

CUTLER, D. F. (ed.): **Applied Plant Anatomy**. — Longman Group Limited, London 1978. Pp. 103. £ 4.95.

This is an instructive example of a modern brief and attractive textbook that enables the non-specialists to understand the basic structures of plants. Its nine chapters demand the attention of anyone who would like to have a basic knowledge of plant anatomy, histology and morphology.

The "Introduction" provides a very brief review of the methods and staining techniques of preparing readily available plant material for study. The following chapter "Basic morphology and tissue systems" informs the readers of the basic arrangements of tissue system. Chapter 3 contains an "Illustrated glossary" with strictly defined terms and many simple but very instructive pictures, which helps to use correct technical terms and thus to make plant anatomy as exact as possible. Chapter 4 — "Histology of leaf, stem and root" deals with the diverse organization of cells into tissues and arrangement of essential tissues in various organizational patterns in different plant families, genera and species. "Meristems", the fifth chapter, is devoted to the characterization of different types of meristematic tissues. "Xylem and phloem: the secondary systems" are characterized in chapter 6. Some of the main habitats and commonly associated plant modifications, developed in response to various environments of plant growth are discussed under the heading "Adaptive features". Chapter 8 deals with "Flower and fruit" mainly with respect to their primary functions in reproduction. The volume is closed by "Economic aspects of applied plant anatomy" illustrating how plant anatomy can be used for identification of plant fragments in food, drugs, archeological remains, forensic materials and in many other disciplines, and to be applied to solve many important problems.

The book, written by the head of the Plant anatomy section at Jodrell Laboratory of Royal Botanical Gardens at Kew, is well printed and arranged; logic interpretations are illustrated by many pictures and photographs. Although it is assigned to undergraduates and non-specialists, it can be useful for everybody who wants to renew his basic knowledge in plant anatomy.

JARMILA SOLÁŘOVÁ (Praž)

CERNUSCA, A. (ed.): **Alpine Grasshedge Hohe Tauern**. Ergebnisse der Ökosystemstudie 1976. — Universitätsverlag Wagner, Innsbruck 1977. Pp. 175. ÖS 280,—; DM 39,—.

Opening a new book series „Veröffentlichungen des österreichischen MaB-Hochgebirgsprogrammes Hohe Tauern“, which brings the results of the Austrian "Man and Biosphere" project on the mountain chain Hohe Tauern, the first volume reports in ten chapters on the research carried out in 1976. The subject of study were two alpine plant communities: *Curvuletum* (2300 m a.s.l.) (with *Carex curvula*, *Primula minima* and others), and a community with dominant *Deschampsia caespitosa*. Besides a chapter on macroclimate of the Hohe Tauern (with data on climate changes in postglacial and historical times), the individual chapters provide and discuss comparative data on microclimate, evapotranspiration and transpiration, on diffusive resistance of leaves, on primary production, on respiration and CO₂ gas exchange and on soil conditions in the above mentioned and other alpine plant communities. The book brings valuable results and stimulating description of highly developed techniques used, both of them being highly interesting for all concerned with ecology of plants in extreme conditions.

B. SLAVÍK (Praž)

DYKUSOVÁ, D., KVĚT, J. (ed.): **Pond Littoral Ecosystems**. Structure and Functioning. — Springer-Verlag, Berlin—Heidelberg—New York 1978. Pp. 464 + XV. Clothbound DM 98.00, US \$ 49.20.

The twenty eighth Volume of Ecological Studies summarizes the results of an extensive ecological research started as the Czechoslovak Wetland Project within the framework of the International Biological Programme. Twenty seven authors contributed to this study of the pond littoral ecosystems of Central-European type, based on the detailed analysis of two particular fishponds in South Moravia and South Bohemia.

