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BOOK REVIEW

LANGE, O. L., NOBEL, P. S., OSMOND, C. B., ZIEGLER, H. (ed.): PHYSIOLOGICAL PLANT ECOLOGY III. RESPONSES TO THE CHEMICAL AND BIOLOGICAL ENVIRONMENT. — Springer - Verlag, Berlin—Heidelberg—New York 1983. 799 pp. DM 298,— ; approx. US \$ 128.50.

The twelfth volume of the New Series of Encyclopedia of Plant Physiology consists of four parts, the first of which deals with features of the physical environment (Biol. Plant. **26** (2) : 155, 1984), and the next one with the special responses of land plants to water use and carbon dioxide assimilation. The volume reviewed considers specific aspects of the chemical and biological environment with special emphasis on the soil. The first part of the book dealing with physiological and ecological aspects of plant nutrition begins with the chapter on the significance of proton movements, ion uptake and other transport processes for fundamental properties of plant cells. In the following chapter physical principles related to osmoregulation and osmotic pressure generation are discussed. The next two chapters deal with osmotic adjustment and related salt uptake as an important component of salinity response of halotolerant eukaryotes, and with the direct biochemical effects of electrolytes in non vascular halophytes and halotolerant prokaryotes. The importance of nitrogen nutrition for plant growth is treated in chapter five, and the influence of limestone, silicates and soil pH on plant distribution in chapter six. In the next one referring on metal toxicity and tolerance of plants to metals significance of ligand properties rather than atomic mass *per se* is emphasized. The next group of three chapters is devoted to ecophysiology of nitrogen-fixing systems, mycorrhizal symbioses and lichens symbioses, which involve a complex of complementary organic and inorganic metabolism just as the interaction between plants and animals in marine systems (in chapter 11). The transfer of nutrients from consumed insects to carnivorous plants, which is mediated by secretion rich in proteins and energy, is dealt with in chapter 12. Chapter 13, which is the shortest of the book, treats the delicate balance in host-parasite systems. In chapter 14 the plant-virus relations are discussed, stress being laid on the "struggle" of genes. Chapters 15–17 are devoted to ecophysiology of zoophilic pollination, physiological ecology of fruits and their seeds and to herbivory as a powerful ecological interaction, its importance, plant responses to it, plant-herbivore symbiosis and evolution. The concluding chapter concerning the above-ground as well as underground plant-to-plant interactions is the logical transition of this part to the last one, dealing with ecosystem processes, mineral cycling, productivity and man's influence. Each chapter is complemented by full text references, and the volume is concluded by the author, taxonomic and subject indexes.

The book is well edited, keeping the well-known standard of presentation of this series. This volume in itself as well as the whole series is a must for every library of plant physiology department of the universities and research institutes.

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SCHLECHTER, R.: DIE ORCHIDEEN. 3. Auflage. BRIEGER, F. G., MAATSCH, R., SENGHAS, K. (ed.). — Paul Parey Verlag, Berlin—Hamburg. Bd. I. Lieferung 14 (pp. 817—880). Bd. II. Lieferung 9, 10 (pp. 513—640); 1984.

The last chapter of the first volume (Taxonomy) of the famous Orchid handbook continues with the genus *Malaxis* (subtribe *Liparidinae* of the subfamily *Epidendroideae*) compiled by K. Senghas. All *Malaxis* species (synon. *Microstylis*) are terrestrial plants inhabiting different natural habitats of South-East Asia and the Indomalaysian archipelago incl. New Caledonia. The monospecific genus *Hamarbya* (*H. paludosa*) was excluded from the group *Malaxis* only because the flowers are resupinated by 360°. Now, it seems that the genus *Hamarbya* will be returned to the group *Malaxis*, because several other insufficiently known South-Asian species may have the same twofold flower resupination, unfortunately not described by the authors.

Oberonia, the next genus, has a large area of distribution from West Africa to the Oceanic archipelagos, and is diversified into more than 300 species. — The remaining genera, *Hippeophyllum* and *Ris-sleya*, with species growing in South-East Asia, are not known in culture. The genera *Vargasiella* and *Buesiella* with insufficiently known species are distributed in the rain forests of Peru and Venezuela.

The following small group, the subtribe *Thuiinae*, includes four genera including the interesting genus *Arundina*, a 3 m high plant with large and beautiful inflorescences. It is often cultivated in many countries of tropical Asia. — The subtribe *Collabiinae* has a quite different growth form with low-lying creeping rhizomes and shoots. Eight genera are described as terrestrial plants of monsoonic South-East Asia. They have not been introduced into culture. — The subtribe *Blettiinae* includes 19 highly diversified genera distributed in the tropical and subtropical countries of all continents: In America, from Mexico to Argentina, there are the genera *Bletia*, *Chysis*, *Coelia*, *Bothriochilus* and the species *Calanthe calanthoides*. The African types include *Ancystrochilus* and some species of *Calanthe* and *Phajus* and also *Gastrochilus*. The Asiatic area of distribution from Sri Lanka, the Himalayas and China to the Marquese archipelagos and Japan, together with Australia (Queensland and New South Wales), hosts altogether 19 genera with 480 species, mostly terrestrial plants. Some genera or species are in culture and hybridization has been accomplished, especially in the large and attractive genus *Calanthe*.

The issues 9 and 10 of the second volume concerning the family *Orchidaceae* as cultivated plants give a tabellar survey of cultivation techniques of all genera and species grown in air-conditioned chamber cultures: illumination, temperature, air and substrate humidity, aeration, irrigation, fertilization, time of flowering and manipulation during the rest periods, composition of natural and artificial substrates, etc.

The next chapter, elaborated by R. Maatsch and H. Hagemann deals with the cultivation of some species in the open garden, which is nowadays one of the most attractive techniques. Different terrestrial species originating from the temperate zones of Europe or North America (*Cypripedium*) or India and China (*Pleione*) are discussed.

The last extensive chapter — phytopathology of Orchids — has been written by several specialists. The two series, Nos. 9 and 10, contain chapters on nonparasitic diseases, such as physical or physiological damage (by W. Sauthoff). The pests or parasitic diseases caused by *Fungi* and *Bacteria* (W. Sauthoff) and viroses (by D. E. Lasemann and R. Marwitz) are complemented by references updated to 1981. — Diseases caused by animal parasites (by G. Schmidt) will be described in the next issue.

The second volume of Orchid Handbook brings, in a perfect and exhaustive form, all the necessary information to orchid growers working with this beautiful group of cultivated plants.

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