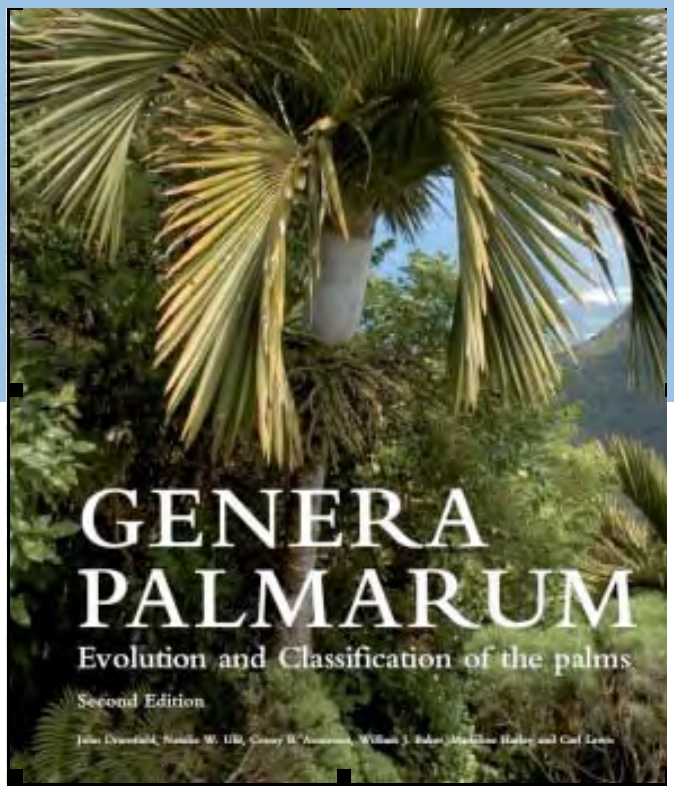

Genera Palmarum. Evolution and Classification of the Palms.

A book review by David M. Jarzen
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I have lived and worked in Florida now for 12 years, and during that time I have visited Walt Disney World® but once–a short visit to Epcot Center. However, during that same time frame, I have managed a dozen or so visits to the Fairchild Tropical Botanic Garden and/or the Montgomery Botanical Center in Miami. On my last visit there in June of this year, I browsed through the gift shop/bookstore and spotted the eye-catching photograph on the cover of *Genera Palmarum*. I had promised myself that someday I would purchase the volume, and that day I did.

I can still recall with much fondness visiting with Professor Hal Moore at the Liberty Hyde Bailey Hortorium, Cornell University in the mid and late 1970's. I was studying what I suspected as being fossil palm pollen from the late Cretaceous of the western interior of Canada, and needed the advice of Dr. Moore. During my visits there I met with Natalie Uhl, a student and research collaborator of Dr. Moore's, and learned of their project to complete the vision of Liberty Hyde Bailey to publish a volume of the world's palms, complete with descriptions and systematics. That goal came to fruition after the death of Professor Moore (1980) with the publication of *Genera Palmarum* in 1987 (Uhl & Dransfield, 1987).

The current edition of *Genera Palmarum* is not really a "second edition," as it bears a different title emphasis "the evolution and classification of palms." Its contents are much expanded and include many newly discovered species, completely rewritten descriptions of the genera, new information as supplied by DNA analysis, chemistry and, of special interest to palynologists, an entire chapter devoted to palm pollen. Indeed the book is, as much as any book may hope to be, up to date, so much so that the new genus of palms, *Tahina* Dransfield & Rakotoarinivo, was incorporated into the manuscript as it was in its final stages of preparation for publication!

Following an introduction, acknowledgements and a section on "How to Use This Book," the remainder of the 732 pages in the book are devoted to chapters covering the structure of palms, palm pollen, chromosomes and cytogenetics, chemistry of the palms, the fossil record, phylogeny and evolution, biogoegraphy, natural history and conservation, and the largest chapter within the book, Chapter 9, the classification of the palms.

Genera Palmarum. Evolution and Classification of the Palms.

John Dransfield, Natalie W. Uhl, Conny B. Asmussen, William J. Baker, Madeline M. Harley and Carl E. Lewis.
Second Edition. Kew Publishing, Royal Botanic Gardens, Kew, UK, 978-1-84246-182-2 (Hardcover), $180.00, 2008.

Frond of *Livistona rigida* Becc., at the Mount Cootha Botanic Gardens, Brisbane, QLD, Australia. Photo: DMJ

The chapter on pollen, contributed by Madeline Harley, introduces the reader to the basics of pollen morphology and the significance of some pollen features, such as the systematic distribution of aperture types, to phylogenetics. The chapter is replete with photographs and tables which illustrate or enhance the discussion of pollen features. Likewise a discussion of the systematic distribution of palm pollen ectexine types is shown, in Table 2.4, to bear strong phylogenetic relationships. Recently I have had an interest in palm pollen bearing spines. As I searched the literature for fossil forms bearing spines, *Nypa* Steck of course was common, yet there are several other forms in the fossil record which bear spines (e.g. *Mauritia* L.*f., Wallichia* Roxb.). The chapter on pollen indicates a total of 19 genera of palms are known to have intectate or tectate spinose (echinate) pollen forms.

