Helbling, E.W. Zagarese, H. (ed.): **UV Effects in Aquatic Organisms and Ecosystems.** – Royal Society of Chemistry, Cambridge 2003. ISBN 0-85404-301-2. 575 pp., GBP 169.50 (hardcover).

It is not very often that a single scientific paper opens new field of scientific research, influences everyday life of many people, or leads to large inter-governmental conference. Yet, all this happened following the report on the stratospheric "ozone hole" in 1985 (Farman, J.C. *et al.,* Nature **315**: 207-210, 1985). The hazards of increased ultraviolet radiation (UVR) for life on the Earth received wide media coverage and the information about the state of the ozone layer and UV forecast became routine part of everyday weather reports. The scientific evidence and public pressure forced the governments to sign the Montreal protocol in 1995. This treaty guarantees that major ozone damaging compounds will be phased-out and their production shall stop. Although the emissions of CFC (chlorofluorocarbons) and bromine halons should be decreasing by now, it will take another several decades before they disappear from the atmosphere and the stratospheric ozone layer shall recover to its pre-industrial level. Indeed, this year (2003) the ozone hole over Antarctica has reached the second larges size ever recorded.

As a result of increased interest in UV effects during the last twenty years, the number of scientific studies of the UVR effects on biological systems of varying complexity has multiplied and new concepts have emerged. This is especially true in studies dealing with the aquatic photobiology, where UVR influences complex interactions and feedback loops among individual constituents. Although there are several reviews of individual aspects of UV photobiology of the aquatic environment, they are either outdated or too specialized to critically cover such complex field.

The reviewed book perfectly fills this gap and provides up-to-date critical and summarizing review of UV effects on aquatic organisms and whole ecosystems. The book is the first volume of the new series "Comprehensive Series in Photochemical and Photobiological Sciences" initiated by the European Society of Photobiology, with D. Häder and G. Jori as series editors. The editors of this first volume have selected 31 authors to contribute to 17 chapters of the book. Five thematically related sections cover most aspects of complex interactions of UVR with aquatic environment: from single molecules through bacterial and algal cells to large vertebrates, food webs, and whole ecosystems. It is truly the encyclopedia of the current UV research in the aquatic domain.

The introduction provides an overview of the role of UV in aquatic systems, pointing out the critical role of chromophoric dissolved organic matter (CDOM). The following section, Physics, provides in three chapters in-depth introduction and current state of knowledge about major processes that determine the interaction of the UVR with aquatic organisms. I especially enjoyed chapter that explains how solar UVR interacts with ozone and other constituents of the atmosphere, describes methods for ozone and UV measurements, and discusses recent data in terms of future levels of UVR. Another chapters deal with optical properties of water, with focus on individual compounds that contribute to the absorption and penetration of UVR in water column, and analyze how vertical mixing within the water column influences interaction of the molecules and organisms with UVR. The next section, Chemistry, deals with the photochemistry of the water environment, with emphasis on the direct interaction of the UVR with CDOM and role of UVR in biogeochemical cycles of C, N, S, and trace metals. Two chapters of this section deal with the photoactivated toxicity of several compounds found in the aquatic environment and formation and decay of reactive oxygen species. The section Individual and Sub-individual Effects and Responses is probably of the most interest to the photosynthesis-oriented reader since it contains detailed information about the UV-induced DNA damage and repair, mechanisms of UV photoprotection, and chapter on direct UV effects on aquatic photosynthesis of phytoplankton and benthic micro- and macro-algae. This chapter includes overview of methods used in physiological studies of the UV effects, review of short- and long-term UV effects on photosynthesis of different groups of aquatic photosynthetic organisms, and finally strategies of how cells and plants reduce the UV effects. Included in this section are chapters on UV effects on aquatic metazoans in general and on freshwater vertebrates and behavioral avoidance. The last section of the book deals with UV effects on whole communities and ecosystems, with chapters on species interactions, paleontological evidence for past UV environments, and interaction between UV effects and global climate change. Here, the importance of CDOM surfaces again—since global climate change influences concentration of CDOM in water, this will determine the future UV effects on aquatic ecosystems much more than the predicted changes in ozone layer.

Each chapter is well written, the book is rich in information and contains precise subject index. I found only few drawbacks: several illustrations were apparently produced in colour but finally printed in shades of grey. This has significantly decreased their legibility and value. I also found in several chapters overlapping or repeating information.

Overall, I consider the book to be well balanced and I hope it will appeal both to students and experts. My copy will serve in the course on Aquatic photosynthesis. Let us hope that the coming volumes of this new series will be at least as interesting as the first one.

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