REVIEWS

W.F. NEWMAN, P.F. BURGESS & T.C. WHITMORE: **Manuals of Dipterocarps for Foresters: Singapore.** Royal Botanic Garden Edinburgh. Manual and Disk. ISBN 1-87229-31-7. Price: £ 10.

This project of the Royal Botanic Garden Edinburgh aims to provide regional manuals and on-line identification computer programs to the timber species of Dipterocarpaceae. The Singapore manual is a first trial, later editions should include other islands in the Malay Archipelago. The possibility is also offered to have tailor-made manuals for specific regions against cost price.

Many data have been gathered, especially vegetative characters one can readily observe while standing underneath these enormous trees. In this respect the database will be very useful, because due to the very irregular flowering of the Dipterocarpaceae, flowers and fruits are usually unavailable, and even if they are present, they are found high in the tree.

The Singapore manual comprises 22 timber producing species of Dipterocarps. The booklet introduces the project and shortly explains the characters used in key and descriptions, mainly field characters like fallen leaves, dead twigs, slash, and physiognomy of the trees. A dichotomous key to the species follows, together with short descriptions of the family, genera, timber groups, and species. Each description concentrates on field characters; a line drawing and notes provide extra information regarding habit, distribution, local names, ecology, silviculture, etc.

The booklet is kept simple, informative, and comprehensive. A few things could be improved. I would favour a complete coverage of the Dipterocarpaceae, not only the timber trees. Now one has to be certain of the timber qualities before identification may start. The dichotomous key is well constructed and uses many characters. However, the most important character is the type of bark. Unfortunately, Dipterocarpaceae change to their mature bark once they have a diameter of about 30 cm and it is unlikely that they will ever be able to show this bark, because, according to the chapter on silviculture, trees in logged forests are harvested every 30 years. Finally, mentioning relative size without exact sizes is not meaningful to those unfamiliar with the plants.

The disk contains the Pankhurst identification program ONLIN7 and the Singapore Dipterocarpaceae data in DELTA format. After the installation the data expand to 3.5 Mbyte. All tricks for identifying are present and well executed. One can retrace mistakes, compare taxa with each other or a specimen with taxa, ask for the best characters to identify with, change characters, etc. However, the user friendliness still has to undergo major improvements. The program(mer) concentrates on a fast execution of tasks, but everything is mainly command orientated. If one is unfamiliar with the commands, then a menu is available. However, the menu window is very small and the choice of commands is not always obvious, while the possibility to scroll directly from the first to the last item is absent. Also, if the menu is used, one often has to make detours to access the general help functions or to see a description/picture after a successful identification. A major change to a Window-like layout with pulldown menus will greatly improve a layman's use of the program. On the other hand, after getting used to the program it is relatively handy and fast to operate. The descriptions

are scanned from the booklet, but the quality of the letters and the plates could be improved. In the booklet genus characters are removed from the species descriptions, they are presented separately. However, on disk no genus descriptions are present and the important genus characters have not been entered in the species descriptions.

Hopefully, this project will be successful and may be able to cover other plant families as well. The information presented is very useful, concise, and easy to use. The utilisation of computers (with or without manuals) will be the most important application of plant taxonomic research in future.

P.C. VAN WELZEN

P.K. ENDRESS & E.M. FRIIS (Eds.). **Early evolution of flowers. Plant Systematics and Evolution / Supplement 8**. Springer-Verlag, Wien/New York, 1994. VI + 229 pp., 130 figs. ISBN 3-211-82599-1.Clothbound. Price: DM 220 (DM 198 for subscribers to Pl. Syst. Evol.).

Recent discoveries of excellently preserved Cretaceous flowers, the application of SEM and cladistic techniques, and the introduction of molecular DNA and RNA studies have been major impetuses to integrating data of fossil and extant angiosperms and understanding their early phylogeny. As a result of these developments the classification of the main angiosperm groups is under extensive revision. 'Early evolution of flowers' contains the proceedings of two symposia held during the XV International Botanical Congress in 1993 (Yokohama, Japan), and includes many new advances.