The bulk of the book is devoted to the classification of the palms, covering all living genera alphabetically, within each of the five subfamilies. Within the subfamilies the taxa are arranged by tribes, and then by genera. An introduction to the systematics, to familiarize the reader with palm family (Arecaceae) classification allows the reader to understand the descriptions and placement of genera that follow. Each description of a genus is complete with an indication of the type species and reference to the original publication. The generic diagnosis is often very detailed and requires a firm knowledge of palm morphology to be thoroughly appreciated. Accompanying the descriptions are beautifully drawn illustrations of the flowers and/or fruits of the genus under discussion. I found the additional information following the description to be of great value in my studies. The authors have added information on the distribution and ecology of each genus, references to the anatomy and relationships, and taxonomic account. When known, details of the fossil record are given, complete with appropriate references. Finally, a section on the common name(s) and economic value or use of the genus is provided. With each generic entry, photographs of the pollen, including LM, SEM and often TM, are provided. This may well be the only complete source of pollen photographs, using LM, SEM and TEM for one family.

Bismarkia nobilis Hildebrandt & H. Wendl. at the Fairchild Tropical Botanic Garden. Photo: DMJ

The liberal use of color photographs of various parts of a palm plant, its habit, or habitat, provides even more enjoyment and information for the reader. The book is packed with photography of the highest quality. The authors have done very well in the selection of illustrative material.

In the chapter covering the fossil record of palms, both macrofossil and microfossils are considered. Caution seems to be the theme in this chapter, and rightfully so, inasmuch as the identity of suspect palm specimens below the family level is often quite difficult. Many leaf or frond macrofossils having a costapalmate structure are indiscriminately placed in the fossil genus *Sabalites*, suggesting affinity with the modern genus *Sabal* (photo next page: Portion of a fossil frond of a *Sabal*-type plant

from the Miocene Alum Bluff in the panhandle of Florida. Photo: DMJ). There are many palms with costapalmate leaves, and placement in *Sabalites* may not be the best determination for the fossil material. Likewise the genus *Arecipites* is used for a variety of simple, monosulcate, palm-like dispersed pollen forms that may or may not be related to the Arecaceae. Of special value to palynologists are the tables contained within the chapter covering the fossil record. These detailed tables, four in all, summarize the accepted, occurrence of macro- and microfossil reports from the Cretaceous, the Tertiary of southern England, the Tertiary of Central Europe, and the Tertiary of India. These tables present in collected form the fossil taxon, the reported age, the provenance, the type of fossil (fruit, leaf, stem etc.), and the authors of the report. I found these tables to be of great value in searching for reports of a specific fossil form or when searching for fossil palm taxa from a given region. For palynologists, this feature of the book is reason enough to purchase a personal copy.

In the chapter on biogeography the reader will soon realize that the distribution of palms is not simply restricted to the lowland wet tropics. The palm family is widely distributed around the world, reaching latitudes of about 44° North and South, in desert environments and to altitudes of 3600 meters (Ecuadorian Andes). Finding palm pollen in palynological preparations is not an automatic indication of "wet tropics." Again caution must be exercised in the interpretation of palm environments as the family is widely distributed through an impressive variety of habitats. The American tropics outnumber the Malesian tropics in number of genera, but the latter certainly outnumbers the former in number of species with a total of 992 species! The richness in number of taxa in these two regions of the world still need more detailed studies to fully appreciate their total palm flora.

The book also includes several additional features which greatly enhance the usefulness of the volume. A geographical listing of all genera is provided following the main text. A glossary of terms used throughout the book, including palynological terms, is well written and easily understood. This glossary is critical to an understanding of the

generic descriptions. Of real value in this glossary are the illustrations that accompany some of the terms, or concepts. This greatly enhances the reader's ability to "see" the features being discussed. It may well be the most complete glossary of terms I have ever seen. The page size at 28.8 x 23.6 cm allows for larger drawings and photographs, providing detailed images of flowers, fruits and other structures. The literature cited is, of course, as would be expected in a volume covering such a broad perspective, extensive. The book closes with three indices, including scientific names, common names and a subject index.

My recommendation is clearly in favor of having this book in my personal library; and I suspect that anyone with an interest in palms, whether modern or fossil, should own this book. It is the most complete coverage of the family available. The price I paid of $180.00, is the street price established by the Fairchild Tropical Botanic Garden. I have seen it listed from Kew Publishing for as little as $130.00 (£79.00).

References

Uhl, N.W. & Dransfield, J. 1987. *Genera Palmarum, a classification of the palms based on the work of Harold E. Moore Jr.* Liberty Hyde Bailey Hortorium and the International Palm Society, Lawrence, Kansas.