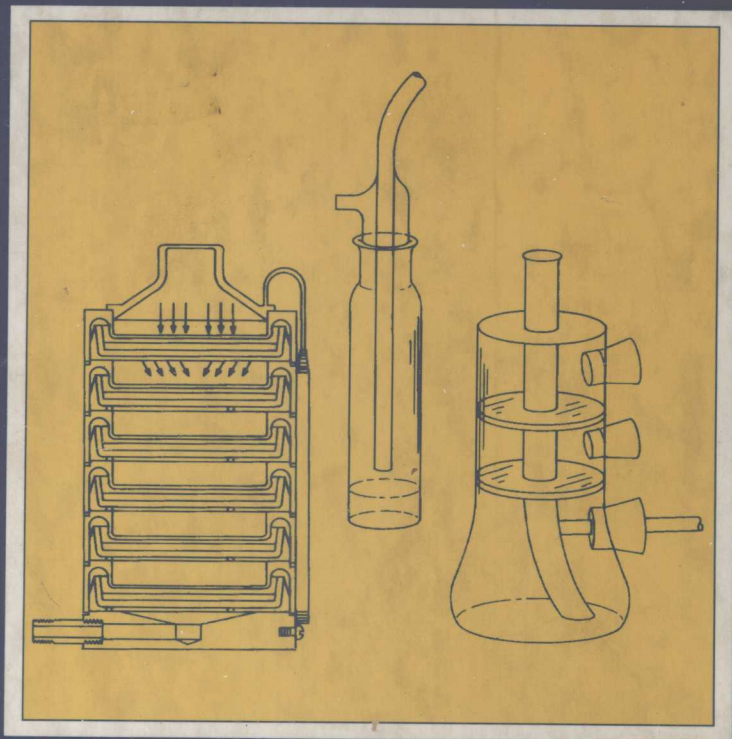


ENVIRONMENTAL BIOTECHNOLOGY

# **MICROBIAL ECOLOGY**

## **Principles, Methods, and Applications**



MORRIS A. LEVIN  
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# Microbial Ecology

Principles, Methods, and Applications

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**McGraw-Hill, Inc.**

New York St. Louis San Francisco Auckland Bogotá  
Caracas Lisbon London Madrid Mexico Milan  
Montreal New Delhi Paris San Juan São Paulo  
Singapore Sydney Tokyo Toronto

Library of Congress Cataloging-in-Publication Data

Microbial ecology : principles, methods, and applications / [edited  
by] Morris A. Levin, Ramon J. Seidler, Marvin Rogul.  
p. cm.—(The McGraw-Hill environmental biotechnology  
series)

Includes index.

ISBN 0-07-037506-2

1. Microbial ecology. I. Levin, Morris A. II. Seidler, Ramon J.  
III. Rogul, Marvin. IV. Series: Environmental biotechnology.

QR100.M516 1992

576'.15—dc20

91-25208

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permission of the publisher.

1 2 3 4 5 6 7 8 9 0 DOC/DOC 9 7 6 5 4 3 2 1

ISBN 0-07-037506-2

*The editing supervisor for this book was Stephen M. Smith and the  
production supervisor was Suzanne W. Babeuf. It was set in Century  
Schoolbook by McGraw-Hill's Professional Book Group composition  
unit.*

*Printed and bound by R. R. Donnelley & Sons Company.*

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# Preface

Elevated expenditures for biotechnology research dealing with environmentally oriented products (e.g., pesticides and waste-treatment products) have resulted in large numbers of petitions for permits and licenses at federal and state regulatory agencies to conduct field tests involving the release of genetically engineered microorganisms. As data bases and other more traditional sources of information are reviewed, it is becoming increasingly apparent to researchers and regulators that ecological measurements and information are the most essential elements in assessing the risks of such releases.

Frustration and difficulties in finding this material have served to sensitize investigators and government officials to the need for a repository of factual information and current methodology in microbial ecology. This book represents a response by microbiologists and allied scientists to bring this knowledge together in a guide to researchers and regulators alike.

The text compiles, describes, and references procedures and concepts being used by environmental scientists in microbial ecology. The need for specific, reliable, and effective methods is essential to the development of protocols for evaluating releases of microbial pest control agents and other environmental applications of either naturally occurring or genetically altered microorganisms.

An advisory group consisting of representatives from the biotechnology scientific community, federal agencies involved in regulating biotechnology products, and public interest groups helped formulate the boundaries of this book, establish its organization, and select the experts who would be responsible for overseeing each of its six parts. The editors wish to acknowledge the many valuable contributions of the advisory group, which consisted of Dr. Mary Ann Danello (Food and Drug Administration), Dr. Robert Frederick and Dr. Elizabeth Milewski (EPA), Dr. Mary Gant (Executive Office of the President; OSTP), Dr. Doug McCormick (*Bio/Technology*), Dr. Margaret Mellon (Environmental Law Institute), and Dr. Richard Parry, Jr. (USDA). The editors, in addition, wish to gratefully acknowledge the financial support of the EPA's Office of Research and Development. However, this book does not represent the official position or opinion

of the U.S. Environmental Protection Agency or any agency with which a contributing author may be affiliated.

