

Industrial Biotechnology

Problems and Remedies

Indu Shekhar Thakur



I.K. International

INDUSTRIAL BIOTECHNOLOGY

Problems and Remedies

By the same Author

Environmental Biotechnology

Basic Concepts and Applications

Environmental biotechnology is a rapidly growing field with increasing relevance for a sustainable development through protection of environment. It continues to revolutionize the understanding of basic life sustaining processes in the environment—identification and manipulation of the molecules. It provides environment-friendly technologies and helps deal with environmental issues. This book provides an overview of basic processes of the environment, imbalance in the environment due to natural and human activities and the use of biotechnological principles for sustainable development of the environment.

Of related interest

Textbook of Environmental Biotechnology

Pradipta Kumar Mohapatra

Reader, P.G. Department of Botany
Utkal University, Bhubaneswar

The book has been designed to serve the students of Environmental Science, Microbiology, Life Science and Biotechnology, and researchers in these fields. An exhaustive reference section to guide the reader for additional reading is also appended at the end of the book.

The book discusses:

- New approaches to wastewater treatment
- Use of endemic or exotic biota as a nutrient filter to purify nutrient-loaded wastewater and nutrient-enriched eutrophic surface water
- Production of usable primary and secondary biomass using waste, wastewater and wasteland
- Efficient biomass management techniques
- Several emerging areas like microalgal cultivation techniques using wastewater
- Production of value added products from algae
- Statistical approach to analyse the toxic effects of xenobiotics using biological test batteries and biopesticides
- Integrated pest management
- Advanced techniques to study environmental contamination
- Biological experimental procedures to determine the level of contamination

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Preface

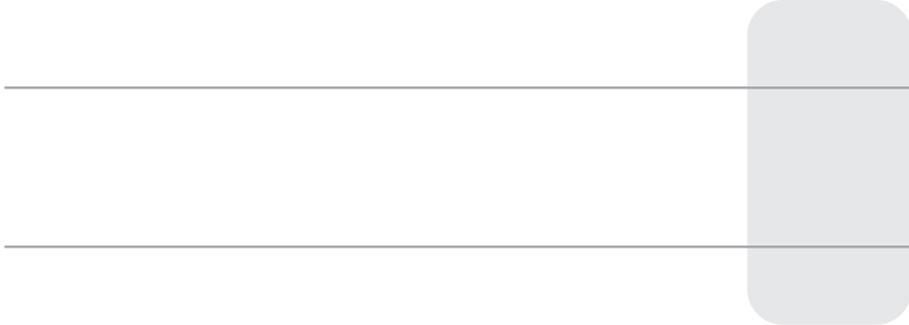
Population explosion and rapid industrial development for the essential commodities have led to formation of various contaminants in the environment. Economic growth and the continuing heavy consumption of natural resources are responsible for air, water and soil pollution, and also for global environmental problems including global warming, acid rain and the destruction of the ozone layer. Since last five decades xenobiotic compounds have been increasingly added to the environment by industrial activities. Some of them are highly toxic, recalcitrant, and have higher bioaccumulating and biomagnification properties. Environmental pollution is one of the most serious problems facing humanity and all other living things today. The Government and regulatory agencies have recognized major polluting industries, and categories based on pollutants released from the industries. The Government of India has recognised 17 categories of major polluting industries. The limitations of our present regulatory regime and the need of introducing new approaches to tackle industrial pollution are widely recognized. But initiatives in this direction have been insufficient. Physical, chemical and biological, and a combination of chemical, physical and microbial treatment methods have been adopted for treatment of pollutants in the industries.

Environmental biotechnology is the multidisciplinary integration of sciences and engineering in order to utilize the huge biochemical potential of microorganisms, plants and parts for the sustainable use of resources. Sometimes this involves formation of value added products as major ecofriendly commercial materials, and offers ways to make industrial processes work more efficient and create less pollution. The main factors influencing the environment performance of industrial product recovery are capacity utilization, efficiency of resource use relating mainly to consumption of raw materials, different sources of energy and water, treatment and disposal of effluent, and management initiative in addressing environmental concerns. Recent advances in biotechnology have driven forward the harnessing of microorganisms and plants to help and protect our environment and formation of ecofriendly products.

The present book provides a broad overview of the subject, focusing on how biotechnological techniques are applied to solve environmental problems. The aims of the book are to determine the processes and utilization of raw materials in the industries, formation and release of pollutants (air, water and soil) in the environment, effect and impact of the pollutants on biotic and abiotic components of the environment, and identification of physical, chemical, biological and other methods for treatment of pollutants in the industrial effluent. Finally efforts have been made to identify the methods for bioconversion and recovery of products from the effluent by biotechnological methods. The potential benefits of innovative biotechnological methods can be applied for environmental protection and biomaterials depending upon the use of raw materials, processing methods for production of materials and nature of industrial effluent. Therefore, ten industries are selected in this book, namely, pulp and paper, distillery, tannery, dye, pesticide, pharmaceutical, thermal power, petroleum, food and beverages and metal industries.

The book covers postgraduate syllabus of Environmental Biotechnology of University Grants Commission, Govt. of India, and other universities offering courses of Environmental Sciences in their Master programme. It will also be helpful for advance undergraduates opting for Environmental Biotechnology course as part of an environmental science or bioscience programme, and postgraduate students pursuing a biotechnology-related biodegradation and waste treatment course.

Author



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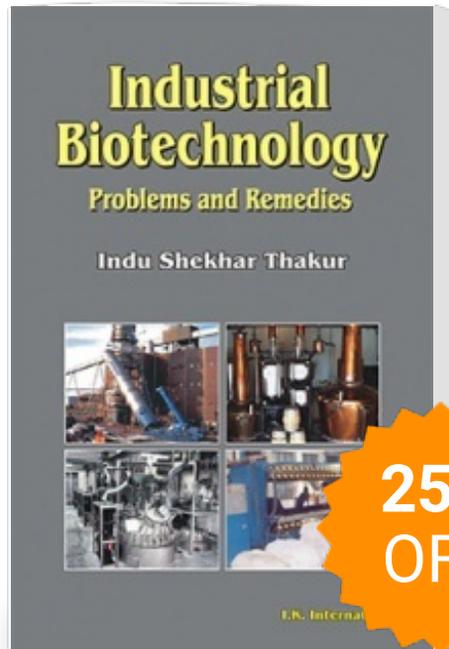


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