

Book Reviews

Handbuch für Pilzfreunde Vol. 6, (2nd edn)
E. Michael, B. Hennig and H. Kreisel.
Gustav Fischer Verlag, Stuttgart/New York. 1988.
310 pp. Illustrated, hardback, DM 36.00.
ISBN 3-437-30352-X.

This is the second edition of the last volume in the well known series of guide books for everybody interested in mushrooms and toadstools. An introduction to the history of mycology is given. The main body of this book consists of keys to all genera of macromycetes in Europe. In general the keys work well, though not all are dichotomous as first macroscopical, then easily observed microscopic and at last more difficult microscopic characters are used. But the genus *Amanita* is keyed out in the group of the Agarics with adnate, emarginate or adnexed lamellae. References to descriptions and illustrations in the first five volumes are given. A glossary, some black-and-white pictures of characteristic representatives of several fungal groups, a survey of all genus names, the natural system of fungi, a list of authors' names and last but not least a general index to all species and genera treated in volumes 1–5 are given.

The authors succeeded well in giving an updated version of the first edition of 1975. This volume is indispensable to all owners of the first five volumes and it is an excellent reference book.

E.C. VELLINGA

Plant Demography in Vegetation

Succession

K. Falińska.

Kluwer Academic Publishers, Dordrecht. 1991.
iv + 210 pp. Illustrated, hardcover, Dfl. 215.00, UK
£75.00, US \$145.00. ISBN 0-7923-1060-8.

Krystyna Falińska's book is a compilation of the results of 15 years of research (1974–1989) on the behaviour of plant populations in the course of secondary succession in abandoned meadows. The first part (16 pages) introduces theories and methods, on which I will comment later. The second part (20 pages) reports on vegetation dynamics in meadows which had been abandoned by farmers in different years over the period 1960–1974. It treats *Cirsietum rivularis*, *Lysimachio vulgaris-Filipenduletum*, *Caricetum acutiformis*, and *Salicetum pentandrocincerae*. Biological mechanisms of species turnover are dealt with in part three (42 pages). Several types of demographic units are clearly distinguished and

defined (e.g. genets, vegets, mono- and polycormones, clones), thus providing a useful terminology to relate individual plant growth to processes of succession. The rate of succession in these abandoned meadows can be accelerated as a result of the behaviour of species like *Cirsium rivulare* and *Filipendula ulmaria*, whereas succession is relatively inhibited by species like *Carex acutiformis* and *Carex cespitosa*. In part four (67 pages) demographic processes are categorized as related to abundance variations, life histories and population structures in the course of succession. Particular attention is paid to the demography of *Cirsium palustre*, *Filipendula ulmaria* and *Iris pseudacorus* as model species. Spatial population structures of various species are dealt with in relation to morphology and reproduction. In part five, the synthesis (44 pages), succession is explained as a population process, mechanisms of succession being the result of the colonization success of species as determined by reproduction and growth. Particular attention is paid to mosaic patterns and species diversity.

This volume really represents what the title suggests. It is all about plants, nothing about abiotic ecosystem factors, and the bibliography is accordingly biased and relatively poor. The first chapter (introduction and aim) misleads the reader to some extent. The author first emphasizes the similarity rather than the dichotomy between an ecosystem approach and an approach dealing with inter-species and species-environment interactions, but finally states: 'The research relayed in this book stems from the adopted outlook that the formation, persistence and passing of phytocoenoses during a succession are the result of intra- and interpopulation processes. Demographic processes are therefore made responsible for the course of succession (once initiated by the cessation of mowing).' She unfortunately suggests (see the first and the last chapter) that a 'hierarchical model of the causes of succession' can be simply related to scale differences, i.e. by studying vegetation, populations and individuals at the scale of plots of 15 ha down to 1 m² in size. I hope that the thorough and interesting set of information on vegetation and plant processes presented in this well-written and nicely illustrated book will stimulate additional studies of ecosystem processes in order to detect the real hierarchies. Only then will I agree with the author's suggestion mentioned in the first chapter: 'It seems that the future succession theory will not be reductionistic or holistic, but rather hierarchical in approach, i.e. it will explain processes at higher levels of ecological systems as the result of processes at their lower levels.'

