Book Reviews

Quantitative ecology and marine biology, by G J Bakus
(Oxford & IBH Publ, New Delhi), 1990, pp. ix + 157,
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In recent years, approach to marine community
ecology has become empirical and conceptual.
Terrestrial plant ecologists were the pioneers in the
field of quantitative ecology and the application of
their models in marine ecosystem analyses has thrown
open a vast new field of interest to those marine
biologists who are mathematically oriented. That
interest in this area has been limited among the Indian
marine biologists is perhaps a reflection on the need
for a deeper mathematical understanding by
intending workers. In this context, this book is a
welcome addition to the few existing books in the field
of mathematical ecology.

The contents of the book are organized into 7
chapters covering topics from sampling techniques to
systems analysis. Chapter 1 deals with sampling
techniques used in marine biology. The topic is
especially important because a well designed
sampling methodology is as important as subsequent
analysis of data. However, treatment of the topic has
been shallow in this chapter.

In chapter 2, the author has attempted to describe
the common statistics related to biometrics. The
standard equations presented are simple and easy to
follow. Quantitative ecological techniques are
described in chapter 3. Starting from quadrat size, the
diverse techniques used in quantitative estimations
under various situations have been described. A few
topics (e.g. analysis of life table data, mortality) lack
the detailed treatment they deserve.

Chapter 4 describes the methods for community
analyses, where procedures for detailed analyses are
outlined with the aid of case studies. This chapter is
divided into three sections dealing with types of data,

methods of handling data and measures of similarity and difference.

Multivariate analysis is used very extensively in community studies. Chapter 5 describes the theory and procedures for a few multivariate methods used in ecology. The steps to be followed in principal component analysis are described with the aid of tables and worked out examples.

Time series analysis and frequency analysis are described under the head 'time trend analysis' in chapter 6. Under the former are included techniques for smoothing and serial correlation. The section on frequency analysis (spectral analysis) is too short and inadequate.

The discussion on modelling and system analysis in chapter 7 is limited to an introductory presentation. However, references to available literature and presentation of several examples are helpful tips to interested readers.

The trends in approaches to problems in marine community ecology have been changing in recent years from mathematical theory and modelling to conceptualisation based on innovative experimentation and examination of responses related to habitat variations. Although it may be argued that the book under review does not offer anything new, as a single source work book for beginners with basic statistical exposure, the book serves as a valuable source of ready reference. The author has taken pains to gather available literature on various techniques and analytical models from a wide range of sources and to explain in a language devoid of the mathematical jargon normally associated with such accounts.

The author has stated (in the Preface) that the material for the book has been developed from the teaching materials for graduate study as well as other research and experience sources and was completed as part of a training programme for Indian Scientists. Thus several topics which have considerable scope for detailed treatment have been side-tracked perhaps because they were not relevant to that context. On page 57 the author states that "H' states nothing about species composition" but overlooks the fact that it is advantageous to use H' because it permits the worker to take into account the hierarchial nature of biological classification (e.g. generic and specific segregation) as it is possible to split the diversity measures into as many taxonomic levels as required [see Pielou E C, 1969, *An introduction to mathematical ecology* (John Wiley & Sons Inc.), pp. 286]. The overall presentation and layout are good except perhaps the figures on pages 6 to 17 which are too conspicuous. About 17 references cited in the text have not been listed under Bibliography. Criticisms apart, this book is a useful aid to beginners in marine ecological research.

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