Book reviews

F. L. FIGUEROA, C. JIMÉNEZ, J. L. PÉREZ-LLORÉNS and F. X. NEILL. Underwater Light and Algal Photobiology. Scientia Marina, Volume 60. International Centre for Coastal Resources Research, Carrer Gran Capit s/n, Campus Nord- UPV, 08034 Barcelona, Spain (e-mail: ciirc@etseccpb.upc.es), 1996, 15 000 ptas/$US 110.

This volume is a report on the Second Algal Photobiology Workshop held at Málaga, Spain, in 1994. There are two sections to the book: the first is longer and contains a series of standard-format scientific papers ordered into subject groups called here ‘Chapters’; the second contains a series of short reports on technical workshops and a few papers on related topics. Considerable artistic thought has been given to the production and each section is introduced by a cartoon and one or more poems. Unfortunately for the reviewer and maybe many other readers, the poems and indeed parts of the cartoons are in Spanish.

The six ‘Chapters’ of the book cover underwater light and light absorption by algae, ultraviolet light, carbon assimilation and carbon-concentrating mechanisms, nitrogen metabolism, photoacclimation and photomorphogenesis. It is difficult to present a coherent synthesis of such a wide-ranging volume and, because there are 38 papers, it is also rather invidious to single out a particular author. Contributions are generally of a high standard and there are many nuggets of useful information to be gleaned. A heavy bias towards Spanish authors, presumably because of the location of the meeting, also illustrates how aquatic science has burgeoned in Spain in the last decade. In spite of the preponderance of Spanish authors, there is a wide spread of institutions represented and some authoritative contributions have resulted. The fact that there is a section devoted to the effects of UV is a sign of the times; work on UV is at the crest of one of those waves of concern that regularly wash over science. In recent times we have had eutrophication, then acid rain, followed by global warming and now the ozone layer. Money follows like a tide into a topic area, then, inevitably, out again before the subject is fully resolved. However, the book as a whole has a wide perspective and strikes a nice balance between review papers and the reporting of new work.

The opening paper by Björn on light propagation in biological materials is a very readable summary and a useful student reference point, but perhaps the weightiest contribution is by Talarico who reviews phycobiliproteins and phycobilisomes in red algae. Talarico’s paper is about twice the length of any other in the book and a very informative update on the fascinating architecture of these complex light-gathering mechanisms. There are many other good papers on both macrophyte and microscopic algae, but one point particularly caught my attention. It is often forgotten that, as Jack Talling has remarked, ‘It is a long way from photosynthesis to growth.’ The assumption of the work on photoinhibition sometimes seems to be that photoinhibition is ‘bad’ for a plant. Wilhelm, Bida and Lohr (pp. 249–255) compared Phaeodactylum tricornutum grown under low light (28 µmol m⁻² s⁻¹) with cells under the same light but with additional exposure to light at 1700 µmol m⁻² s⁻¹ or 2400 µmol m⁻² s⁻¹. Although the cells in the high light treatments showed many signs of photoinhibition in their photosynthetic characteristics, their growth rate was unaffected.

The last section of the book reports on three ‘Technical Discussions’ which were held on underwater light measurement and light attenuation by algae, on flow cytometry and on fluorescence measurements. Some things never change – discussions on light measurement have been continuing for years and the lack of calibration of light meters has been a perpetual lament. The problem has been particularly acute with UV light meters, where differences in design characteristics and perhaps calibration resulted in discrepancies of up to 100-fold in the measured irradiance at noon! Other remarks by this working group are worth quoting at length (p. 294):

(1) Because irradiance (vectorial irradiance) is expressed in the same units as fluence rate (scalar irradiance) it is necessary to specify whether irradiance or fluence rate is meant. Thus it is not sufficient to write ‘The plants were exposed to 15 W m⁻² of white light’.

