



Agricultural Microbiology

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R. P. Pareek
Navneet Pareek

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The Authors



Dr. R.P. Pareek, Emeritus Professor, has about forty years' experience of research and teaching undergraduate and post graduate students at various universities. He had guided about twenty M.Sc.(Ag) and Ph.D. students for their theses research.

Dr. Pareek did his graduation in Agriculture from S.K.N. College of Agriculture, Jobner, Rajasthan securing 8th place among top ten students. He earned his Master's (1968) and Doctorate (1972) Degrees from Indian Agricultural Research Institute (IARI), New Delhi in Microbiology. He is a gold medalist in his Master's Program.

Dr. Pareek had his first appointment (1972) as Assistant Soil Microbiologist at Punjab Agricultural University, Ludhiana, Punjab. He shifted to G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand (1977) as Sr. Research Officer and later became Professor of Soil Microbiology in 1987. His area of research all through was biological nitrogen fixation. He was Visiting Scientist at International Rice Research Institute, Los Banos, Laguna, Philippines from 1987 to 1989.

After superannuation in June 2003, he was granted Scientist Emeritus with a research project on biofertilizer production by ICAR. However, he preferred to join Birla Institute of Scientific Research (BISR) at Jaipur, Rajasthan as Principal Project Scientist with a research project financed by Department of Biotechnology, Govt. of India. He was with BISR till 2008. Dr. Pareek also has an experience of teaching UG, PG and research scholars at some private universities.



Navneet Pareek presently holding a post of Professor and Group Leader, Soil Quality Consortium in the Department of Soil Science at G.B. Pant University of Agriculture and Technology, Pantnagar, US Nagar, Uttarakhand, India. He was first appointed in 2001 as Assistant Professor in the Division of Soil Science and Agricultural Chemistry at Shere-E-Kashmir University of Agricultural Science and Technology of Jammu, Jammu. He is engaged in teaching and has about 18 years experience of teaching students in the universities. Presently he is teaching various Under Graduate and Post Graduate courses in Soil Science and Soil Microbiology. He is guiding

research scholars of Master's and Doctoral programmes and also advising under graduates. He has guided about 05 M.Sc. (Ag) and 02 Ph.D. students till date.

His research pertains to increasing efficiency of biofertilizers of various useful soil microorganisms, namely, rhizobia and plant growth promoting rhizospheric microorganisms (PGPRM). He is also involved to seek the role of PGPRs particularly in diseases suppression. He is associated with many projects related to the nutrient management for hill and plains. Apart from teaching, right now his whole time associated with All India Coordinated Research Project (AICRP) on Pulses Improvement, a national research project having centers at different Agricultural Universities, and working on harnessing the potential of rhizospheric microorganisms including rhizobia of grain legumes. He is also associated in AICRP on LTFE (Long Term Fertilizer Experiments) in the university.

He has published more than 40 peer reviewed papers in Journals of national and international repute in the field of soil and microbiology. He has written 13 book chapters, 03 technical bulletin and many popular scientific articles for the magazines related to agriculture field.

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**R.P. Pareek
Navneet Pareek**



Published by

SCIENTIFIC PUBLISHERS (INDIA)

Jodhpur –

5 A, New Pali Road

P.O. Box 91

Jodhpur - 342 001 INDIA

Correct citation-

Pareek, R.P. and Pareek, Navneet 2019. Agricultural Microbiology. Publisher Scientific Publishers (India), Pp. 418.

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ISBN: 978-93-86652-28-7

eISBN: 978-93-88043-02-1

Visit the Scientific Publishers (India) website at

<http://www.scientificpub.com>

Printed in India

PREFACE

Agriculture as a subject or discipline is quite interesting. It mainly deals with farming. A student of agriculture needs the knowledge of many disciplines. Agricultural Microbiology is one of those disciplines. It is basically Soil microbiology which is an applied science interwoven with the threads of microbiology and soil science disciplines. In agriculture there is an involvement of crop plants, soil and microorganisms. Microbes live with plants even after their death in soil and decompose them to release nutrients and synthesize soil organic matter. Though Agricultural microbiology is a small component of Agriculture discipline, yet microorganisms play pivotal roles such as release of nutrients from organic and inorganic fraction of soil and nitrogen fixation.

