

Murata, N. (ed.): **Molecular Mechanisms of Responses of the Photosynthetic Apparatus to the Environment. Vol. I, II, III, IV.** - National Institute of Basic Biology, Okazaki 1997. V + 38 + 658 pp.; V + 38 + 643 pp.; V + 38 + 725 pp.; V + 38 + 699 pp.

The four-year (1992-1995) research project on the topic of this four-volume set was supported by a Grant-in-Aid for Scientific Research on Priority Area No. 04273102 of the Japanese Ministry of Education, Science, and Culture. The research was done by two teams of ten members each and by 31 individual scientists. The results of this project were published in 404 articles in international journals in the years 1992-1997. The majority of the articles (*ca.* 95 %) is reprinted in the reviewed book set.

The research on experimental and stress factors controlling photosynthesis was mostly done on transgenic plants and cyanobacteria. Its main results include production of transgenic organisms tolerant to low or high temperature, high irradiance, salinity, and active oxygen species. Induced modifications comprised mainly membrane lipids, glycinebetaine, activity of photorespiration, heat-shock genes, *etc.* The scientists also isolated and characterised the operons that encode translocation systems for bicarbonate, nitrates, and phosphates. One of the main findings was that the precursor to the D1 protein is active in controlling photoinhibition. They also studied the mechanisms of plant adaptation and acclimation to various environmental factors.

First two volumes (94 and 81 papers) are on the first topic, "Photosynthetic Apparatus and Photooxidative Stress". Volume III contains 53 papers dealing with "High and Low Temperature Stress", and 50 papers on the topic "Salt, Ionic and Drought Stress". Volume IV contains 106 papers on the "Acclimation to Nutrient Supply". Not all papers deal directly with photosynthesis, especially those in Vol. IV, and topics such as pollen physiology were also included. The impact of molecular biology is very high in these volumes. The papers are arranged alphabetically according to the name of the senior author. This arrangement may induce feeling of a large variance of topics, because stress effects on different photosynthetic characteristics determined in photosynthetic bacteria, algae, and higher plants are presented without any further subdivision.

I appreciate much this collection of full papers because it summarises recent results of Japanese colleagues in the very important research field of plant physiology, genetics, and biochemistry. Every researcher of stress physiology and of effects of environmental factors on plants will find here a broad basis for further research.

Z. ŠESTÁK (*Praha*)