



Environmental Microbiology, Second Edition

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Environmental Microbiology, Second Edition From Academic Press

For microbiology and environmental microbiology courses, this leading textbook builds on the academic success of the previous edition by including a comprehensive and up-to-date discussion of environmental microbiology as a discipline that has grown in scope and interest in recent years. From environmental science and microbial ecology to topics in molecular genetics, this edition relates environmental microbiology to the work of a variety of life science, ecology, and environmental science investigators. The authors and editors have taken the care to highlight links between environmental microbiology and topics important to our changing world such as bioterrorism and national security with sections on practical issues such as bioremediation, waterborne pathogens, microbial risk assessment, and environmental biotechnology.

WHY ADOPT THIS EDITION?

New chapters on:

- Urban Environmental Microbiology
- Bacterial Communities in Natural Ecosystems
- Global Change and Microbial Infectious Disease
- Microorganisms and Bioterrorism
- Extreme Environments (emphasizing the ecology of these environments)
- Aquatic Environments (now devoted to its own chapter- was combined with Extreme Environments)

Updates to Methodologies:

- Nucleic Acid -Based Methods: microarrays, phyloarrays, real-time PCR, metagenomics, and comparative genomics
- Physiological Methods: stable isotope fingerprinting and functional genomics and proteomics-based approaches
- Microscopic Techniques: FISH (fluorescent in situ hybridization) and atomic force microscopy
- Cultural Methods: new approaches to enhanced cultivation of environmental bacteria
- Environmental Sample Collection and Processing: added section on air sampling

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Editorial Review

Review

"This book... provides a good source of reference of many of the important concepts relating to environmental microbiology... It would be a useful text for undergraduate students with interests in this area of microbiology... The information is well written and presented and is supported by good figures and tables, as well as case studies, which are effectively used to highlight particular issues."

- *Microbiology Today*

From the Back Cover

The field of environmental microbiology encompasses aspects of several areas of study, including microbial ecology, molecular genetics, and environmental science. **Environmental Microbiology** is the first book to offer a comprehensive discussion of this field as a discipline, which the authors define as the study of microbial fate and activity in air, water, and soil and the resulting impact on human health and welfare. While the roots of environmental microbiology can be traced to sanitary engineering (water and wastewater treatment), the field has grown to include other practical issues such as bioremediation, the control of known and emerging waterborne pathogens, microbial risk assessment, and environmental biotechnology. Five general areas are emphasized in this text: (i) foundation chapters, (ii) microbial environments, (iii) detection of microbial activity, (iv) the impact of microbial activity on the environment in terms of nutrient cycling and pollutant fate, and (v) detection and control of pathogens in the environment. Designed for courses at senior undergraduate and graduate levels, **Environmental Microbiology** will also serve as an essential reference for environmental microbiologists, microbial ecologists, and environmental engineers, as well as those interested in epidemiology, water and wastewater treatment, and biotechnology.

Among the Highlights of this State-of-the-Art Textbook:

- * Includes foundation chapters for background in biological and earth sciences
- * Covers emerging areas such as transport of microbes and DNA, microbial risk assessment, and use of molecular detection in environmental applications
- * References key or landmark works without interrupting the flow of text
- * Describes the newest analytical and molecular methodologies
- * Contains many detailed, full-color graphics to make the text visually stimulating
- * Presents numerous "case studies" to emphasize relevance to real-life situations
- * Provides study questions at the end of each chapter

About the Author

Dr. Ian Pepper is currently a Professor at the University of Arizona. He is also Director of the University of Arizona, Environmental Research Laboratory (ERL) and the NSF Water and Environmental Technology (WET) Center. Dr. Pepper is an environmental microbiologist specializing in the molecular ecology of the environment. His research has focused on the fate and transport of pathogens in air, water, soils and wastes. His expertise has been recognized by membership on six National Academy of Science Committees and former memberships on an EPA FIFRA Science and Advisory Panel. Dr. Pepper is a Fellow of the American Association for the Advancement of Science, American Academy of Microbiology, the Soil Science Society of America, and the American Society of Agronomy. He is also a Board Certified Environmental Scientist within the American Academy of Environmental Engineers and Scientists. He is the author or co-author of six textbooks; 40 book chapters; and over 180 peer-review journal articles.

Dr. Charles P. Gerba is a Professor at the University of Arizona. He conducts research the transmission of pathogens through the environment. His recent research encompasses the transmission of pathogens by

water, food and fomites; fate of pathogens in land applied wastes; development of new disinfectants; domestic microbiology and microbial risk assessment. He has been an author on more than 500 articles including several books in environmental microbiology and pollution science. He is a fellow of the American Academy of Microbiology and the American Association for the Advancement of Science. In 1998 he received the A. P. Black Award from the American Water Works Association for outstanding contributions to water science and in 1996 he received the McKee medal from the Water Environment Federation for outstanding contributions to groundwater protection. He received the 1999 Award of Excellence in Environmental Health from National Association of County and City Health Officials.

Dr. Terry Gentry is currently an Assistant Professor at Texas A&M University and is also the Director of the Soil and Aquatic Microbiology Laboratory (SAML). He is an environmental microbiologist specializing in the development and use of molecular technologies to enhance the detection and remediation of environmental contamination. This includes the detection and identification of microbial pathogens from animal, human, and natural sources and also the characterization of microbial populations and communities contributing to applied remediation processes such as the bioremediation of organic and metal contaminants. He teaches undergraduate and graduate courses in environmental microbiology and environmental soil science. He is the author or co-author of over 45 peer-reviewed journal articles and 4 book chapters.

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