(2) The terms photon flux density (PFD) and photosynthetic photon flux density (PPFD) are often used by researchers on photosynthesis. This is most unfortunate because (a) different people do not mean the same quantity; PFD may be either irradiance or fluence rate, (b) in other areas ‘flux’ implies something expressed per unit area, thus flux density is a tautology. Although the discussion group did not arrive at any single terminology to recommend for future use, there was unanimous condemnation of the term photon flux density.

There was also discussion on the use of the terms ‘dose’ and ‘exposure’ to describe the light experience. Unfortunately, most people felt uncomfortable with the term ‘exposure’ to describe the light experience of a cell although, as Björn pointed out, elsewhere the term ‘dose’
is wisely reserved for the amount of radiation actually absorbed.

There are several helpful indexes at the back of the book as well as a contents page and an address list of contributors. It is maybe a little churlish to mention that there are some rather major typographical errors throughout the book – even on the title page – but it is particularly unfortunate because it gives a false impression of the worth of the contents. This is an excellent book and anyone interested in algae and light will certainly profit from reading it.

Chris Gibson

Department of Agriculture for Northern Ireland
Agricultural and Environmental Science Division
Belfast
Northern Ireland


Some 19 years in preparation, this remarkable work is a welcome and valuable addition to the literature dealing with the Indian Ocean marine algae. The wealth of information contained is best appreciated by surveying the statistics of the volume, by which any standards are staggering. All published records of species and infraspecific taxa from the Indian Ocean are assembled, including some 35 000 records of 3289 accepted names (and probably 3–4 times as many nomenclatural synonyms, taxonomic synonyms and misapplied names).

Of the accepted names, 1323 have type localities in the Indian Ocean. Bibliographic details are given for each name (excluding those deemed to be misapplied), and the resultant bibliography includes over 4000 references. Three new generic names are adopted and new binomials are proposed in 57 genera. Introductory chapters include a foreword by Sylvia Earle, a history of algal exploration in the Indian Ocean, and some explanatory notes regarding the scope and format of the catalogue. Each entry in the catalogue includes nomenclatural information, type locality, Indian Ocean distribution, and a notes section where appropriate. Two appendices cover ‘Excluded Records’ and ‘Taxonomic and Nomenclatural Notes’, the latter by P. C. Silva. Needless to say, this volume is the result of years of dedicated and meticulous research and the authors are to be congratulated for recognizing the need for such a catalogue and their perseverance in completing the task.

With only one figure in 1273 pages, the volume is unlikely to grace any coffee tables – but as a source of taxonomic and nomenclatural information it is without equal. The authors’ experience and impeccable reputations inspire confidence in all nomenclatural decisions and the reader can safely assume accuracy and reliability. It is, however, more than an extensive bibliographic exercise. Whilst the authors have ‘in general…restricted the content of this catalogue to published opinions and records’ (p. 7), they have also consulted the unpublished observations of G. F. Papenfuss and it is apparent that, on rare occasions, they have made taxonomic judgements based on their own experience and not simply relied on the most recent treatment of a particular taxon. I have no problems with that and support their choice to do so. But, whilst nomenclatural proclamations can be justified by reference to the relevant sections of the ICBN, taxonomic judgements are more fluid and inclined to be more controversial. I make this point not to be critical of the volume, but to illustrate to the reader that our understanding of the taxonomy of the marine algae is constantly evolving. It would be tempting to regard this catalogue as the final word, something the authors most surely did not intend. No matter how much we would like it to be, nothing is written in stone (for which we should be grateful). To illustrate this I will use the example of Caulerpa racemosa and its subspecific taxa. Most recent treatments regard Caulerpa peltata as a variety or form of C. racemosa. In the catalogue C. peltata is retained as a distinct species, but includes C. racemosa var. laetevirens as one of its synonyms, based on culture studies that show the two morphological ‘forms’ to be interchangeable under varying light and temperature conditions. In support of this the authors cite Coppejans & Prud’homme van Reine (1992), who came to a similar conclusion based on observations of field-collected material. In the absence of additional studies, Caulerpa racemosa is regarded as distinct from the C. peltata/racemosa var. laetevirens assemblage. Similar culture experiments by Peterson (1972), however, demonstrated a comparable interchangeability between Caulerpa racemosa var. unifera (= ‘var. racemosa’) and C. peltata – this was likewise later supported by the field observations of Coppejans & Meinesz (1988). One could, therefore, equally justify the alternative opinion and regard C. peltata as a form of C. racemosa. Admittedly I have chosen a complex example – the problems of C. racemosa and its bedfellows are far from resolved – and the authors have admitted that theirs is an interim arrangement. It must also be stated that the overwhelming majority of entries in the catalogue are more straightforward. This work represents a summary of the present state of knowledge in an active field of research, and as such it is inevitable that further studies will render some information obsolete. It is therefore pleasing to note that the authors have made a version of the catalogue available on the ‘web’* and that this electronic version is updated as time permits. It must have been a risky step to take – with great potential for reducing sales of the printed

