

Contents

<i>PREFACE</i>	<i>v</i>
1. INTRODUCTION	1
1.1. Importance of Mangroves	2
1.2. World Mangroves	3
1.3. Indian Mangroves	5
1.4. Mangroves of Odisha	7
1.5. Threats to Mangroves	14
1.6 Conservation and Management of Mangroves of Odisha	15
2. ECOLOGY OF MANGROVES	17
2.1 Mangrove Ecotypes	18
2.2 Ecological Importance of Mangrove	20
2.3 Ecological Characteristics of Mangrove	21
2.4 Limiting Water Loss	21
2.5 Nutrient Uptake	22
2.6 Nutrient Recycling in Mangrove Environment	25
2.7 Carbon Content and its Cycling in Mangrove Soil	27
2.8 Nitrogen Content & its Cycling in Mangrove Soil	29
2.9 Phosphorus Content and its Cycling in Mangrove Soil	31
2.10 Sulphur Content & its Cycling in Mangrove Soil	32
2.11 Mangrove Vegetation of Different River Estuaries of Orissa Coast	34
2.12 Physico-chemical Characteristics of Water from Mangroves of Bhitarkanika and Mahanadi Delta.	37
2.13 Soil physico-chemical and Nutrient Content of Mangrove Soil of Bhitarkanika	39

2.14 Soil physico-chemical and Nutrient Content in soils of Mangroves of Mahanadi Delta	39
2.15 Soil Heavy Metal Contents from Mangroves of Mahanadi Delta and Bhitarkanika	43
Conclusion	44
3. MICROBIAL DIVERSITY OF MANGROVE ECOSYSTEM	47
3.1 Algae	49
3.2. Fungi	53
3.3. Actinomycetes	60
3.4. Bacteria	61
3.5. Ennumeration of different groups of bacteria from Bhitarkanika and Mahanadi mangroves of Odisha	66
3.6. Principal Component Nnalysis	71
3.7. Phenotypic Identification of Four Important Groups of Bacteria from Mangroves of Bhitarkanika.	72
3.8. Phenotypic and molecular studies on salt tolerant bacteria from Bhitarkanika mangrove soils.	79
3.9. Ennumeration of Different Groups of Bacteria from Mangroves of Mahanadi Delta	84
3.10. Principal Component Analysis	87
3.11. Phenotypic Identification of Some Major Groups of Bacteria from Mangroves of Mahanadi Delta	88
3.13. Sulphur oxidizing bacteria isolated from Mangrove of Mahanadi delta, Odisha	92
Conclusion	98
4. BIOTECHNOLOGICAL POTENTIAL OF MANGROVE MICROORGANISMS	99
4.1 Biotechnological Potential of Mangrove Microorganisms	99
4.2. Biotechnological Potential of Bacteria Isolated from Mangroves of Odisha Coast	104
4.3. Cellulose Degrading Bacteria from Mangroves of Mahanadi Delta.	128
4.4. Sulphur Oxidation	135
4.5. Evaluation of Enzyme Production from Halotolerant Bacterial Strains from Bhitarkaneku	147
4.6. Mangrove Microorganism in Bioremediation of Heavy Metals	148
Conclusion	156
REFERENCES	157