Yunus, M., Pathre, U., Mohanty, P. (ed.): **Probing Photosynthesis; Mechanisms, Regulation and Adaptation.** - Taylor & Francis, London - New York 2000. 558 pp. GBP 85.00. ISBN 0-7484-0821-5

This book contains some views over one of widely researched and reviewed topic in plant sciences – over photosynhesis. The authors aim to give new insights into this classical theme and also to document that probing for mechanisms, regulation and adaptation of this vital plant process is particularly possible owing to use of a variety of modern experimental tools and techniques. Twenty seven chapters are divided into 4 parts. The contributions are written by both well and less known experts in the field, most of them being from India. The quality of contributions is variable. The volume is provided with a general index, and lists of abbreviations and contributors.

The book is introduced by a preface, foreword, and tribute to P.V. Sane, an Indian scientist engaged in photosynthesis research. Then, the contributions open a paper by Govindjee discussing milestones in photosynthesis research. Chapters 2 to 7 in Part 1 called Evolution, structure and function deal with photosynthesis based on newly found chlorophylls, light-harvesting antennas, photosynthetic ATP synthase, energy transduction in the Z-scheme, chloroplast thylakoid membrane genetics and biogenesis including organelle transformation, and EPR study of the manganese cluster in photosystem 2, respectively. Biodiversity, metabolism and regulation are subjects of 7 chapters in Part 2. They follow C_3/C_4/CAM carbon metabolism and regulation, ecophysiological and molecular strategies for plant survival, activation, regulation and specificity of the key assimilation enzyme ribulose-1,5-bisphosphate carboxylase/oxygenase, and interaction between chloroplasts, mitochondria and peroxisomes during photorespiration. Chapter 14, the last in this part, puts photosynthesis and crop productivity into relation. Part 3 comprises chapters 15 to 22 which are devoted to strategies of photosynthetic adaptations and acclimation to stresses by means of light-regulated expression of photosynthesis-related genes, expression of water stress responsive genes, or state transitions in cyanobacteria. Subsequent chapters deal with other stress-related phenomena like photoinactivation of the 2 photosystems, photosynthetic productivity prospects under CO_2-enriched atmosphere, molecular targets of UV-B radiation in the photosynthetic membranes, and photosynthetic adaptation to nutrient stress. Five chapters in very interesting Part 4 provide details of experimental techniques adopted to apply in photosynthesis research; mass spectrometry to study photosystem 2, Fourier transform infrared spectroscopy to study the structure and function of the photosynthetic apparatus, and the fluorescence transient (fluorescence induction, fluorescence kinetics) as a tool for characterisation of photosynthetic samples. Next chapter notices the photoacoustic effect in leaves, and the last chapter of the volume discusses common errors in gas exchange measurements.

The book will serve researchers in photosynthesis as a useful reference text and a helpful guide for their experiments. Students and course instructors will also find it as a convenient source of knowledge in the fields of plant biochemistry and physiology, biotechnology, functional ecology, and environmental botany.

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