Analyses d'ouvrages / *Book reviews*

Su Y. C. F. & Saunders R. M. K. 2006. — Monograph of *Pseuduvaria* (Annonaceae). *Systematic Botany Monographs* 79, The American Society of Plant Taxonomists, 204 p., 90 figs, 3 tab., 3 colour pls.

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The present volume deals with *Pseuduvaria*, a middle-sized, but until then weakly known annonaceous genus. It comprises 52 mostly dioecious species, widespread from Myanmar to northeastern Australia, with a primary dispersal centre in New Guinea, and a secondary one in Peninsular Malaysia. All are trees or treelets, growing in the tropical lowland forests below *c.* 1000 m, some of them showing even a rheophytic habit. Most of these species are rather narrow endemics. Eleven species are newly described in this work. Inclusion of the former and puzzling monotypic genus *Petalolophus* is moreover convincingly proposed.

Morphological and anatomical features take up 30 pages in the introductory part. Leaf anatomy is detailed, especially venation and epidermis. The usefulness of calcium oxalate crystal shape for distinguishing the taxa – a classical topic in the family – is nicely assessed (p. 10).

Inflorescence morphogenesis is then interestingly discussed (p. 11-15), with sharp definitions of the peduncle, the rachis – axillary and mainly evolving from massive floral abscission –, and the pedicel. The rather complex developmental process may lead to a unique long-stalked flower, terminal at a first glance, but truly lateral upon a lateral rachis (*P. sessilifolia*). Floral specialization is also obvious in perianth structure, especially the inner petals arranged in a reversed mitriform dome over the reproductive parts, each petal being provided with diffuse or most often paired adaxial glands, sometimes winged. Many SEM pictures are given (p. 18, 19), but unfortunately gland topography should have been better illustrated by synthetical sketches. Moreover few data are given about their histology, and even their true role in the pollination process, which involves flies. However, as expected in such a monograph, the main taxonomical characters (stamen and carpel morphology, as well as palynology and carpology) are thoroughly analysed, and three coloured plates offer selected beautiful pictures of the diversity of living flowers and fruits in *Pseuduvaria*.

The other items are briefly described, as too few data are yet available about caryological and ethnobotanical aspects. Moreover, the frequent lack of material of both female and male individuals in several species, and the scarcity of recent collections impede strongly phylogenetical and even chorological (and thus conservation) studies. Seed dispersal is mainly achieved by frugivores, especially primates, bats, and birds (sometimes large ones such as cassowaries).

The actual taxonomical treatment covers 182 pages, with two introductory identification keys based upon flowers and fruits, this last almost exhaustive. At least 2 pages are devoted per species, including large distribution maps and, for critical species, comprehensive plates skilfully drawn by Ngai Yuen Yi.

Descriptions are somewhat dry, otherwise rich in significant details, and attaching a broad place to biometrical data. Nomenclatural aspects are developed, and studied material from 28 herbaria is carefully reported (p. 298), an invaluable help for herbaria practitioners throughout the world.

This noteworthy monograph is in keeping with the general pattern of renewal in Asian Annonaceae studies, initiated *c.* 10 years ago by Richard Saunders, at the Hong Kong University. In this scope, the authors provide us here a firm source document for any further work on the genus *Pseuduvaria*.

Thierry Deroin

Erkens R. H. J. 2007. — *From Morphological Nightmare to Molecular Conundrum. Phylogenetic, Evolutionary and Taxonomic Studies on* Guatteria *(Annonaceae)*. Universiteit Utrecht, Nationaal Herbarium Nederland & Biodiversiteit, Gildeprint Drukkerijen, Enschede, 276 p., 70 figs (incl. maps and diagrams), 12 tab.
ISBN: 978-90-9021525-9.
Format 24 × 17.1 cm.

At a first glance, this book looks like a bunch of papers and submitted manuscripts, drawn up in order to obtain a PhD, defended at the Utrecht University last February. In fact, it might better be seen as the well-commented report of a research work carried over six years by the author and 13 collaborators, of which the unusual style allows to propose new insights of a wide biological, methodological, and even epistemological interest.