J. VAN ANDEL

Abscisic Acid: Physiology and Biochemistry

W.J. Davies and H.G. Jones (eds).
John Bradley, Bios Scientific Publishers, Oxford.
1991. xiv + 266 pp. Illustrated, hardcover, UK
£39.95, US \$79.90. ISBN 1-8727-4865-1.

This book is the result of a 3-day discussion meeting of the Society for Experimental Biology held at the University of Birmingham, United Kingdom in April 1991. It contains 17 chapters written by representatives of leading laboratories in the field of abscisic acid (ABA) research. The first chapters focus on physico-chemical techniques to extract, purify and measure ABA levels in plant materials, the use of ABA immunoassays and the unravelling of ABA biosynthesis and metabolism. The role of ABA in drought-induced changes in stomatal conductance and gene expression is extensively discussed in chapters 6, 7 and 11. The interaction of ABA with various other biotic and abiotic stimuli such as pathogens, wounding (mechanical and through herbivory) and overwet soil conditions are reported in chapters 13, 14 and 15 respectively. Chapters 8 and 9 present information on the physiology of developing and mature seeds in relation to ABA, whereas the role of second messengers in the ABA signal transduction pathway is discussed in chapter 10. Finally, the physiological knowledge on ABA is implemented in the optimization of crop production and discussed in chapters 16 and 17.

Overall, this book presents an excellent review of progress in ABA research during the last decade.

My only point of criticism concerns the main criteria used to organize the book into the various chapters. Two principal themes, (a) the role of ABA in acclimatization and adaptation to environmental stimuli (drought, stomatal regulation, wounding, pathogens, flooding), and (b) the physiology and biochemistry of ABA (biosynthesis, metabolism, second messengers, gene expression) are intermingled throughout the 17 chapters which leads to a substantial lack of continuity limiting the book's appeal and usefulness as a reference book. Choosing the second of these themes would have been the more appropriate bearing in mind the book's title. I would like to compliment the editors and their publisher on the very rapid appearance of these conference proceedings. Less than a year passed between the scientific meeting and the publication of the book. This demonstrates that fast publication of conference books can be achieved and the present volume serves as an excellent example for future editors of proceedings of symposia and conferences.

I became convinced that it would be worthwhile to integrate some of the physiological, biochemical and molecular knowledge on ABA-regulated processes

which are described in this book into ecological questions. In this respect it was interesting to read that differences in embryo dormancy between *Acer pseudoplatanus* and *A. platanoides*, were related to the timing of ABA peaks in the seed development (page 108). Perhaps this correlates with different survival strategies related to habitat differences between both species?

In summary, I would recommend this up-to-date and well written book on the physiology and biochemistry of abscisic acid to active researchers and those involved in advanced teaching.

L.A.C.J. VOESENEK

Practical Taxonomic Computing

R.J. Pankhurst.
Cambridge University Press, Cambridge/New York/
Melbourne/Port Chester/Sydney. 1991. xi + 202 pp.
Illustrated, hardback, £24.95, \$49.95.
ISBN 0-521-41760-0.

In this book, a complete and up-to-date account of the modern day application of computers in taxonomic practice is given. The use of computers in systematic work is rapidly diversifying and intensifying; the present book thus replaces the older one, entitled *Biological Identification* (Pankhurst 1978). The book is written for biologists as well as for computer programmers, although the well-versed layman may also find it extremely interesting as taxonomy is shown to be a lively and modern science. This broad group of readers is possible, because for every phase in systematic work, from data collection to classification, the biological theory is explained together with the computer implications, both in a very critical way. Representative software packages are mentioned at the end of every chapter.

