

contributed papers of Giordani and Wolseley et al. are interesting reads as well. The former is methodological and smartly describes how to control noise in air quality models by using climate indicators to delineate geographic boundaries. The latter paper makes a very clear case for the utility of monitoring epiphytic twig communities as an “early warning system” of air quality impacts.

In the last section, “Conserving Lichen Communities and Species Diversity,” Edwards effectively pens a rallying cry for closer study of wayside trees in the U.K., which seem to be a refuge for rare and endangered lichen species yet receive no official conservation protection. To paraphrase the concern of Edwards, even though wayside lichen communities developed in tandem with agricultural N, at what level will N prove harmful? And finally, the paper written

by Lambley et al. serves as a great closer. Highlights from the workshop are woven together with research published elsewhere, culminating in a frank review of N impacts to lichens in Sites of Special Scientific Interest in England.

The 16 papers in this report provide a comprehensive survey of salient issues in a quickly growing branch of lichen-air quality research. Depth and refinement of articles do vary widely although comprehensibility of text and graphics rarely suffers. While sometimes limited in scope, previews of fledgling studies are engaging and likely to inspire readers to seek out related publications. Altogether, this report is dense with vital information and is an essential, enjoyable read for researchers interested the ecological impacts of N, related bioindication techniques and determination lichen indicator species.

New hepatic keys for Europe

Reviewed by

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Schumacker, René & Jiří Váňa. 2005. *Identification Keys to the Liverworts and Hornworts of Europe and Macaronesia (Distribution and Status)*, second edition fully revised and updated. Sorus, Poznań, Poland. [210 pp., 21 × 29 cm, ISBN 83-89949-11-34] Price: € 30 (Europe), \$44 USD (Rest of the world). Available from: René Schumacker, rschumacker@ulg.ac.be; orders from Poland from Sorus Publishing & Printing House, Poznań, Poland, www.sorus.pl.



Five years after the publication of the first edition of the *Identification Keys*, an update has been issued by the small Polish publisher, Sorus, co-owned by the Polish botanist and bryologist, P. Szmajda. The first edition was reviewed in detail here by Davison (2001); hence I refer to that review for the description of book structure, taxon selection, etc., which has stayed essentially unchanged, and I will mainly comment on the updates and revisions.

First of all, the new edition has benefited from the professional typesetting of the Polish publisher, in spite of the fact that the format and inner, graphic layout remain practically unchanged—a metallic spiral-bound A4 handout in durable covers. A CD-ROM version, which was the alternative packaging for the same price in the first edition, has not been produced this time. This second edition has now received an ISBN and the only non-standard thing

remains the way of ordering it and having to send payment to the private bank account of one of the authors (other titles published by Sorus are normally available from the publisher, including the possibility of paying by credit card). Additions in the text and a slightly looser typeface and leading has caused the volume to have an inflated size, increasing by 50 printed pages. The additions consist of a few taxa that have been newly found or recognized in Europe during the time period between the editions (including an addendum with nomenclatural changes and a note on the discovery of *Cyathodium* from Italy dated 8 Dec 2005) and from the inclusion of several other species that occur close to the boundaries of Europe and Macaronesia and are likely to eventually be found within them. The main updates or revisions are a partial rewriting of several keys to species (the most notably changed ones include those to *Fossombronia*, *Herbertus*, *Lophozia*, *Plagiochila* and *Riccia*) and the keys to infraspecific taxa, now inserted into the main keys rather than merely being in a list of accepted taxa within each genus. Other important updates include the revision of author citations, addition of new synonyms, updates to distributions, and inclusion of many new literature and illustration references. Generally, great care has been devoted to correcting small errors and inaccuracies of the first edition, and the authors obviously benefited from solicited critical remarks by users.

A promise in the first edition to add illustrations in future editions unfortunately remains unrealized, which can easily be understood but will definitely be met with regret by all potential users. Considering that the promise of adding illustrations “next time” is now missing, the authors seem to have relinquished their ambitions to do so in an envisaged 3rd edition. The revision of the distributional synopsis unfortunately does not address modern geopolitical changes and still retains Czechoslovakia and Yugoslavia, for example, despite the existence (in a majority of cases) of recent published checklists of the newly segregated countries and the comprehensive treatment of Söderström et al. (2002). The reader will also not learn the general distribution of taxa beyond the borders of Europe. The delimitation of genera remains essentially unchanged (the exception being *Lepidozia azorica* moved to *Telaranea*) and differs only slightly from that of

Grolle and Long (2000). For example, *Chiloscyphus* includes *Lophocolea*, and *Lophozia* includes *Leiocolea* but excludes *Barbilophozia*. The delimitation of species and the occasionally recognized infraspecific taxa generally follow recently published treatments.

I regard the new edition as a valuable, thorough update of the first edition, and one that will remain a basic reference for the identification of European hepatics and hornworts. It should also be usable for northeastern North America, although perhaps generally not for beginners due to the absence of illustrations or even basic diagnostic characters unless these are also key differentiating characters. The keys may be viewed as a more specialist-oriented alternative to the recent English translation of the European pocket cryptogamic flora for bryophytes and ferns (Frey et al. 2006), the latter having the advantage of mostly providing brief diagnostic characters and basic ecological preferences, supplemented by partial illustrations of those characters. However, that flora does not provide full treatments of critical and “small” taxa or the extensive synonymy and copious references to literature found in the work reviewed here. The keys of Schumacker and Váňa work fairly well, if you already know most of the keyed species in order to feel comfortable in excluding them; if not, you will need to have a good library at hand for checking descriptions. Owners of the first edition will probably regret that the update has not also been made available in an electronic version or as a several page pamphlet of addenda and errata, for a reduced price, considering the relatively short time between the two editions and lack of any major upgrade. On the other hand, those who hesitated to purchase the first edition can now be warmly recommended to buy this new edition, enjoying all the benefits of this corrected and technically “professionalized” treatment. **LITERATURE CITED**—Davison, P. G. 2001. [Review] René Schumacker and Jiří Váňa. Identification Keys to the Liverworts and Hornworts of Europe and Macaronesia (Distribution and Status). *Bryologist* 104: 498–500. Frey, W., J.-P. Frahm, E. Fischer & W. Lobin. 2006. The Liverworts, Mosses and Ferns of Europe. Harley Books, Colchester. Grolle, R. & D. Long. 2000. Annotated checklist of the Hepaticae and Anthocerotae of Europe and Macaronesia. *Journal of Bryology* 22: 103–140. Söderström, L., E. Urmi & J. Váňa. 2002. Distribution of Hepaticae and Anthocerotae in Europe and Macaronesia. *Lindbergia* 27: 3–47.