

## REVIEWS

D.J.N. HIND, C. JEFFREY & G.V. POPE (eds.): **Advances in Compositae Systematics**. Royal Botanic Gardens, Kew, 1995. 496 pp., illus. ISBN 0-947643-737. Price: UK£ 24.

The International Conference 'Compositae: Systematics, Biology, Utilization' held in 1994 inspired the authors, on the suggestion of Dr. K. Ferguson, to publish a book accommodating more general systematic papers on Asteraceae, resulting in the present work. It contains seventeen chapters [in English, French (1), and Spanish (1)], including the Introduction by C. Jeffrey, and is provided with a taxonomic index. Following the Introduction, Jeffrey gives a review of the developments in Asteraceae systematics during the last 20 years, since the conference of 1975. I agree with him that improvements are possible in the use of cladistic analysis in taxonomy, but it seems to me that his review is a bit too negative in this respect.

Advances in Compositae Systematics presents studies at many different taxonomical levels, from macromorphology to molecular systematics and chemistry. The sequence of the chapters seems rather arbitrary; however, starting with a paper dealing with the origin of the Asteraceae seems very logical. In this chapter DeVore & Stuessy argue that the Asteraceae originated in late Eocene on the South America–Antarctica–Australia supercontinent. The Calyceraceae and Goodeniaceae would be families most closely related to the Asteraceae. DeVore & Stuessy used information on (pollen) morphology, present distribution, fossil records, and geology to reach their conclusions.

In the next chapters Holmes (*Mikania*), and Soria & Zardini (the tribe Astereae in Paraguay) present a precursor of a revision. Revisions based on general morphology are presented by Mouradian Isawumi (*Vernonia* in West Africa), Ling Yeou-Ruenn (*Artemisia* and *Seriphidium* of the New World), Ouyahya (*Artemisia* of Morocco), and Mesfin Tadesse & Reilly (*Helichrysum* of Northeast Tropical Africa). The morphology, anatomy and ontogeny of (the hairs of) achenes yielded useful characters to the taxonomy of *Filifolium* and related genera (Mouradian), and the Nassauviinae (Freire & Katinas). The recognition of three genera distinct from *Centaurea* is supported by both morphological and chemical data (Gabrielian). The chemistry of *Arnica* (Willuhn et al.), however, is of such complexity and diversity that no final conclusions on the taxonomy of the group are made. Three contributions deal with the genetic material of taxa within the Asteraceae. The question of the chromosomal base numbers in the Astereae and the genus *Aster* ( $x = 9$  versus  $x = 5$ ) is reviewed by Semple. Chromosome number, allozyme variation and karyotypes indicate probably Pleistocene evolution of northern and other Eurasiatic species of *Erigeron* by means of geographical speciation and hybridization (Huber & Nilsson). The preliminary study of *Senecio squalidus* cpDNA revealed three haplotypes, one ancestral, and two of probably hybrid origin (Abbott et al.).

Summarizing, the volume presents a rather random overview of recent advances in Asteraceae Systematics. By the way, is it coincidence that a cladistic analysis is not included? The contributing papers are very heterogeneous, and are in my opinion not all of high quality. Nevertheless, this work should be present in the libraries of at least all institutions working on Asteraceae.

HELENA DUISTERMAAT

**R. KELLER: Identification of tropical woody plants in the absence of flowers and fruits. A field guide.** Birkhäuser Verlag, 1966. 248 pp., illus. ISBN 3-7643-5184-5 (Basel), 0-8176-5184-5 (Boston). Available from Birkhäuser Verlag, P.O. Box 133, CH-4010 Basel, Switzerland. Paperback. Price: DM 88.

Botanists, ethnobotanists, ecologists and other groups working on tropical floras often find great difficulty in naming many of their plants. Most identification tools require complete fertile material, i.e., with flowers and fruits, to arrive at a reliable identification. Well-known identification tools to family are Thonner's Key (Geesink et al., 1981) and Hansen & Rahn's (1969) punched card system. (Neither of these works are cited by Keller.) However, flowering in tropical plants is notoriously irregular and if flowers are present, they are often out of reach in the upper canopy of the rain forest.

The book here under review claims to enable identification of the majority of tropical woody plants to family, and often to genus level, without much botanical background.