version — but I suspect the authors (and publisher) realize that taxonomists are essentially Luddites who value the ‘feel’ of the printed page as opposed to a computer screen. Have you ever met a taxonomist that is not also a bibliophile? I haven’t.

This volume will be invaluable to all with an interest in marine benthic algae and a desire to apply accurate names. To quote from the catalogue, ‘taxonomy is a synthesis of all previously published data … the older literature may not be ignored. The present catalogue was designed to facilitate the task of integrating the new with the old’ (p. 6). Those of us invested with that task should be eternally grateful to the authors for producing this informative and inspirational volume.

References


JOHN HUISMAN

School of Biological and Environmental Sciences
Murdoch University
Murdoch
Western Australia 6150


The long history of detailed phycological research in Scandinavian countries, especially Sweden, has been a cornerstone of studies in other parts of the world. The present publication capitalizes on this by summarizing published information on the taxonomy and distribution of Scandinavian brown and red algae, back to the time of Linnaeus and up to recently published papers, and also includes information from some exsiccatae.

The short introduction presents the traditional Swedish phycological literature in a charming way and outlines the idea of Svedelius (1920) that arctic species should be particularly well adapted for establishment in the low-salinity Baltic Sea. This idea is followed through the taxonomic part of the book, where asterisks draw special attention to arctic species. The main part is an annotated list of names at the level of species, varieties or forms, arranged as homotypic taxa. Each taxon is indicated by bold italics for the first mentioned name, either the currently accepted name or the most recently published one. This is followed by the basionym and synonyms in alphabetical order. The taxa are listed alphabetically by species arranged systematically in divisions, classes, subclasses, orders, families, subfamilies, tribes and genera. The annotations to each name comprise references with notes on distribution, and in some cases on phenology, culture studies and taxonomy. Annotations to the basionyms include comments on type material such as the type localities and present location of material. The author’s own observations are primarily found as footnotes, but otherwise unpublished information about species distribution and phenology may be placed in other annotations. Most of the footnotes are explanations of genus names with a Greek origin. Others are comments on phenology, taxonomy or nomenclature.

Special attention is given to algae reported from Sweden, so within each family these are mentioned first. Symbols indicate the distribution of these species in eight Swedish districts that differ with respect to salinity and which are depicted on the maps on pp. 230 and 280. The occurrence of each species is indicated by underlining the actual district names.

Following this comes additional species reported from other parts of Scandinavia, and then other ‘utomskandinaviska’ (= North Atlantic) species listed in a table. The 15 new combinations are summarized on p. 276. The short ‘biogeography’ section considers the distribution of selected red algae in the Baltic Sea and discusses Rhodophyte/Phaeophyte ratios from areas in Scandinavia, Greenland, the Arctic, the Antarctic and the Mediterranean Sea, with numbers based on published reports and the author’s own observations. The very long reference list includes recent checklists from this area, but not the very recently published Norwegian catalogue (edited by Brattegard & Holte, 1997).

