Schulze, E.-D., Caldwell, M.M. (ed.): **Ecophysiology of Photosynthesis**. - Springer-Verlag, Berlin - Heidelberg - New York 1995. 576 pp.

In a world of increasing atmospheric carbon dioxide, there is intensified interest in the ecophysiology of photosynthesis and increasing attention is being given to carbon exchange and storage in natural ecosystems. We need to know how much photosynthesis of terrestrial and aquatic vegetation will change as global CO_2 increases. The present book review the progress that has been made in understanding photosynthesis ranging from molecular biology to global modelling. It is dedicated to Otto Ludwig Lange on the occasion of his retirement. He carried out pioneer work on gas exchange under field conditions.

The book is divided into five parts. The first part "Molecular and physiological control and limitations" is introduced by two chapters concerning biophysics and biochemistry of photosynthesis on the chloroplast level. Responses to environmental stresses are included. Great attention is paid to the photoinhibition and to the mechanisms that enable to regulate both the interception and the dissipation of light energy. The third chapter is devoted to chlorophyll fluorescence and its application for the assessment of *in vivo* photosynthesis under field conditions. The relationship of photosynthesis to respiration and photorespiration is the main item of chapter four. The fifth chapter is specialized to apoplastic and symplastic proton concentrations. The following three chapters are devoted to impact of photosynthesis on growth, storage and biomass allocation. Transgenic plants seem to be a good tool for solution of special problems. The first two chapters of the second part ("Responses of photosynthesis to environmental factors") deal with the effect of soil moisture and air humidity, the first one paid attention on co-ordination of responses on plant level and to physiological control of water flow through the soil - plant - atmosphere continuum; the second one on the mechanism of direct humidity response on guard cell level. The third chapter describes a method that enable direct observation of stomatal movements and simultaneously the measurement of gas exchange. Carbon gain in relation to water use is the object of the further chapter. The purpose of the following chapter is to show affection of photosynthetic parameters by chilling, frost or heat stresses. The last chapter of this part deals with air pollution. The third part "Plant performance in the field" is focused on diversity of plant kingdom and on adaptation of plants to special environments. Aquatic plants, poikilohydric lichens and bryophytes, understory plants, desert plants, tundra plants as well as parasitic plants are taken into account. The important feature of ecological studies is combination of experimental work with simulation models. The fourth part "Global aspects of photosynthesis" is introduced by the survive of leaf diffusive conductances in the major vegetation types of the globe. It is followed by the chapter concerning predictions and measurements of the maximum photosynthetic rate at the global scale. The third chapter of this part is devoted to remote sensing technique. The fourth chapter tries to answer the question of C_4 pathway evolution. The item of the last part is given by its name: "Perspectives in ecophysiological research of photosynthesis".

The book is well arranged and produced. The text is accompanied by many illustrative figures. It is not only a mirror of the rapidly evolving discipline of ecophysiology, but also a basis for future global climate modelling. With no doubt this book will find its place on bookshelves of many scientists and laboratories.

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