In the past 35 years I have been heavily involved in naming plant collections from Malesia and surrounding areas, and have often been driven to desperation by the poor quality of many specimens. By using a large number of spot-characters (Van Balgooy, 1997) and often simply by memory, most of these specimens can be named, but many have to be filed as 'indet.'. Keller's guide would thus seem to be an ideal identification tool to deal with these specimens. However, a brief test did not provide satisfactory results; although in all fairness this *field guide* is not meant to be used in the herbarium. Hopefully colleagues in Malesia will test it locally and, no doubt, with much more success.

It must be said that this identification tool requires a very thorough knowledge of morphology, anatomy, tree architecture and botanical terminology. In other words, this is not an 'easy' book. The many illustrations (all prepared by the author himself) are a great help in this respect.

The format of the book is very reminiscent of Endert's Key to the trees of Malesia (Endert, 1953), a work understandably not cited since it is written in Dutch. The book consists of two main parts: glossary and key, and characterization of the main families. After the introduction, which explains how to use the book, it starts with a general key leading to various special keys. These lead to genera and more often to families in which case some common genera are often mentioned as examples, and the continent(s) where they occur are indicated. Personally I would have preferred bracketed keys to indented ones.

I admire the great knowledge of tropical woody plants the author has gained in a short time but regret that I cannot refrain from making some critical comments.

In the general key, lead 5 reads: "no latex, resin or coloured exudate", leading to special keys C through G in which most of the Dipterocarp genera as well as Caricaceae and Hamamelidaceae are accommodated. Likewise lead 13 reads: "no latex, resin or coloured exudate", leading amongst others to special key O with the well-known resin producing genus *Agathis*. In the same key *Pimenta* (Myrtaceae) can only be reached by accepting that it has no pellucid dots, which it clearly has. In key U the simple leaved *Gluta* (Anacardiaceae) can only be reached by assuming it has compound leaves, and *Harpullia* (Sapindaceae) by accepting that it has white latex. *Quas-*

*sia* (Simaroubaceae) is said to have pellucid dots (p. 86) which it does not, and *Bhesa* (Celastraceae) is said to have palmate venation (p. 124), which again is not the case. These are just a few of the errors that need to be amended in a new edition.

M.M.J. VAN BALGOOY

- M.M.J. van Balgooy. 1997 (in press). Malesian Seed Plants. Volume 1. Spot-characters. Rijksherbarium / Hortus Botanicus, Leiden.  
 F.H. Endert. 1953. Geslachtstabellen voor Nederlands-Indische boomsoorten naar vegetatieve kenmerken (revised ed. by F.H. Hildebrand).  
 R. Geesink, A.J.M. Leeuwenberg, C.E. Ridsdale & J.F. Veldkamp. 1981. Thonner's analytical key to the families of flowering plants. Leiden Bot. Series No. 5.  
 B. Hansen & K. Rahn. 1969. Determination of Angiosperm families by means of a punched-card system. Dansk Bot. Arkiv 26.

R.CH. KRUIJT: **A taxonomic monograph of *Sapium* Jacq., *Anomostachys* (Baill.) Hurus., *Duvigneaudia* J. Léonard and *Sclerocroton* Hochst. (Euphorbiaceae tribe Hippomaneae).** Bibliotheca Botanica 146, 1996. 109 pp., 35 fig., 8 tables. E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart. ISSN 0067-7892, ISBN 3-510-48017-1. Price: DM 128.

The thesis of Rob Kruijt, dating from 1989, has finally been prepared for publication by Rob Gradstein. The resulting book comprises a revision and a cladistic analysis of the formerly large genus *Sapium*. The taxonomic part is of a very high quality and will be an asset to any library. However, the cladistic section is mediocre. The generic concepts applied mean a radical change to the formerly used and certainly artificial taxa. Also on the species level the work was carefully and thoroughly executed. The distinction of the genera was reached after several philosophical reflections concerning the species concept, the choice of the cladistic method to be used (Chapter 2) and the cladistic analysis of the species (Chapter 3). The discussion in Chapter 2 is already outdated and in parts quite incorrect. The author ends this chapter with the statement that formalized methods may help to produce stable classifications.

Unfortunately, the method followed in the cladistic analysis is neither formalized nor are all choices made obvious and the results are certainly not repeatable.

— A binary data matrix of character states is produced. This will at least add one step per character in the parsimony results.

