



**Tom Blockeel** reports on the discovery of a continental species of *Orthotrichum* on the verge of a lane in Derbyshire.

## *Orthotrichum consimile* in Derbyshire

*Orthotrichum consimile* was first reported in Europe from Germany, where it was described as a new species under the name *Orthotrichum winteri* by W.P. Schimper (1866). Recently, however, Porley (2000) discovered that it had been collected in Britain 20 years previously by William Mitten in Sussex, in 1846, but not recognized as a new species at the time. *O. winteri* is now considered to be synonymous with the American species, *O. consimile* Mitt. Perhaps not surprisingly, Mitten (1865) failed to make a connection with the plants he collected in Sussex in 1846 and the plant from Vancouver Island that he named *O. consimile* 19 years later.

After these first collections in Europe, it was more than a century before *O. consimile* was again reported on the continent. Its rediscovery was reported by Lewinsky-Haapasaari, Ederra & Schmidt (1995) on the basis of specimens collected in Spain in 1980, and at Brilon in Germany in 1994. Once it was known still to occur in Europe and bryologists became aware of

its distinctive features, it was found in many new localities (Table 1). In parts of northern Spain it occurs in some quantity, but elsewhere it is scattered and appears to be rare.

Given its occurrence in many parts of the near continent, it seemed likely that *O. consimile* would eventually be refound in Britain. This has proved to be the case. While bryologizing with Michael Pearman near Ashover in Derbyshire on 9 June 2007, I noticed a tuft of a distinctive *Orthotrichum* with exerted capsules on the stem of a small elder tree. On a return visit in the following month, we photographed the tuft (Fig. 1) and collected a single fertile stem for microscopic examination. This confirmed its identity as *O. consimile*.

### Morphology and identification

The important characters of *O. consimile* are:

- ▷ Leaves linear-lanceolate, often slightly curled when dry; margins strongly recurved almost to the apex
- ▷ Cells in mid-leaf 8–12 µm wide, with low simple papillae
- ▷ Seta longer than the capsule; capsule clearly exerted

△ Fig. 1. *Orthotrichum consimile* in situ on an elder in Derbyshire, 14 July 2007. Tom Blockeel

Table 1. Recent reports of *O. consimile* in Europe

Territory	Reference	Host species
Germany: Westphalia	Lewinsky-Haapasaari <i>et al.</i> (1995)	<i>Salix</i>
Germany: Erzgebirge	Seifert (2003)	<i>Salix</i>
Germany: Black Forest (Baden-Württemberg)	Ahrens (2004)	Elder ( <i>Sambucus</i> )
Germany: Southern Baden-Württemberg	Schäfer-Verwimp (2006)	Elder ( <i>Sambucus</i> )
Netherlands	Pluijm (2000), BLWG (2007)	Elder ( <i>Sambucus</i> )
Luxembourg	Hans (2004)	Elder ( <i>Sambucus</i> )
Belgium	Sotiaux <i>et al.</i> (1998)	Elder ( <i>Sambucus</i> ), <i>Salix</i>
France	Sotiaux (1999)	Elder ( <i>Sambucus</i> )
Spain: Navarra	Lewinsky-Haapasaari <i>et al.</i> (1995)	Beech ( <i>Fagus</i> )
Spain: North-west	Mazimpaka <i>et al.</i> (1997); Franco <i>et al.</i> (2003)	Not stated, but in forest of deciduous oak ( <i>Quercus</i> )
Spain: Álava	Garilleti <i>et al.</i> (1998)	Elder ( <i>Sambucus</i> )
Portugal: Trás-os-Montes e Alto Douro	Lara <i>et al.</i> (2001)	Deciduous oak ( <i>Quercus pyrenaica</i> )

- ▷ Vaginula lacking hairs
- ▷ Stomata immersed, scattered over the lower half of the urn
- ▷ Outer peristome teeth remaining united in 8 pairs, pale whitish-brown, reflexed when dry
- ▷ Calyptra covering almost the whole capsule, without hairs
- ▷ Capsules maturing in June–July.

The specimen from Derbyshire is small, the individual shoots being about 6 mm tall (including the sporophyte). The seta measures about 2 mm. Numerous organic fragments are present on the leaves and calyptrae. They appear to be lichen granules and may have originated from splash-back during the unusually frequent and heavy rainfall experienced in Derbyshire (as in other parts of England) in June–July 2007. Seven sporophytes were present on the single tuft at the time of discovery. Fig. 1 shows the tuft after the removal of one stem for microscopic examination. The calyptrae were still intact on July 14. However,

when the capsule that had been collected was examined microscopically, the lid fell away spontaneously on removal of the calyptra. Clearly, the capsules were almost mature at that time.

*O. consimile* is one of the easiest species of *Orthotrichum* to recognize in the field because of its long setae and exserted capsules. In some respects it resembles a small *Ulota*, but differs from *U. bruchii* Hornsch. ex Brid. and *U. crispa* (Hedw.) Brid. by its hairless calyptrae and only slightly curved leaves. Of the other British species of *Orthotrichum* with exserted capsules, *O. anomalum* Hedw. rarely grows on trees (except near limestone quarries) and it has a hairy calyptra and erect-spreading peristome teeth. *O. speciosum* Nees is a larger plant and is more likely to be mistaken for *O. affine* Schrad. ex Brid. than *O. consimile*. It too has a hairy calyptra and the capsules are only weakly striate, with superficial stomata.

