

Jennings, R.C., Zucchelli, G., Ghetti, F., Colombetti, G. (ed.): **Light as an Energy Source and Information Carrier in Plant Physiology**. - Plenum Press, New York - London 1996. ISBN 0-306-45383-5. 313 pp., USD 95.00.

A NATO Advanced Study Institute held at Volterra in Italy in autumn of 1994 dealt with various roles of sunlight in plant functions. Main lectures of the meeting are present in the reviewed book.

The introductory part of G. Forti surveys photosynthesis and is focused on the Emerson effect, electron transport chain, photophosphorylation, reaction centres of photosystems, and protection against excessive excitation. Theory of migration of excitation, with examples for chlorophylls and bacteriochlorophylls, is the next topic (A.Y. Borisov). R. Bassi *et al.* present in a fairly long paper the biochemistry and molecular biology of pigment binding proteins that function in photosystems, and their phylogeny. Spectral heterogeneity and energy equilibration in photosystems are reviewed next (R.C. Jennings *et al.*): spectral broadening of absorption bands, their thermal analysis, and energy trapping in photosystem 2. P. Mathis deals with models of photosynthetic reaction centres of purple bacteria and of oxygenic photosynthesis; a list of appropriate methods of study is supplemented. Next chapter (N.R. Baker) deals with photoinhibition: induced energy losses, photodamage of reaction centres (D1 degradation and repair), and photoinhibition in nature. Nonphotochemical quenching of chlorophyll fluorescence is the next topic (P. Horton). The chapter contains a useful table of properties of different types of nonphotochemical quenching, a clear explanation of distribution and role of the xanthophyll cycle, roles of structural change of proteins and minor components of the light-harvesting complex II, and relationships of  $q_E$  and  $q_N$ . J.-M. Briantais explains the regulation of excited states in photosynthesis of higher plants, modulation of the states *in vivo* (by changing energy input, antenna size, environmental conditions, by  $q_T$  and  $q_E$  quenching, by exciton transfer among photosystems, *etc.*). Possible structural and regulatory roles of macrodomains in thylakoid membranes are discussed by G. Garab. Circular dichroism spectra, chirally organised macroaggregates in thylakoid membranes and light-harvesting complexes, reversible rearrangements of thylakoid composition, *etc.* are dealt with here. Effects of UV radiation on photosynthetic systems is the next topic (J.F. Bornman): explained are the perception of UV radiation (also techniques of measurement), responses at the levels of chloroplast composition and mRNA transcription, interactions of induced stress and photosynthetic performance, *etc.* Molecular basis of photoreception is dealt with by F. Lenci *et al.*: they describe photosynthetic and photosensory units and respective pigments (also rhodopsins, flavins, pterins, *etc.*).

Next chapters deal with photomorphogenic systems (W.R. Briggs *et al.*), general principles of photosensing (W. Haupt), energy and signal transducers (D.-P. Häder), and phytochrome mediated signal transduction (D. Sommer and P.-S. Song).

Two chapters deal with the penetration of radiant energy: into canopy of terrestrial ecosystems (M.G. Holmes), into aquatic ecosystems (D.-P. Häder), and into plant tissues (M.G. Holmes). Attention is paid to various wavelength regions. R. Marangoni *et al.* describe photosensory transduction in flagellated algae (functions of eyespot and stigma, role of calcium). Action spectroscopy is the next topic (F. Ghetti and G. Checcucci): it is used for studying *in vivo* absorption properties and primary reactions of photoreceptors. The technique is used in studies of algal phototaxis, UV effects on photosynthetic oxygen production, *etc.*

Next two papers deal with fungi: gene expression (E. Cerdá-Olmedo and L.M. Corrochano), and phototropism (E. Cerdá-Olmedo and V. Martín-Rojas). The closing chapter (W. Haupt) shows on many photobiological examples "what can errors contribute to scientific progress".

The above overview and the brief subject index confirm the importance of the reviewed book for plant photobiologists, especially for those interested in photosynthesis.

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