

Raghavendra, A.S. (ed.): **Photosynthesis. A Comprehensive Treatise.** – Cambridge University Press, Cambridge 1998 (first edition), 2000 (paperback edition, with correction). ISBN 0 521 57000 (hardback), 0 521 78444 1 (paperback). Pp. 376, GBP 70.00, USD 115.00 (hardback), GBP 29.95, USD 47.95 (paperback).

Contributed by 44 co-authors, leading and internationally acknowledged persons in photosynthesis research, the book represents superb concise and comprehensive review of contemporary knowledge on molecular biology, biophysics and biochemistry, physiology and ecology of photosynthesis. Photosynthesis was a key evolutionary invention, which formed further development of Earth atmosphere and the whole biosphere. Understanding of the processes underlying light harvesting in thylakoids, primary photochemical events, CO<sub>2</sub> fixation, and related enzymatic cycles in whole variety of their evolutionary alternatives and discovery of the multiple-level regulatory and control mechanisms needs truly interdisciplinary approach. Both the significance and interdisciplinarity in photosynthesis are the reasons why photosynthesis always forms an essential, extensive, and rather difficult-to-understand chapter of every plant physiology textbook. It was the aim of the editor to come with the advanced level and still concise textbook on photosynthesis. After I went thoroughly through the book, I am convinced he succeeded in the difficult task.

The contributions are grouped into four parts each with five to eight chapters. The first part, "Cell and molecular biology of chloroplasts", deals with ultra-structure and development of chloroplasts, light-harvesting complexes of higher plants, structure and function of photosystems 1 and 2, electron transport and energy transduction, import, assembly and degradation of chloroplast proteins, expression and regulation of plastid genes, and chloroplast pigments. The second block of contributions, "Physiology and biochemistry", includes excellent reviews on photosynthetic carbon reduction, C<sub>4</sub>, CAM, and C<sub>3</sub>-C<sub>4</sub> intermediate photosynthesis, starch-

sucrose metabolism and assimilate partitioning, photo-respiration, assimilation of non-saccharide compounds, and interactions of photosynthesis with respiration and nitrogen metabolism.

The third part deals with agronomy and environmental aspects of photosynthesis and crop yield. Basic parameters of crop productivity and concepts of high yielding varieties introduce the series of chapters reviewing plant adaptation mechanisms to important environmental constraints. Water deficiency and salt stress effects on photosynthesis and plant performance introduce the series. In the following, various strategies of perennial and annual plants in avoiding photo-inhibition at low growth temperature are dealt with. Variations in light environment led to adaptations and acclimation ranging from thylakoid to whole plant and canopy levels. So, the factors determining light harvesting in shade- and in sun-acclimated leaves deserve the paid attention. The prospects of photosynthesis and respiration in the higher-CO<sub>2</sub> atmosphere affected by global climate change are treated in the last chapter of the third section.

The last chapters, grouped under the title "Special topics and applications", review state of the art in methodology of photosynthesis research and of plant stress diagnostics (chlorophyll fluorescence measurement, mathematical modelling). Further three chapters deal with evolution of photosynthesis, action of photosynthetic herbicides, and recent applications in biotechnology.

The book represents a unique and successful attempt in offering an up-to-day and comprehensive "digest" of all-important topics in photosynthesis. Excellent for advanced students, lecturers, and researchers!

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