

Book review: Rui-Liang Zhu and May-Ling So. 2001. **Epiphyllous Liverworts of China**. Nova Hedwigia Beiheft 121. 2001. 418 pp. + 140 figures and 5 tables. J. Cramer. Berlin/Stuttgart. ISBN 3-443-51043-4 (Paper).

This is a very well written and fully illustrated flora of epiphyllous liverworts found in China. A total of 168 epiphyllous species belonging to 28 genera in 10 families are recognized, described, and illustrated. Of these, 43 species are obligate epiphyllous liverworts, with the rest either as accidental or facultative epiphyllous taxa. For each species, the distribution inside China and their worldwide range are enumerated. Dichotomous keys to the families, genera and species are presented. Two new species and one new variety, and full synonymy for each taxon, of which 10 are new synonyms, are proposed. The volume also contains several nomenclatural changes and new lectotypifications. A glossary and index to scientific names help a great deal in understanding the technical terms and in accessing the rich information provided by this well-done revision.

Undoubtedly, the presence of epiphyllous liverworts forms one interesting and unique visual phenomenon of the wet tropical rain forest. Biologically speaking, this group of tiny plants and their adaptations to grow on the wet surface of leaves of numerous plants has been a challenging area of investigation for more than a century. Although many of the species of hepatic epiphyllae are not a natural group from the phylogenetic point of view, nevertheless, their repeated occurrence across the wide tropical rainforest belt represent a remarkable convergent pattern of evolution. As such, the reader is recommended to be educated first on this topic by reading carefully the introductory discussion of the morphological characteristics of epiphyllous liverworts and their adaptations to the phyllosphere, as well as the summary on the ecology and distribution of epiphyllous liverworts, found on pages 9–30, before attempting to use the volume for any taxonomic identification.

Although the epiphyllous liverwort flora described in this volume is based on the Chinese materials, more than a hundred of the species recognized are, however, widespread in E and SE Asia. As such, the flora is an up-to-date reference and useful guide to the study of epiphyllous liverworts in Malesia, including Singapore.

In using the volume to key out some of my epiphyllous liverworts collected from Nee Soon Swamp in Singapore, I have found the species description too lengthy and the many measurements of leaf sizes and leaf cells too detailed to be of great help to the reader who often needs to decide on a species determination under time pressure. In the end, I have resorted many times to base my conclusion about the species identity on

the short paragraphs of taxonomic synopsis and the diagnostic comments that are concisely and sufficiently written for each taxon. Having said this, the excellent and accurately executed line drawings of the species are very useful in illustrating the species concept, especially for beginners.

My other enquiry pertains to the five centres of occurrence of epiphyllous liverworts in China, presumably, these are the local areas with high species number and diversity of epiphyllous liverworts. They are identified as (1) Hainan, (2) Taiwan, (3) southwestern Zhejiang and northern Fujian, (4) southern Yunnan, and (5) northwestern Yunnan and southeastern Xizang. An oversight in this part of the discussion lies in the failure of the authors to indicate the exact number of epiphyllous taxa reported from each of the five centres. Instead, the richness of the taxa for the five centres is represented in the map (Fig. 10) by the proportional length of bars. It becomes difficult to estimate, by visual judgment of the comparative length of the five bars, the differences in the number of taxa, say between Centre 1 & 2 or Centre 2 & 3. Additionally, my own limited experience with the study of tropical mosses in China has called my attention to the richness of tropical bryophytes in Guangdong Province. Does the omission of a Guangdong Centre represent a reality or an artifact of under-collecting of epiphyllous liverworts in this province?

In collaboration with outsiders, resident Chinese plant taxonomists have in recent years published many excellent floristic revisions and modern systematic monographs that have shown the world the great diversity and richness of their indigenous flora. This volume adds more evidence to this fact by revealing convincingly the little known and yet very diverse world of epiphyllous liverworts that exists in the wet tropical forests in China. Workers in E and SE Asia can only thank the two authors for rendering a great service in producing such a magnificent piece of summary work based on their many years of hard work in the field and careful observation of minute taxonomic characters under the microscope for each of the species described. A copy of this supplement volume of the journal *Nova Hedwigia* is a must for libraries specializing on tropical botanical literature.

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