Doyle reviews the origin of angiosperm flowers in a cladistic perspective. Three contributions deal with Cretaceous flower finds (Friis et al., Crane et al., Crepet & Nixon). Generally, the opinion is reflected that the earliest angiosperms were herbaceous plants with small flowers ('paleoherbs'), related to the Magnoliidae and monocots. Drinnan et al. treat floral evolution in non-magnoliid dicots (eudicots), based on cladistic analyses of morphological and molecular data, and combining these with the fossil evidence. The results reinforce the view that the Ranunculidae and lower Hamamelidae are in some sense transitional between the Magnoliidae and the higher eudicots, which is also supported by the long fossil history of several families in the eudicot alliance. Nishida describes a new Late Cretaceous angiosperm fruit with ten carpels and axile placentation, resembling the fruit of some modern Dilleniidae. The second part of the book consists of ontogenetic studies of flower structures in extant plant groups: *Schisandra* (Tucker & Bourland), *Barclaya* (Williamson & Schneider), *Ceratophyllum* (Endress), Ranunculaceae (Kosuge), Magnoliidae and Alismatidae (Erbar & Leins), Magnoliidae, Dilleniidae and Caryophyllidae (Leins & Erbar). Especially interesting is the contribution of Erbar & Leins, who, on the basis of perfect SEMs, compare Magnoliidae having both trimerous perianth and spiral androecium with Aristolochiaceae and Alismatales.

It seems needless to say that this amply and attractively illustrated book is an indispensable state of the art document for all studying or interested in early angiosperm evolution.

R.W.J.M. VAN DER HAM & W.A. VAN HEEL

A. ROGERS: **Peonies**. Timber Press, Portland, Oregon, 1995. 296 pp., 143 colour plates. ISBN 0-88192-317-6. Price: US$ 34.95.

This new book on peonies is beautiful enough to fall in love with these plants straight away. Like many other books on genera of plants of horticultural interest, this one is written by a lifelong lover of the genus. This is apparent from the good looks of the book and the enormous amount of information it contains: about the use of the plants through history, about their cultivation, propagation, about their place in the garden, and even about how to grow them commercially. The book contains a chapter on Landscaping with peonies by Linda Engstrom, and several very useful lists: of peonies in cultivation, listing some species and many cultivars; of nursery sources, and a fairly comprehensive list of literature on the genus *Paeonia*. It also has an index of cultivars, but unfortunately lacks a general index in which all wild species and subjects treated throughout the book can be found. On the other hand, the 143 colour photographs of peonies in bloom are arranged alphabetically on species or cultivar name, which makes it very easy to find the plant you are looking for, provided it is depicted in the book. Furthermore, there are black-and-white sketches throughout the book, illustrating practical points of cultivation etc.

However, it is a book with a definite focus on North America. This is apparent in the history of cultivation, the list of nursery sources, and also in the lists of cultivars: many cultivars currently available in Europe are not listed in the book (Hart, 1995; Huxley, 1992), and all the accents in the French cultivar names have been omitted! As to the U.S. Department of Agriculture hardiness zones, prospective peony growers in other parts of the world should check climatic conditions in their area. For Europe, this information is available in Huxley (1992). There are some slight discrepancies between the information on peonies as given by Huxley and by Rogers – the main thing being that peonies, although they are generally trouble-free plants, seem to be attacked by different sets of pests in Europe and America.

Reading this book has made me almost forget that peonies only bloom about two months a year, and that the rest of the season one has to make do with the shape and colour of their leaves.

G.A. VAN UFFELEN

S. Hart. 1995. Plantenvinder voor de Lage Landen. Terra, Warnsveld. ISBN 90-6255-623-X.
A. Huxley (ed.). 1992. The New Royal Horticultural Society Dictionary of Gardening. Macmillan Press, London and Basingstoke. ISBN 1-56159-001-0 (4 volumes).

E. SOEPADMO & K.M. WONG (eds.): **Tree Flora of Sabah and Sarawak, Volume 1.** Published by Forest Research Institute Malaysia (FRIM), with Sabah Forestry Department and Sarawak Forestry Department. Ampung Press Sdn, Bhd, Kuala Lumpur. 1995. VII–LI + 513 pp., illus. ISBN 983-9592-34-3. Hardcover. Price unknown.