— The choice of the outgroup is not really obvious, (*H*)*Omalanthus* is usually classified in the same tribe and it is not clear if it will be the sistergroup to all others.

— The monophyly of the ingroup has never been questioned.

— The subdivision into character states is not discussed and is in some cases questionable.

— The number of character states used is very small (47) compared to the number of taxa (also 47). It is therefore surprising that only three cladograms were found. A re-analysis with Hennig86 (Farris) resulted in 1232 cladograms (options mhennig\* and bb\*, 160 steps, ci .28, ri .73). Iterative character weighting reduced this to 612 trees. The strict consensus tree, which is well resolved except for *Sapium* s.s., does not support all taxa delimited by Kruijt. *Shirakia* is not the sistergroup of *Sclerocroton* but paraphyletic to *Sclerocroton*; while *Sebastiania* and *Excoecaria* are split up and distributed over several places in the cladogram. Only *Sapium*, *Triadica*, *Duvigneaudia*, *Anomostachys*, and *Sclerocroton* are monophyletic.

— The apomorphies presented for the various taxa are often not unique, because of the high amount of homoplasy in the character states. The homoplasy is either not or hardly at all discussed.

All revisions contain a short introduction to characters, a user-friendly key with a division in vegetative and generative parts except in the key to the genera (Chapter 4) and to the species of *Shirakia*, while a synoptic key is also included in *Sapium*. All taxa are fully and excellently described with a full nomenclatural treatment and often accompanied by well produced drawings.

The monotypic genus *Anomostachys*, endemic to Madagascar, is resurrected (Chapter 5). This chapter contributes a wealth of new data to this formerly poorly and insufficiently known taxon, including the first available illustrations.

The revision of *Duvigneaudia* (Chapter 6; together with Roebers), is detailed and consistent. It includes one new combination, *D. leonardii-crispi*. Unfortunately, in addition to the two African taxa treated, several Asian and Neotropical ones will have to be included. This will reduce the genus to a synonym of *Sarothrostachys* Klotzsch. The chapter is definitely not a monograph of *Duvigneaudia* but only a revision of its African taxa.

The monograph of *Sclerocroton* (Chapter 7; also together with Roebers) is a complete revision of a well characterized, monophyletic taxon, formerly known as *Sapium* section *Sclerocroton* or section *Armata*. Kruijt & Roebers propose two new synonyms and accept six species of which new combinations are provided for five.

Chapter 8, the revision of *Sapium* sensu stricto, is the central taxonomic part of this book, with a large number of new synonyms and lecto- or neotypes. This excellent chapter discusses several difficult nomenclatural and systematic problems, supported by field studies and will certainly remain valid for a considerable time. Although several keys to the species of this difficult genus are provided, they are not easy to use. They contain errors (*Sapium jenmanii* has very indistinct to nearly absent petiolar glands), inaccuracies (species are separated by few vs. numerous leaf veins, though numbers of veins are not provided in the descriptions), and problematic characters (we could not confirm the distinctions in stipule number used by the author). Kruijt used a broad species concept; he united 57 names under *Sapium glandulosum*, and he has good arguments for it. Unfortunately, 24 species were left as doubtful because the (sometimes available) types were not studied. At the end of this chapter there is a long list of excluded species including several new combinations, but still incomprehensive [e.g., *Sapium luzonicum* (Vidal) Merr. and most taxa described from China are not mentioned here].

Chapter 9 comprises a preliminary revision of the genus *Shirakia* which is not mentioned in the title of the book. It is a quite uncritical synopsis of a genus that corresponds mostly with the former section *Parasapium* of *Sapium*. It contains a useful key but also several errors in the characters (the leaf glands mostly are marginal, not laminar, and the fruits often dehiscent, not indehiscent). The quite different species included do not form a monophyletic group and it is therefore unfortunate that several new combinations are provided that are not sufficiently well corroborated.

The book concludes with detailed taxonomic and specimen indices, pleasing features which facilitate the practical use of the generally excellent taxonomic treatment of this monograph.

P. C. VAN WELZEN & H.-J. ESSER

**Flora of Australia. Volume 28. Gentianales.** CSIRO, Melbourne, Australia, 1996. xxi + 335 pp., illus. Paperback. ISBN 0-643-05885-0. Price: Aus \$ 69.95. Hardback. ISBN 0-643-05884-2. Price: Aus \$ 79.95.

