REVIEWS

J. KOMÁREK & K. ANAGNOSTIDIS: **Cyanoprokaryota. 1. Theil: Chroococcales. Süßwasserflora von Mitteleuropa 19/1.** Gustav Fischer Verlag, Jena, Germany, 1998. ISBN 3-437-35408-6. Price: DEM 228.

This important book, written in somewhat baroque and not always clear English, provides a wealth of information for all those studying or working with Cyanoprokaryotes. That are the organisms usually known as Cyanobacteria or still just blue-green algae. A modern book on identification, but only on the unicellular or colonial members, not on the important filamentous groups. Two parts will follow later. Although in the 'Anschrift der Authoren' it is indicated that Professor Anagnostidis has died, no further information is given about that sad event.

The introduction is very important for users and reviewers. The editors printed in bold "Please, read this chapter" and they are right. Without reading this no-one would know that the book contains "a review of all Cyanoprokaryotic taxonomic units, registered and recognisable from European natural biotopes, including marine coasts." And that "non-European species and species with vague taxonomic descriptions are listed under the appropriate genera." The book was written for identification and standardisation of morphologically and ecologically distinguishable European Cyanoprokaryotes, that have been described from natural populations. The keys and taxonomic descriptions in the book permit identification of natural populations and some culture material; however, they are less suitable for identification of non-European specimens. Moreover, according to the authors, "identification of strains without previous knowledge of natural material needs to be studied with special care, because only a few Cyanoprokaryotes keep their typical form in culture." The authors strongly dissuade the use of taxon names to include specimens or strains that deviate from features that are characteristic for "any higher taxon". And they warn: "If the incorrect name is accepted, all the information about any given population or strain is *a priori* wrong." And "Identification of any species is correct only if your material corresponds **fully** (in all characteristics, including ecology) with the description. The variability of species can be broader than described in the book, but you must be convinced of the taxonomic identity of your material."

The introduction concludes with the wish "Good luck in research on Cyanoprokaryota." Well, this good luck is really necessary. In the first place the taxonomic axioma of the authors is highly debatable. If one only can use names for material that corresponds **fully** with a description, then this opens the gates for descriptions of multitudes of new taxa which are in fact just aberrant specimens and not normal taxa with normal variability and defined according to the type-method. It is true, the authors dissuade to try to designate all species or to identify all samples. And they recommend the use of indications like 'cf.' or 'aff.' to indicate doubt. They also state that "populations developing under suboptimal conditions usually possess wide plasticity, forming numerous morphological deviations of no taxonomic significance." The users of the book are asked (by the authors) to avoid describing such morphological deviations as new taxonomic units. However, users of the book will normally search for names for their material, thus most of these recommendations will not have much impact. A serious difficulty for users of the book is that a key to the families is lacking. There is, indeed, a pictorial key in Table 4, but this often does not help enough. Moreover, the

family Gloeobacteraceae is not included in that key. In some cases one will have to check several of the other ten families to key out the correct name. The further contents of the book look marvellous and the formal identification of blue-green algae in Europe has certainly got an important push in the right direction. The authors rightly state: "The investigation of Cyanoprokaryotes is still far from satisfactory. The review compiled in this book is a manual for the identification of all known species and should be used as a basis for further research."

Please use this book to identify many samples. Maybe one may then subsequently forget several parts of the introduction.

W.F. PRUD'HOMME VAN REINE

R. HALL & J.D. HOLLOWAY (eds.): **Biogeography and geological evolution of SE Asia**. Backhuys Publishers, Oegstgeest, The Netherlands, 1998. vi + 422 pp., 167 fig., 26 tables, 12 colour plates. ISBN 90-7334897-8. Price: NLG 280, USD 156.

A two-day meeting of biologists, geologists, and palaeontologists at the Natural History Museum (London) in March 1996 resulted in this beautiful book. The meeting was more or less a sequel to an earlier meeting in 1994. In the 1994 meeting most presentations were given by geologists; during the 1996 meeting it were mainly the biologists who showed their results. The contents is roughly divided into two parts, the early, Palaeozoic and Mesozoic geology and biogeography, and the later, Cenozoic to recent geology and biogeography. The second part is by far the largest, which is not surprising, because most plant and animal distributions have been mainly influenced by the more recent geological and climatological changes.

