REVIEWS

C. VAN DEN HOEK, D.G. MANN & H.M. JAHNS: **Algae: An introduction to phycology.** Cambridge University Press, United Kingdom, 1996. 623 pp., many illus. ISBN 0-521-31687-1 (paperback); Price: £ 24.95 or US$ 39.95. ISBN 0-521-30419-9 (hardback); Price: £ 70 or US$ 110.

This important book contains a clear, modern introduction to the cytology, morphology and systematics of the algae, providing a wealth of information for all those studying or working with these organisms. It takes in account recent re-evaluations in algal systematics and phylogeny, and these two main fields are the most extensively covered. The re-evaluations have been made necessary by insights provided by molecular genetics, electron microscopy, and new life history studies.

The introduction gives thought about classification, evolution and phylogeny and is directly followed by the chapters on the main algal groups. There the principal characteristics of each group are outlined, usually followed by chapters on size and distribution of the division, as well as on its structure and characteristics, its systematics, and its phylogeny. Occasionally only general remarks and some typical examples are discussed in smaller divisions, while in the two largest divisions, the Heterokontophyta and especially the Chlorophyta, many classes are treated separately.

The text is larded by many excellent and very clear figures with comprehensive captions. Thus skimming the book is a very pleasant experience.

When discussing the designation 'algae', the authors admit to cover an unnatural group of organisms, viz., a gathering of very diverse photosynthetic plants that have neither roots nor leafy shoots and also lack vascular tissues. They include, nevertheless, two groups of prokaryotes, the Cyanophyta and the Prochlorophyta. However, although it is clearly stated that certain algae are not able to photosynthesize but are nevertheless classified as algae because of their close resemblance to photosynthetic forms, the heterotrophic groups of the division Heterokontophyta are not included.

The book contains a list of references, a glossary, and two indexes, a 'species index' and a 'general index'. As it is the case in many handbooks, the glossary and the general index are not always consistent and neither complementary nor mutually referring. Most terms can be found both in the glossary and in the index, which is the preferred and expected situation. The index, however, does not indicate the inclusion of terms in the glossary, nor their explanation therein, while the glossary does not indicate where the explained terms occur in the text. Occasionally the glossary and the main text do even differ in their explanations of terms, or terms are spelled differently. This can be corrected in a subsequent edition.

Some examples: 'A-tubule' is given in the glossary, but not in the index, the same with 'accessory pigments'. In the glossary 'acronema' is explained, in the index only 'acronemata' occur, while in the text again usually 'acronema' is used. 'Alginic acid' can be found in the glossary, but not in the index, where only 'alginates' are included. Although in the text (p. 169) it is explained that alginates are salts of alginic acid, the definition of its contents differ with the definition given in the glossary. That alginic acid also occurs in the cell wall of some red algae is only explained in the glossary (without any reference) and nowhere in the text. Although in the general index anisogamy in many algal groups is listed, that of Sphacelariales is lacking, but never

theless it is discussed on p. 184. A bit strange is inclusion of the name *Sphacelaria radicans* in the index; it occurs on p. 182 in the caption of a figure, which itself is omitted, however. Another irregularity is that in the text (p. 179) it is stated that 'desmarestene' is produced by two species of *Desmarestia* and by one species of *Cladostephus*, while in fig. 12.9, to which is referred, only the two *Desmarestia* species are included in the overview of sexual pheromones in several brown algae. Not in all parts similar small shortcomings can be found, however. When checking the numbers in small print that refer to the titles in the comprehensive list of references (1937 titles!), only correct ones were found. It is certain that the present book will find its place in the offices of many phycologists. It is suggested to place it on the same shelf as the still indispensable Fritsch volume, of which the present book is the long-abided modern and likewise indispensable counterpart.

W.F. PRUD'HOMME VAN REINE

B.J. CONN (ed.): **Handbooks of the Flora of Papua New Guinea. Volume III.** Melbourne University Press, Carlton, Victoria, 1995. 292 pp., illus. ISBN 0-522-84582-7. Price: Au$ 49.95.

Volumes I and II in this series already appeared in 1978 and 1981, respectively. Now, almost 15 years later, the third volume has been published. It deals with the following families: Araliaceae (excl. *Schefflera*), Droseraceae, Erythroxylaceae, Guttiferae (Subfam. Calophylloideae), Buddlejaceae, Loganiaceae, Nelumbonaceae, Nymphaeaceae, Onagraceae, Portulacaceae, Proteaceae. For *Osmoxylon* (Araliaceae) an appendix for the species from the Solomon Islands has been included.

The book contains descriptions of families, genera, and species, as well as keys, and at least one drawing for each genus. By using vegetative characters in the identification keys, for example in the key to the species of *Calophyllum*, the authors make it possible to identify incomplete material. The excellent drawings have all been prepared especially for this work, and are based on material, partially living, from the area dealt with. Notes are provided concerning distribution, literature, ecology, and for some groups (Araliaceae, Guttiferae) also field characters are given.

