

Baker, N.R. (ed.): **Photosynthesis and the Environment**. - Kluwer Academic Publishers, Dordrecht - Boston - London 1996. ISBN 0-7923-4316-6. 491 pp., USD 292.50.

Fifth volume of the series *Advances in Photosynthesis* (Series Editor: Govindjee) is devoted to physiology and ecology of photosynthesis. Its 20 chapters were written mostly by well-known scientists from all over the world.

First chapter (T.G. Owens) deals with the role of antenna pigment complexes in photosynthesis (light-harvesting, regulation of energy utilization, protection against active oxygen species). Next chapter (D.M. Kramer and A.R. Crofts) is on the control and *in vivo* measurement of photosynthetic electron transfer (chlorophyll fluorescence, thermoluminescence, absorbance, thermal radiometry, blue fluorescence). Regulation of radiant energy utilisation for electron transfer is the next topic (B. Genty and J. Harbinson). Chapter 4 (B. Andersson and J. Barber) is on photoinhibition: photodamage of acceptor and donor sides of photosystem 2 and its reaction centre subunits; also repair of damaged components is modelled and discussed. Production of radicals and dioxygen, primary target sites, scavenging enzymes, and protection from photoinhibition are dealt with in chapter 5 (K. Asada).

Metabolic regulation of photosynthesis by enzymes of Calvin cycle and of sucrose and starch synthesis (including distribution of carbon in plant cells) is dealt with by M. Stitt. Chapter 7 (R.C. Leegood and G.E. Edwards) is on high and low temperature dependence of carbon metabolism and photorespiration. Chapter 8 (J.M. Cheeseman and M. Lexa) explains models of photosynthetic gas exchange (biochemical models, effects of conductances, carboxylation enzymes, primary metabolites, etc.). Biochemical and biophysical aspects of stomata functioning are dealt with by W.H. Outlaw, Jr. *et al.* Chapter 10 (C.J. Pollock and J.F. Ferrar) is on the role of sucrose in source-sink regulations of photosynthesis.

Effects of irradiance and mineral nutrients (mainly nitrogen) on changes in leaf anatomy, gas exchange, conductances, photosystem and carboxylase activities are the next topic (J.R. Evans). Chapter 12 (C.A. Raines and J.C. Lloyd) deals with genetic aspects of environmental stresses (includes experiments with transgenic plants). Photosynthesis under fluctuating irradiance (sunflecks, adaptation mechanisms) is reviewed by R.W. Pearcy *et al.* Drought stress is the next topic (G. Cornic and A. Massacci): it includes stomatal and non-stomatal effects, resistance to drought, changes in photosynthate production and partitioning, control of transpiration and water uptake, etc. Short-term and long-term effects of temperature on photosynthetic electron transport, gas exchange, and production of photosynthates as well as interactions of temperature and irradiance are explained next (S. Falk *et al.*). G. Bowes deals with the effects of CO₂ concentration in air on photosynthesis (with special attention to the increasing CO₂ content in atmosphere). Chapter 17 (R.L. Heath) deals with the effects of ozone on photosynthetic characteristics. The following chapter (A.H. Teramura and L.H. Ziska) deals with the effects of UV-B radiation on pigments, photosystem activities, carboxylases, gas exchange, etc. Chapter 19 (H. Griffiths) deals with the use of stable isotopes (¹³C, ¹⁸O, D) in the evaluation of environmental stresses. Last chapter (by the Editor) overviews some prospects of future research. The results may be used for predictive modelling of global climate change effects on plant production.

The book is supplemented with a detailed subject index, but the authors' index is missing. Its chapters present an up-to-date state of knowledge in the given field. Unfortunately, some important aspects (such as environmental interaction with plant and leaf development) are missing. Nevertheless, this volume (similarly as the preceding ones of this series) belongs to actual basic reference books for photosynthesis research.

Z. ŠESTÁK (*Praha*)