ELSEVIER

Journal of Photochemistry and Photobiology A: Chemistry 136 (2000) 141

Journal of Photochemistry and Photobiology A:Chemistry

www.elsevier.nl/locate/jphotochem

Book review

The Effects of UV Radiation in the Marine Environment By Steven de Mora, IAEA Marine Environment Laboratory, Monaco, Serge Demers, ISMER, Rimouski, Québec and Maria Vernet, University of California at San Diego, Cambridge University Press, 2000, ISBN 0 521 63218 8 (hardback), 324 p., US$ 80, £50

Stratospheric ozone depletion caused by gaseous pollutants of anthropogenic origin result in a global increase in solar short wavelength ultraviolet radiation (UV-B). This development is of major concern to scientists, politicians and the general public since it may affect humans, animals, terrestrial and aquatic ecosystems. The development of the Antarctic ozone hole has attracted considerable interest and research which has subsequently been extended to other threatened marine and freshwater environments.

The volume has evolved from a workshop entitled '*The Effects of UV Radiation on various Ecosystems at Different Latitudes*' held in Ensenada, Mexico, in September 1996. This may be the reason why all of the 11 chapters — with one exception — are written by authors from the Americas, including Canada and South America.

The book provides a comprehensive overview of the effects of enhanced solar UV radiation on aquatic, specifically marine ecosystems. Following the introductory chapter, the second chapter provides an excellent introduction into the penetration of solar radiation through the atmosphere and into the water column, followed by a well written chapter on the spectral weighting functions to quantify the effects of solar UV radiation in marine ecosystems.

While in the beginning of UV effects research, individual organisms and responses were studied, more recently whole ecosystems and their importance for global consequences are considered. Therefore, the marine photochemistry and the carbon cycling is discussed in detail. Considerable space is devoted to discuss the molecular targets of UV radiation in marine organisms as well as their strategies to protect themselves from excessive damage. In addition to phytoplankton, the main biomass producers in the sea, heterotrophic bacterioplankton and viruses are discussed. Also direct and indirect effects on zooplankton and invertebrates and vertebrates are summarized. One obvious omission is a chapter on macroalgae, which are major biomass producers at least in coastal areas. The final chapter discusses the possible implications of UV radiation for the food web structure and the potential consequences on the carbon flow.

One difficulty is the divergent definition of UV-B radiation in different chapters. The wavelength range has been defined as 280–315 nm by C.I.E.; however, several authors still use the 'illegal' definition 280 (or 290)–320 nm. This causes irritations since the wavelength band between 315 and 320 nm provides about the same energy in solar radiation as the band between 280 and 315 nm.

The volume serves as a well balanced review of the major topics and provides a large number of references. It is useful to scientists in the field as well as newcomers to obtain a first overview.

Prof. Donat-P. Häder
Institut für Botanik und Pharmazeutische Biologie
Friedrich-Alexander-Universität
Staudtstr. 5, D-91058 Erlangen
Germany

1010-6030/00/$ – see front matter © 2000 Elsevier Science S.A. All rights reserved.
PII: S1010-6030(00)00314-2