This volume of the Flora of Australia contains the families of the Gentianales as defined by Cronquist, that is Loganiaceae, Gentianaceae, Apocynaceae and Asclepiadaceae. The format has already been established and reviewed but it deserves to be mentioned that this volume too is attractively produced with clear text and fine drawings, photographs and maps.

In an introduction to the families treated it is acknowledged that the delimitation of some of these families is rather fluid. Recently the Loganiaceae, in particular, has been radically reappraised and the status of Asclepiadaceae as a family separate from Apocynaceae depends on whether one accepts paraphyletic taxa or not. The authors have wisely adopted a fairly conservative approach to their family delimitation. This results in Loganiaceae (which does not include *Buddleja*) with 9 genera and 100 species, Gentianaceae with 8 genera and 31 species, Apocynaceae with 22 genera and 87 species and Asclepiadaceae with 23 genera and 98 species.

A few criticisms can be made. Firstly some of the keys make use of fruiting and flowering characters in different couplets of the same key making it impossible to identify material which does not have both flowers and fruits. Within the Apocynaceae some questions remain as to taxon delimitation, particularly whether *Ochrosia* and *Neisosperma* should be maintained separately and whether the two species of *Tabernaemontana* recognised are distinct. Some changes will occur when monographs appear for genera which have been treated here. *Alstonia* is currently being revised and changes will be made. Other genera are in need of revision and the authors have often noted this and accept that their account must be dependent on further critical study. This is particularly true in the Asclepiadaceae where genera such as *Cynanchum* and *Secamone* are greatly in need of critical examination.

Despite these points it cannot be denied that this work is not only a valuable contribution for those working on the Australian flora but also for specialists in the various families treated.

DAVID MIDDLETON

**E.P. KLUCKING: Leaf venation patterns. Volume 7. The classification of leaf venation patterns.** J. Cramer, Berlin, Stuttgart, 1995. 96 pp., 120 plates. ISBN 3-443-50018-8. Hardcover. Price: DM 270.

One of the main criticisms on the earlier volumes of this series has been the lack of a recognisable system in the discussed venation patterns. This final volume aims at answering this criticism. Here Klucking defines the various patterns and discusses the relationship between them. Unfortunately he has changed his ideas about the patterns from an ontological outlook in earlier volumes to a 'phylogenetic' view in this final volume. As a consequence some of the patterns are not the same as those discussed in earlier volumes. Only a few earlier systems of venation patterns are briefly discussed, i.e., those of Von Ettingshausen & Pokorny (1876) and that of Melville (1970). The often used system of Dilcher [P.L. Dilcher, Approaches to the identification of angiosperm leaf remains, Bot. Rev. 40 (1974) 1-157] is left out of the discussion. Klucking's system is essentially an enlargement of that of Melville.

The central group of venation patterns in Klucking's book is called the 'Intermediate System'. This 'system' clearly overlaps a number of the other groups and some of the examples could easily be placed in one of those. The 'Arcuate System' also shows a great overlap in other systems, especially the 'Pinnate System'.

Although the author says that much has been done to address other criticisms on earlier volumes, typing errors still abound and also the simple lay-out does not make this volume a very attractive book. Most of the plates show cleared leaves that illustrate the system of the venation patterns very well.

FRITS ADEMA

**N.G. WALSH & T.J. ENTWISLE (eds.): Flora of Victoria. Volume 2. Ferns and allied plants, conifers and monocotyledons.** Inkata Press, Melbourne, Sydney, 1994. ix + 946 pp., illus. ISBN 0-409-30849-8. Price: Au\$ 195.

After the appearance of volume 1 with general chapters, this is the first taxonomic one of a planned 4-volume series. Volumes 3 and 4 will deal with the dicotyledons. This volume is beautifully executed and a worthy successor of Willis's Handbook (1970–1973). With the enormous increase in knowledge particularly due to that standard work, and to the enlargement of information produced by similar projects in Australia, last but not least the successful Flora of Australia project, the Handbook has become outdated. The present series compiles new and old information and makes it more easily accessible. The sequence of families of flowering plants is more or less that as proposed by Cronquist (1981), while that of the ferns and allies is that of the Flora of Australia. Difficulties are of course found in the alternative classifications as for the Liliaceae s.l., and a more or less intermediary course has been adopted. Genera and species have been arranged to superficial resemblance, which may or may not reflect their natural relationships, but provides a practical method of identification.

