

Conocephalum in Britain and Ireland: a BBS mini-survey

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Introduction

Until this year, most British bryologists would have thought of *Conocephalum conicum* as one of the most straightforward liverworts to identify – large, conspicuous and without taxonomic complications. However, a very thorough recent paper by Szweykowski, Buczkowska & Odrzykoski (2005) has shown that there are two species of *Conocephalum* in Europe, both of which occur in Britain. These are the typical *C. conicum* (L.) Dumort. and a second plant, which they described as a new species, *C. salebrosum* Szweykowski, Buczkowska & Odrzykoski. These species were originally distinguished by isozyme studies. Fortunately, a detailed examination of herbarium specimens and of cultivated material has revealed morphological distinctions between the two taxa that allow them to be identified, even in the field.

Although Szweykowski *et al.* (2005) confirmed the presence of both species in Britain, checking both the isozymes and the morphology of a few specimens, there are as yet few British records. Since August 2005 we have seen each species in both Britain and Ireland, and our very preliminary observations suggest that most material can be identified without undue difficulty. Recent field experience has also revealed that the two taxa can coexist at the same locality, often in close proximity to one

another, but populations of each species also occur independently. We think that the best way of investigating the distribution and ecology of the species here is to ask field bryologists to collect information from as wide an area of Britain and Ireland as possible. To do this, the BBS Conservation and Recording Committee has agreed to our suggestion of a ‘mini-survey’ of *Conocephalum*. The aims of the survey are:

- i. to confirm that *C. conicum* and *C. salebrosum* can be distinguished in Britain and Ireland, and check the characters used by Szweykowski *et al.* (2005) to separate them;
- ii. to establish the vice-comital distribution of the two species;
- iii. to produce provisional maps of their distribution in the 10-km squares of Britain and Ireland;
- iv. to investigate the ecology and reproductive features of the two species with a view to highlighting any differences between them.

In this survey, we are just as interested in records of *C. conicum* as we are in those of the new species *C. salebrosum*.

The differences between the species

The differences between the species set out in Table 1 are based on information published by Szweykowski *et al.* (2005), supplemented by a

few of our own measurements and observations. The characters are therefore based to a large extent on material from outside Britain and Ireland. Photographs of the two taxa are shown in Figures 1 and 2 and on the BBS website. In the field, the dull surface of the *C. salebrosum* thallus with a more reticulate pattern provides the best way of distinguishing it from *C. conicum*, which has a markedly shiny surface.

The microscopic differences between the two species are illustrated in Szweykowski *et al.* (2005), and this paper can be downloaded from the BBS website.

Both species are dioicous, and we hope to obtain information on the frequency of male and female plants, as well as of sporophytes. Tubers have also been recently observed in both taxa; they are found most often on the ventral surface of moribund parts of thalli, either on the parent plant or among rhizoids and soil debris. A tuber is illustrated in Paton (1999) and further detail is provided by Paton (1993).

Taking part in the survey

We are asking bryologists to visit *Conocephalum* sites, to record the details on a recording sheet and to send us a fresh sample of the plant with the completed sheet. The recording sheets can be downloaded from the BBS website or obtained from us. An example of a completed recording sheet is shown on the website. To split the workload we have each taken responsibility for different areas:

Northumberland, Scotland (v.-c. 67-68, 72-112): David Long.

N Wales, N England, Isle of Man (v.-c. 47-52, 57-66, 69-71): Tim Blackstock.

SW England, S Wales, Ireland (v.-c. 1-6, 33-35, 41-46, H1-40): Sam Bosanquet.

Rest of England, Channel Islands (v.-c. 7-32, 36-40, 53-56, C): Chris Preston.

Please send your material to the appropriate address (at the head of this article), although there is no need to stick rigidly to these area representatives if it is inconvenient to do so. For example, if one weekend you collect several specimens from one region and a single specimen just over the border, you might as well send them all to the person who is responsible for the main region in which you have collected. It is important to send material of *C. conicum* as well as *C. salebrosum*, as we would like to see as much comparative material as possible, and voucher specimens of both species will be needed for a revision of the vice-comital distribution. In sending fresh material, make sure that the plants are not too wet and, if possible, put them in a package that protects them from crushing in the post.

Interim results of the survey will appear on the BBS website, so you will be able to see where collections are still needed. If the species prove fairly easy to identify there may come a time when the area representative tells you that you need not send any more vouchers from those vice-counties in which you have already collected a voucher specimen.

The survey will continue until December 2006.

References

- Paton JA. 1993. Tubers on *Conocephalum conicum* (L.) Lindb. thalli. *Journal of Bryology* 17: 503-505.
- Paton JA. 1999. *The liverwort flora of the British Isles*. Colchester: Harley Books.
- Szweykowski J, Buczkowska K, Odrzykoski IJ. 2005. *Conocephalum salebrosum* (Marchantiopsida, Conocephalaceae) – a new Holarctic liverwort species. *Plant Systematics and Evolution* 253: 133-158.

Table 1. Differences between *Conocephalum conicum* and *C. salebrosum*.

Character	<i>C. conicum</i>	<i>C. salebrosum</i>	Notes
Size of plant	Usually large: 50-110(-135) mm long, 8-12(-16) mm wide	Somewhat smaller: (20-) 30-60(-190) mm long, 5-10.5(-12.5) mm wide	Genetically dwarf plants of <i>C. conicum</i> with thalli sometimes as short as 20 mm and only 2-4 mm wide occur rarely, e.g. the Isle of Man plant discussed by Paton (1999).
Texture and pattern of dorsal surface of thallus	Shiny, with pores conspicuous but borders between air chambers inconspicuous	Dull, with borders of air chambers more conspicuous than pores so thallus has a reticulate pattern	<i>C. salebrosum</i> may appear shiny when wet. Droughted plants and dried herbarium specimens of <i>C. conicum</i> are dull but do not develop conspicuous borders to air chambers.
Smoothness of dorsal surface of thallus	Smooth, with junctions of air chambers flush with surface	Undulating, with junctions of air chambers in shallow 'valleys' in thallus	Most clearly seen in cross-sections of the thallus, but can be detected in the field.
Number of air chambers between midrib-like elongated chambers in centre of thallus and the edge	Usually 5-8(-9)	3-5(-6)	The 'Isle of Man' variant of <i>C. conicum</i> has fewer air chambers (3-4).
Number of rows of more or less elongated hyaline cells at margin of thallus	(2-)3-4(-5)	2-3	Szweykowski <i>et al.</i> (2005) give 1-2 as the figure for <i>C. salebrosum</i> but their figure illustrates 2-3 and the latter accords with our limited experience. Occasional irregularities of margin (including deeper 'bays' of hyaline cells) should be disregarded.
Junction of air chamber wall with dorsal epidermis	Highest cell of air chamber wall reaches dorsal epidermal cells but is not inserted between them	Highest cell of air chamber wall is inserted between dorsal epidermal cells	Most clearly visible in cross-section.
Shape of hyaline cells in layer immediately below pores	Flask-shaped	Pyriiform	
Stomata on archegoniophore heads	66-121 μm long x 33-77 μm wide	99-165 μm long x 44-88 μm wide	We have not yet examined fertile material.



Figure 1. Mixture of *Conocephalum conicum* and *C. salebrosum* at Nantgwynant, Gwynedd. Photo: J.D. Sleath.



Figure 2. *Conocephalum salebrosum* at Nantgwynant, Gwynedd. Photo: J.D. Sleath.