With probably more than 300 species, *Guatteria* is the largest Annonaceae genus, and one of the largest Neotropical tree genera. Despite its recognition as early as 1794 by Ruiz & Pavon, and the thorough revision studies carried out by R. E. Fries between 1934 and 1959, the taxonomical knowledge remained unsatisfactory, mainly because of gaps in gathering the data. In particular, many *Guatteria* species are known from very sparse herbarium collections. Such a situation led Roy Erkens to use the molecular tool, but always with a critical eye. So, interesting remarks are spread in the whole text, and only some items will be tackled below.

The work is divided into two unequal parts, a phylogenetics and evolution part, and a taxonomic part.

The first and main part (p. 9-158) is dealing with phylogenetics and evolution, and is introduced (chapter 1) by a somewhat provocative sentence (p. 10): "Where morphology was the main source of information for study in systematics some decades ago, its place now has been taken by molecular (sequence) data".

This claim is questionable. First, plant morphology is to be considered as an autonomous field, and has undergone very recent developments (e.g., floral morphology in the second half of the last century). Therefore, it is by no way reducible to a mere systematic practice. Second, molecular biology appears to exhibit some morphological aspects, as comparison of sequences is indeed not so far from comparative morphology. This controversy (morphology vs. genetics) is obviously the backbone around which all the chapters are arranged, and the problem is left unresolved until the Discussion (chapter 8), where new approaches are proposed. The four aims of the authors are: 1) to pinpoint the phylogenetic position of the *Guatteria* group in the Annonaceae phylogeny (chapters 2 and 3); 2) to elucidate the relationships between the genera in the *Guatteria* group (chapter 5); 3) to build a phylogenetic tree containing at least half the *Guatteria* species, based on multiple sequences of the plastid genome (chapter 4); and 4) to provide insight into the evolution of key morphological and anatomical characters by character mapping onto the phylogenetic tree (chapters 4 and 6).

After a nice homage to the pioneer work of R. E. Fries, a peculiar attention is devoted to methodological and technical aspects of the molecular analysis.

In chapter 7, the topic of molecular analysis takes precedence over any other, the goal of the authors being to assess the (commonly assumed) predictive value of age and greenness of herbarium specimens for DNA extraction and amplification success. They present a quantitative study based on specimens from three plant groups: 1) the Neotropical genus *Guatteria* (Annonaceae) – 151 specimens from six to 184 years old; 2) the pantropical genus *Zehneria* (Cucurbitaceae) – 64 specimens from three to 240 years old; and 3) eight specimens from diverse families found in the historic Rauwolf collection (L) dating to the 1500's (*c.* 430 years old).

The three groups of specimens were used for DNA extraction (modified CTAB and/or QIAGEN kit protocols are detailed) and PCR amplification of several genomic (plastid and nuclear) regions from 120 to 700 bp long. Success was checked both after extraction and after PCR. For *Guatteria* specimens, the colour of specimens was coded as green or brown. DNA extractions were highly successful in all three groups of specimens (> 70% success) and there was no obvious qualitative relationship between age and extraction success: some specimens up to 160-188 years old yielded DNA while some recent (a few years old) specimens did not. However, older specimens yielded lower amounts of DNA (on average, one more year leads to 1% less DNA). A combination of age and

colour (but neither age nor colour taken separately) was significantly related to extraction success. Performed on successful DNA extractions, the PCR did work on 90-100% of the samples for at least one region. Shorter regions were usually more easily amplified, probably because DNA from herbarium specimens is often degraded. Statistical analyses showed a positive relationship between age, greenness and amplification success.