Main emphasis has been laid on the detailed quantitative description of all biotic constituents, of their structure and activity in establishing the littoral ecosystems. Macroecological factors and abiotic environmental conditions such as microclimate (including the radiation climate in the littoral macrophytic communities) and water and bottom chemistry serve as the background for the subsequent and the largest section dealing with the primary production and

production processes. It contains productivity estimates based on well deliberated sampling procedures both of aboveground and underground biomass, growth analyses, estimations of solar energy conversion, estimations and direct measurement of photosynthesis and dark respiration (including a model of photosynthetic production in littoral helophyte stand and the comparison with results obtained in cultures), water relations of *Phragmites* (water balance, transpiration, s.c. water turnover), and nutrient uptake (absorption, accumulation, translocation, control by nutrient availability). The following section describes the structure and functioning of algal communities. Decomposition processes and their variation in space and time are discussed in the fifth section. The "zoological" section brings a quantitative description of the structure and role of mammalian populations (including their final energy budget), of birds (incl. interaction between bird and plant communities), invertebrates (with a special reference to soil surface arthropods and *Phragmites* destroyers).

Two last sections are devoted to the effect of fishpond management (drainage, cutting, amelioration with heavy machinery and waterfowl farming, cultivation and propagation of *Phragmites communis*) and to the conservation of littoral plant communities and of wildfowl.

The amount of data, the intelligent way of forwarding and discussing them and the critical evaluation of the results of general significance make the book a valuable source of information for a broad spectrum of readers. Editors and authors as well as all those who have been involved in the research may be congratulated.

JIRNA SLAVÍKOVÁ (Praha)

HARPER, J. L.: **Population Biology of Plants**. — Academic Press, London—New York—San Francisco 1977. Pp. 892 + XXIV, 315 figures, £ 30.00, US \$ 58.60.

This voluminous book is the first comprehensive survey of population biology devoted to plants. Until recently the life of organisms with respect to their number was studied mostly by zoologists. In spite of many similarities between animal and plant populations a great deal of characteristics remain that are specific to the populations of plant.

The main value of the book lies in that the author thoroughly reviewed and critically synthesized a great amount of results which were until now scattered in many journals all over the world. The chapter "Summaries" introduced at the very beginning of the book, presents a very condensed synthesis of the results discussed in individual chapters, thus enabling the reader to get a quick and competent information on the topics involved.

The book is divided into five parts according to the topics with a total of 24 chapters. The first part is devoted to the seed dispersal, where in four chapters the problems of the flux of diaspores, different reasons of seed dormancy, seed reserves (seed bank) and development of seedlings are discussed. The relatively most voluminous is the second part, where in six chapters (and on almost 200 pages) the results of experiments with interspecific and intraspecific relations in plant populations with different density and in different mixtures and their changes in time and space are critically reviewed. In six chapters of the third part the influence of different types of predators and the mechanisms of their action are described. In the fourth part three chapters discuss the natural dynamics of plant populations of annuals, biennials, herbaceous perennials and woody plants. The last part with four chapters deals with reproduction and growth with life cycles, natural selection and structural features in plant populations. Fifty pages of references yield a representative review in both general and special (plant) population biology. Author, subject and species indexes enable good orientation.

This is really an indispensable manual supplying the reader with clear and ample information (including a great deal of data from original papers with many figures) about the present situation in plant population biology. It is surely an excellent starting point for those dealing with ecology, phytocenology, as well as phytogeography, and with applied sciences as agronomy and forestry, since a modern research in these fields always more or less deals with problems where population concepts play a significant role. Such a comprehensive manual fulfills all desires of those who missed authoritative and up-to-date information on this progressive part of ecology.

JIRNA SLAVÍKOVÁ (Praha)

GERHARDT, B.: **Microbodies/Peroxisomen pflanzlicher Zellen**. Morphologie, Biochemie, Funktion und Entwicklung eines Zellorganells. Cell Biology Monographs. Continuation of Protoplasmatologia. Vol. 5. — Springer-Verlag, Wien—New York 1978. 283 S. 59 Abb. 960,— ÖS. 139,20 DM.

Unsere Kenntnisse über Microbodies/Peroxisomen sind in den 20 bis 25 Jahren seit ihrer Definierung und besonders in den letzten Jahren so weit fortgeschritten, dass selbst die Angaben

über diese Organellen in Pflanzenzellen ausreichend Stoff für vorliegende Monographie geliefert haben. Es ist das Verdienst von Prof. Dr. B. Gerhardt aus dem Botanischen Institut der Universität Münster sich der Aufgabe angenommen zu haben eine umfassende Übersicht über diese Zellorganellen zusammenzustellen und die auch oft widerspruchsvollen Daten zu ordnen.

