

Leigh, R.A., Sanders, D. (ed.): **The Plant Vacuole**. - Academic Press, San Diego – London – Boston – New York – Sydney – Tokyo – Toronto 1997. ISBN 0-12-005925-8 (hb), ISBN 0-12-441870-8 (pb). Pp. 463.

The present volume (vol. 25 of the series *Advances in Botanical Research Incorporating Advances in Plant Pathology*) is an excellent and deep review of the contemporary knowledge about the biogenesis, physiology, and functions of plant vacuole. During the last decade, this dominant compartment of majority of differentiated plant cells has turned out to be one of the most important foci in plant molecular and cell biology. I am sure that the book will attract a broad spectrum of molecular plant physiologists and anatomists.

Plant vacuolar compartment is a very variable and heterogeneous multifunctional system of endomembrane subcompartments of different origins. The book is composed of fifteen chapters dealing with different aspects of vacuole multiple functions and approaches of their study. It comprises a detailed review of role of a vacuole during cell senescence as well as during defence mechanisms, which are cell- or tissues-specific. For example, the vacuoles employed for defence or signalling can be expected only in cells that are positioned in strategically favourable positions. Without vacuole, plant cells would be constrained to accumulating only those solutes that are compatible with the effective operation of metabolic processes in the cytoplasm. The presence of a vacuole overcomes these problems by effectively

separating the solutes within it. Therefore, attention is given to solute composition of vacuoles. Interrelations between sucrose metabolism, in both cytoplasm and vacuole, and the metabolism of other vacuolar saccharides and their sequestration against concentration gradients are thoroughly considered. The accumulation of ions in the vacuolar lumen is a central attribute in many of the principal functions of vacuoles. Most obviously, as storage compartments, vacuoles are used as a repository for nutrient ions when these are in ample supply. The problem of storage of ions in vacuole and their transport is discussed in one chapter. At the same time much attention is devoted to the analysis of tonoplast transport systems with the use of patch clamp electrophysiological methods. Importance of tonoplast-localized pyrophosphatase (V-PPase) for proton import into the vacuole along with V-H⁺ATPase was recognized. The next chapter describes the methods used for coupling ratio determination, the experimental studies for both the V-PPase and V-ATPase, and the coupling ratio data by applying them to putative *in vivo* examples of vacuolar energization. The last chapter is devoted to water transport across the tonoplast facilitated by pores or water channels composed of proteins referred to as aquaporins.

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Tuba, Z., Nagy, Z., Szente, K., Raschi, A. (ed.): **Grassland Ecology and Ecophysiology Under Elevated Atmospheric CO₂ and Temperature**. – L. Eötvös University, Department of Plant Taxonomy and Ecology, Budapest 1997. ISSN 0133-6215. 120 pp.

An international ecophysiological workshop dealing with one of the main global problems—steady increase in atmospheric CO₂ concentration and temperature—was held in Budapest within the frame of EURECO '95 on 20-25 August, 1995. Papers presented at the workshop and some invited additional contributions were published in parallel in two forms: (1) as a special issue of a rather unknown scientific journal *Abstracta Botanica* (vol. 21, no. 2, 1997) published in Hungary (its title is misleading because the readers probably suppose that it brings only abstracts, and abstracts are often neglected nowadays); (2) as a separate book (volume 13 of the series *Special Features in Vegetation Science*) published by the Opulus Press in Uppsala (Sweden). This practice is not welcome, especially because the papers will be cited in two forms and probably with different pagination. And thus it only increases the fantastic amount of papers existing in the Universe.

The volume contains (in addition to three forewords) 13 papers, written by scientists from France, Austria, Thailand, Ireland, Finland, the U.K., Italy, Hungary,

Czech Republic, and Belgium. They bring interesting information on the plant-soil and plant-plant-interactions in an atmosphere with elevated CO₂ concentration, and on the role of the mentioned stresses in partitioning of dry matter and energy, in development, structure, and composition of canopies, in growth, nutrient status, and yield of plants, in water use efficiency and other parameters of water relations in plants, in photosystem 2 activity (determined as fluorescence induction parameters) related to CO₂ uptake, in saccharide metabolism, etc. In addition to analysis of canopy structure and dry matter accumulation, methods of growth analysis were often used in these studies. Not only grassland and pasture plants, but also crop plants and even mosses were objects of these studies.

Two of the papers have character of a review; the last paper prepared by the Editors is an overview of the problem of grasslands under elevated air CO₂ concentration (the methodical difficulties and future research needs are also discussed).

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