While teaching the course of Agricultural microbiology the authors observed that there is need of a book containing the subject matter which could be easily understood and assimilated by undergraduate students. Though there are books available on the subject but they are not meant only for undergraduate students. The book exclusively covers course content recommended by Deans' Committee of ICAR. The book has five sections dealing with basics of microorganisms, soil biota and their ecology, geobiochemical cycles, exploitation of agriculturally useful microorganisms, food and water microbiology. The authors have tried to be brief, to the point and make the subject interesting and palatable. It has been tried to keep language simple and easy to assimilate.

Large numbers of books, reviews and websites have been consulted in writing the book. Authors of the book are grateful to those authors whose materials have been consulted. We are highly thankful and sincerely acknowledge the websites from where we copied diagrams. The personal help rendered in reading the manuscript and extending suggestions by Dr. M.C. Bardiya and Dr. K.C. Khandelwal is highly appreciated and we gratefully acknowledge their help.

Authors

CONTENTS

INTRODUCTION

1. Agricultural Microbiology and Scope	1-6
Importance of microorganisms	1
Branches of microbiology	2
Importance of agricultural microbiology	4
Commercialization of agriculturally useful microorganisms	5
Scope of agricultural microbiology	5
2. History of Microbiology	7-22
Historical events in development of microbiology	7
Theory of spontaneous generation of life	7
Germ theory of diseases	8
Development of microbiological techniques	9
Protection against infection-immunity	10
Development of industrial microbiology	11
Development of plant pathology	11
Development of agricultural microbiology	14
History of development of agricultural microbiology in India	19
Development of microbial inoculants	20
Coordinated projects and development of agricultural microbiology	21

BASICS OF MICROBIOLOGY

3. Microbial Cell: Constituents and Composition	25-41
Origin of life on the Earth	26
Phylogenetic classification	27
Domains	28
Prokaryotic Cell	30
Eukaryotic Cell	35

Cytoplasmic organelles	37
4. Prokaryotic Cell Metabolism	42-61
Microbial classification based on source of nutrition	42
Catabolism: Generation of energy and reducing power	44
Anabolism: Biosynthetic Reactions and Use of Energy	55
Enzymes	57
Regulation of enzyme synthesis and activity	59
5. Nutrition, Growth and Culturing Microorganisms	62-77
Mineral nutrients	63
Organic nutrients	66
Growth factors	67
Microbial growth	68
Bacterial growth parameters	68
Growth phases	70
Measurement of microbial growth	71
Culturing microorganisms	72
Culturing methods	74
6. Genetics of Prokaryotes	78-98
Terminology used in microbial genetics	79
Down flow of genetic information (central dogma)	79
DNA replication in prokaryotes	80
Gene expression in prokaryotes (Process of protein synthesis)	81
Mechanisms of genetic variation in prokaryotes	87
DNA repair mechanisms	90
Bacterial plasmids and episomes	90
Genetic recombination	90
Genetic engineering	95
Application of microbial genetic engineering	96
7. Bacteriophages	99-105
Morphology of viruses	99
Bacteriophages	100
Mechanism of infection	102
Attachment	102
Penetration and injection of nucleic acid	102

Life cycle of lytic (virulent) phage	102
Life cycle of alytic (avirulent or temperate) phage	103
Beneficial uses of bacteriophages	104

