

XIII. REVIEWS

(continued from page 433)

BRUENIG, E.F. 1996. **Conservation and management of tropical rainforests. An integrated approach to sustainability.** 352 pp., illus. CAB International, Wallingford, Oxon OX10 8DE, United Kingdom. ISBN 0-85198-994-2. Hardcover. Price: US\$ 99, £ 55.

This is the ?ultimate masterpiece of Eberhardt Bruenig. In this work he evaluates the tropical rainforest ecosystem, all its different kinds of being used, the way in which it is possible to harvest the rainforest for timber, the principles and strategies of sustainability, etc. He also gives attention to the traditional customary rights of the indigenous peoples, and the many pitfalls surrounding these rights. Restoration of degraded ecosystems is one of the chapters, as well as short rotation tree plantations, and, of course, forest management guidelines. Bruenig is an expert especially in the last subject. He discusses the guidelines for forest management with as an example the ITTO guidelines and devotes a chapter to Timber certification, Trademarking, and Monitoring. In this chapter he argues that timber species should not be included in CITES (the Convention on International Trade with Endangered Species) as has been tried by Germany and the Netherlands with *Intsia* (Merbau), *Gonystylus bancanus* (Ramin) and other species. He admits, however, that for some special timber species in Africa and South America, like rosewood and true ebony, CITES may help, although it would be ineffective unless the species and habitats are at the same time protected. This book gives a wealth of information but is sometimes hard to read because of the use of many acronyms (a list of which is given, however). — H.P. Nooteboom.

SOEPADMO, E. & K.M. WONG (Eds.). 1995. **Tree Flora of Sabah and Sarawak, Volume 1.** li, 513 pp., illus. Sabah For. Dept., For. Res. Inst. Malaysia, and Sarawak For. Dept. Ampung Press Sdn Bhd, Kuala Lumpur (hard cover). ISBN 983-9592-34-3. Price unknown.

After completion of the Tree Flora of Malaysia in four volumes, the Forest Research Institute of Malaysia (FRIM) together with the regional forest research institutes of Sabah and Sarawak embarked on a similar but much more detailed flora series of Sarawak and Sabah, starting November 1991. The first volume appeared in October 1995.

The actual flora treatments are preceded by three interesting introductory chapters.

Soepadmo provides background information on The Tree Flora project. The importance of Borneo as a centre of biodiversity is illustrated by many examples: Dipterocarps, Orchids (although New Guinea is certainly richer), *Durio*, *Mangifera*, and *Rafflesia*. All species reaching 5 m in height or a trunk diameter of 10 cm or more are to be treated in full, whereas smaller and climbing genera are treated in 'user-friendly' keys. Although Palms and Bamboos qualify according to the above criteria we have been informed that they will not be included. The estimated 3000 species are to be treated in eight volumes. "... to strike an acceptable balance between development and conservation ... it is imperative that up-to-date botanical inventories should be carried out without further delay ..."

Wong provides a detailed survey of botanical collecting, not only in Sabah and Sarawak, but of the whole island up to the beginning of the 1980's, treated under three headings: Early collectors, Early 20th century collectors and Postwar collectors. A survey of checklists and floras is also provided.

Ashton adds a chapter on biogeography and ecology. He points out the difference between the Malay Peninsula and Borneo. In the former the landscape has probably remained little changed since the Cretaceous, the soil cover is deep, whereas in Borneo sinking and uplifting continues to the present day, soils are nowhere deep. This results in a complex pattern of small scale variation which "... persuades us that finely distinguished species based on single specimens will be rarely maintained as knowledge increases, and that Van Steenis' admonition to hold a conservative and broad species concept may prove wise."

In the present volume 31 families are treated. Understandably these include a large proportion of small ones and mostly families previously treated in Flora Malesiana, notable exceptions being *Alangiaceae*, *Illiciaceae*, *Rhamnaceae*, and *Rutaceae*.

The administration team of the Sabah and Sarawak flora project, headed by Soepadmo and Wong, managed to find the financial support to attract qualified contributors within the country as well as man-power abroad, so as to warrant steady progress in publication. The facilities created prove the evident importance the Malesian Government and modern society as a whole attaches to open up insight in the exceptionally rich and complicated forest resources of northern Borneo. This flora project has good prospects and no institute nor student should refrain from subscribing to it. The woody portion of the incredibly varied flora is an essential part of Central Malesia. The reader is provided with a wide range of information on various topics: ecology, uses and distribution. The descriptions are accurate and more elaborate than in the Tree Flora of Malaya. The recent and still ongoing intensive collecting efforts by the respective Forest departments are an essential prerequisite for durable flora treatments. The large amount of fine specimens, also distributed to herbaria abroad, have facilitated and accelerated better and more refined species concepts, leading to the steady discovery of new local species, but one should certainly heed Ashton's advice cited earlier.

