

Lambers, H., Chapin, F.S., III, Pons, T.L.: **Plant Physiological Ecology**. - Springer, New York - Berlin - Heidelberg - Barcelona - Budapest - Hong Kong - London - Milan - Paris - Singapore - Tokyo 1998. 540 pp. DM 98.00. ISBN 0-387-98326-0.

Plant ecology is focused on the relationships among species within plant communities and the way in which plant populations are adapted to characteristic range of environment. Plant ecophysiology seeks to describe the physiological mechanisms that underlie ecological observations. This textbook is notable in emphasizing that the mechanisms underlying plant physiological ecology can be found at the levels of biochemistry, biophysics, molecular biology, and plant physiology. At the same time, the integrative power of physiological ecology is well suited to assess the costs, benefits, and consequences of adaptations, and to evaluate the role of plants in ecosystems.

After short Introduction, the book starts with the primary processes of carbon metabolism and transport. This chapter begins with general characteristics of the photosynthetic apparatus. Following parts are devoted to responses of photosynthesis to environmental factors (light, availability of water, mineral supply, temperature, air pollutants, elevated CO₂ concentration) and to comparison of the plants with different types of carbon metabolism (C₃, C₄, CAM, aquatic plants). Further, this chapter deals with respiration and long-distance transport of assimilates in different species and environments. The third chapter is devoted to water relations of cells, to factors (mainly water availability in soil and evaporative demand of the atmosphere) and processes (water uptake, transport and loss from leaves) determining the water balance of the whole plant, and to adaptations to drought and salinity. The leaf energy budget is the main item of the fourth chapter. The fifth chapter is concentrated on scalling-up gas exchange and energy balance from the leaf to the canopy level. The sixth chapter discusses the plant mineral nutrition and the numerous ways by which plants cope with low availability of nutrients on the one side and on the other side with toxic concentrations of some metals (e.g., sodium, aluminium, heavy metals) in soil. The seventh chapter is dedicated to growth of cells, individual organs and whole plants as affected by environmental factors and to allocation of resources to storage. In this chapter plant growth regulators are also briefly described. The eighth chapter continues with life cycles (seed dormancy and germination, developmental phases, reproductive phase, and seed dispersal). Toward its close, the book turns to interactions between individual plants and other organisms: surrounding plants, symbiotic and pathogen microorganisms, and herbivores. The last chapter summarize global processes in ecosystems.

The book is well produced. Text is accompanied with 356 illustrations, each chapter has its own numerous list of references. Throughout the text, "boxes" are used to elaborate on specific problems. Also accessory parts such as Index, Glossary, Abbreviations, and Units and conversions are helpful.

The environment changes and degrades largely as a result of human activities. Therefore the appearance of this book is extremely important as it could help to analyze contemporary ecological problems and to predict behaviour of individual plants and ecosystems in future.

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