After a general introduction (chapter 1) databases are discussed (chapter 2), their terminology, types of databases, data collection, direct uses such as distribution maps, taxon descriptions, and listings. Chapter 3 elaborates on two types of classification: phenetic and phylogenetic (the third one, the classical or evolutionary school is not treated). It is advisable, after having read about the phenetic classification, to continue with chapter 5 as several features reappear. As far as the explanation of the phylogenetic school is concerned, the general rule applies that one never should explain a method to which one is opposed. Readers are advised to skip this part as, for instance, the summary does not show the major flaws of the phylogenetic methods but rather Pankhurst's often out-of-date misunderstandings. 'Non-evolutionary characters' do not exist, ordering characters *a priori* is unnecessary, the outgroup-rule should not be confused with the, indeed incorrect, common-is-primitive rule, etc. Several of the computational difficulties are true (NP-completeness, difficulty of

combining binary, discrete, and continuous multi-state characters), just as these are true for several of the phenetic methods where they are not stressed as weaknesses. Chapter 4 shows the presently used non-computational methods of identification, of which the diagnostic keys are most extensively treated as they are commonly used. The longest most important and impressive part, chapter 5, describes the world of computerized identification. It explains the DELTA-format, now widely becoming accepted for data-collecting and shows the possibilities to identify on-line with this format. Building diagnostic keys without and with the user's assistance will be an eye-opener for those who suspect the computer to make ill-use of characters; it is shown how the most informative, discriminating, easy to observe characters are (automatically) selected in the key-building process. Two additional methods (simple matching and probabilistic methods) are shown for identification when characters are very variable and overlapping and/or when the taxa are highly similar. The three short, final chapters tell the history of identification (chapter 6), show examples of determination tables (chapter 7) and briefly explain the theory of expert systems (chapter 8), a field which receives much attention nowadays.

The book is easy to read, contains clear explanations, and is highly informative. It is required reading at least for every taxonomist who has bought a computer, because it shows how to make the most of one's investment.

P.C. VAN WELZEN

Chemotaxonomie der Pflanzen Vols IX and X

R. Hegnauer (with M. Hegnauer for Vol. X).
Birkhäuser Verlag. 1990 and 1992. xii + 786 pp. and
viii + 847 pp. respectively. Hard cover, SFr. 580.00
and c. SFr 600. ISBN 3-7643-2299-3 and
2-7643-2578-X.

These two recent volumes almost complete and fully provide access to chemotaxonomic information on

the plant kingdom published over the last 30 years by Professor Robert Hegnauer. One mammoth task still lies ahead: an inventory of the chemical compounds found in the large and economically extremely important superfamily of the Leguminosae (hopefully to be completed in the next 4 years). Volume 9 contains addenda to volumes 5 and 6 (published in 1969 and 1973 respectively) on the families Magnoliaceae-Zygophyllaceae of the dicotyledons; volume 10 is a tripartite index to the nine previous volumes with a taxonomic index (371 pages), an index to taxonomically relevant classes of natural products and chemically defined plant structures (crystals, waxes, oils and mucilages, etc., 94 pages) and a voluminous subject index.

Chemotaxonomie der Pflanzen is a monumental and immensely informative series on chemical markers of plant families (and fungi). Its value far transcends that of plant taxonomy because the information on the occurrence of natural products in specific plant groups is basic to many studies on plant resources. The last volume is dedicated to one of the fathers of systematic plant anatomy, Hans Solereder, whose *Systematische Anatomie der Dicotyledonen* inspired the author to embark well over 30 years ago on his *Chemotaxonomie der Pflanzen*. Plant anatomists will find much of interest in these volumes because Hegnauer has summarized relevant anatomical information in each family treatment.

The high prices of the well-executed volumes will be prohibitive to most individual botanists; for botanical libraries the series will remain a good investment for many years to come.

P. BAAS