To mention shortcomings in a work of such quality is like splitting straws. The flaws are very minor and are listed with reluctance.

Distribution of species is sometimes not completely indicated, e. g. *Deplanchea bancana* also occurs in Celebes, *Crateva religiosa* is not limited to West Malesia but extends far into the Pacific. Some vernacular names mentioned under the genus are not found under the species, e. g., *Alangium*, *Anisophyllea*, *Pellacalyx*. Fruits of *Sarcotheca* are also eaten in Kalimantan and Celebes, fruits of *Dacryodes rostrata* are edible.

We would like to recommend the inclusion of more data on pollination and dispersal where available. For instance, many species of *Alangium*, *Burseraceae*, and *Celastraceae*, *Rutaceae* and *Sonneratia* are eaten by birds and other animals.

Printing errors are few. An amusing one is found on p. 433 where the omission of 'not' suggests that "aphrodisiac properties (of *Eurycoma*) ... have been substantiated by rigorous experiment."

This is a highly critical and accurate flora. The editors are to be complimented on their achievement. Their continued involvement warrants the quality of the volumes to come. — M.M.J. van Balgooy & W.J.J.O. de Wilde.

THORNTON, I. 1996. **Krakatau, the destruction and reassembly of an island ecosystem.** xiii, 346 pp., illus. Harvard University Press. ISBN 9-674-50568-9.

"Just after 10.00 A.M. on the twenty-seventh of August 1883, an event occurred that literally, as well, as figuratively shook the world. In Sunda Strait, between the islands of Java and Sumatra ..., the island of Krakatau exploded with the force of more than ten thousand Hiroshima-type *hydrogen* bombs." These are the first lines that set tone and style. The rest is more accurate and the story of Krakatau and the aftermath of this still enormous explosion (heard as far as Sri Lanka, Rodriguez, and Alice Springs) is well told although sometimes a bit repetitive. In a matter of moments the large island disappeared and its remnants were covered by up to 60 metres of ardent ash. Most scientists think that no life could have survived this, but Backer vehemently denied this: seed banks and other subterranean organisms could well have survived, and indeed seeds of local species appear to be able to survive pyroclastic burial for more than 60 years. It is a pity that there was no immediate officially backed survey after the event, in fact the first biologist to arrive was Treub in June 1886. He was not able to move around much because of the dangerous and rough terrain, but he did report the presence of 25 species of vascular plants. The geologist Verbeek, landing a few months after the eruption, found no sign of life, and a French team visiting in May 1884 found only a small spider, yet Verbeek also reported scattered grasses on the slopes of Rakata in 1884. For a clearer survey of visits it would have been nice to have had a chronological table with places, dates, personnel. Apparently in the following years haphazard and brief excursions were made to the various island remains of Krakatau and a great chance to record the recolonization processes was missed. It was not until 1908, 25 years after the eruption, that the islands were surveyed for animals by Jacobson, and he apparently looked mainly for *Diptera*. No mammals (rats, bats) were found and only 13 species of non-migrant land birds. Monitors were reported to have returned in 1889, and *Python reticulatus* was casually mentioned in a report on volcanic gasses in 1905.

Obviously the interest was there, but the islands were remote, rough, and dangerous, and there was no united effort to have an observational station of any sort. Apparently, the first one was established on Sertung in 1986, and again in 1990, while a shelter was built on Anak Krakatau in 1985/1986 ... Thornton suggests that this was a good thing, as human influences were thus minimal. True, but does this outweigh the wealth of data that might have been obtained? No observers, no data. As usual, when visits are difficult to make and data are scant, speculation is much easier and vehement debates ensued and last until to-day what exactly happened on that fateful date (3 geological theories), and whether any life could have survived any of them. Whatever the case, there can have been very little of it (perhaps some nematodes?), and most species now present must have come from abroad in one way or the other. This recolonization still goes on providing 'the most spectacular example' (Richards) of an experiment in dispersal, settlement, and succession that could have been a classic case of a study of ecological change in the tropics had it been monitored well.