Der Text des Buches ist in dreizehn Kapitel gegliedert. In der Einleitung werden zuerst die Begriffe Microbodies (durch einen bestimmten strukturellen Aufbau charakterisierte Zellorganellen) und Peroxisomen (Zellorganellen mit Katalase und zumindest einer H_2O_2 -bildenden Oxidase, also biochemische Charakterisierung) definiert und die Funktion dieser Organellen erläutert. Es folgt die Beschreibung der Struktur der Microbodies; der umgebenden Membran, der Matrix mit ihren Einschlüssen und cytoplasmatischen Invaginationen und der so typischen Assoziation der Mitochondrien mit Abschnitten des Endoplasmatischen Reticulums, mit Chloroplasten, Mitochondrien oder Lipidkörpern. Das Vorkommen der Microbodies in einzelnen Geweben der Pflanze, deren Zahl pro Zelle u.v.m. sind der Inhalt des nächsten Kapitels. Die Enzymausstattung der Peroxisomen in situ kann vorteilhaft mittels cytochemischer Methoden nachgewiesen werden — das geht aus folgendem Kapitel klar hervor. Des weiteren werden die allgemeinen Gesichtspunkte der Methoden zur Isolierung der Peroxisomen aus Pflanzenzellen behandelt und die einzelnen Komponenten der Peroxisomen eingehender biochemisch charakterisiert. Der nächste Abschnitt behandelt die einzelnen Funktionstypen der pflanzlichen Peroxisomen, hauptsächlich die Glyoxysomen, die an der Mobilisierung von Speicherfett für die Keimung beteiligt sind, und die Blattperoxisomen, wo Teilreaktionen des Glycolatstoffwechsels und der Photorespiration lokalisiert sind, sowie Nachweis, Stoffwechsel und Funktion der Peroxisomen in Algen und Pilzen. Es folgen zwei Kapitel über die Biogenese und Entwicklung von Microbodies/Peroxisomen und die Regulation ihrer Funktion durch die Faktoren Licht, Phytohormone und Metabolite. Der Inhalt des Buches wird in einem zwölfseitigen „Assessment“ in englischer Sprache zusammengefasst und die einzelnen Fakten nochmals beurteilt, eingeordnet und Schlussfolgerungen gezogen. Das Buch schliesst mit einem Literaturverzeichnis (777 Zitationen) und Sachregister. Es enthält viele Aufnahmen, graphische Darstellungen und Tabellen und ist tadellos auf Kreidepapier gedruckt.

Einzelne Kapitel des Buches sind als Literaturübersichten konzipiert und die Fülle an Zitationen erschwert manchmal etwas das Verfolgen des Textes. Andererseits war der Verfasser bemüht viele Angaben in übersichtliche Tabellen zusammenzustellen. In der Regel sind meist auch die Befunde, die zur gegebenen Thematik für Peroxisomen tierischer Zellen vorliegen, kurz zusammengefasst. Diese Monographie ist besonders für Pflanzenphysiologen und Biochemiker bestimmt, jedoch auch für alle anderen, die mehr über diese interessanten Zellorganellen erfahren wollen.

INGRID TICHÁ (Praha)

HOLM, L. G., PLUCKNETT, D. L., PANCHO, J. V., HERBERGER, J. P.: **The World's Worst Weeds. Distribution and Biology.** — The University Press of Hawaii, Honolulu, 1977. 610 pp., 220 figs. and maps. US \$ 35. —

This voluminous monograph summarizes up-to-date knowledge of the principal weeds of the world's major crops. The book is based on the information and papers of a large number of scientists from more than 100 countries the world over.

In "Part 1 — Weeds" the authors tried to present for each of 76 weed species described a summary of the world-wide distribution, the known biology and the agricultural importance. Line drawings and descriptions are included as well as a list of common names used in countries where the weed species are troublesome. The summary of the agricultural importance of the weed is often accompanied by a World distribution map and a list of major crops in which the species is a pest. In "Group 1" 18 most serious weed species are included in the approximate order of their noxiousness. Among them *Cyperus rotundus*, *Cynodon dactylon*, *Echinochloa crusgalli*, *Eleusine indica*, *Sorghum halepense*, *Imperata cylindrica*, *Chenopodium album*, *Digitaria sanguinalis* and *Convolvulus arvensis* are considered to stand apart from all other weed species. These widely distributed species are not only cited more often than other world weeds but the workers have also ranked them as the greatest troublemakers in the largest number of crops.

