

BOOK REVIEWS

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COOKSEY, KEITH E. [ED.]. 1998. **Molecular approaches to the study of the ocean.** Chapman and Hall. xvi + 549 p. US\$213.50 ISBN 0-412-62960-1.

The advent of techniques to sequence, manipulate, and label nucleic acids has revolutionized the study of almost all areas of the biological sciences. Indeed, these days, taxonomy and *Taq* DNA polymerase go hand-in-hand. Application of these techniques to studies of the oceans has shed light on many previously inaccessible subjects. For example, in the last 10 yr they have unequivocally demonstrated the enormous diversity of prokaryotes in the oceans (Giovannoni et al. 1990; DeLong 1992) and definitively established the genetic relatedness of populations and stocks of marine animals (Taylor et al. 1996; Avise 1998). Given the growing importance of molecular techniques to oceanography, this book is a welcome addition to related literature, including books by Kemp et al. (1993) and Hurst et al. (1997). It is largely a collection of substantial papers on molecular approaches in marine science, whereas the other volumes are manuals describing a broad range of methods in aquatic and environmental microbiology, respectively.

Cooksey's book consists of 27 papers that describe various molecular approaches to studying marine microorganisms. Books of this nature are expected to have some variation in the scope of different chapters. Even so, the chapters in this volume are all over the map. Some are broad, give excellent overviews, and provide useful perspectives for upper-level undergraduate or graduate students (e.g., DeLong's chapter on molecular phylogenetics and Geller's on invertebrate biodiversity). At the other end of the spectrum are highly focused chapters that will have limited general appeal (e.g., chapters on molluscan adhesive protein genes and sponge cell culture). Some subjects are dealt with extensively (e.g., molecular phylogenetics, phylogenetic analysis of phytoplankton, macroalgal phylogeny, and phylogeny of planktonic copepods). Others, such as those on marine toxins, lipids in pelagic zooplankton, and viral ecology, have little to do with what would normally be considered molecular approaches. In the Forward it is stated "Thus in this book, the term 'molecular' includes all analyses related to the determination of chemical markers . . ." This definition expands the scope of the book to include a vast array of tools in biochemistry and cell biology, ranging from mass and emission spectrometry to gas and high-pressure liquid chromatography. However, the goal was clearly not to produce a comprehensive volume encompassing such a broad range of approaches, and the book would have benefited from a more narrowly focused effort.

While individual chapters provide important and insightful perspectives, in my opinion the collection does not hang together well as a book. Rather than presenting a synopsis or state-of-the-art summary of molecular approaches for studying marine environments,

this eclectic collection does not target any specific audience, and several molecular approaches that are having a big impact on marine studies are not covered or are mentioned in a cursory way. These include in situ polymerase chain reaction (PCR), real-time PCR, microarrays, and analyses for genetically fingerprinting populations (e.g., analyses based on restriction fragment length polymorphism [RFLP], terminal restriction fragment length polymorphism [TRFLP], and denaturing gradient gel electrophoresis [DGGE] are not covered, but randomly amplified polymorphic DNA [RAPD] analysis is mentioned in the context of phytoplankton). Cooksey stresses that the book's focus is "on organisms near the base of the food web"; this is a pity, because molecular methods have contributed much to our understanding of populations of higher organisms in the sea, and these topics have typically received less attention. Finally, for a book with such a hefty price, it is poorly copyedited; some examples include *Summary* spelled as *Summart* in the Contents, and the author's name being misspelled in the first chapter of the book.

Thus, one may reasonably ask, "Who is this book for?" Because of its steep price, it is unlikely to appear on many private bookshelves. Nevertheless, the wide range of topics covered in the volume (albeit frequently unconnected) will make it a useful addition to institutional libraries that have strong research or teaching programs with a marine emphasis.

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