This study does not draw any general relationship between the characteristics of herbarium specimens and their potential use for molecular studies, suggesting that the indicators that are commonly used (age, colour) may actually have limited usefulness. The use of herbarium specimens in molecular work is probably highly dependent on how specimens are handled just after collection. However, this information (e.g., alcohol treatment, temperature and duration of drying) is often not recorded. Nevertheless, the present results provide a basis for future discussions on herbarium specimen use in molecular research. Although performed on a sample that may be considered too restricted (this is acknowledged by the authors themselves), it seems unlikely that much broader-scale studies will be performed by any single laboratory. The authors therefore insist on the need for researchers to share their empirical results and updates of their lab protocols in order to optimize the use and avoid the waste of herbarium material.

For projects involving the collection of new material, the preservation of leaf material in silica gel immediately after collection, in association to dried plant specimens, obviously remains the best procedure to allow both morphological and genetic analyses.

Chapter 8 summarizes very nicely the main results of the thesis: a tentative cladogram of the South American clade of *Guatteria* (p. 136), remarks about the paleogeography of the genus and its evolutionary radiation. Many improvements are proposed to the traditional Sanger sequencing methods, as well as the statistical treatment of data (combining here both frequentist and Bayesian approaches). In spite of the great advances in the knowledge of *Guatteria*, which are here registered, Roy Erkens admits humbly the failure of his monographic project (a too great one in a PhD frame). The significance of increasing knowledge about morphology, anatomy, caryology, chemistry, etc., is thus rightly emphasized (p. 143). The plea for "systematics as a prerequisite" (p. 144) is undoubtedly one of the heights of this book and provides an outstanding insight into the most debatable trends of the present botanical research. The following sentence is worth contemplating (p. 145): "The gap between molecular systematists and taxonomists will widen as new generations of students receive less and less training in the full complement of systematic methods and systematic positions are filled by molecular biologists with little training beyond molecular laboratory techniques".

This phylogenetic part ends with an extensive bibliography (p. 149-158).

The taxonomic part of the work was conveniently treated as appendices, encompassing two taxonomical revisions (chapters 9 and 10, in which seven new *Guatteria* species are described), and a list of vernacular names of *Guatteria* (chapter 11). It is perhaps unfortunate that no plate was drawn – at least for the new species – as photographs fail to show the diagnostic features, such as venation pattern, outline of perianth parts, as well as stamen and carpel morphology. Illustration should still play a major role in the transmission of botanical data.

In brief, this book, rich in data and thoughts, is wholly advisable for any botanist concerned with the application of molecular approaches in systematics. It should be of the highest interest for students and science historians.

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Aleck Yang T. Y. 2006. — *Type Specimens of Taiwanese Plants Named by Dr. C. J. Maximowicz and Housed at the Herbarium, Komarov Botanical Institute of the Russian Academy of Sciences, St. Petersburg, Russia (LE)*. Special publication 10, National Museum of Natural Science, Shuncheng Printing Co., Taichung (Taiwan), 90 p., 85 figs.
ISSN 1015-8391.
Format: 29.6 × 21 cm.

Despite the limited scope of this booklet, it may be of interest for any botanist involved with enhancing data from historical herbaria, especially by analysing type

specimens for a given area. The author, a well-known specialist of the genus *Clematis*, aimed to achieve such a research for Taiwanese plants, kept at LE, named by Carl J. Maximowicz, either on his own collections, or on those of R. Oldham and S. Tschonoski.

The result is a nice work where, after a short recall of the relevant taxonomical literature, coloured illustration takes obviously the first place with several magnified details, both from plants themselves (leaves, especially venation, flowers and fruits), and from labels (incl. autographs, notes and drawings). These fine documents afford all needed data about the sheets, summarizing moreover the related characteristic herbariological features. When necessary, more than one plate is used per species (until 8 for *Clematis lasiandra*), for showing the main morphological peculiarities of holotype and pinpointed isotypes. In all, 85 type specimens were examined, of 38 different species (1 *Lycopodium* and 37 angiosperms).

Of course this study, supported by several Russian botanists – such as Alice Borodina-Grabovskaja, a famous expert of Bunge's collections – will be a very useful tool to all people concerned with endemic plants from Taiwan, but appears to offer also a valuable insight into the raw material of botany in the middle of the 19th century.

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