Many groups in this volume have already been treated for the Flora Malesiana project or in monographs. Even for genera which are well-represented in the area, such as *Polyscias* (Araliaceae; 20 species) and *Calophyllum* (Guttiferae, c. 40 species), no new species have been described since the Flora Malesiana treatment (1979) and the (regional) monograph (1980), respectively. Most groups which are treated are small, with the exception of the two genera mentioned above and the genera *Osmoxylon* (Araliaceae, 10 species), *Mammea* (Guttiferea, c. 12 species but not well-understood yet), *Fagraea* (Loganiaceae, c. 16 species) and *Helicia* (Proteaceae, 47 species). Nevertheless, it is useful for the relatively poorly known area of New Guinea and the neighbouring islands on the eastern side (Bismarck Archipelago, Solomon Islands) to have a regional, updated flora.

Concluding, this volume can be considered a valuable contribution to our knowledge of the flora the New Guinea region. Hopefully, we will not have to wait until the year 2010 for the appearance of volume IV!

A.M. POLAK

A. KEAST & S.E. MILLER (eds.): **The origin and evolution of Pacific Island biotas, New Guinea to Eastern Polynesia: Patterns and processes.** SPB Academic Publishing bv, Amsterdam, 1996. vi + 531 pp., 143 fig., 75 tables, 51 col. plates. ISBN 90-5103-136-X. Price: NLG 365, US$ 228.50.

This is an extremely difficult book to review, due to its scope and its depth of treatment. With a subject as wide-ranging as this, from the plate tectonic development of the last 100 myr to the history of human occupation over the last 10,000 years, who can claim to be able to comment on it within the scope of an ordinary review? Allen Keast manages to give a summing-up in the final chapter. Including, for good measure, a review of the status of MacArthur and Wilson's theory of island biogeography, but abstaining wisely from similarly reviewing the status of vicariance- and panbiogeography, it requires 35 pages.

If nothing helps, try statistics. This book packs vi + 531 pages in not more than an inch, including the cover. It packs well over 600 words on a page full of print. It therefore packs probably something well over 250,000 words, and manages to squeeze in figures, tables and coloured photographs as well. The 27 chapters are arranged in three major sections: "Origins and development of islands and their biotas", "The Pacific Islands floras and faunas: New Guinea to Eastern Pacific and Wallacea", and "Patterns and processes: ecological and evolutionary basis". Eight chapters, comprising 122 pages, are primarily botanical, 12 chapters (221 pages) are zoological or use mainly zoological examples. The remaining chapters deal with general subjects: geology, providing status reports on the plate tectonic development of the Pacific and the development of the Hawaiian-Emperor volcanic chain; development of island biotas illustrated by Krakatau; evolutionary theory; anthropology and conservation issues. The book is completed by a subject index of 5 pages, with over 500 subject entries, which seem to have been extracted intelligently. The references are appended to the separate chapters, the colour plates are not.

In short, this book may tell you all you need to know about Pacific biogeography. If it does not, its bibliographies will guide you further. A must and well worth the money. One minor quibble only: the editors have not been able to resist the tendency to inflate book titles by inserting colons and related subjects rather indiscriminately. I hope this tendency will be stopped before it gets us into its grip as it has the social studies. "Biotas of the Pacific" would have been fine. P. HOVENKAMP

M.M.J. VAN BALGOOY: **Malesian Seed Plants. Volume 1. Spot-characters. An aid for identification of families and genera.** Published by Rijksherbarium / Hortus Botanicus, Leiden, 1997. 154 pp., numerous text fig. ISBN 90-71236-31-5. Paperback. Price: NLG 50.

The ability of some people to identify plants to family or even genus on sight has always fascinated me (well, it might be more accurate to say that I have always envied people who can do this well). These days, this ability is particularly in demand both for inventory work and also in general herbarium curation, yet it is one possessed by ever fewer systematists. Watching systematists at work, some seem to have an especially good memory, rather like a good memory for faces; once seen, a particular facies, a genus or even species, is never forgotten. However, it may be difficult to find out why a person with such a memory gives a plant a particular name, and they

can be stumped by a new plant. Other people have a less prodigious memory of form, but they have a great knowledge of basic plant morphology and of characters. Of course, in neither case – and most people fall somewhere between the two extremes – does good identification come easily, but, rather like becoming a great chess player, it involves a great deal of hard work.

Van Balgooy has certainly put in a great deal of hard work in naming plants over his long career, although he clearly also has a gift for doing this. This volume is the first of a projected three (the next two will consist of 'portraits', brief characterizations, of all families of Malesian seed plants). Here, Van Balgooy has given us a series of spot characters that he and others at the Rijksherbarium have used over the years when identifying Malesian plants. For 105 characters, ranging from 'cushion plants' to 'ruminate endosperm', he provides an illustration or illustrations and a list of the families and genera with the character. If one has a plant, or even a part of a plant, with one of these distinctive features, one can scan the list and hope that finding a name on the list will jog one's memory as to the name of the plant. Indeed, the illustrations of seeds with ruminate endosperm and the accompanying list, helped me identify a seed from Papua New Guinea that I have had sitting on my bedside table for the last three months.