The main part of the book is in Swedish, with many of the annotations repeating statements from the refereed publications in the original language. In English are a summary of the introduction, the footnotes and the biogeographic part. There is also a ‘Scandinavian–English lexicon’ (pp. 277–279), translating Scandinavian words to English. With this amount of detailed information, the unavoidable printing errors are forgivable, although it is frustrating to see Rhodella/Rhodela on two consecutive lines on p. 8, and the misspelling of Porphyra thuleae (pp. 14 and 15), of Straggularia on pp. 190–191, and of the type species of Kuetzingiella on p. 143. M. Vahl is spelt with a ‘W’ on p. 270. Worse is the omission of one ‘i’ in species names such as Acrochaetium thuretii (p. 23) and Rhodochorton rothii (p. 24), as these names are in agreement with ICBN recommendation 60C 1(b) (Greuter et al., 1994), and therefore cannot be corrected according to article 60.11. The spelling of Choreonema thuretii (p. 36) is the original one but should be standardized to C. thuretii according to article 60.11 and recommendation 60C 1(b), although article 60.3 provides for retention of the original spelling.
Besides offering detailed background for the distribution of Scandinavian and especially Swedish red and brown algae, this book is a very useful tool for the modern taxonomist to trace the old phycological literature and for anyone trying to determine the identity of an unknown red or brown algal specimen. Although it could potentially be a used as a key to obscure synonyms, a name like *Gobia baltica* is virtually impossible to get to except by chance (p. 164). The index contains only currently accepted names of genera, and not even those mentioned in the ‘utomskandinaviska’ tables. It would be of great benefit to have an appendix or second part that contains a detailed index to all the names mentioned. Some comments on the classification system used would also be of interest.

This is probably not the book most of us will read breathlessly from first to last page, but with this enormous amount of information, we will return to it frequently to check the number of taxa described within different groups and to use it as a key for further information. I recommend that this book should be present in the libraries of all botanical institutes and museums.

References


**Ruth Nielsen**

Botanical Museum and Library
University of Copenhagen
Copenhagen
Denmark


The Preface tells us that ‘this volume provides a historical perspective on phycology at the end of the 20th Century as the field becomes transformed to include more experimentalists and becomes more molecularly based’. Appropriately, it was published in the 50th Anniversary year of the publishers, the Phycological Society of America. It includes biographical accounts of 39 deceased distinguished phycologists, the chapters being separately authored and carefully researched. Each concludes with a summary of their Primary Contributions, selected references and additional biographical sources. Although the majority of the phycologists included were North American or European, there are also entries from South Africa, Japan, India, Brazil and the Ukraine. The accounts appear under five headings: I. Microalgal Systematics; II. Macroalgal Systematics; III. Ecology, Hydrobiology and a Collector; IV. Life Histories and Development; V. Cultures, Experiments, and Cell Biology. An Index of Names (of people) completes the volume. The attractive cover is a copy of a watercolour by Lothar Geitler showing the view from his laboratory, looking out on the back of the Vienna Botanical Garden.

I found it a book to dip into, savouring the fascinating vignettes of different lives and times across the world, spanning as it does over a century from the birth of both Setchell and Gardner in 1864 to the deaths of Dixon, Hoshaw, Kornmann and Neushul in 1993. I was impressed by the zeal and dedication with which research and teaching has been undertaken, often against formidable odds. This was especially true during the World Wars, as exemplified by Provasoli’s ‘fire in the belly’ which drove him to distil liquid from specimen jars to provide alcohol for lamps. In addition, phycologists have shown an array of other talents, from Geitler’s creative ability in art and music to Sweeney’s feminist determination to combine a challenging scientific career with raising a family at a time when one was expected to make the choice.

The accounts are both interesting and inspiring and would like to endorse the editors’ suggestion that there may well be room for a second volume along similar lines.

**Linda M. Irvine**

Department of Botany
The Natural History Museum
London
UK