The weed species alphabetically arranged in "Group 2" are next in importance and are troublesome for mankind in cultivated crops, pastures and waterways. Some are confined to one or two regions whilst others are limited to a specific group of crops. Those which are widely distributed seldom compete with crops as severely as do the weed species from group 1. All weed species described in this part of book have an important role in human affairs in a great part of the world: they offer severe competition in cultivated fields and grasslands, are toxic for man

and animals, may decrease the quality of many products and interfere with fishing, irrigation schemes, hydroelectric plants and movement of vessels on navigable streams.

In "Part 2 — Crops" the authors deal with 16 of the world's most important crops in terms of the major weeds infesting them.

The book complemented by World List of Useful Publications on Weed Distribution, Identification, Biology, and Control (Appendix A), Books and Special Publications on Poisonous Plants (Appendix B), Glossary, Bibliography, Index of Common Weed Names and General Index, is well written, illustrated and printed. It demands attention of anyone who has a serious interest in weed biology, agriculture, herbicide technology and in related branches.

JARMILA SOLÁROVÁ (*Praha*)

ENGELHARDT, H.: *Hochdruck-Flüssigkeits-Chromatographie*. — Springer-Verlag, Berlin — Heidelberg — New York 1977, pp. 257; 62 figs., 18 tables.

The book provides a fundamental review of the principles of the modern rapid analytical method of chromatography — high pressure (performance) liquid chromatography (HPLC). This second edition of the book is overworked and extended. During the last years HPLC has attained a very high stage of development.

The book is divided into 12 chapters, 9 chapters of which constitute the main content of the central theme. In the first chapters the author describes the principles of chromatography, the technical aspects of apparatuses, detectors, sorbents, and different forms of liquid chromatography (adsorption-, partition-, gel- and ion exchanger chromatography).

The last but one chapter of the book concludes the choice of solvent systems and special techniques. The last chapter contains a short description of purification of chromatographic solvents.

All the chapters provide a survey of fundamental literature, which would be very useful to the readers. The book presents many practical comparative tables (for example — review of chemical properties of modified sorbents).

This publication is obligatory reading for all who will use this method in the plant material analysis in the field of herbicides and growth substances.

J. ULLMANN (*Praha*)

TEVINI, M., LICHTENTHALER, H. K. (ed.): *Lipids and Lipid Polymers in Higher Plants*. — Springer-Verlag, Berlin — Heidelberg — New York 1977, pp. 306., 136 figs. Clothbound DM 90.—, US \$ 39.60.

This book is a collection of the 16 articles dealing with very different fields of plant lipids and lipid polymers, presented at the Symposium "Lipids and Lipid Polymers in Higher Plants", held at the Botanical Institute of Karlsruhe University in July 1976.

The main emphasis is placed on composition, distribution, biosynthesis, function, and on physiology and biochemistry of the various higher plant lipids and their role in biomembranes and epidermal cell walls.

The content of the book is divided into five main sections. The first section describes lipid composition, functional organization of plant biomembranes and distribution and localization of biosynthesis of the prenylipids, glyco- and phospholipids. The second section deals with the physiology and biochemistry of fatty acids and glycerides in developing seeds, with enzymology of galactolipids and with regulation effect of light on the lipids during plastid development. The further section presents the bases of biosynthesis of plant steroids — sterols, steryl glycosides and acylated steryl glycosides. Physiology and biochemistry of prenylipids cover their biosynthesis and biological significance of prenols, carotenoids, xanthophyll cycle, the phytylation step of chlorophyll formation and regulation of prenylquinone synthesis. The final chapter includes detailed information on the biosynthesis and degradation of lipid polymers — cutin, cutin acids and suberin.

This book provides an excellent review on modern up-to-day aspects of biochemistry and physiology of plant lipids and therefore it will be of interest to plant physiologists, biochemists and phytochemists.

J. ULLMANN (*Praha*)