*O. consimile* is most closely related to *O. pulchellum* Brunt., although to judge from the

Derbyshire plant the two species are noticeably different, at least before the capsules dehisce. This is partly because *O. pulchellum* has a slightly shorter seta, but also because it has loose-fitting calyptrae with dark stripes along the plications. After dehiscence *O. pulchellum* is recognized by its distinctive orange peristome, and microscopically by the position of the stomata in the middle and upper middle part of the capsule. *O. consimile* has a pale brown peristome and the stomata are positioned in the lower half of the capsule. As noted by Schimper in the original description of *O. winteri* (Schimper, 1866), and confirmed by numerous authors since, the capsules of *O. pulchellum* mature in spring (March–May), and those of *O. consimile* in summer (June–July).

#### The Derbyshire locality

The locality for *O. consimile* in Derbyshire is on the verge of a lane about 2 km south west of the village of Ashover, in the area named Ravensnest on the Ordnance Survey map (grid reference SK3461). Ashover lies in small valley bounded to the south west by a steep hillside formed by acidic grit-shale strata. The underlying rocks in the district are of Carboniferous age. Grit-shale strata are dominant, but there are exposures of limestone, partially quarried, in the valley near the village.

*O. consimile* was found at the top of the hillside at Ravensnest, at an altitude of 300 m. The adjacent land consists of open fields and the site is rather exposed, but it receives some shelter from planted beech trees on the opposite side of the lane. The single tuft was found on the inclined stem of one of a small group of elder bushes. It was about 1.5 m above ground level. There were no close associates, but *Dicranoweisia cirrata* (Hedw.) Lindb., *Bryum capillare* Hedw., *O. affine*, *Amblystegium serpens* (Hedw.) Schimp. and *Brachythecium rutabulum* (Hedw.) Schimp. were present on the same stem within a distance

of 40 cm. *Pylaisia polyantha* (Hedw.) Schimp. was noted on one of the adjacent bushes. However, the occurrence of *Pylaisia* may not have particular significance here, as it is known from many localities in Derbyshire and is abundant at a few sites in the vicinity of limestone quarries.

#### Discussion

Through most of the 20th century Derbyshire had an impoverished epiphytic flora. In the report of the Matlock meeting in 1972, Hill commented that 'the epiphyte flora is still restricted by air pollution, leaving *Aulacomnium androgynum*, *Bryum capillare*, *Ceratodon purpureus*, *Dicranoweisia cirrata*, *Dicranum strictum*, *Hypnum cupressiforme*, *Orthodontium lineare* and *Tetraphis pellucida* as the principal survivors' (Hill, 1973). Happily, this is no longer the case. Species that were unknown in the county at that time [e.g. *Metzgeria fruticulosa* (Dicks.) A. Evans, *Ulota phyllantha* Brid. and *Cryphaea heteromalla* (Hedw.) D. Mohr] are now widespread. Because of the formerly high levels of atmospheric pollution, and the presence of only a single tuft of *O. consimile* at the new locality, it is safe to conclude that this species is a recent arrival in central Derbyshire. However, it is not possible to say at present whether the species has spread there from populations that have survived elsewhere in England, or whether this is a chance colonization from spores blown in from continental Europe.

The occurrence of a solitary tuft at the new site is not unusual in the context of the recent European discoveries. At the Brilon site in Germany, one tuft of the species was found on *Salix* at the entrance to an old limestone quarry (Lewinsky-Haapasaari *et al.*, 1995). In the Netherlands in 1993 one small cushion was found on elder in a freshwater tidal area, the Biesbosch, and a few further plants were found on a dead elder branch in the following year (Pluijm, 2000). On the other

hand, the species was found in greater quantity at Straimont in Belgium in 1996 and 1997, on elder and on *Salix* (Sotiaux *et al.*, 1999), and it occurs plentifully at some localities in northern Spain (Mazimpaka *et al.*, 1997; Garilleti *et al.*, 1998). Elder (*Sambucus*) and willow/sallow (*Salix*) have been reported most frequently as the host species for *O. consimile*, but in the Iberian Peninsula it has also been found in deciduous oak forest (Table 1).

The plants from Derbyshire have another point of similarity with those from continental Europe in their small stature. The plants from Brilon in Germany were about 6.5 mm tall (Lewinsky-Haapasaari *et al.*, 1995), and the Belgian plants from Straimont measured 5–8 mm (Sotiaux *et al.*, 1999). European plants are generally smaller on average than those from America, where they range from 8 to 20 mm (Vitt, 1973).

As in these continental European countries, it is likely that further populations of *O. consimile* will be found in Britain in future years. It is easily overlooked if present in small quantity, but the exerted capsules catch the eye when seen in profile.

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