The first Symposium on Krakatau was in Batavia (Jakarta) in 1919 and included an excursion during which a good number of new records were made. It was decided that more regular observations should be made, to be headed by Dammerman (zoologist) and Docters van Leeuwen (botanist), and indeed over the next years several visits were made, but these consisted of only a few hours to days spent in one locality. Backer wrote

a scathing paper in 1929 on the subject to coincide with a Congress in Batavia where Krakatau was also to be discussed. Scientific visits to the archipelago remained scarce and infrequent: 1952, 1974, but after 1979 more or less continuous surveys were made, though still more by chance than coordination.

The taxa arriving first and later are generally air-, animal- (esp. birds, later also bats), or sea-dispersed, i.e. not only those able to float, but also those that live on or in them (incl. ships).

In a later stage of forest development the original pioneers have now become opportunistic colonizers of gaps, and animal-dispersed trees have taken over. Of special interest are the figs: after 40 years two-thirds of the tree species, while at present they are the major constituent of the forest in W. Rakata. The more figs there are, the more animals are attracted, which bring more seeds, not necessarily of figs, so increasing local biodiversity, and equalizing the overall pattern. One apparent problem is the availability of the short-living fig wasps, each fig with its own species. They will not survive ingestion, will not live long enough to see the seedling produce flowers, so, as establishment was fairly early and fruit was set soon, how about the wasps? It has been discovered that there is a constant 'rain' of wind-borne insects with the wasps among them. The small spider of 1884 would not have starved.

The three older Krakatau islands have a different composition of their forests, and the question is why. Again, by lack of real facts, several hypotheses exist: different moments of establishment of the main species; disturbances in development by the various ash falls from Anak Krakatau since the 1930's, or rather deflections, for the differences were already there before Anak Krakatau emerged. It possibly is a mixture of both, one event fortuitously more or less coinciding with and perhaps enhanced by the other.

Another chance was missed with the emergence of Anak Krakatau in 1930. As it rose directly from the sea, this was a real clean slate, but the errors of 1883 were repeated: no regular monitoring, no coordinated effort, leading to more 'intelligent guesses' than data. At least 5 attempts for the establishment of a vegetation are postulated, all but the last destroyed by volcanic activity. No botanical survey was made until 1963, and the next one was in 1971. Between 1984 and 1995 Thornton made 6 (p. ix; 14, p. 282) visits, but these sometimes had to be very limited due to eruptions every few minutes.

Thornton then launches into extensive discussions on the theory of island biogeography, the ways communities may obtain their members, and what constraints are placed on both with Krakatau as an example. The sequence of colonization, its timing, and the period until a next colonizer arrives sets up a process with only limited numbers of courses toward a stable combination of species. This could be the reason why the forests of the islands are so different.

Human influences are now increasing on Anak Krakatau because of volcano tourism, once with a deadly consequence. A World Heritage listing is badly needed. A glossary, biographical notes, references, credits, and indices end this very enjoyable book. — J.F. Veldkamp.

WALSH, N.G. & T.J. ENTWISLE (Eds.). 1994. **Flora of Victoria. Volume 2. Ferns and allied plants, conifers and monocotyledons.** IX + 946 pp., illus. Inkata Press, Melbourne, Sydney. ISBN 0-409-30849-8. Au\$ 195.00.

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. It 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 also 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 *Chiloglottis* (*Orchidaceae*, p. 748) bound within a treatment of *Bromus* (p. 502–503). These places are not indicated under the species, but in the index. It might have been more logical to have had 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 of 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 need 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 the inflorescence of this *Pennisetum* 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, 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 *Hierochloë*, the split-off of *Rytidosperma* from *Danthonia*, are not.

Lead 3 leads to leads 4 and 106, lead 4 to 5 and 108, but lead 106 goes to *Zea* and to 107 and 107 again to 108. Strange. For back-tracking it would have been useful to have the originating lead here added in brackets.

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.

WONG, K.M. 1995. **The morphology, anatomy, biology and classification of Peninsular Malaysian bamboos.** Univ. Mal. Bot. Monogr. 1: VII + 189 pp., illus. ISBN 983-99033-0-6.

WONG, K.M. 1995. **The bamboos of Peninsular Malaysia.** Mal. For. Rec. 41: X + 200 pp., illus. ISBN 983-9592-40-8.

These two books belong together and the second one can be seen as the complement of the first.

Bamboos play a very important part in the daily lives of the Malesian peoples. Unfortunately, their taxonomy is very complicated. There is a great confusion in the delimitation of the taxa and application of the scientific names, and hence exact knowledge about them is difficult to obtain. What there is, is either in scientific works unavailable or incomprehensible to the general public, or so succinct that it is of little practical use. Most of what has been written is based on the fragmentary, badly annotated material available in temperate herbaria. Wong, however, has spent many years in the field, an absolute must for a better understanding of these species, and from this first-hand observation is now able to write an authoritative introduction to and account of the group.

