Article

Liverwort Key

John Lowell introduces a staged multi-access key to British and Irish liverworts

When I began to learn to identify bryophytes I found it difficult to use keys effectively (and indeed still do outside my comfort zone). Keys to species within a particular genus can be straightforward, but faced with a completely unknown plant a 'general' key can be quite forbidding. Liverworts seem particularly difficult, perhaps because the morphology is rather variable and the boundaries of genera often rather vague. Thus, one frequently encounters terms like 'usually..', 'often...', ' if not X then Y', 'not X, or scarcely/slightly so...' and so forth. To pick a way through these unavoidable qualifications, and the often fine distinctions (lanceolate/linear lanceolate etc.) is not easy without a lot of experience. The recent BBS field key goes a long way toward solving these problems, particularly by limiting the key to commoner species (dealing with others in the relevant species accounts), and by the use of thumbnail illustrations to clarify the characters. But some plants will still be problematic.

A dichotomous key will always prove difficult if the characters it uses are subject to variation, or rely on subtle and easily misinterpreted distinctions: one wrong decision is very likely to be fatal. A multi-access key can be more forgiving (for example, it may be possible to avoid characters to which the 'answer' is unclear). If there are more than a very few species involved a *printed* multi-access key may be impossibly cumbersome, but that can be largely avoided in a *digital* implementation. Nevertheless, if many species are involved there is another problem: the key will inevitably need to employ many characters – some of them 'major' in the sense that they will eliminate a significant fraction of the taxa, but most 'minor', serving to decide between just a few taxa. The user cannot distinguish 'major' from 'minor' and will be liable to waste much effort in trying to respond to characters which are irrelevant to the taxon

to be identified. A possible solution is a kind of dichotomous/multi-access 'hybrid' key which proceeds in stages, offering at each stage just a few characters, calculated to separate taxa not already eliminated in previous stages.

I have made an attempt at a staged multi-access key to British and Irish Liverworts which I believe may be helpful to less experienced bryologists. It is (inevitably) computer-based and in no sense a field key. It aims to suggest an identification on the basis of answers to successive sets (typically 4-5 sets) of a few (typically ~4) characters, with the option to avoid responding to characters when the 'answer' is unclear; the structure of the key makes it very easy to explore the consequences of alternative answers to any particular characters.

To handle the problem of character variation the 'answers' to characters in the key's database are not restricted to 'true' or 'false': there are additional values, 'usually true' and 'usually false'. Suppose, for example, that a particular species usually has underleaves but may occasionally lack them. If the response to a character 'Underleaves present?' is 'no' the key will not eliminate the species from consideration but assign it to a category 'less likely' so that it remains a candidate. These additional character values are also used to 'forgive' common mistakes – if underleaves are invariably present but obscure the key can regard them as 'usually present' so that an incorrect response to 'Underleaves present' will flag the species 'less likely' rather than eliminating it.

A major part of the difficulties in conventional keys is associated with the need to cover all species. If you are attempting to become familiar with the liverworts of Cheshire an attempt to key out a *Scapania* specimen will involve responding to several characters – possibly troublesome - aimed at highland species quite irrelevant to your Cheshire project: any one of which will forestall identification if misinterpreted. To simplify identification of species in a particular area the key described here allows an option to confine attention to species known to occur in a selected vice-county (or country); characters relevant only to other species are suppressed if the option is active. This results in considerable simplification, at the expense of a slight risk that the specimen under consideration may be new to the selected area.

I would greatly value comments on the usefulness and accuracy of the key; the link is

http://www.tinyplants.uk/LiverwortKey.html

The key contains no new bryological data, all characters are based on published information, in particular the Bryophyte Floras of Paton (1999) and Damsholt (2002), as well as other sources such as BRYOATT. But there may be simple blunders on my part. Please bear this in mind! It is intended for use with a desktop PC; it has not been tested on phones or tablets.

Acknowledgements

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References

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