As Van Balgooy suggests, these lists can (and should) be extended. For instance, I noticed as I was walking around Kew last week that several *Celastraceae*, including our *Celastrus* and *Euonymus*, have fringed stipules. Perhaps if there is one obvious area where more characters could be added, it is in branching. Here one thinks of the well-developed prophyllar buds found in most *Urticales* (think of the paired inflorescences so common in *Ficus*, as well as *Poikilospermum* and *Urtica*). Axillary branches in *Rhamnaceae* commonly leave a little to one side of the strictly axillary position, while many *Apocynaceae* appear to have branches alternating with leaves (they are really subtended by scale leaves). The sylleptic branches of *Myrsinaceae* are often elongated where they join the stem, while branches in *Sapotaceae* often apparently have a long basal internode, although at the very base there are buds that can produce inflorescences.

The spot characters Van Balgooy lists may help in the identification of plants from outside Malesia, since some are quite consistent within a family or genus, e.g., the T-shaped hairs of *Malpighiaceae* or the pellucid dots or lines in the leaves of *Casearia*. (In this connection, I have a minor complaint. It would be helpful if families in the list were in Roman or bold type in any future editions; this will make scanning the lists much easier.) Even in those cases where the extra-Malesian taxa differ, this suggests interesting patterns of variation. Thus New World species of *Colubrina* have black glands (rather like those of *Prunus*) on the lower surface of the lamina, but they are absent in our species.

By putting into print what was previously something just a few people knew, Van Balgooy has placed succeeding generations of systematists in his debt. It is up to us to repay this. We can find new characters, extend the list of examples, and put into words the feature we use to identify a genus or family, but which, as the author mentions in his introduction, may never have been put into words. And we will also repay the debt by making computer keys, a desideratum he also mentions in the introduction. My colleague, Jim Jarvie, sized the book with glee and carried it away and

used it with great profit for just that purpose. Of course, only time will tell how good such keys will be. I think that at the very least they will reduce the burden placed on people like Van Balgooy who truly know their plants, and allow them to concentrate on naming the really difficult (and interesting) 'unknowns'. But such computer keys will be as good only as our accurate knowledge of characters, and Van Balgooy has shown us the way. P.F. STEVENS

Y. LAUMONIER: **The vegetation and physiography of Sumatra.** Kluwer Academic Publishers, Dordrecht, Series Geobotany, 1997. ix + 222 pp., illus., incl. 3 separate maps in colour. ISBN 0 -7923-3761-1. Price: NLG 400, US$ 256, UK£ 156.

The merit of this volume is that it presents a condensed version of the scientific findings on the (forest) ecology and vegetation description as a result of some two decades of research in the vast everwet tropical island of Sumatra.

Possibly one of the positive results of this book has been the inclusion of the three separate, detailed vegetation maps of South, Central, and North Sumatra, in the 80s published in France. The majority of the text concerns further explanation of the accepted vegetation types (formations), and thus gives an overview of all vegetation in Sumatra. As a matter of fact, the basic division for the definition of the formations accepted is, of course, topographic (lowland area West of the main range, the central mountain range itself, and the plains to the East), and physiographic, with furthermore as usual the altitudinal zonation ranking as a major criterion (bioclimates, according to rainfall and temperature), with in addition geomorphology (geology, lithology), soils, and drainage. Besides the description of the spontaneous vegetations, attention is given to the nowadays continuously more and more prevailing secondary and cultivated types. As customary in the 'French School' most of the ultimately accepted units are sustained by the renowned semi-schematic line-drawn figures of transects with named trees and their projections, accompanied by species-lists and lists of floristic compositions of forest layers or 'eco-units' (Oldeman, 1983).

One of the main methods for vegetation classification and mapping included the use of air-photography and remote sensing, which has, as much as possible, to be followed by personal local inspection, the latter a strongly limiting procedure. However, the top regions of the non-volcanic Gunung Leuser area in North Sumatra are almost constantly under cloud cover, and possibly the reason that its extraordinary interesting high mountain 'blang' vegetation (present mainly on the mountains Kemiri, Bandahara, Leuser, and Goh Lembuh), detected and described already by Van Steenis (1938), and mentioned by Whitten et al. (1984) and De Wilde & Duyfjes (1994), has not received due attention. Mountain (forest) vegetation was mainly studied of some volcanogenic mountains in West Central Sumatra, viz. Mt Talamau and Mt Kemiri, where true 'blang' vegetation is absent, although photo 19, on page 164, shows a resembling vegetation at 2800 m on Mt Talimau. In the treatment of plant life in the Leuser National Park (De Wilde & Duyfjes, 1996) a brief description of these high mountain wet heathland-like vegetations has been given. The present treatise of the Sumatran vegetation includes the digestion of a large number of reference publications, listed in a separate chapter. One of the aspects of the present publication is the fact that it confirms the enormous biodiversity, forming a check-point in the monitoring of the on-going conversion of the vegetation into land development.

(Additional) References:

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