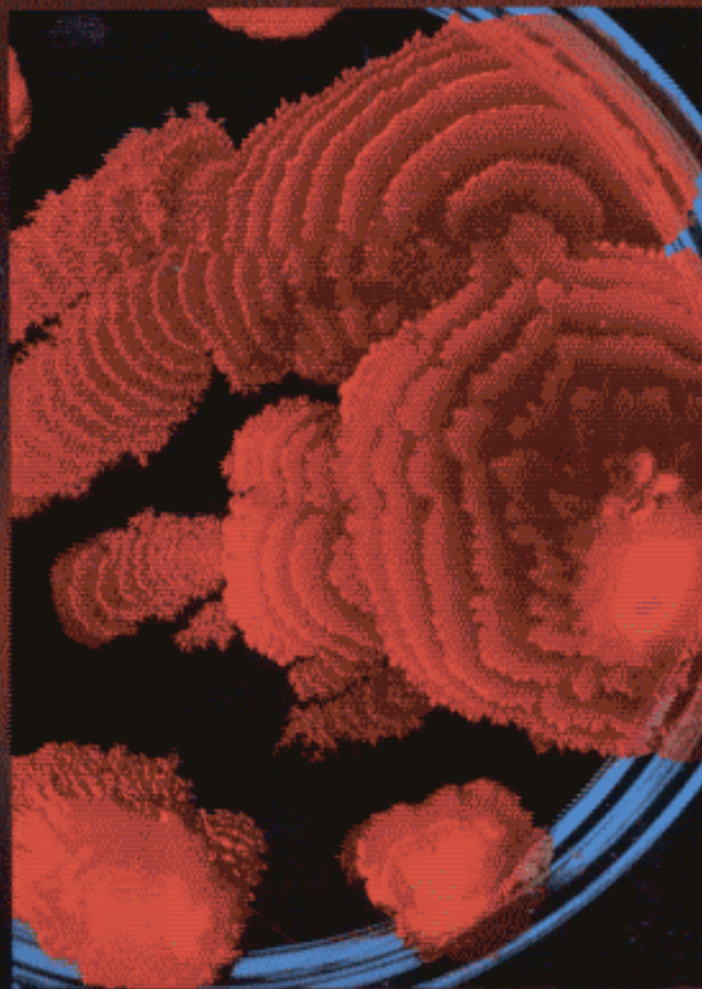


Eighth Edition

Microbiological Applications

Laboratory Manual in General Microbiology



Benson

SHORT VERSION

Contents

Preface	v
Laboratory Protocol	vii
PART 1	
Microscopy	
1. Brightfield Microscopy	3
2. Darkfield Microscopy	9
3. Phase-Contrast Microscopy	11
4. Microscopic Measurements	17
PART 2	
Survey of Microorganisms	
5. Protozoa, Algae, and Cyanobacteria	22
6. Microscopic Invertebrates	31
7. Aseptic Technique	35
8. The Bacteria	42
9. The Fungi: Yeasts and Molds	44
PART 3	
Microscope Slide Techniques	
10. Negative Staining	52
11. Smear Preparation	54
12. Simple Staining	58
13. Capsular Staining	59
14. Gram Staining	60
15. Spore Staining: Two Methods	63
16. Acid-Fast Staining: Ziehl-Neelsen Method	65
17. Motility Determination	66
PART 4	
Culture Methods	
18. Culture Media Preparation	70
19. Pure Culture Techniques	76
20. Cultivation of Anaerobes	83
21. Bacterial Population Counts	87
22. Slide Culture: Molds	93
23. Slide Culture: Autotrophs	97
24. Bacteriophage: Isolation and Culture	98
PART 5	
Environmental Influences and Control of Microbial Growth	
25. Temperature: Effects on Growth	104
26. Temperature: Lethal Effects	106
27. pH and Microbial Growth	108
28. Osmotic Pressure and Bacterial Growth	109
29. Ultraviolet Light: Lethal Effects	110
30. Evaluation of Disinfectants: The Use-Dilution Method	112
31. Evaluation of Antiseptics: The Filter Paper Disk Method	114
32. Evaluation of Alcohol: Its Effectiveness as a Skin Degerming Agent	116
33. Antimicrobial Sensitivity Testing: The Kirby-Bauer Method	118
34. Oligodynamic Action	121
35. Bacterial Mutagenicity and Carcinogenesis: The Ames Test	122
36. Effectiveness of Hand Scrubbing	125
PART 6	
Identification of Unknown Bacteria	
37. Preparation and Care of Stock Cultures	130
38. Morphological Study of Unknown	132
39. Cultural Characteristics	135
40. Physiological Characteristics: Oxidation and Fermentation Tests	139
41. Physiological Characteristics: Hydrolytic Reactions	148
42. Physiological Characteristics: Miscellaneous Tests	152
43. Use of <i>Bergey's Manual</i> and <i>Identibacter Interactus</i>	155
PART 7	
Miniaturized Multitest Systems	
44. Enterobacteriaceae Identification: The API 20E System	163
45. Enterobacteriaceae Identification: The Enterotube II System	167
46. O/F Gram-Negative Rods Identification: The Oxi/Ferm Tube II System	172
47. Staphylococcus Identification: The API Staph-Ident System	176
PART 8	
Microbiology of Water, Food, and Milk	
48. Bacteriological Examination of Water: Qualitative Tests	180
49. Bacteriological Examination of Water: The Membrane Filter Method	184
50. Standard Plate Count of Milk	186
51. Microbiology of Yogurt Production	187

Contents

52. Microbiology of Alcohol Fermentation 189
53. Bacterial Counts of Foods 191

PART 9

Medical Microbiology and Immunology

54. A Synthetic Epidemic 194
55. The Staphylococci:
Isolation and Identification 197
56. The Streptococci: Isolation and Identification 202
57. Gram-Negative Intestinal Pathogens 210
58. Urinary Tract Pathogens 214
59. Slide Agglutination: Serological Typing 219
60. Slide Agglutination (Latex) Test:
For *S. aureus* Identification 221
61. Tube Agglutination Test:
The Heterophile Antibody Test 223
62. Tube Agglutination: The Widal Test 225

63. Phage Typing 227
64. White Blood Cell Study:
The Differential WBC Count 228
65. Blood Grouping 232
66. The Snyder Caries Susceptibility Test 235

- Laboratory Reports 237
Descriptive Charts 326
Appendix A Tables 333
Appendix B Indicators, Stains, Reagents 341
Appendix C Media 345
Appendix D Identification Charts 349
Appendix E The Streptococci 359
Appendix F *Identibacter interactus* 363
Reading References 377
Index 379