The selection of part coordinators was especially difficult since there are many persons who have made major contributions to the field of microbial and molecular ecology. The efforts of these coordinators in selecting chapter authors and reviewing the chapters were instrumental in the successful completion of this project.

Finally, the editors thank Dr. Edwin L. Schmidt, Dr. M. J. Sadonsky, and Dr. B. K. Kinkle, who reviewed the entire manuscript and provided many constructive comments to individual authors and part coordinators. Their efforts significantly improved the quality of individual chapters and the overall content of the end product.

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Ramon J. Seidler  
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# Contents

Contributors	xxiii
Preface	xxvii

Introduction	1
Background	2
Data Quality	4
Importance of Quality Assurance and Control	4
Implementation of Quality Assurance Procedures	5
Recording Activities	5
Quality Control	6
Organization of This Book	6
References	8

## Part 1 Detection, Identification, Classification, and Enumeration

Chapter 1. Overview: Historical Perspective, Present Status, and Future Directions	11
Introduction	11
Available Methods	12
Ideal Methods	13
Comparison of Methods	14
Cultural: <i>Escherichia coli</i> As an Example	14
Heterotrophic Bacteria	16
Application of Methods	19
Actinomycetes As a Prototype	20
Conclusions	24
References	25

Chapter 2. Detection and Enumeration of Microorganisms Based upon Phenotype	29
Detection and Enumeration of Viable Microorganisms	30
Sampling and Processing	31
Viable Plating Procedures	32
MPN Method	35

Genetically Engineered Markers	37
Pigmentation and Bioluminescence	37
Antibiotic Resistance and Heavy Metal Tolerance	38
Substrate Utilization	39
References	41
 <b>Chapter 3. Immunological Techniques for Detection, Identification, and Enumeration of Microorganisms in the Environment</b>	 45
Introduction	45
Immunoglobulins	46
Antigenic Stimulation of Antibodies	46
Immunoglobulin Molecules	46
Affinity of Antibodies to Antigens	47
Microbial Antigens	47
Microbes in the Environment	47
Electrophoresis	48
Monoclonal versus Polyclonal Antibodies	49
Animal Responses	50
Monoclonal Antibody Production	52
ELISA	53
Fusion Procedure	54
Intrasplenic Immunization	55
Commercial or University Biotechnology Centers As Producers of Antibodies	55
Antibody Standardization and Purification	55
Adsorbed Polyclonal Antiserum	55
Purification of Antibodies	56
Testing Whether Monoclonal Antibodies Recognize the Same Antigenic Site	56
Selected Assays	57
Immunofluorescence	57
ELISA	58
Precipitation and Agglutination Tests	58
Dot-Immunoblot Tests	59
Immunomagnetic Particles to Extract Bacteria from Mixed Cultures	59
References	60
 <b>Chapter 4. Nucleic Acid Hybridization Techniques for Detection, Identification, and Enumeration of Microorganisms in the Environment</b>	 65
Introduction	65
General Principles	66
Strategies for Probe Construction	70
Total Genomic DNA	70
Cloned Restriction Fragments	71
Synthetic Oligodeoxynucleotide Probes	72
Labeling Techniques and Hybridization Formats	73
The Mixed-Phase Format	74
Radioactive Labels	76

Nonradioactive Labels and Alternative Formats	80
Polymerase Chain Reaction	82
Recovery of Nucleic Acids from Environmental Samples	83
Soil and Sediment	84
Water	85
References	86
 <b>Chapter 5. Microscopy Applications for Analysis of Environmental Samples</b>	 93
Introduction	93
Morphology-Based Identification	93
Epifluorescent Microscopy	95
Total Count	95
Viable Cell Detection and Enumeration	99
Image Analysis	103
Fluorescent Antibody Microscopy	103
Electron Microscopy	105
Summary	106
References	107
 <b>Chapter 6. Application of Numerical Taxonomy in Microbial Ecology</b>	 113
Introduction	113
Data Acquisition and Preparation	114
Manual Input of Data	115
Automated Acquisition of Data	116
Output Format	116
Data Preparation	116
Clustering Models	117
Choice of OTVs and Attributes	117
Measure of Resemblance between Pairs of OTVs	118
Methods of Cluster Formation	119
Portraying Results of Clustering Techniques	120
Statistical Packages Available	125
Effect of Choice of Clustering Techniques on Classifications	125
Validation of Classifications	125
Identification Models	129
Identification Models for Binary Data	129
Identification Models for Continuous Data	131
Criteria for Acceptability of Identification	131
Additional Testing	132
Software Available for Identification	132
Assessment of Performance of Identification Systems	133
Commercial Identification Systems	133
Conclusions	134
References	135

