P. Mathis (ed.): **Photosynthesis: from Light to Biosphere.** Vol. 4. - Kluwer Academic Publisher, Dordrecht - Boston - London 1995. 954 pp. ISBN 0-7923-3860-X.

The book is the fourth part of voluminous five-volume Proceedings of the X$^{th}$ International Photosynthesis Congress, which took place in Montpellier, France, 20-25 August 1995. Volume four consists of only four chapters of 24 total. They are numbered from the first volume: 15 Carotenoids. 16. Photoinhibition and oxidative stress. 17. Water deficiency; salt and chemical stresses. 18. Temperature stress.

Chapter 15 deals with all aspects of carotenoids and consists of 35 contributions. It describes mainly protective role of carotenoids in plant functions but also their biosynthesis. Naturally, the great part of this chapter is devoted to elucidation of xanthophyll cycle mechanism. Consequently, the enzymes in this process were also studied. Apart from higher plants, also other organisms were used in such studies with respect to performance of this cycle. Many contributions touch the topic of the next chapter - effect of high irradiation.

Chapter 16 is devoted to widely studied area - photoinhibition, and therefore contains the largest number of articles, as many as 84. The number of contributions in this chapter reflects the importance and attractivity of this topics. It copes with the adverse effect of high irradiance as well as with the influence of UV-B and UV-A irradiation on photosynthetic apparatus and activities. Also in this chapter the studies on xanthophyll cycle are included. The prevailing method in this field is fluorescence and, naturally, electrophoresis. The most frequently used object is *Synechococcus* and its several mutants. Moreover, the effect of photooxidative stress usually in combination with another stress is presented here. In this case, formation and detoxification of harmful oxygen species were investigated. The valuable tool here are transgenic plants with changed antioxidative enzymes production. There is a suggestion that the photorespiration plays a protective role against photoinhibition.

Chapter 17 consists of 64 contributions and concerns on water, salt and osmotic stresses. The effect of desiccation and of salt stress on photosynthesis and gene expression were frequently investigated. This comprise responses on the leaf and molecular level. The occurrence of a novel drought-induced poplypeptide is compared to protein involved in osmoregulation. There are involved several studies dealing with plant senescence and its influencing by various stresses. As a contribution to chemical stresses, also effect of some heavy metals on photosynthetic parameters were followed in several contributions.

The last chapter 18 is devoted to other type of stress - temperature. That means both low and elevated. The chilling as a cause of oxidative stress and elevated temperature in connection with the global warming are presented. Usually such stress conditions occur together with other stresses, as above mentioned: drought, salinity, and irradiation. An attempt to improve photosynthetic capability was done by means of genetic engineering. Further, there are some articles in this chapter dealing with xanthophyll cycle mainly due to presence of low-temperature photoinhibition. The role of membrane lipid, especially fatty acids, composition on sensitivity and acclimation to chilling was studied. This part contains 40 articles.

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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