Names are given in full, i.e., with author and publication, but the synonymy has been reduced largely to that which has appeared in Victorian literature. The descriptions of the species and lower taxa are based on actual living or dead Victorian material and not copied from existing literature, so conflicts may appear to occur when the variability outside the state is greater. This, of course, makes the treatment the more valuable as errors through thoughtless copying, as are so often found in regional floras, are avoided. Casuals are briefly mentioned in notes and fortunately have been included in the keys. Vernacular names (i.e., English ones) are given when they already existed, and some native Koorie names have been included as well. All taxa are provided with state distribution maps, and at least one taxon of each genus has been depicted (but some, like *Agropogon*, *Leersia*, *Nasella*, *Piptatherum*, are not). Most of the figures are in black-and-white, but some are in colour; it is a bit strange, though, to find a *Calectasia* (Xanthorrhoeaceae, p. 734) and a *Ciliglottis* (Orchidaceae, p. 748) bound with a treatment of *Bromus* (p. 502). These places are not indicated under the species, but in the index. It might have been more logical to have them all together either in the centre, or at the end of the volume. All are exquisitely executed, and all are based on recently collected material.

A partly illustrated glossary, some literature references, and an index are found at the end of the book.

The flora of Victoria is rich and varied and this is shown here well. I have no first-hand experience with it, but the contents make one's mouth water. Being specialized in the grasses, I immediately took a look at their representatives here. This course led to some nit-picking:

In the key *Pennisetum clandestinum* is one of the first taxa to be keyed out. Why is only the generic name given and not the specific one immediately? And why the vernacular name? It is not a diagnostic character, and, if you already knew it, you would not use the key at all. The employment of vernacular names in the key is, moreover, rather haphazard, sometimes they are given, sometimes not, although then they turn out to be available. It is strange to note that in the generic key and the description of the inflorescence of this *Pennisetum* it is said to be "a cluster of 2–6 spikelets", while in the specific key it is said to be "reduced to 1 or few spikelets". So, if you have a solitary spikelet, you are immediately stuck.

It would have been more convenient to have had the page added to the names in the key; now one has to pencil them in oneself for more rapid access. The best way to find *Elytrophorus*, *Leymus*, *Urochloa*, and *Zea* is through the index. Apparently the editors have accepted Webster's reduction of *Brachiaria*, while other concepts, such as the reduction of the Ehrharteae to a single genus, the union of *Anthoxanthum* and *Hierochloe*, the split-off of *Rytidosperma* from *Danthonia*, are not.

Under *Diplachne fusca* it should have been noted that the correct epithet might be 'malabarica'. Likewise, *Axonopus affinis* has to be called *A. fissifolius* and *Zoysia tenuifolia* is *Z. matrella* var. *pacifica*.

J.F. VELDKAMP

G.J.H. GRUBBEN & S. PARTO HARDJONO (eds.): **Cereals. PROSEA Volume 10.** Hardbound edition: Backhuys Publishers, Leiden, 1996. 199 pp., illus. ISBN 90-73348-56-0. Price c. NLG 125, c. US\$ 80. Paperback edition: PROSEA, Bogor, 1996. ISBN 879-8316-31-2. Price: c. US\$ 10.

Grasses form one of the largest and economically important families of the flowering plants as several species provide the most important staple foods of the world. Civilisation without cereals would be very, very different, if any.

The concept cereal is here broadened to include also some pseudo-cereals as *Amaranthus*, *Chenopodium*, and *Fagopyrum*, while *Cyanotis* is briefly mentioned.

The introduction describes the history of domestication, the social, cultural, economic, agronomical, and genetic aspects, and the various uses and applications. A brief morphological description of grasses is useful for a basic knowledge of the terminology of the family. Then 20 important cereal and 3 pseudo-cereal crops are extensively described with the for PROSEA usual paragraphs on synonyms, vernacular names, origin, production, properties, botanical description, growth and development, notes, ecology, propagation and husbandry, diseases and pests, harvesting, yield, genetic resources, breeding, prospects, and a literature list. An analytic drawing of good quality is provided for each. Another 9 less important cereals are briefly discussed. Especially the notes on the origin, uses, and botany make fascinating reading.

There were no less than 20 specialists contributing to the good quality of this book.

J.F. VELDKAMP