After the completion of the Tree Flora of Malaya, the Forest Research Institute of Malaysia (FRIM), together with the regional forest institutes of Sarawak and Sabah, started in 1991 (officially November 1991) the writing up of a similar though more extended Flora series for the states of Sarawak and Sabah, to be produced in eight

volumes within ten years. Lately, October 1995, the first volume appeared, containing the treatment of 31 families. Understandably, these include a large portion of the smaller ones, and mostly families which had been treated previously – besides in the Tree Flora of Malaya also in Flora Malesiana. Notable contributions of families not yet in FM are Alangiaceae, Illiciaceae, and (the larger) Rhamnaceae and Rutaceae. The Sabah and Sarawak Flora treatments are more extended as compared to those of the Tree Flora of Malaya, and emphasize the Bornean aspects. The administration team of the Tree Flora of Sabah and Sarawak project, headed by E. Soepadmo and K.M. Wong, managed to finance the operation of a group of qualified contributors within the country, and in addition could attract man-power abroad, so as to warrant steady progress in publication. The created facilities prove the evident importance the Malaysian Government, and modern society as a whole, attaches to opening up the insights in the very rich and complicated forest resources of northern Borneo.

This Tree Flora project has good prospects, and no institute nor student should refrain to subscribe. The present book describes taxa of the incredibly varied tree flora of an essential part of Central Malesia and the reader can get information over a wide range of topics. Good prospects for quality indeed, not in the least because of previous, recent and still on-going intensive collecting endeavours effected by the respective forest departments. This should be mentioned emphatically because good representative study material is a pre-requisite for durable Flora treatments. The large amount of fine specimens available, also distributed to larger herbaria abroad, have facilitated and accelerated better and refined species concepts, leading to a steady discovering of new species, which appear to be mostly restricted to the area.

The present volume is executed in a user-friendly spacious format with pleasant type-setting. A full treatment is given for all species that can reach some 5 m height (or 10 cm trunk diameter), whereas lesser and lianescent genera and species are described more briefly within the keys. The setup and scope are considerably wider than in the Tree Flora of Malaya, where trees lower than 25 m generally had been excluded. The revisions are produced with accuracy, each genus represented by a fine, original line-drawing, including details of flowers. The treatments further include identification with (hopefully) 'user-friendly' keys, give the accepted names, type-specimens, relevant synonyms, references, descriptions of the taxa (with diagnostic characters printed in italics), vernacular names, distribution, ecology, uses, notes on taxonomy, and keys and descriptions of infraspecific taxa. This assemblage provides up-to-date, complete, and adequate information, to be expected as the result of the preceding intensive botanical surveying as alluded to above. It meets the public need for an advanced yet concise synthesis of the modern specialists' floristic knowledge of the area.

The introductory part contains treatises on the history and background of this Tree Flora project (by Soepadmo), the history of the botanical collecting and documentation in Borneo (by Wong), and a composition describing the biogeography, forest formations, and ecology of the Flora area, also including a first attempt to subdivide this area on historical-biogeographical grounds (by Ashton); all with bibliographies. A glossary of botanical terms, and indices to scientific and vernacular names are given at the end.

W.J.J.O. DE WILDE

I. SOERIANEGARA & R.H.M.J. LEMMENS (eds.): **Plant Resources of South-East Asia No 5 (1). Timber trees: Major commercial timbers.** Pudoc Scientific Publishers, Wageningen, 1993. 610 pp. ISBN 90-220-1033-3. Price hardbound edition: US$ 260; cheap paperback edition only available through the PROSEA offices in the participating countries.

I. Soerianegara, R.H.M.J. Lemmens & W.C. Wong (eds.): **Plant Resources of South-East Asia No 5 (2). Timber trees: Minor commercial timbers.** Backhuys Publishers, Leiden, 1995. 655 pp. ISBN 90-73348-44-7. Price hardbound edition: NLG 225, US$ 150; for paperback edition see above.

The PROSEA project is well underway. The first volume of the handbook, on the pulses, was published in 1989, and now almost 23 centimetres of the bookshelf are filled with the ten blue books that have emerged so far.

The timber trees are of course one of the most spectacular plant resources of the region and they will be covered in three parts of which the third one, now in preparation, will contain the 'lesser known timbers'.

