

Lambers, H., Chapin, F.S., III, Pons, T.L.: **Plant Physiological Ecology**. - Springer-Verlag, New York etc. 1998. ISBN 0-387-98326-0. 540 pp.; DM 98.00, GBP 37.50, FF 370.00, Lit 108.230, oeS 716.00, sFr 89.50.

Two excellent textbooks of plant ecophysiology have appeared recently. Besides of this one, the 3rd edition of the classic W. Larcher's textbook "Physiological Plant Ecology" was published by Springer-Verlag in 1995. While plant physiology is mostly concerned with the plant individual or organ and studies the effects of variables under ecologically unreal, constant, conditions in phytotrons, "plant ecophysiology is an experimental science that seeks to describe the *physiological mechanisms* that underlie ecological observations" say the authors in the Introduction of the former book.

The content of the book consists of an introductory and nine main chapters, that usually cover considerably wide topics. The first chapters deal with the primary processes of carbon metabolism and transport. Differences in photosynthetic traits among species are linked with the species' natural habitat. Trade-offs are discussed, like that between a high water-use efficiency and a high efficiency of nitrogen use in the photosynthetic machinery. In the next chapter, carbon use in respiration is analyzed and its significance for the plant's carbon balance explored in different species and environments. Species differences in the transport of photosynthates from the sources to various sinks are explained next (*i.e.*, phloem loading in the minor veins of the leaves and the types of saccharides that are transported in the sieve tubes are pivotal plant traits for the geographic distribution of the species and for their performance in different environments). The phloem transport system in climbing plants also involves an interesting trade-off between transport capacity and safety of the system. A similar trade-off is encountered in the following chapter, which deals with plant water relations. Plant energy balance and the effects of radiation and temperature are subsequently discussed. Having restricted the discussion of photosynthesis, water use, and energy balance to individual leaves and whole plants so far, then the processes are scaled up to the level of an entire canopy, demonstrating that processes at the level of a canopy are not necessarily the sum of what happens in single leaves, because of the effects of surrounding leaves. The next chapter explains the plant's mineral nutrition and the numerous ways that plants cope with soils in which nutrients have low availability or where metals occur in toxic concentrations (*e.g.*, sodium, aluminium, and heavy metals). These eight main chapters emphasize those aspects that help us to analyze ecological problems.

A later set of chapters deals with a higher level of integration, patterns of growth and allocation, life-history traits, and integrations of individual plants with other organisms: surrounding plants, herbivores and pathogens, animals used as a prey by carnivorous plants, parasitic plants, and symbiotic microorganisms. These chapters build on information provided in the first chapters. The final chapters deal with ecophysiological traits that affect decomposition of plant material in contrasting environments, and with the role of plants in ecosystem and global processes. Many topics in the first two sets of chapters are addressed again, now from a different perspective.

Throughout the text, "boxes" are elaborated on specific problems, without cluttering up the text. They are meant for the students who wish to gain a deeper understanding of problems discussed in the various chapters. A glossary has been added to check the meaning of numerous terms used throughout this text or in the vast literature. The numerous references added to each chapter or subchapter should help the reader to access the relevant literature used for this text. Although all graphs, drawings, and tables used throughout the text are only black-and-white they are visually well-arranged. The whole text is well-arranged as well.

It is an advantage of this book that it presents a lot of typical examples richly followed by figures or tables rather than wide theories with limited validity which are often dealt with in plant ecological textbooks. In addition, this excellent up-to-date textbook presents a lot of wise suggestions, comments, and approaches and asks many questions to the attentive reader. This book is eminently useful for colleagues working mainly in the field of plant ecology or physiology and for students and lecturers concerned with different plant sciences of ecological context including agronomy.

L. ADAMEC (Třeboň)