SOIL BIOTA AND THEIR ECOLOGY

8. Soil: A Habitat of Microorganisms	109-119
Role of soil environment	109
Physical environment	110
Soil type	111
Soil moisture	112
Soil air	112
Soil temperature	113
Soil mineral elements	114
Soil reaction	114
Soil organic matter	117
Parasites and predators	117
Role of soil management and agronomic practices	117
9. Soil Bacteria	120-130
Distribution	122
Abundance	122
Nutritional groups	123
Phylogeny of important soil bacteria	125
Strategies of bacteria to survive in soil	127
Importance of soil bacteria	128
10. Soil Fungi	131-143
Cell wall	132
Distribution	132
Abundance	132
Reproduction	133
Growth	136
Phylogeny of soil fungi	137
Importance of soil fungi	139
11. Soil Green Algae	144-148
Distribution	144

Abundance	144
Nutrition	146
Taxonomic classes	146
Importance of soil algae	147
12. Soil Animals	149-154
Protozoa	149
Other soil animals	152
13. Rhizosphere	155-165
Rhizoplane	155
Rhizosphere	156
Rhizosphere microorganisms	160
Effect of rhizosphere microflora on plants	163
Endophytes	164
14. Phyllosphere	166-171
What is phyllosphere?	166
Plant factors affecting phyllosphere microbes	168
Effect of phyllospheric microbes on plants	169
Inhibitory effect of phyllospheric microbes on plant	169
15. Methods for Studying Soil Microorganisms	172-197
Culture dependent methods	173
Plate culturing	173
Shake flask culturing	173
Use of markers	174
Methods for microbial quantification	177
Microscopy	182
Culturing Plus Microscopy	185
Culture independent methods	186
Molecular Methods for Studying Soil microbes	188
Limitations of molecular methods	195

BIOGEOCHEMICAL CYCLES OF PLANT NUTRIENTS

16. Carbon Cycle	201-203
Greenhouse gases	202
CO ₂ fixation	202

17. Organic Matter Decomposition and Nutrient Recycling	204-220
Advantages of soil organic matter	205
Nature of organic matter received by soil	205
Decomposition of organic matter and nutrient release	206
Microbiology of organic matter decomposition	208
Synthesis of soil organic matter	215
Decomposition of soil organic matter	217
Factors affecting rate of organic matter decomposition	218
18. Nitrogen Cycle and Transformation	221-231
Nitrogen cycle	221
Nitrogen transformation	223
Organic nitrogen	223
Inorganic nitrogen	224
Mineralization	225
Immobilization	226
Mineralization –immobilization interaction	227
Biochemistry and microbiology of protein and nucleic acid degradation	228
Nucleic acids degradation	229
19. Nitrification and Denitrification	232-241
Microbiology and biochemistry of nitrification	233
Effect of soil environment on nitrification	235
Nitrification inhibitors	237
Denitrification	237
Assimilatory and dissimilatory nitrate reduction	238
Microbiology and biochemistry of denitrification	238
Factors influencing denitrification in soil	239
Other factors	240
20. Basics of Biological Nitrogen Fixation	242-253
Significance of biological nitrogen fixation	242
Historical background	243
Estimation of amount of BNF	244
Types of biological nitrogen fixation	244
Nonsymbiotic nitrogen fixation	244

Associative nitrogen fixation	245
Symbiotic nitrogen fixation	245
Biochemistry of nitrogenase	245
Characteristics of nitrogenase complex	245
Mechanism of dinitrogen fixation	247
Regulation of N ₂ fixation	248
Genetics of N ₂ ase complex synthesis and function	250
Uptake hydrogenases	251
Assimilation of biologically fixed nitrogen	251
21. Nonsymbiotic and Associative Nitrogen Fixation	254-261
Non symbiotic N ₂ fixation	254
Associative N ₂ fixation	257
Associative and endophytic diazotrophs	258
Estimates of N ₂ fixed	259
Ecological constraints	259
22. Legume-Rhizobia Symbiosis	262-283
Historical back ground	262
Leguminosae family as a host	263
Rhizobia	263
Genetics of symbiosis	266
Rhizobial genes	266
Regulation of <i>nif</i> and <i>fix</i> genes expression in rhizobia	270
Role of host plant genes in symbiosis	271
Physiology of nodulation process	272
Colonization of rhizosphere	272
Infection and nodule initiation	272
Development and functioning of nodule	275
Factors affecting of symbiosis	277
Physical factors	278
Chemical factors	279
Biological factors	281
23. Actinorhizal Symbiosis (Actinorrhiza)	284-288
Macrosymbiont	285
Microsymbiont	285
Infection and nodulation	286

