Yunus, M., Pathre, U., Mohanty, P. (ed.): **Probing Photosynthesis. Mechanisms, Regulation and Adaptation.** – Taylor & Francis, London – New York 2000. ISBN 0-748-40821-5. 558 pp., GBP 85.00.

This book is dedicated to P.V. Sane, Indian scientist and former director of the National Botanical Research Institute. As shown by S.K. Sinha in the introductory article, the studies of Sane dealt with various aspects of photosynthesis—biochemical, biophysical, molecular, biological, ultrastructural, *etc.* Five of his papers were published in Photosynthetica. A similar broad scope has the reviewed book: it deals with structural aspects of photosynthesis, biodiversity of metabolism, effects of stresses, and techniques of photosynthesis research. It was prepared by 54 authors from 11 countries (India 18, the U.S.A. 9, Germany 6, the U.K. 5, Canada, Japan and Switzerland 3 each, Australia, Israel and Sweden 2 each, Colombia 1).

Chapter 1 (Govindjee) introduces milestones in photosynthesis research, such as findings on chlorophylls, photosynthetic unit, the Z scheme, structure of thylakoid membrane, bicarbonate effect, oxygen evolution, thermoluminescence, and photophosphorylation. Seven chapters form Part I of the book (Evolution, structure, and function). Chapter 2 (S. Itoh and M. Iwaki), on oxygenic and anoxygenic photosynthetic mechanisms, discusses new findings on chlorophyll *d* and Zn-bacteriochlorophyll *a*. Chapter 3 (S.M. Gómez and P.R. Chitnis) is on light-harvesting antennas, their diversity in various plant types (LHCIIa to e), excitation energy trapping and transfer in photosystems (PS) 1 and 2, *etc.* Chapter 4 (R.J. Berzborn) deals with photophosphorylation at levels of chloroplast, membrane, enzyme, subunit, and amino acids. CF_1CF_0 interactions, new locations of subunits, and their functions are explained in detail. In Chapter 5, G. Hauska and M. Arnold overview new findings in the field of Z-scheme and its individual components. Biogenetic and evolutionary complexity of chloroplast membranes is the next topic (R.G. Herrmann and R.M. Maier) connected with molecular biology and transgenic plants. Chapter 7 (K.A. Åhrling and S. Styring) shows new findings (by EPR spectroscopy) of water-splitting cluster of PS2 that are applied in models.

Seven chapters form also Part 2 (Biodiversity, metabolism and regulation). The first of them is a brief (2 pp.) introduction to this field by D.O. Hall who untimely passed away on 22 August, 1999. The chapter on C_3/C_4 carbon metabolism (R. Singh) shows regulation of carbon reduction cycles by irradiation, transport of intermediates, product formation, leaf anatomy, genes, *etc.* Special chapters (A. Bhagwat; G.F. Wildner) are dedicated to ribulose-1,5-bisphosphate carboxylase/oxygenase, its activation (by CO_2, Mg^{2+}, sugar phosphates, *etc.*) and regulation at the level of gene expression, the role of enzymes and sugar phosphates, *etc.* Chapter 12 (A. Ramachandra Reddy and V.S. Rama Das) deals with CAM photosynthesis: its taxonomy, biochemistry, functions of tonoplast, intermediate plant species, regulation by gene expression, *etc.* Photorespiration and interactions between chloroplasts, mitochondria, and peroxisomes are the next topic (K. Padmasree and A.S. Raghavendra). Chapter 14 (R. Khanna-Chopra) relates photosynthetic activities with crop production.

Part 3 (Stress and adaptation) contains eight chapters. First of them (J.M. Anderson) is on basic strategies of plant adaptation and acclimation, mainly to surplus photons, with feedback mechanisms that regulate expression of genes. Photoinactivation of PS1 and PS2 is the topic of chapter 16 (I. Ohad *et al.*). Chapter 17 (P. Dominy and C. Mullineaux) deals with models of state transitions in cyanobacteria and with changes in photosystems that accompany them. The role of phycobilisomes, studies on mutants and on reorganisation of photosynthetic complexes are included. Chapter 18 (A.K. Tyagi *et al.*) discusses expression of photosynthetic genes regulated by irradiation. Next chapter (A. Ramachandra Reddy and A. Gnanam) is on prospects of photosynthetic productivity in the 21st century, probably affected by CO_2-enriched atmosphere. Chapter 20 (G. Kulandaivelu and K. Lingakumar) deals with targets of UV-B radiation in photosynthetic membranes (PS2, oxygen-evolving complex). I.M. Rao and N. Terry explain photosynthetic adaptations (leaf expansion, dry matter partitioning, stomatal and non-stomatal limitations, structural changes, activities of photosystems and carboxylases, carbon partitioning and export, *etc.*). Chapter 22 (A. Grover) deals with water stress responsive proteins and genes.

The last part is dedicated to techniques of studying photosynthesis. J. Barber and J. Sharma show the applications of mass spectrometry in studies of PS2. In chapter 24, H. Zhang *et al.* explain the use of Fourier transform infrared spectroscopy for examining the structure and function of photosystems and their components. Fluorescence transients used in screening photosynthetic samples are discussed next (R.J. Strasser *et al.*). In chapter 26 S. Malkin describes the use of photoacoustic spectroscopy in photosynthesis research. Last chapter (D.K. McDermitt *et al.*) shows common errors in gas exchange measurements, such as chamber effects, CO_2 leaks, *etc.*

The reviewed book certainly belongs to those that should be on bookshelves of every photosynthesis laboratory: it brings broad information on both theory and research praxis. A fairly large part dealing with modern methods underlines the importance of the book. The reader will certainly appreciate a comprehensive index that combines names of authors and subject items.

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