

BOOK REVIEW

Chlorophyll *a* Fluorescence: A Signature of Photosynthesis: Edited by: George C Papageorgiou and Govindjee, Published by: Springer, Dordrecht, The Netherlands, 2004; ISBN: 1-4020-32170XHB; Hard Copy: Bound, Page - 818; Price: Euro 240 _(Rs. 14, 000 Approx.)

The tiny little red light emitted from green pigments of plants, algae and cyanobacteria provides huge information on the vital plant processes – from light capture and utilization of quanta in photochemistry to its down-stream processing in carbon and nitrogen assimilation and regulation. Chlorophyll (Chl) fluorescence has had wide applications in plant biology research in recent years, and is used by photosynthesis researchers, crop scientists, ecologists and town planners. Thus, are a large number of books, reviews and circulars appearing regularly on Chl fluorescence from photosynthetic systems. The current volume 19 of AIPH series ‘Chlorophyll *a* fluorescence: A signature of photosynthesis’ edited by Prof. George C Papageorgiou of NRC Demokritos, Greece and Prof. Govindjee of University of Illinois, Urbana, Illinois, USA, two pioneers in this field, is one of the most comprehensive treatises on this subject. The two editors successfully persuaded 54 experts to contribute 31 authoritative chapters on both basic and applied aspects of Chl *a* fluorescence by photosynthetic organisms.

Starting with a bit of basic and history of Chl *a* fluorescence and on the fluorescence characteristics of photosynthesis pigments *in vitro* and *in vivo*, the volume expands into many basic and applied features of Chl *a* fluorescence. Among the basic aspects, the topics like excitation energy migration and energy transfer, trapping of excitation energy in photosystems, and trapping models of photosystem (PS) II include new developments in the area. Also, specific topics such as photon capture by cyanobacteria, PS II Chl *a* fluorescence yield changes under multiple flash-regime as well as the fluorescence of photosystems in the red algae, discussed in this book, are of interest to photosynthetic researchers.

The development of Pulse Amplitude Modulated (PAM) fluorometry has made the Chl *a* fluorescence ‘global’. Analysis of fluorescence fast-transient parameters has provided new dimensions for studies on photophysiological processes in plants. The developments of guidelines on the measurements of Chl *a* fluorescence, as well as new user-friendly equipment have made Chl *a* fluorescence studies a very popular technique in plant research. All these aspects have been vividly described in this volume.

The volume also describes the use of Chl fluorescence in probing photosynthesis performance and plant productivity, in remote sensing as well as metal toxicity and other environmental stresses. Chl fluorescence is used in

transgenic plants as well as state transition mutants. Besides, the book presents the valuable development in Chl *a* fluorescence imaging that has added new dimension to the monitoring power of this technique. Imaging is not only used in indexing the photosynthetic performance of crop plants but also in estimating the exact extent of biotic and abiotic stresses and associated damages to the crop. Chl *a* fluorescence transition has been successfully used in monitoring primary processes in aquatic, marine and wetland ecosystems, and these topics have been adequately discussed in the book. Chl *a* fluorescence signatures, can be studied and measured in a variety of oxygenic photosynthetic organisms as well as at numerous biological diversities.

The major importance of the present volume lies in providing the readers the wide spectrum of use of Chl *a* fluorescence technique and providing considerable guidelines for its numerous applications. The book is, therefore, likely to satisfy both the professional and general readers. It can be used as a reference text for courses in photosynthesis, crop sciences, and stress physiology. Like the previous volumes of the series, the present volume is printed on high quality paper and contains illustrations (graphs, charts and photographs). Although the book is bulky in size and cost, but that should not deter anyone to purchase this volume. The book is a worth addition to the collection for students, faculty and libraries as well.

We hope that the readers would appreciate the efforts that the two editors and international authors (including Prof. Prasanna Mohanty and Dr Manoj Joshi from India) have put in bringing out such a quality publication. The editors and all the contributors deserve appreciation from all of us.

B Vani
Biosciences and Biotechnology, BITS, Pilani, India

Sujata R Mishra
Dept of Molecular Biology, Pusan National University, South Korea

G B Kashpuri
LBG House, Bhubaneswar, India

E mail: photosis@rediffmail.com