Frank, H.A., Young, A.J., Britton, G., Cogdell, R.J. (ed.): **The Photochemistry of Carotenoids**. – Kluwer Academic Publishers, Dordrecht – Boston – London 1999. ISBN 0-7923-5942-9. 399 pp., USD 223.00, € 190.50, GBP 139.00 (Hb).

Volume 8 of the well-known series "Advances in Photosynthesis" was edited by four top scientists in this field that work in the U.K. and the U.S.A. Twenty chapters of the book were written by 39 authors: eight chapters were prepared by 15 scientists from the U.S.A., four chapters by 14 scientists from the U.K., and three chapters by four Japanese scientists. Further authors work in Australia, France, Germany, the Netherlands, and Poland.

The chapters are arranged into five parts. Part I is on biosynthetic pathways of carotenoids and their distribution in photosynthetic organisms. Govindjee wrote the introductory chapters dealing with the history of research of carotenoids, the important participants in photosynthetic processes. Their participation in excitation energy transfer and in plant photoprotection is stressed here. Chapter 2 deals with synthesis of carotenoids and their functions in plants; using mutants of *Arabidopsis thaliana* lead to the recent main discoveries. Another often-studied topics are synthesis and functions of carotenoids in photosynthetic bacteria (chapter 3).

Four chapters of part II (Structure of Carotenoid-Chlorophyll Protein Complexes) are mainly based on studies with eukaryotic algae (green algae, diatoms, dinoflagellates, brown algae, prymnesiophytes, *etc*.) and purple bacteria (*Rhodopseudomonas, Rhodobacter*). Light-harvesting complexes, their assembly, arrangement of pigments, role of proteins, energy transfer between carotenoids and chlorophylls, structure of reaction centres, and components of electron transfer chains are the central topics.

Six chapters form part III (Electronic Structure, Stereochemistry, Spectroscopy, Dynamics, and Radicals). Electronic states of carotenoids, functions of *cis-trans* carotenoids, stereochemistry and resonance Raman spectroscopy, electron magnetic resonance, carotenoid radicals and interaction of carotenoids with active oxygen species, and incorporation of carotenoids into reaction centres and light-harvesting pigment-protein complexes are explained here.

The recently very often-studied xanthophyll cycle and its functions in plant physiology and ecology are dealt with in four chapters of part IV. Energy dissipation, antioxidant metabolism, non-photochemical quenching, molecular biology of xanthophyll cycle, enzymes functioning in the cycle, and regulation of photosynthetic processes are the hot topics here. Three chapters of the last part of this book describe mainly model systems. They deal with functions of carotenoids in artificial photosynthesising systems, in the solid state, and in natural and artificial membranes.

The carefully prepared and understandable texts are accompanied with numerous figures and tables. Nine colour plates show structures of pigment light-harvesting and reaction centre complexes, mutant locations and expression, as well as the historical figure representing separation of leaf carotenes and xanthophylls on adsorption chromatographic columns. On this occasion I recalled the classic author of these separations, Harold Strain, a nice and friendly scientists I met years ago both in Prague and the U.S.A.

Each chapter is supplemented with a broad list of references (40 to 206 per chapter). As usual in this book series, a detailed index contains both subject items and scientific names of organisms.

I summarise that this book is again a must for every photosynthesis library.

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