

Mosses, liverworts and hornworts of arable fields

It would be difficult to fill a book such as this on the mosses, liverworts and hornworts of arable land. This is not because there are so few, for some 90 different kinds (out of a total of about one thousand in the British Isles) have been recorded on cultivated ground, but because we still know so little about their biology, distribution and current status.

Mosses, liverwort and hornworts, collectively known as bryophytes, are unlike flowering plants in that they have no flowers or seed but produce tiny spores or have other specialised reproductive structures. The three types are not particularly closely related but do share certain life-cycle characteristics. Arable mosses have small narrow or oval leaves with a midrib (nerve). Liverworts in arable land tend to be flat thalli, lobes resembling liver with curly margins or forming small rosettes. They lack true roots but are anchored by filamentous threads known as rhizoids. Hornworts look superficially similar to liverworts but there are some slight differences: they usually have thalli that are wavy or crisped at the edge, are greasy to look at and produce spores on horn-like appendages.

These plants are small, often ephemeral, only visible from autumn to spring and, it has to be said, are not easy to identify. When the green plants are not visible on the surface, they are likely to be hidden in the 'diaspore bank', in much the same way that the seeds of annual flowering plants overwinter in the soil. Cultivation subsequently brings them to the surface and triggers their growth.

In any one field there are likely to be no more than 20 bryophytes, usually far fewer, but even the 'typical' arable bryophyte assemblage appears to have declined in the last half-century or so. Evidence for this loss is largely anecdotal but many bryologists find they need to look further afield before finding suitable fields to explore. In particular, the hornworts are very rare, as is the attractive liverwort known as Balloonwort (*Sphaerocarpos*). Many of the typical arable mosses are increasingly confined to other disturbed places, such as tracks and quarries, as the farmed landscape become more inimical to their survival. Three mosses are included in the UK government's Biodiversity Action Plan (UKBAP) action plan: Sausage Beard-moss *Didymodon tomaculosus*, *Ephemerum stellatum* and *Weissia rostellata*.

It may come as a surprise to find that arable fields harbour not only flowering plants but also mosses which we usually associate with damp shady areas in woods. And the damp is the key to their survival, since they need moisture to help them reproduce. These primitive types of plant also have no water transport system so they usually lie on the surface acting as spongy carpets. Even though arable land is known to support a distinctive bryophyte flora, as yet we do not know much about them. Indeed, without the interest of the late Harold Whitehouse, they might have continued to be overlooked.

Finding and identifying bryophytes

Arable bryophytes occur where there is little or no competition from either the crop or from other flowering plants. The best time to see them is from late autumn to early spring on uncropped field margins, or, best of all, among cereal stubbles where they can complete their life cycle. The principal change in the countryside which has led to the decline of these plants has been the loss of stubble fields which used to be bryophyte havens. Nowadays, fields are rarely left for any period of time following harvest, but are cultivated almost immediately which effectively destroys the next generation of mosses and liverworts. Being such tiny plants, they cannot compete with the larger, more vigorous plants, including the crop, and, as a result, mosses have become confined to the edges where competition, and the effects of fertiliser and herbicides, are reduced.

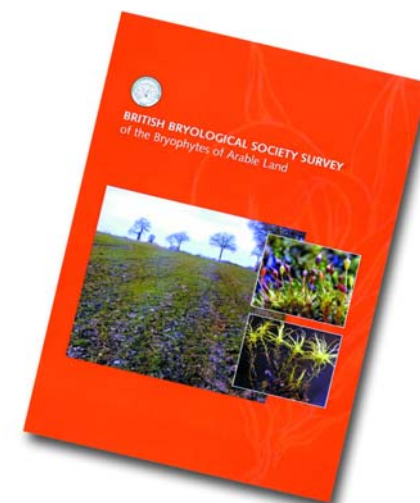
It remains to be established whether or not organic farming is beneficial for bryophytes. Although chemicals are not generally used, other weed control measures may be just as harmful. Mosses and liverworts can survive in conventional farming systems, particularly in those using spring-cropping régimes and incorporating uncropped margins or headlands. Our knowledge of the value of other crop types for bryophytes is still rather limited.

The photographs on pages 268–269 show just a few of the species of mosses, liverworts and hornworts found in arable fields. Further information and help with identification can be obtained from the British Bryological Society (BBS), who have produced a very useful, more detailed guide.

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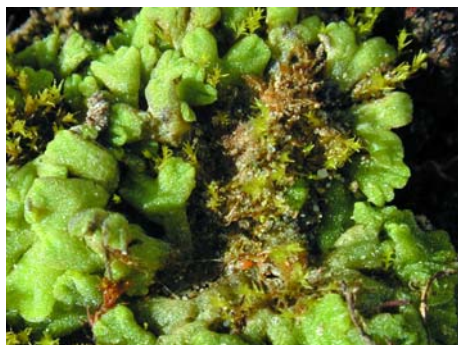


Some liverworts and hornworts of arable fields



Common Frillwort *Fossombronia pusilla* LIVERWORT

photograph × 6;



Glaucous Crystalwort *Riccia glauca* LIVERWORT

5 mm across
photograph × 8;



Common Crystalwort *Riccia sorocarpa* LIVERWORT

5 mm across
photograph × 8;



Texas Balloonwort *Sphaerocarpus texanus* HORNWORT

8-9 mm across
photograph × 6;



Field Hornwort *Anthoceros agrestis* HORNWORT

7 mm across
photograph × 6;

Some mosses of arable fields



Bicoloured Bryum *Bryum bicolor* MOSS

leafy stem 5 mm, sporophyte 5 mm:
photograph × 3;



Hasselquist's Hyssop *Entosthodon fascicularis* MOSS

9 mm tall
photograph × 3



Common Bladder-moss *Physcomitrium pyriforme* MOSS

9 mm tall
photograph × 3



Cuspidate Earth-moss *Tortula acaulon* MOSS

3 mm high
photograph × 3;



Common Pottia *Tortula truncata* MOSS

8 mm tall including sporophyte
photograph × 3;