Laisk, A., Oja, V.: **Dynamics of Leaf Photosynthesis. Rapid-Response Measurements and their Interpretations.** (Techniques on Plant Sciences No.1.) - CSIRO Publishing, Collingwood 1998. ISBN 0 643 06378 1. 160 pp.; USD 59.95.

This book has appeared as the first volume of a new series of monographs "Techniques in Plant Sciences", published by CSIRO Publishing. The objective of the founders of the Series, Laurie Martinelli (Publisher) and Barry Osmond (Series Editor), is to publish a series of inexpensive monographs devoted to specific set of techniques and methodological approaches in experimental botany. The book of Agu Laisk and Vello Oja, based on more than 30-year experience of the authors in the methodology of photosynthesis studies, is presented exactly in this style.

The book contains 8 chapters. Conceptual background of fast-response leaf gas exchange measurements is dealt with in the first chapter, including also explanation of physical principles of gas flow. The main topic of the second chapter is focused on measuring kinetics of leaf photosynthesis using rapid-response system. Attention is paid on conditioning of carrier gas (O_2 and CO_2 concentrations, humidity, temperature), design of the leaf chamber, irradiation systems including fibre optics, gas analysis (CO_2, O_2, water vapour), and data logging and processing. Kinetic analyses of leaf photosynthesis in steady-state (calculation of effective CO_2 concentration, effect of stomata distribution, leaf optical properties, CO_2 fluxes and diffusive conductances, *etc.*), and transient phenomena (dark-light induction of photosynthesis, photorespiration, application of fast-response system for kinetic studies of carboxylation and electron transport, *etc.*) are discussed in Chapters 3 and 4. Proton concentration and transport in leaves studied by gas exchange methods are the main topics of the Chapter 5 (CO_2 capacity of leaf as an indicator of the pH in chloroplast stroma, CO_2 titration of leaves). Chapter 6 is devoted to the use of rapid-response gas exchange system for studying chlorophyll fluorescence and photosystem 2 *in vivo* (quantum yield,. rate constants, thermoinhibition and photoinhibition of photosynthesis, non-photochemical excitation quenching, *etc.*). *In vivo* measurement of photosystem 1 using the above system is discussed in the Chapter 7 (electron and excitation budget at photosystem 1, 800 nm absorbance changes, *P*700, quantum yield of photosystem 1, excitation capture efficiency, photosynthesis oscillations, *etc.*). Chapter 8 summarises concluding remarks. The Bibliography presents 221 essential references to the world literature.

It is an advantage of both authors, graduate physicists, that they have worked for several decades in a well-known biological research group in Tartu, Estonia, on problems of canopy functioning and photosynthesis. Therefore, they were able to prepare this unique volume presenting unique gas exchange methods for studying photosynthesis. Although Drs. Martinelli and Osmond assume that "the paperbacks (of the Series) are designed to have a useful working life in the laboratory of about 5–10 years", I am convinced that many ideas, experimental approaches, construction details, and various tools may be live for much longer time, and may serve in constructing sophisticated, commercially unavailable installations. The volume is well produced, carefully edited, and may be recommended as a guide to contemporary techniques which are suited to the graduate students, post-doctoral fellows, or the established researchers. The book is available from: CSIRO Publishing, PO Box 1139, 150 Oxford Street, Collingwood, VIC 3066, Australia. Fax: (+613) 9662 7555; e-mail: sales@publish.csiro.au; internet site: http://www.publish.csiro.au.

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