Hot off the Press features easy-to-read summaries of just a few of the interesting papers published in recent issues of our own journal, *Journal of Bryology*, and of other bryological and botanical journals that are available through the BBS reading circle (for details of the reading circle, please go to www.britishbryologicalsociety.org.uk and follow the link under 'Activities').

How well does NVC relfect bryophyte distribution?

Callaghan, D.A. & Ashton, P.A. (2008). Bryophyte clusters and sand dune vegetation communities. *Journal of Bryology* **29**, 213–221.

The National Vegetation Classification (NVC) has become the standard method for assessing and categorising plant communities in the UK. It was commissioned in 1975 by the Nature Conservancy Council. Some 16 years later, and after analysis of around 35,000 samples of vegetation, the first volume, covering woodland and scrub habitats, was published. In 2000 the fifth and final volume of the series was published, completing the description of 286 different plant communities in Great Britain (not including Northern Ireland).

Despite its popularity, however, NVC does have some limitations. First, NVC is based solely on plant species data, with a particular emphasis on vascular plants, and therefore habitats lacking vascular plants are not covered, e.g. rock surfaces and some aquatic habitats. Second, and of more relevance to this study, each NVC community is defined by a table of frequency values for the species found in quadrat samples in a given area. Each of these 'floristic' tables consists of all the vascular plants, lichens and bryophytes likely to be found in that defined community that occur at a frequency of 5% or more. Therefore, although the presence of some of the commoner species of bryophytes forms an important part of the definition of several NVC communities, species which occur with a frequency of less than 5% in a sample are omitted from the analysis.

No studies have been performed to determine how accurately NVC reflects the distribution of bryophytes. However, Des Callaghan and Paul Ashton from Edge Hill University, have now performed a detailed bryological survey of the sand-dune systems along the Sefton Coast in Lancashire to (i) identify and characterise the main ecological clusters of bryophytes in the area, and (ii) assess the distribution of these clusters in relation to seven NVC sand-dune communities.

Following collection of a large amount of species data from 97 quadrats, each 50 x 25 cm, the authors performed a rigourous statistical analysis on these data to determine if any patterns could be observed.

Thirty-nine bryophyte taxa were recorded and seven distinct bryophyte clusters, described in terms of their bryophyte and vascular plant species composition, life history strategies, life forms, habitat and NVC communities, were identified following statistical analysis using two statistical methods, known as detrended correspondence analysis and partitioning around medoids (the latter being used to identify clusters of species). For example, cluster 1 consisted principally of tight turfs of *Syntrichia ruraliformis* and *Ceratodon purpureus* with loose mats of *Brachythecium albicans*. Loose, rough mats of *Brachythecium rutabulum* and *Eurhynchium praelongum* were predominant under dense, low *Salix* scrub in cluster 4, and thalloid mats of *Pellia endiviifolia* punctuated with tight turfs of *Bryum pseudotriquetrum* comprised cluster 7, and so on.

Three of the more distinct bryophyte clusters were found to be closely associated with NVC communities. For example, cluster 7 was very closely associated with NVC community SD13. Bryophyte cluster 1 was associated with two communities, SD6 and SD19, showing that in this case a change in

vascular plant distribution did not match bryophyte variation. The relationship between some of the bryophyte clusters and SD14, 15 and 16 was not resolved and further study is required to determine if this is due to bryological gaps in the NVC data or variation in bryophyte composition that is not correlated with changes in vascular plant communities.

The authors concluded that a full evaluation of the bryological quality of the NVC for habitats that are particularly important for bryophytes is justified.

The study also highlighted a difficulty in the distinction of NVC communities SD14 and SD15. These are very similar, but they are separated by defined minor variations in species composition, including the abundance (SD14) or scarcity (SD15) of *Campylium stellatum*. However, in the field it was found that the various criteria required to define these communities varied in a complex manner, with aspects of both communities being intermingled.

Ian Atherton

What is *Cryptothallus mirabilis*?

Wickett, N.J. & Goffinet, B. (2008). Origin and relationships of the myco-heterotrophic liverwort *Cryptothallus mirabilis* Malmb. (Metzgeriales, Marchantiophyta). *Botanical Journal of the Linnaean Society* **156**, 1–12.

Even those bryologists who have never seen it will surely have heard of the bizarre subterranean liverwort *Cryptothallus mirabilis*. As its name suggests the colourless thallus of *Cryptothallus* grows hidden up to 20 cm beneath damp peat or mats of other bryophytes where it derives its nutrients by hijacking an existing mycorrhizal association between itself, a basidiomycete fungus and a host tree, typically birch.

When initially described by Denis in 1919 he thought that it was just a form of *Aneura pinguis* without chlorophyll. Even when later described as a separate genus, it was still considered to be closely related to *Aneura*. In a recent study, Wickett and Goffinet have used DNA sequence data to study the relationships and evolutionary origin of *Cryptothallus*.

They sampled examples of all genera of the Aneuraceae and examined seven molecular regions, four from the chloroplast, two from the nucleus and one from the mitochondrion. They found that phylogenetic analysis of the DNA sequence data indicated that *C. mirabilis* is nested within *Aneura* rather than forming a sister group to it. They also found that *Aneura* and *Cryptothallus* form a strongly supported monophyletic group.

It was felt that a fungal association capable of simultaneously infecting the roots of neighbouring plants may have been present in the common ancestor of *C. mirabilis* and *A. pinguis*, and that a study of the fungal symbionts of other species of *Aneura* may illuminate the evolutionary pattern.

The authors conclude that *C. mirabilis* is a highly derived, mycoheterotrophic species of *Aneura* and propose that it should be reclassified as the new combination *Aneura mirabilis* (Malmb) Wickett & Goffinett.

Martin Godfrey

▽ *Cryptothallus mirabilis*. *David Holyoak*

Some definitions

Monophyletic group – a group of closely replated species that share a common, recent ancestor.

Mycoheterotrophic species – a non-photosynthetic parasite that uses fungi to obtain nutrients.