The geological chapters show the latest reconstructions of the very complex geological history of the Malay Archipelago and SE Asia. The collision of several major tectonic plates (Eurasian, Indian, Indian Ocean, Australian, Pacific, and Philippine) with each other and the presence of many microplates have caused very intricate geological and biogeographical patterns. In their endeavour to unravel the geological past of the region, geologists tend to concentrate on the hard facts provided by, e.g., palaeo-magnetism, stratigraphy, palaeontology, and they have far less need for the historical biogeographic patterns based on phylogenetic analyses of present-day species. Quite a few biological chapters indeed prove that biologists have more to gain from the geological data than geologists from the biological data. The editors discuss that new historical biogeographical methods like paralogy free subtree pruning might improve the biological data. However, I am afraid that the latter method is not very suitable, because it makes many *a priori* assumptions and it mainly aims to find patterns, not to provide explanations of distributions (N.B. paralogy free is just a synonym for what used to be called redundant information in assumptions 1 and 2 of Nelson & Platnick). The editors also discuss another possible future development, the topic of modelling. Models should be built which simulate processes like dispersal, vicariance, etc. and which then may explain present-day distributions. Such models will be wonderful, but I guess that they will be extremely complex and probably never able to provide 100% correct simulated distributions, because detailed examination of distributions show that no two taxa have the same distribution (symbionts and parasites perhaps excepted). This lack of exactly similar distributions is not surprising, because all taxa are unique, they have their own niches, their own reactions to changes, and their own interactions with other taxa.

The topic of the book is complex, but most chapters are well written and easy to read. Unfortunately, a detailed discussion of all novel insights presented is beyond the scope of this review. Many more new facts are presented, the reconstructions show more detail than ever, and competing hypotheses are evolving towards each other. All chapters are well illustrated, though some of the illustrations are very complex. Especially the geological reconstructions show a wealth of detail, which takes more than a quick scan to fully comprehend them. Particularly the colour plates with geological information are impressive. For those of you who are unable to obtain the book, most plates can be seen on the Internet (www.gl.rhbnc.ac.uk/seasia/html/landseamaps.html).

P.C. VAN WELZEN

H.C.F. HOPKINS, C.R. HUXLEY, C.M. PANNELL, G.T. PRANCE & F. WHITE: **The Biological Monograph. The importance of field studies and functional syndromes for taxonomy and evolution of tropical plants. A festschrift for Frank White.** Royal Botanic Gardens, Kew, 1998. 236 pp. ISBN 1-90034-7180 (paperback). Price: USD 42.

"Without ecological understanding taxonomy is lifeless and dull, and taxonomically important information goes undetected." This quotation remarkably is the motto of a book published by the RBG Kew in 1998. It is a collection of papers dedicated to the late Dr Frank White, who is responsible for the statement above. The core chapters, 2 to 6, deal with: Pollination and dispersal in neotropical Lecythidaceae; Bat pollination and taxonomy in Parkia; Taxonomy, ecology and reproductive biology of Aglaia; The tuberous epiphytic Rubiaceae – the Hydnophitinae; and The vegetative structure of African Ebenaceae and the evolution of rheophytes and ring species, successively. This wealth of topics makes the book a bit of a hotchpotch, but all topics are presented orderly and scholarly by specialists in the plant taxa involved. The authors also convincingly demonstrate the essential role of ecological fieldwork in understanding the taxonomy of their study group (and vice versa). For each of the groups particular characters, like fruit or flower type, are discussed in relation to functional syndromes as well as in a systematic context. The remainder of the book consists of short chapters on topics as general as co-evolution or biodiversity conservation and discuss the light that is shed on them by the studies previously presented. It is an unusual way of structuring a book and it makes good reading in this way. However, some of the topics treated, like the chapters on Conservation of Biodiversity or Complementarity of taxonomic method could do with a more critical and broader perspective. In the present form a reader who chooses to start reading any of the later chapters first, might find them unsatisfying discussions of the topic mentioned in the title. They do, however, show once more that monographic studies that include extensive field work yield interesting results with regard to many different aspects of systematic biology. The book is illustrated with some beautiful photographs and a few nice colour paintings (by Rosemary Wise). These are unfortunately not integrated in the text like the black-and-white pictures, but found at the end after the index. The ISBN found on the back cover is wrong, the correct one is cited above.

ARJAN STROO

F. WEBERLING & W. TROLL: **Die Infloreszenzen. Typologie und Stellung im Aufbau des Vegetationskörpers. Band II. Teil 2.** G. Fischer, Jena, Germany, 1998. 483 pp., illus. ISBN 3-437-35436-1. Price: DEM 238.

The present book completes a set of four volumes by W. Troll and F. Weberling, treating the comparative morphology of inflorescences. A short guide runs as follows:

1. W. Troll: Die Infloreszenzen. Typologie und Stellung im Aufbau des Vegetationskörpers. Band I. G. Fischer, Jena, 1964.
2. W. Troll: Die Infloreszenzen. Typologie und Stellung im Aufbau des Vegetationskörpers. Band II, Teil 1. G. Fischer, Jena, 1969.
3. W. Troll & F. Weberling: Infloreszenz-Untersuchungen an monotelen Familien. G. Fischer, Stuttgart, 1989.
4. F. Weberling & W. Troll: as cited above.

In the English language the subject is presented in Weberling's textbook 'Morphology of flowers and inflorescences' (University Press, Cambridge, 1989), which includes a glossary.