Strain specificity	286
Importance of the symbiosis	287
24. Azolla- Anabaena Symbiosis	289-292
Macrosymbiont	289
Microsymbiont	290
Symbiosis	291
Importance of symbiosis	291
25. Microbial Transformation of Soil Phosphorus	293-299
Phosphorus in soil	293
Transformation of soil phosphates	294
Mineralization	295
Immobilization	295
Oxidation -reduction of phosphorus	295
Factors affecting the rate of mineralization-immobilization	295
Phosphate solubilization	296
Phosphate solubilizing microorganisms	296
Mechanisms of phosphate solubilization	298
26. Mycorrhizae	300-310
Types of mycorrhizae	301
Ectomycorrhizae (EM)	302
Endomycorrhizae (AM)	304
Importance of mycorrhizae	306
Benefits to plants	306
Benefits to agroecosystem	307
Factors affecting mycorrhizae	307
Physical factors	307
Chemical factors	308
Biological factors	308
27. Microbial Transformation of Sulfur in Soil	311-317
Forms of sulfur in Soil	311
Sulfur cycle in soil	312
Microbial transformations of sulfur	313
Factors influencing soil sulfur transformation	316
Biological factors	316

**EXPLOITATION OF MICROORGANISMS IN
AGRICULTURE**

28. Biofertilizers	321-336
Brief history of biofertilizers production	322
Definition of terms	323
Types of biofertilizers	323
Nitrogen fixing biofertilizers	323
Phosphate solubilizing inoculants	332
Phosphate mobilizing inoculants	332
Consortium of Inoculants	333
Biofertilizers Production	334
Strain selection	334
Production	334
Quality control	335
29. Microbial Insecticides and Herbicides	337-340
Microbial insecticides	337
Microbial herbicides	338
30. Composting	341-351
What is compost?	341
Why composting is done?	341
Methods of composting	342
Open methods of composting	342
Closed methods of composting	345
Microbiology of composting	345
Role of environment in composting	347
Composting material	347
Temperature	348
Oxygen availability	348
Quality of compost	349
Importance of compost and composting	350
31. Microbial Interactions and Biocontrol of Soil Borne Plant Diseases	352-366
Microbe - microbe interactions	353
Importance of microbial interactions	355

Plant-Microbe interactions	355
Biocontrol of soil borne plant diseases	357
What is biocontrol?	358
What is suppressive soil?	358
Merits of biocontrol	359
Role of Rhizobacteria and fungi in biocontrol	360
Mechanism of biocontrol of plant diseases	360
Commercialization of biocontrol agents	364
32. Biogas Production	367-382
Uses of biogas	368
Potential of biogas production	368
Different wastes used for biogas production	370
Microbiological and biochemical processes	370
Bioreactors	372
Factors affecting biogas production	375
Biogas upgrading techniques	378
Cleansing of biogas	379
Types of biogas plants	380
33. Microbiology of Water	383-389
Water borne diseases	384
Water purification	386
Microbiological Qualitative Tests of Potable Water	387
Membrane filter method	388
34. Waste Waters	390-398
Definitions of terms	390
Characteristics of waste water	391
Wastewater treatment processes	392
Constructed wetlands for wastewater treatment	396
35. Food Microbiology	399-418
Source of microbes in food	400
Fermented foods	400
Microbial spoilage of food	404
Microbial spoilage of canned foods	407
Food poisoning or Food intoxication	407

Prevention of food borne disease	413
Microbiology of food preservation	414
Methods of food preservation	416
Microbiological methods	417
Glossary	419-428
Subject Index	429-433

INTRODUCTION

