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Book reviews

Plant Resources of South-East Asia 15 (2) Cryptogams: Ferns and Fern Allies
W. P. De Vinger, V. B. Amroso (Eds.); PROSEA, Backhuys, Leiden, 2003, 268 pages, ISBN 90-5782-128-1, € 75

This book is part of a series of "Plant Resources of South-East Asia" which aims to summarize knowledge about useful plants for workers in education, research extension and industry. Previous volumes of this series, Pluses, Edible fruit and Nuts, Dye and tannin-producing plants, Forages, Timber trees (1–3), Rattans, Bamboos, Vegetables, Plant yielding non-seed carbohydrates, Cereals, Auxiliary plants. Medicinal and poisonous plants (1–3), Spices, Vegetable oils and fats, Cryptogams: algae, Stimulants, Fibers plants, Plants producing exudates and Essential oil plant and two volumes, Cryptogams: fungi and Ornamental plants will be published. CD-ROM version of several volumes is also available.

Interest in medicinal and aromatic plants in particularly, South-East Asia is increasing in the field of medicine as well as in the pharmaceutical, cosmetic and perfume industries. More than 4000 fern species are known in this region and many of them are economically important since they have been used medicinally against illness of the respiratory tract, rheumatic, diabetes, cough, fever, stomach-ache, laxative, intestinal worms, bladder complaints, head-ache etc. and as aliments.

This monograph titled 'Cryptogams: Ferns and fern allies' contains up-to date important information for traditional medicine, ornamental value and foods of more than 100 pteridophytes and bryophytes grown in South-East Asia.

The book begins with the excellent introductory chapter which divided into nine sections, definitions and diversity, importance of ferns and fern allies, properties, botany, ecology, propagation, genetic resources and breeding. Each section is followed by a comprehensive reference.

Chapter 2 was written by 23 different authors and it deals in great detail with 23 fern species in which the Latin name, synonyms, vernacular names, origin and geographical distribution, uses (medicine, ornamental, vegetable, fiber, starch, manure, fodder, insecticide, stimulant, absorbent, salt, thatch, dye, anti-erosion, timber and flavoring), production and international trade, properties, description growth and development, other botanical information, ecology, propagation and planting husbandry, harvesting, genetic resources and breeding, prospects and literature.

Similarly, chapter 3 presents botany, ecology, uses, prospects and references of only three mosses (Bryophytes). Bryophytes consist more than 20 000 species. Compared to the ferns and Phanerogamous plants, bryophytes are little used in South-East Asia although 37 species have been treated as the medicinal plants in China.

For the most readers of *Phytochemsitry,* the item of medicine, properties, alkaloids and phenolic glycosides, terpenes and steroids, tissue culture written in first chapter and use, properties and propagation in Chapters 2 and 3 will be the most interesting. The chemical structures of the isolated compounds from each fern and moss are not presented in the text, however, readers can check each component in the recommended literatures. It contains good illustration of each fern and moss, the informative glossary (explanation of technical terms), a comprehensive index including scientific and vernacular plant names and maps of South-East Asia PROSEA sources and extensive new references which provide readers to better understanding such specific topics of ferns and fern allies.

Chemotaxonomy of ferns has been developed using by triterpenoids and flavonoids. However, the pharmacological properties of medicinal ferns have not fully been investigated although a number of ferns produce promising compounds for pharmacological and medical use. The present handbook plays an important role for better comprehending of phytochemically and pharmacologically unexplored ferns and fern allies.

Overall, the production values of this hand book is high and there are a number of very attractive information for medical use of special ferns and mosses distributed in South-East Asia.

The printing is clear and attractive and the paper is of good quality. The price for a book in this category is reasonable.

I would therefore like to recommend this handbook to all researchers and graduates in botany, phytochemistry, pharmacology, pharmacognosy, agronomy, and also for anyone interested in learning about medicinal plants.

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Wandering in the Gardens of the Mind: Peter Mitchell and the Making of Glynn
John Prebble, Bruce Weber; Oxford University Press, 2003, 344 pages, ISBN 0-19-514266-7, £40.99

The second half of the twentieth century saw two major advances in chemical biology. The Watson–Crick DNA model and the identification of the genetic code, initiated modern molecular genetics in explaining the transmission of the genome from generation to generation and the way in which it controls the characteristics of organisms. By contrast, the recognition of the role of proton gradients in both the generation of ATP and its utilisation to provide means of active transport against the energy gradient was a major advance in understanding how biological systems survive and grow in a thermodynamically hostile environment. The basis of this latter was the chemiosmotic-hypothesis (then theory) propounded by Peter Mitchell from 1961 onwards. This book provides a fascinating account of how the theory came about and was developed.

Peter Mitchell was a genius, or at least unconventional in his approach. His theory stemmed from a succession of theoretical models, starting out with a philosophy, already expounded by the Greek philosopher, Heracletus, in which natural systems were seen as statids or fluctoids, the latter being characterised by the environment flowing through a defined space. From there, Mitchell came to distinguish the activities of organisms in space as well as in time. The biochemistry of the day was based largely on kinetics, change with time, with little or no reference to spatial change. Mitchell developed ideas of vectorial biochemistry, involving the directed movement of molecules in which the cell membranes played a pre-eminent role.

These ideas were not welcomed with open arms. The reviewer was present at the Biochemical Society meeting at Oxford in March 1961; the presentation was not helped by some rather pawky traces, and provoked total scepticism from many in the audience. Even in 1968, a seminar attended by senior and junior members in an Oxford College in chloroplast photophosphorylation ended in confusion: what are the intermediates? Name them. It needed a full 20 years before these problems were recognised to be biophysical rather than biochemical.

Yet plant biochemists should know that the evidence was more easily come by with chloroplast preparations. The acid-bath experiments of Jagendorf, and the demonstration of alkalinity in illuminated isolated grana and its discharge with the production of ATP satisfied most. Meanwhile, the mitochondrialists struggled with membrane resides, some inside out, often leaky or partially uncoupled, while chloroplasts provided granal preparations, intact and with the optimum CF_1, orientation.

Nevertheless, by 1978, the walls of resistance to the theory had collapsed, and Mitchell was awarded, unshared, the Nobel Prize for Chemistry. A final battle was to be lost by Mitchell. He hung on too long to a P/O ratio of 3 for oxidative phosorylation, claiming that the cytochrome oxidase stage provided no ATP. With better mitochondrial preparations, Wikstrøm proved to be right, although Mitchell's opposition had provoked experiments, which put the matter beyond doubt.

Phosphorylation was not the whole story of proton gradients. It was recognised that these could be generated by the hydrolysis of ATP by ATPases in all membranes, and with the assistance of uniports, symports and antiports, the proton concentration gradient or its electrical counterpart could provide the energy for the active transport of ions and solutes. An all-embracing theory.

It seems small to cavil about such an excellent account in this book. Yet a mere detailed statement of the chemical intermediate theory, provided by Slater in 1953, might have been given in the appendix, the better to assess its importance in the arguments over Mitchell's theory. During the 1950s and 1960s, investigators were always about to find the elusive high-energy intermediate (rather like the WMDs in Iraq today). Bob Williams's (1959) approach deserved more explanation; he provided the chemical rationale for the utilisation and provision of protons during the synthesis and hydrolysis of ATP, by mass action, but missed out on the essential vectorial component.

This book contains much about Mitchell, his life and loves, his eccentricities, his artistic interests. His health