P. Mathis (ed.): **Photosynthesis: from Light to Biosphere.** Vol. 5. - Kluwer Academic Publishers, Dordrecht - Boston - London 1995. 1066 pp. ISBN 0-7923-3861-8.

The book is the last part of voluminous five-volume Proceedings of the Xth International Photosynthesis Congress, which took place in Montpellier, France, 20-25 August 1995.

Volume five consists of six chapters of 24 total. They are numbered from the first volume: 19. Enzymology of the photosynthetic metabolism. 20. Integration of C, N, P, S metabolisms. 21. Intra- and inter-cellular exchanges. 22. CO_2 diffusion and concentration mechanism. 23. Carbon partitioning and productivity. 24. Ecosystems productivity and global aspects.

Large chapter 19 deals with wide range of enzymes connected with photosynthesis and therefore it contains as many as 77 contributions. All aspects of CO_2 fixation enzymes - Rubisco and PEPcarboxylase - were studied. It comprises Rubisco activation, its regulation by different factors, and genetic engineering of this carboxylase. Several articles are devoted to protein phosphorylation through kinases and a regulation of this process. Moreover, studies on antioxidant enzymes, which play an important defensive role, are included in this chapter. Both the transgenic and the mutant plants are useful material in such research area.

Issue of the chapter 20 is mineral metabolism and utilisation in a plant. It consists of 25 articles. Also interaction of carbon and nitrogen metabolism is included. Several contributions focus on relation between the uptake of minerals and other metabolic processes as well as photosynthesis. Biosynthesis and metabolic pathway of aminoacids and other cellular compounds were studied.

Chapter 21 consists of 19 contributions and concerns on intra- and inter cellular exchanges. This represents various transport processes in plant cell and their regulation. For this reason, function of several translocators from different membranes were studied.

Twenty four articles of chapter 22 are devoted to CO_2 as the main substrate for photosynthesis. Some aspects of CO_2 diffusion through stomata, concentrating mechanism and control of this processes are discussed. One of the major enzyme for CO_2 utilisation - carbonic anhydrase - was studied with respect to its purification and characterisation and its activity regulation. Also special mutants were evolved for investigation of the problem of CO_2 uptake. Further, rubisco is concerned on in terms of investigation its substrate specificity in different conditions. Interestingly, gene expression inducible by the low CO_2 was observed and these genes were characterised.

The carbon metabolism within a whole plant is the topic of chapter 23. The assimilate synthesis and its regulation by environmental factors, *e.g.*, irradiance, nutrition and elevated CO_2 are discussed. It continues with carbon partitioning and assimilate transport. These events were frequently studied in plants with CAM and C_4 metabolism. Novel quantitative method for visualization of a spatial distribution of assimilation control in leaf was introduced. This method is based on chlorophyll *a* fluorescence imaging. The chapter consists of 23 contributions.

The very last chapter 24 contains articles deals with general problems as ecosystems and global aspects of photosynthesis. First of all it focuses on effect of rising CO_2 concentration on photosynthesis and on plant capability of acclimation to this condition. Further, annual variation and diurnal fluctuation in photosynthesis and associated metabolism were studied. In this chapter, several methods were developed for measuring of photosynthetic characterisetics of phytoplankton, algea and plants. They are mostly fluorescent methods. Several articles also deal with photoinhibition under special conditions.

Also this part of Congress proceedings contains a lot of valuable information and the most recent results from important fields of photosynthesis research.

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