The Morphology volume summarizes in its first chapters the various types of morphology, growth habits, anatomy, flowering, and evolutionary tendencies of the bamboos in general. In the later chapters these concepts are applied to the Malaysian taxa. At the end a key is given with the subtribal and generic classification according to the Ellis & Soderstrom (1987) system. Overall this is an extremely good introduction to bamboos and those of Malaysia in particular. For the latter this is a classic text.

In the Bamboos volume much of this is repeated in a somewhat more popular manner and it seems to me that it might have been better to have organized this as a companion to the Morphology, whereby this duplication might have been avoided and one has not to read the same thing twice (in the bamboos volume it is a better read!). In fact this volume really picks up after p. 49, where propagation and silviculture, and uses are discussed, subjects that probably have the widest audience.

It must be noted that both volumes deal with the woody representatives only, the herbaceous ones are only rather casually noticed in the Morphology volume. It is curious that *Scrotochloa* (previously *Leptaspis*) *urceolata*, a herbaceous bambusoid occurring in Malaysia, is not mentioned at all! In the Bamboo volume no mention is made of the centothecoids and oryzoids and whether these are bambusoids or not.

It might have been a good idea to devote a brief chapter on 'what to collect', for the keys employ only a few characters at a time and are obviously for field use. Only there can it be observed whether the plants are climbing, if there are thorny branches at the base of the culms, the basal internode inflated or not, what the branching system at mid-culm is, what the culm sheath looks like, whether the leaves are variegated, etc. This makes use of such keys nearly impossible in the herbarium, as field labels are usually lacking in such apparently vital information, and the necessary parts have not been collected, either. So, it is nearly impossible to identify the many unidentified specimens present in herbaria world-wide, unless one is a specialist already, and a burgeoning interest by beginners in the group is quickly smothered. A pity, for bamboos are interesting and these books deserve good and wide-spread use.

Next to the keys extensive well-illustrated descriptions are given. In both volumes the plates are marvelous, especially those in the second part. — J.F. Veldkamp.

WONG, W.W.W. & A. LAMB (Eds.). 1993. **Fruits, nuts and spices**. Leaflet 162: xi + 161 pp, illus. Dept. of Agriculture, Sabah, Malaysia. ISBN 983-9200-00-3.

This publication contains the proceedings of an in-house seminar held in Tenom, Sabah, in 1990, combined with a summary of conclusions reached at a subsequent workshop on guidelines for the fruit industry in Sabah. There are surveys of major and minor fruit trees and spices in Sabah and their potential; on vegetative reproduction; on diseases and pests and their control. Finally, a summary is given of the proposed policy and programme of the Department of Agriculture, Sabah.

The added interest of this volume is the large number of colour photographs showing many little-known fruits for the first time, e.g. *Artocarpus rigidus*, *Baccaurea macrocarpa*, *Canarium megalanthum*, *Durio graveolens*, *Mangifera pajang*, and *Nephelium maingayi*. — M.M.J. van Balgooy.

In 1995 the **International Code of nomenclature of cultivated plants**, ed. 6 (Regn. Veg. 133) appeared. It is quite different from the earlier editions and it is to be hoped that the nomenclature of cultivated plants will now become more uniform and stable. Next to the General Rules with Recommendations and Examples, as in the 'normal' Code (ICBN), there are 12 appendices, the last but not in the least unimportant a Glossary, something that would be very useful in the ICBN as well. Terms have changed, e.g. 'establishment' has been introduced for 'valid publication', 'acceptance' for 'correct', 'precedence' for 'priority', etc. Rules for the formation of cultivar names have been loosened. The starting point has been altered and is now the same as in the ICBN: 1 May 1753. A typological concept has been introduced as 'Standards'. The term 'culton' for 'taxonomic group of cultivated plants as defined in this Code' has not found acceptance; it is to be hoped that it will in a future edition.

Among the appendices are lists of the International Registration Authorities (IRAs), Statutory Plant Registration Authorities, herbaria maintaining Standards with fax, and even e-mail numbers.

Interesting is the appendix 'the nomenclatural filter' which consists of an identification key to check whether a name or epithet is established and accepted. Something like that might be useful in the ICBN, too. Then there is a 'Quick Guide', a kind of manual on how to use this Code, again. — J.F. Veldkamp.