Volume 5 (1) covers in an alphabetic treatment 47 genera, most of them with several to many species. Included are the important dipterocarp genera as *Hopea* and *Shorea*, sapotaceous genera like *Palaquium*, ceasalpiniaceous genera like *Intsia* and *Koompassia*, and the conifers *Agathis, Araucaria,* and *Pinus*. The treatments of the genera follow a general pattern, giving summaries on trade groups and vernacular names, botanical information (description, ecology, wood anatomy), timber information (properties, production, trade), and silvicultural information (propagation, planting, diseases, harvesting, etc.). The text on the genus is followed by shorter paragraphs on the important species belonging to it. Altogether some 550 species are treated. The wood of each genus is illustrated by 3 microphotographs (transverse, radial, tangential section), and there are also botanical drawings for many of the species, usually quite simple but adequate for recognition. An introduction of c. 50 pages contains much useful general information on the subjects covered under the genera and species. A table of some 25 pages summarizes the technical information, as far as known, on the wood properties of the genera and species treated in the volume. A literature list of more than 800 items, a glossary, and indices to scientific and vernacular names complete the book. There is, I would say, little worth knowing about these timber trees which is not covered in this volume.

Volume 5 (2) is arranged along the same lines but the information available and given is less extensive. The number of genera treated is 62, that of the species lies between 750 and 800.

The list of contributors to the books is impressive: it is a big achievement in itself that more than 60 people from more than 10 countries were prepared to contribute in some way to 5 (1) and/or 5 (2). One can imagine the difficulties facing the editors who must have been confronted with widely diverging texts and the task to mould these into a recognizable pattern. Compliments to editors and authors are well earned.

The PROSEA project was initiated to replace the historical books by K. Heyne, I.H. Burkill, and W.H. Brown. It is astonishing how much more information there is now available on whichever useful plant or plant product one can think of. With the PROSEA books the categories in the target group (workers in education, research,

extension, and industry) are served better than in most other regions of the world. The books are very well organized and of an easy approach. The present commod-ity group (timber trees) is the largest one, and in comparison with the two other large commoditiy groups (medicinal plants and ornamentals) that have still to be written, it is in and for the region much more important commercially. We must hope that financial restraints will not cause too much delay in the completion of the still lacking groups, in the first place the third part on 'lesser known' and economically less important timber trees.

C. KALKMAN

M. FLACH & F. RUMAWAS (eds.): **Plant Resources of South-East Asia No. 9. Plants yielding non-seed carbohydrates.** Backhuys Publishers, Leiden, 1996. 237 pp. ISBN 90-73348-51-X. Price: NLG 125 or approx. US$ 75 (Paperback edition available at the same address for NLG 45 as from 1998). For developing countries a low-price edition (ISBN 979-8316-30-4: approx. US$ 10) is available from Prosea Network Office, P.O. Box 234, Bogor 16122, Indonesia.

The PROSEA series of publications aims to make available the existing wealth of information on the plant resources of South-East Asia for education, extension work, research, and industry.

The present account gives an overview of the plants yielding non-seed carbohydrates as their main product. Pulses and cereals that store starch in their seed are dealt with in Volumes 1 and 10, respectively. The species belonging to this commodity group include annuals and perennials, monocotyledons as well as dicotyledons. The underground storage organs mostly vary from roots to tubers and stolons. The above ground storage organs are mostly stems, more rarely trunks, and fruits. The introductory chapter covers a wide range of subjects (elaborating on some widespread misconceptions), including nutritional and quality aspects, average and potential yield levels, taxonomy, growth and development, ecology, cropping systems, propagation and husbandry, harvesting and post-harvest handling, processing and utilization, genetic resources and breeding, and, finally, future prospects.

The major crops comprise 54 species and are dealt with comprehensively in 33 papers. The species include important export crops such as sugar cane (*Saccharum officinarum*), cassava (*Manihot esculenta*) and sweet potato (*Ipomoea batatas*), as well as species of local importance as a staple food such as yam (*Dioscorea* species) and sago palm (*Metroxylon sagu*). The information in the papers varies depending on what is known (of each species), but it attempts to cover all the subjects of the introductory chapter, with full reference to the literature and a(n attractive) line drawing.

In addition, about 50 species that are minor producers of non-seed carbohydrates are briefly described, and another 107 species with a different primary use are simply listed. The main literature section, an (elaborate) glossary, sources of illustrations, indices to scientific and vernacular names and some general information on PROSEA take up the last 50 pages.

Except for sugar cane, the crops yielding non-seed carbohydrates still form a largely neglected group. However, these crops are of great importance to millions of subsistence farmers in the region. They provide both food and household security. Hopefully this comprehensive state-of-the-art overview will stimulate renewed attention and support for these crops.

JOHAN L.C.H. VAN VALKENBURG