M.H. Kalaji, V.N. Goltsev, K. Żuk-Golaszewska, M. Zivcak, M. Brestic: **Chlorophyll Fluorescence: Understanding Crop Performance — Basics and Applications**

It is a unique book that aims to show that chlorophyll *a* fluorescence-based methods can serve as easy, quick, noninvasive, and highly sensitive methods for basic research of photosynthesis efficiency, but also for monitoring various crops and ecosystems affected by different environmental factors, for assessments of plant tolerance to various stresses, and nutritional requirements of crops.

The first chapter provides a general review of current knowledge on photosynthesis, particularly, concerning the photosynthetic apparatus involved in the first light phase, when photons are absorbed by photosynthetic pigments, and chlorophyll fluorescence and basic photochemical reactions occur.

The second chapter is devoted to the theory of chlorophyll *a* fluorescence and to methods, techniques, and instruments used for its measurements.

The third chapter describes the relationship between physiological state of the photosynthetic apparatus and chlorophyll fluorescence parameters calculated and analyzed by the JIP (OJIP) test based on the Strasser´s theory of energy flow in thylakoid membranes.

Delayed fluorescence is introduced in detail in the fourth chapter. It can be measured parallelly with fast fluorescence kinetics and provides additional valuable information on PSII photochemistry.

One of the most widely used techniques for chlorophyll fluorescence measurement, pulse-amplitude modulated fluorescence (PAM) method, is described in the extensive fifth chapter. Here, the authors focused also on physiological interpretations of individual parameters, which can be derived from chlorophyll fluorescence measurements, and useful protocols for practical applications.

The sixth chapter contains model applications of chlorophyll fluorescence for assessment of effects of various unfavourable conditions, such as stress by light, temperature, water, flooding, salinity, heavy metals, and availibility of nutrients.

The book provides the necessary background on chlorophyll *a* fluorescence measurements and interpretations of various parameters, which can be used for evaluation of photosynthesis efficiency in different plants and under different environmental conditions. It is designed for beginning researchers, advanced undergraduate students, graduate students, and even research specialists in research on photosynthesis, plant physiology, functional plant biology, biophysics, bioenergy, and biofuel. It is well readable and readers can also find useful protocols for realization of their own research in photosynthesis.

Nevertheless, there are some basic inacurracies, mainly in the first chapter, where photosynthesis is generally described. I would not recommend to students to rely on information concerning namely the dark phase of photosynthesis with incorrect enzyme nomenclature in some cases, wrong products of their reactions, *etc*. Even if this was not the main focus for the authors, it should be better to avoid such errors. The book would deserve a better proofreading to correct various formal problems and typing errors. I see as rather obsolete and distracting to use black-and-white figures in the text and to put all colored figures into one section in the middle of the book.

However, the above mentioned small shortcomings do not render this book worthless to read and possess in a lab library.

HELENA SYNKOVÁ (*Praha*)