tapering gradually (Kronestedt, 1980 – figs. 18-20). These characteristics were relatively easy to see in the examined Irish specimens and were thought to be more reliable than the suggested measurements across the diameter of the coiled embolus (Roberts, 1987). In the Irish specimens the diameter of this structure ranged between 0.25 and 0.275mm, averaging at 0.269mm (17 measurements). Roberts suggests that the diameter in *W. alticeps* ranges from 0.27 to 0.31mm. It should be noted that none of the Irish specimens fell within the range suggested by Roberts for *W. antica*.

Habitat preferences

Obviously, some earlier records of *W. antica* may have been of *W. alticeps* and this situation obscures to some extent the possibility of recognising distinct habitat preferences. Kronestedt (1980) notes that the information on the preferred habitat of *W. antica*, summarised by Wunderlich (1972), may be contradictory in part because of confusion with *W. alticeps*.

In Britain, *W. alticeps* seems to be very scarce. It was first recognised there in 1982 when it was collected from a wet heath site (Merrett, 1983). The habitat with which it is generally associated in Britain is characterised as *Sphagnum* bog overgrown with *Molinia*, *Betula* and *Vaccinium myrtillus* (Harvey *et al.*, 2002) and sites with moist leaf litter and shaded *Sphagnum*. This accords quite well with the Irish records, the combination of *Sphagnum* bog and taller, shading vegetation possibly being significant.

Kupryjanowicz *et al.* (1997) recorded *W. alticeps* at four out of six peat bogs in Poland. One of the sites was treeless, the others densely shaded. The species was never recorded at levels exceeding 2% of the total catch. As a result, its apparent absence at some sites does not necessarily imply it is absent from them. It was recorded in highest numbers from a site with a dense tree layer of *Pinus*. Kronestedt (1980) found the species primarily in *Sphagnum* bog, one specimen occurring near a pond in an unspecified woodland type.

A quite different habitat preference is noted however in Hänggi *et al.* (1995). These authors summarise information from twelve sources in Switzerland, Germany and Austria. The original datasheets used to compile this work are available from the authors and it was possible for the

present author to trace the records as extracted from the source papers. These gave 52 individual items of data associating *W. alticeps* with particular habitats. The greater proportion (34.6%) were from ‘Waldränder’ ‘forest edges’ – a term which receives no further explication or qualification in that work – in Switzerland. Thereafter, most records are from beech *Fagus* forest (a habitat not occurring naturally in Ireland), dry, moist and mixed (26.92%) and other forest habitats (13.46%), including dry oak *Quercus*, mixed *Quercus*, *Pinus*, spruce *Picea* (plantation) and alder *Alnus*. Most remaining records (15.38%) were from moist/wet habitats, including *Sphagnum* bog, *Carex* dominated fen, wet *Molinia* meadow, moist lake/river shores and moist (including fallow) meadows. A number were from hedges and field shrubs/trees but specimens had been taken in these situations in pitfall traps, so the species was not making use of their vertical component. Only two of the records summarised in this work were from above 800m – from *Sphagnum* bog in Austria (Freudenthaler, 1989) and fallow grassland in Switzerland.

As a result, *W. alticeps* seems to be somewhat restricted in its habitat preferences, occurring most frequently either in *Sphagnum* bogs (possibly preferring those with woodland), or broadleaf, especially *Fagus*, woodland and perhaps then preferring woodland margins. This may explain the species’ scarcity generally. From its habitat preferences, its absence from a range of grasslands in northern England (Rushton, 1991) is certainly not surprising.

The significance of the Irish occurrence of *W. alticeps* in two relatively proximate (about 30k apart) midlands raised bogs is arguably enhanced by the fact that both retain a substantial element of their woodland component. This habitat, historically, was almost certainly exterminated by grazing or burning from numerous other Irish raised bogs. Given the strong association of the species with woodland edge and broadleaf woodlands in parts of continental Europe, it may be the case that *W. alticeps* has maintained a presence at both Irish sites in part as a consequence of the presence of the woodland. Possibly the woodland area helps maintain a permanent population, which then may also spread into more open areas of the bog – hence the records from Clara bog and station B1 on All Saints’ bog. As a habitat, or habitat component, woodland edge is extremely difficult to characterise: it may plausibly grade into almost any

other habitat e.g. lakeshore, bog, agricultural land, developed land etc and at its margins may contain almost any ‘microhabitat’ structures e.g. tall woody vegetation, grazed sward, ditches, human infrastructure etc. However, the number of records associated with what Hänggi *et al.* (1995) describe as woodland edge are taken here to be significant. If *W. alticeps* does have a preference for woodland edges of particular kinds, could this suggest the spider’s presence deeper within some continental woodlands may be a spillover effect from the edges?

Life cycle and status

Adult females of *W. alticeps* are found in Britain from April to August and also in November with males occurring in May & November (Harvey *et al.*, 2002). These dates accord broadly with the Irish records although adult males are shown to also occur in April. Traps were maintained at some stations at All Saints’ bog until late in 2007 and through the winter months but they did not collect any more specimens of *W. alticeps*. The presence of adults in November suggests that the species overwinters while mature, prior to breeding the following summer. This could suggest a life-cycle similar to *W. antica* i.e. biennial, with small juveniles and then adults overwintering, mating occurring from May and egg-laying going on until August (Toft, 1978). If the two species have similar life-cycles, it could make sense that they occupy differing habitat ranges in order to avoid competition. Irish records do suggest that this is the case.

Recent Irish records of *W. antica* show that it occurs in a fairly wide range of open habitats:- lowland blanket bog (Co. Leitrim), mosses on a mountain summit (*circa* 650m) (Cawley, 2004), mosses on sand dune (Cawley, 2004, 2008). It occurred in a range of habitat types on Tory Island (Cawley, 2007):- cliff vegetation, a marshy area on cutover bog, grassy banks, heathy (*Calluna*) banks, coastal *Ammophila*, gravely cutover peat. Gibson (1982) recorded the species from fixed dunes and coastal grasslands in Co. Wexford. Neither species occurred in recent large-scale surveys of agricultural grasslands or planted forests (Anderson *et al.* 2008; Oxbrough, 2008). The presence of *W. antica* in lowland blanket bog might suggest the possibility that the two species overlap although the differences between western lowland

blanket bog and the flushed, wooded raised bogs of the midlands are very considerable. Kronstedt (1980) noted that Starega (1976) claimed to have found females of the two species in the same mountainous *Fagus* woodland in Poland and also that Wunderlich (1972) stated that the two could appear close together in mixed habitats. However Palmgren (1976) noted that *W. antica* was eurytopic and only rarely found in wet peat mosses or dense/dark woodlands.

In Britain, *W. alticeps* has recently been assigned DD (Data Deficient) status in a draft National Status Review due to uncertainty about its status (Dawson *et al.*, 2008). It has been recorded at a number of sites in Wales and has a very scattered distribution throughout much of central, eastern and northern England. There are a few records from Scotland, from some of the Western Isles and also the extreme north. In Slovakia, the species is also categorised DD (Korenko, 2004) and in a red list for Flanders it is described as threatened with extinction (http://www.inbo.be/content/page.asp?pid=FAU_SPI_start).

W. alticeps is widely distributed through Europe, although it does not occur in either Norway, Finland, or on any of the Mediterranean islands or European territories (Hesldingen, 2009) but the species is found as far east as Iran (Platnick, 2009).

Its occurrence in a habitat of significant rarity in Ireland suggests that the species may be of some conservation interest and further enhances the status of the sites in which it was found.

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