

An appendix details 'Nomenclatural novelties'. This is an important section on the designation of type specimens and the names adopted in this treatment, often with source quotations giving the background to some of the names. It is very thorough and suggests most type specimens have been systematically examined. The book closes with indices to specimens used for photographs and synonyms. There is no general index, either to genera or species, and curiously, there is no overall list of the references which are dealt with in the text. The volume is dedicated to the tutors of the authors, Prof. Rolf Santesson on the occasion of his 90th birthday, and Prof. Dr Aino Henssen.

The book is well produced with generous margins and there seem to be few mis-spellings apart from *Peltigera aphthosa* on the plate, page 192. Although this is the third volume of the Nordic Lichen Flora, the companion volumes detailing *Caliciales* (vol. 1) and *Physciaceae* (vol.2) are, surprisingly, nowhere indicated.

Flora of Australia Volume 57 Lichens 5. Edited by **P. M. McCarthy and Brigitte Kuchlmayr.** 2009. Victoria: CSIRO Publishing/ABRS. P. O. Box 1139, Collingwood VIC 3066, Australia. Publishing.sales@csiro.au. Pp 687, 64 colour plates, 183 monochrome figures, 654 maps, 25.5 × 18 cm. ISBN 978-0-643-09664-6 hard cover, price Aus \$ 180; ISBN 978-0-643-09665-3 soft cover, price Aus \$140. [UK, £153-50-113-50 from Natural History Book Store]. doi:10.1017/S0024282910000526

This volume is the most recent of the 5 volumes so far completed on Australian lichens (Vol 54 (1992), Vol 55 (1994), Vol 58A (2001), Vol 56A (2004) see website <http://www.environment.gov.au/biodiversity/abrs/publications/lichens>).

This excellent volume continues a tradition of recruiting a great number of specialists to contribute family and generic accounts that now include 1822 taxa described from Australia in the 5 volumes so far produced. This has resulted in a series that presents recent advances in generic and species concepts in a Flora format, easy for everyone to use, which together with the ample illustrations makes the volumes useful far outside the geographic range for which they were designed. These volumes are amply illustrated with both colour and monochrome photographs, the former including a great number of beautiful and informative pictures by W. Malcolm as well as from the authors. Distribution maps for most species are also included.

The huge number of species included is in part due to the great variety of geographical and ecological regions on the Australian continent, from wet tropics to desert conditions and to the south temperate conditions on the mountains. The result is an astounding range of taxa that includes both temperate, xerophytic and tropical species. These volumes, while being practical manuals for identification of lichen diversity in Australia, are also very helpful in many other regions of the Southern Hemisphere where there is no literature available. The detailed accounts of genera and species, with references to the source literature and the synonymy, provide anyone interested with essential taxonomic information. In addition the series provides a real insight into the potential diversity of the lichen flora on our planet!

Finally, this is a most important volume and the authors should be congratulated on the high academic standard and precision, particularly relating to the citation of sources of names. The volume strongly emphasises the critical, and frequently overlooked, importance of the typification concept and its continuing and fundamental value in modern taxonomy.

Peter James

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Volume 57 has 687 pages, and is the largest volume so far, covering 21 families, 78 genera and some very large, mainly tropical, families such as the *Graphidaceae* and the *Thelotremaaceae*, the former containing 19 genera (out of 23 described) and 163 species (out of c. 1050), and the latter containing 17 genera and 173 species. Both these families have been recently revised in a number of papers and monographs (Archer 2006; Frisch *et al.* 2006, Lücking *et al.* 2009; Staiger 2002) based on molecular and chemical analyses, resulting in a great number of confusing additional genera defined by characters very different from the traditional ones used by Hale in the 1980s. This volume reflects the advances in taxonomic techniques now available to redefine generic and species concepts, including the use of HPLC to define an ever increasing range of secondary compounds and the application of molecular analysis to the identification of phylogenetic groupings, particularly in the *Graphidaceae* and the *Thelotremaaceae*. Now in one volume we have an overview of these revisions, with detailed descriptions of the new genera including keys and good descriptions of the species themselves with clear synonymy – this being essential where there have been so many name changes. However the reader who has no access to HPLC or TLC is dependent on spot tests as confirmation of the presence of secondary compounds. In most cases these are provided, together with the compounds present, but in the *Graphidaceae* only the compounds are given, which is a pity as these tests provide preliminary information necessary for distinguishing the taxa. However this is a small criticism of a volume that can be considered to be essential literature for all lichenologists.

The accounts of the *Pyrenulales* and *Trypetheliales* by Aptroot are not as large as expected but the majority are pan-tropical corticolous species with rather few endemics and are restricted to the north and west parts of Australia where conditions are suitable. Other families in this volume include the colourful sub-tropical to tropical *Letrouitiaceae* and the more cosmopolitan *Physciaceae*, where species associated with increasing atmospheric nitrogen and climate change are increasing their range across the world. One omission from this group is the rapidly expanding *Hyperphyscia adglutinata* although it was a new record in the Tasmanian checklist (Kantvilas, 1989). The *Arthoniaceae* include recently described species in *Herpothallon*, a genus of sterile byssoid crusts, found in Queensland, that are widespread in rain forests throughout the old world tropics. In contrast the distribution maps show that species of the largely temperate families *Nephromataceae* and *Peltigeraceae* are restricted to montane areas in the south-east of the continent. As in other volumes the distribution maps are included in a block at the end and add considerably to its interest. Colour photographs are restricted to 32 plates at the beginning of the volume and 32 plates towards its end, but there are plenty of black and white pictures that illustrate critical features of spore septation and locule shape. The inclusion of a section on essential distinguishing characters for similar species at the end of each species account is a very useful addition providing a quick check for confusing taxa.

The importance of this series cannot be overestimated. The whole project has stimulated research in many lichen families and has greatly added to our

understanding of the taxonomy, ecology and distribution of taxa that were formerly considered to have a restricted distribution. There are still more volumes to come in this series. We welcome the change in plan to produce smaller volumes at more regular intervals as sufficient treatments of families are ready and we look forward to further elucidation of this fascinating lichen flora.

Pat Wolseley

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