## Part 2 Genetic Transfer and Stability

<b>Chapter 7. Overview: Methods for the Evaluation of Genetic Transport and Stability in the Environment</b>	<b>141</b>
Introduction	141
Background Development, Significance, History: Mechanisms of Gene Transfer in Bacteria	142
General Characteristics of Methods to Be Covered	144
Phase 1: Idealized Laboratory Studies for the Determination of Maximal Potentials	144
Phase 2: Laboratory Simulations—Microcosm Studies	144
Phase 3: Environmental Studies	145
Environmental Implications and Considerations	145
Cell Concentration and Probability of Association	146
Temperature	146
Particulate Matter	147
Barriers to the Entry of DNA into the Recipient Cell	147
Restriction—Modification	148
Incompatibility	149
Superinfection Immunity	149
Fertility Inhibition	150
DNA Replication Compatibility	150
Recombination	150
Consideration of Potentials for Gene Expression	151
Other Factors That May Affect Gene Stability	152
Mutation	152
Transposition	153
Conclusions	154
Overview of Part 2	154
References	155
 <b>Chapter 8. Assessment of Genetic Stability</b>	 <b>161</b>
Introduction	161
Principles	162
Current Practices and Trends	163
Monitoring Gene Presence	163
Introduction of Monitoring Element	166
Methods	167
Chromosomal Insertion Procedures	167
Verification of Recipient Strain Identity-Integrity	172
Gene Insertion Verification	175
Insert Purity	175
Insert Stability	176
Summary and Conclusions	177
References	179

<b>Chapter 9. Relative Fitness: Its Estimation and Its Significance for Environmental Applications of Microorganisms</b>	<b>183</b>
Introduction	183
Definitions and Principles	185
Specific Methods	187
Assumptions	192
Summary and Conclusions	196
References	198
<b>Chapter 10. Analysis of Conjugation in Bacteria</b>	<b>199</b>
Introduction and History	199
Introduction	199
History	199
General Considerations	208
Gram-Negative Organisms	209
Gram-Positive Organisms	212
Mobilization	213
Biological-Environmental Parameters	213
Specific Procedures	216
Liquid Matings	216
Surface Matings	217
Plate Matings	217
Qualitative Methods	218
Transiently Heterozygous Donor Strains	219
Summary and Conclusions	219
References	220
<b>Chapter 11. Methods for Evaluating Transduction: An Overview with Environmental Considerations</b>	<b>229</b>
Introduction: A Historical View of Transduction	229
Principles	230
Lysogeny	230
Generalized Transduction	231
Cotransduction	232
Specialized Transduction	232
Diversity of Transduction As a Mechanism of Gene Transfer in Bacteria	232
Methods	233
Enumeration of Phage	233
Isolation of Bacteriophage from Nature	233
Induction of Lysogens	240
A General Method for Transductional Analysis	241
Variables to Be Considered in Designing a Specific Transduction Assay	243
Conclusions	245
References	246



<b>Chapter 12. Natural Transformation and Its Potential for Gene Transfer in the Environment</b>	<b>253</b>
Historical Perspectives and Introduction	254
Mechanism of Natural Transformation	258
Development of Competence	259
DNA Binding	261
DNA Uptake	262
Recombination	263
Current Practices	266
Trends in Natural Transformation	270
Specific Methods for Measuring Environmental Transformation—	
Strain-Specific Assays	272
Selection of Chromosomal Antibiotic Resistance Mutations in Bacteria	273
Juni Lysis Procedure	274
Preparation of Purified DNA	274
Determining DNA Concentration	274
Plate Transformation Method (Qualitative Assay)	275
Filter Transformation Assay (Quantitative Assay)	276
Generic Transformation Screen Using Multimeric Plasmid DNA	276
References	278
 <b>Chapter 13. Evaluating the Potential for Genetic Exchange in Natural Freshwater Environments</b>	 <b>283</b>
Introduction	283
Principles	285
Establishing Model Systems	285
Test Systems In Situ	289
Enumeration of Recombinant Organisms	291
Effect of Environmental Parameters	296
Methods	297
Conjugation in Fresh Water	297
Transduction in Fresh Water	300
Transformation in a Freshwater Environment	306
Conclusion	306
References	306
 <b>Chapter 14. Measurement of Conjugal Gene Transfer in Terrestrial Ecosystems</b>	 <b>311</b>
Introduction and Historical Perspective	311
Current Practices	312
Specific Methods to Evaluate Conjugal DNA Transfer	314
Laboratory Techniques	314
Soil Slurries	316
Terrestrial Microcosms	317
Summary and Conclusion	324
References	325