The fourth book presents the analysis of five more monotelic families among which Rubiaceae and Campanulaceae, and also four polytelic families with the Leguminosae as the most interesting one. In each family the basic scheme is given first and then the morphology of special taxa is derived by impact of a number of similar variations. The main difference between monotelic and polytelic inflorescences is again dealt with (see p. 250). Most families are either wholly monotelic or wholly polytelic. However, in some polytelic families some taxa are monotelic, for instance the Caesalpinieae in the Leguminosae. In the same way some monotelic families show transitions to polytely, for instance the Ranunculaceae. Weberling holds monotely as fundamental.

The book is richly illustrated, provided with references, and ends with a large taxon index.

WILLEM A. VAN HEEL

L.P.A. OYEN & NGUYEN XUAN DUNG (eds.): **Essential-oil plants. PROSEA Volume 19.** Hardbound edition: Backhuys Publishers, Oegstgeest, The Netherlands, 1999. 277 pp., illus. ISBN 90-5782-010-2. Price: c. USD 85, NLG 150. [Paperback (from 2001): c. NLG 65.] Paperback edition (for developing countries): PROSEA, Bogor, 1999. ISBN 979-8316-00-2. Price: USD 12.

Plant Resources of South-East Asia (PROSEA) is a multivolume handbook that aims to summarise knowledge about useful plants from this geographic area for workers in education, research and industry. Previous titles include Pulses, Edible Fruits and Nuts, Timber Trees, Rattans, Bamboos, Medicinal and Poisonous Plants, Spices, etc. The present volume deals with essential oils and the plants they are derived from.

An essential oil is a mixture of fragrant, volatile compounds, named after and always derived from a single species or variety of plants. However, a single species may yield several essential oils, because it may consist of several genetically defined chemotypes. We owe the term 'essential' to Paracelsus (1493–1541) who expounded the theory of the 'quinta essentia', believing that this quintessence was the truly effective element in a medicinal preparation. This information is given in the comprehensive introduction of this beautifully produced book. A wide range of aspects of essential

oils are described in this introduction, including their history, uses, production, properties, chemistry, distribution in plants, ecology, agronomy, and breeding. Economic trends are discussed, such as the current revival of interest in 'natural' plant-based materials, which applies strongly to aroma therapy and to flavour and fragrance products, whereas in the food industry, natural products are enjoying a strong consumer preference. Of interest is also the development of new uses, e.g. controlling pests and diseases of crop plants by means of plant-derived essential oils, because many have activity against insects and micro-organisms.

In the main section of the book short monographs (2–6 pages per entry) are given on 39 major essential oil plants such as species of *Blumea*, *Cymbopogon* and *Lavandula*. These monographs have been written by an international team of some thirty different scientists, including botanists, agronomists, chemists and representatives of the perfume industry, many of whom are from South-East Asia. Despite the multitude of authors, the entries give a very homogeneous impression as if they had been written by just one person, and this is a credit to the editors. Each monograph is accompanied by an attractive illustration showing morphological details of the plant from which the essential oil is derived. The literature references are very up-to-date and more than half of them are less than 10 years old, which is unusual in this type of book. I was especially interested reading the entries of essential oil plants I have investigated myself. In all cases the descriptions appeared to be accurate and thorough, which gives me confidence that the entries on the species less familiar to me are of the same high standard.

In addition to the descriptions of the major essential oil plants, another 31 minor essential oil species are briefly described (on average less than half a page). This is followed by a long list of species which has as a heading "Essential oil plants with other primary use". However, this title is misleading as many of the plants in this list are grown primarily for their essential oils. For instance, the primary use of a number of *Mentha* species, including *M.* × *piperita* was said to be 'medicinal and poisonous plants', whereas in reality they are principally essential oil plants (the estimated worldwide production of *Mentha* oils is 12,000 tons per year) whereas their second most important use is as culinary herbs. Furthermore, *Mentha* species are medicinal, but not poisonous. *Ocimum basilicum* was listed as a 'spice', whereas again this is primarily an essential oil plant, which also has an important function as a culinary herb and an insecticidal plant. Obviously, the heading of this list should have been "Essential oil plants which were included in previous PROSEA books", for that is what this list seems to be. The fact that many essential oil plants had already been described in previous volumes of PROSEA, was explained in the introduction, but this would not have been obvious to people just browsing through the book, and may lead to wrong conclusions and quotations.

Apart from this minor criticism, I have nothing but praise for this volume and can recommend it thoroughly to all botanists and other scientists interested in the economic uses of plants. No knowledge of chemistry is needed to appreciate the book; there are only eight pages showing chemical structures, and these can be skipped easily. However, the volume also gives plenty of information to those who aim to learn something about the chemistry of essential oils. Finally, an especially praiseworthy feature is the low-priced edition available in developing countries.

RENÉE GRAYER-BARKMEIJER