

Preface

Marine microbiology has emerged as one of the most important areas of modern science, and I hope that readers will share a sense of my excitement of learning about new discoveries in this fascinating and fast-moving subject. This book is intended primarily for upper-level undergraduates and graduate students, but I anticipate that it will also prove useful to researchers who are interested in some of the broader aspects and applications outside of their specific area of investigation. University courses often include some element of marine microbiology as a specialist option for oceanography or marine biology majors who have little previous knowledge of microbiology, but marine microbiology is lightly covered in most marine biology textbooks. I hope that this book may play some part in rectifying this deficiency. I also hope that the book will be useful to microbiology majors studying courses in environmental microbiology, who may have little knowledge about ocean processes or the applications of the study of marine microorganisms. I have attempted to make the book sufficiently self-contained to satisfy all of the various potential audiences. Above all, I wanted to create a book that is enjoyable to read, with the overall aim of bringing together an understanding of microbial biology and ecology with consideration of the applications for environmental management, human welfare, health, and economic activity.

As will become evident, many common themes and recurring concepts link the activities, diversity, ecology, and applications of marine microbes. I have attempted to summarize the current state of knowledge about each aspect with extensive cross-linking to other sections. To improve readability, I rarely use references in the main text, but each chapter contains special interest boxes, which contain references to recent research. Short boxes marked with the symbols  or  highlight important questions or interesting facts that supplement the main text. The choice of these topics is entirely my personal whim—they represent subjects that I think are particularly intriguing, exciting, or controversial. The longer *Research Focus Boxes* are intended to be relatively self-contained “mini-essays,” which explore in more detail some topical areas of investigation. Space does not permit exhaustive reviews of these topics, but they may serve as a stimulus for students to follow up some of the original research papers suggested and use these as a starting point for further enquiry. Also included is a glossary of some of the most important key terms.

The great advances in marine microbiology have occurred because of the development and application of innovative new techniques. A basic understanding of the main principles of methodology is essential if the student is to make sense of research findings. Chapter 2 is written in a style that students with limited practical experience can understand, by concentrating on the principles and avoiding too much technical detail, so I implore students to read this chapter right through at an early stage and refer back to it whenever a particular technique is mentioned later.

What's new in this edition? The general aims and structure of the book are similar, but all material has been updated and most sections have been completely rewritten to take account of the many new discoveries in this field since the first edition was published in 2003. I have also tried to incorporate the numerous helpful comments received from students, course leaders, and reviewers. There is more emphasis on the role of microbes in ocean processes and nutrient cycles, new information about the importance of viruses, and expanded coverage of the beneficial role of marine microbes in biotechnology. Despite an exhaustive review process, astute readers may

spot some errors and omissions or have suggestions for improvement. I welcome comments from students and instructors—please e-mail me at c.munn@plymouth.ac.uk.

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