Cryptogamie, Algol., 2006, 27 (1): 103-104

BOOK REVIEW

Antarctic Marine Protists. Edited by Fiona J. Scott and Harvey J. Marchant. *Hobart, Australian Biological Resources Study, Canberra and the Australian Antarctic Division, 2005, vii + 563 pp. (ISBN 0 642 56835 9 Hardback Price: $95 (Australian), price includes postage (surface for overseas orders); Contact: abrs@deh.gov.au).*

The book gathers together select Antarctic marine protists in a taxonomic, floristic text that includes distribution data; anyone hoping for ecological, physiological or cell/molecular information will be disappointed. The editors' definition of "protist" adds two new wrinkles to an already compromised, if not confusing, term. They use the formal Kingdom Protista, which is difficult to justify these days. Like many scientists, they exclude the seaweeds from the protists. Therefore, the microscopic green algae are in the Kingdom Protista, but the green algal seaweeds belong to the Kingdom Plantae - their phylogenetic relatedness is ignored. The first new wrinkle appears when they limit protists to those found only in pelagic waters and sea ice. That is, typical benthic organisms (e.g., attached to rocks or vegetation; on or in sediments) are excluded, but some of the included sea ice organisms like *Gyrosigma* or *Pinnularia* probably also occur in other benthic habitats. The second new wrinkle appears when the editors include the prokaryotic cyanobacterium *Synechococcus* in the Protista. The remaining marine cyanobacteria apparently belong to a different kingdom. Therefore, the book consists of an assemblage of taxonomic descriptions for select microscopic, marine planktonic organisms living in the vicinity of the Antarctic continent. This isn't necessarily a bad approach, but the title is at least partially misleading for the average reader.

The first chapter (H.J. Marchant and F.J. Scott) provides a (new) definition of protists, explains the importance of these organisms, provides a very brief section about sample collection and processing, and ends with a formal classification (e.g., class, order, family) for each species included in the book. The second chapter (F.J. Scott and D.P. Thomas), comprising nearly 200 pages, describes the diatoms (196 taxa). The centric diatoms are presented with the families and genera arranged in alphabetic order, *i.e.*, the organization is not phylogenetic but artificial. The pennates follow, and they are also arranged alphabetically. Each species entry gives a reference to the publication where the nomenclatural type was described; synonyms are included when appropriate. Most, but not all, of the species are illustrated with either light or electron micrographs. The quality of the figures ranges from outstanding to very poor; most are very good.

Chapter three (A. McMinn and F.J. Scott, with Suessiales by P.G. Thomson) describes the dinoflagellates (49 p.). The thecate dinoflagellates are treated much more thoroughly than the nonthecate taxa. The SEM figures are generally of good quality, although the SEM images of *Gymnodinium* spp. are not very informative, a problem exacerbated by the lack of a written description for these species. Seventy taxa are described and an additional twenty-two rarely encountered species are only listed by name. Chapter four (G.M. Hallegraeff) is short, describing three species of *Dictyocha* (silicoflagellates). The haptophytes are covered in two chapters. Chapter five (H.J. Marchant, F.J. Scott, and A.T. Davidson) is on the Prymnesiales (1 *Phaeocystis* sp., 21 *Chrysochromulina* spp.). Figures are mostly good quality, largely TEM images from shadow-cast specimens. Chapter six (C.S. Findlay, J.R. Young, F.J. Scott) is on the Coccolithophorales (20 species, with 29 descriptions). A few taxa are described twice – holococcolth and heterococcolith stages – but in separate sections of the text. The images are mostly good quality SEM micrographs. There is no mention of *Pavlova*, *Isochrysis* and other common haptophyte genera. Chapter seven (H.J. Marchant, F.J. Scott) covers the chrysophytes, but includes only the silica-scaled taxa. Figures are either TEM or SEM images, and quality ranges from excellent to poor. The Parmales are included in the Chrysophyceae, which is probably acceptable since no definitive evidence (e.g., pigments, gene sequences, ultrastructure) is available to establish the phylogenetic place of this order.

More confusing is the classification of the enigmatic *Meringosphaera* in the family Pleurochloridaceae, order Synurales. The Pleurochloridaceae is a family assigned to the Xanthophyceae (possibly the Eustigmatophyceae), but the family has never before been placed in the Synurales. No explanation is given. And, a reviewer always pays special attention to citations of his/her publications. In this chapter, the authors misspell my name and give the year as 1996 – the book was published in 1986 (the same errors occur in the references).

Chapter 8 (H.J. Marchant) covers three prasinophytes (*Pterosperma, Pyramimonas, Mantoniella*). Chapter 9 (F.J. Scott) includes a single chlorophyte (*Polytomella papillata*). Chapter 10 (F.J. Scott and J. van den Hoff) covers two cryptophytes (*Geminigera*, unidentified sp.). Chapter 11 (F.J. Scott) covers four euglenoid taxa, and Chapter 12 (H.J. Marchant) is based upon *Synechococcus*, the only representative of the cyanobacteria. Chapter 13 (H.J. Marchant) covers the choanoflagellates, and it includes 32 taxa. The images are of good quality for choanoflagellates, who are not always photogenic taxa. The ciliates are described in 101 pages of chapter 14 (W. Petz). Unlike the previous chapters, almost all the taxa are illustrated with good quality ink drawings. A few light and electron micrographs are also included. This chapter, like that for the diatoms, describes a rich flora (fauna?) for the Antarctic region. Chapter 15 (F.J. Scott and H.J. Marchant) is titled Protista *incertae sedis*, but the authors then classify the organisms (e.g., Phylum Amoebozoa, Class Lobosea; or Superclass Kinetoplastida; or Phylum Chromista, Subphylum Heterokonta, Class Bicosoecidea). Thus, the authors apparently define "*incertae sedis*" as meaning a catchall group of organisms not covered in other chapters rather than its usual meaning of uncertain position.

The glossary is extensive and good, but the index is limited to taxonomic names. The cover is very beautiful, in my opinion, and the binding seems to be of high quality. Likewise, the paper is good quality, which is especially important for the numerous EM images.

In summary, the book brings together a protistan flora and fauna for the Antarctic region, albeit a biased assemblage. In general terms, organisms are included if they possess a hard covering or scales; organisms lacking features that preserve well are rarely reported. The ciliates are a major exception. In fairness to the contributing authors, it is difficult to collect and preserve naked cells and it is impossible to identify most coccoid picoplankters by microscopy of any type. Given these limitations and biases, the editors have assembled a valuable taxonomic treatment for protists from the Antarctic region that they study.

Robert A. Andersen
Provasoli-Guillard National Center for Culture of Marine Phytoplankton
Bigelow Laboratory for Ocean Sciences
West Boothbay Harbor, ME 04575 USA