

Microbial Ecology Atlas Bartha 4th Edition

Today, microbiology is a rapidly growing discipline in the life sciences, and the technologies are evolving on a virtually daily basis. Next-generation sequencing technologies have revolutionized microbial analysis, and can help us understand the biology and genomic diversity of various bacterial species with significant impacts on agro-ecosystems. In addition, advances in molecular biology and microbiology techniques hold the potential to improve the productivity and sustainability of agriculture and forestry. This new volume addresses the role of microbial genomics in understanding the living systems that exist in the soil and their interactions with plants, an aspect that is also important for crop improvement. The topics covered focus on a deeper and clearer understanding of how microbes cause diseases, the genome-based development of novel antibacterial agents and vaccines, and the role of microbial genomics in crop improvement and agroforestry. Given its scope, the book offers a valuable resource for researchers and students of agriculture and infectious biology.

The world of halophiles is quite diverse and their representatives in three domains of life i.e. archaea, bacteria and eukarya. They are found all over the small subunit rRNA based tree of life and these micro-organisms are adapted to salt concentration up to saturation hence able to grow at >300g/l Nacl concentration. Their metabolic diversity is high as well encompassing oxygenic and anoxygenic phototrophs, aerobic heterotrophs, denitrifiers, sulphate reducers, fermenters and methanogens. The proteins of halophiles are magnificently engineered to function in a milieu containing 2-5M salt that encodes genes represent a valuable repository and resource for reconstruction and visualizing processes of habitat selection and adaptive evolution. Search for new enzymes endowed with novel activities and enhanced stability continues to be desirable purpose for important commercial production of biotechnological significance. These poly extremophiles proved excellent source of enzymes and metabolites possessing inherent ability to function in extreme conditions of high salt, alkaline pH and facilitating catalysis for industrial application in food processing, industrial bioconversion, bioremediation etc. In fact, it has just begun to realize the great potential and true extent of diversity and suitable applications if explored them judiciously. This book highlights current applications and research on halophiles to provide a timely overview. Chapters are written by expert authors from around the world and include topics of varied importance which include their role to play in enzyme production, restoration of soil fertility and plant growth , antimicrobial and biocatalytic potential, biomolecules in nanotechnology and aspects of quorum sensing. The book is divided into three sections, dealing with biodiversity, biotechnology and sustainable exploitation of halophiles. This major new work represents a valuable source of information to all those scientists interested in microorganisms in general and extremophiles in particular with respect to their innovative products and applications.

The book is divided into three parts that are logically connected. The first part defines the principal characteristics of the subterranean world and describes the microorganisms that live there as well as the environmental constraints they are subjected to. The second part shows how the action of the microorganisms can modify the physico-chemical surroundings, the microbiological equilibria and the growth of plants. The third part dwells on a few methods of intervention that would help in limiting the proliferation of harmful microorganisms and how to make the best use of the activity of auxiliary microorganisms.

This book serves as a reference for engineers, scientists, and students concerned with the use of materials in applications where reliability and resistance to corrosion are important. It updates the coverage of its predecessor, including coverage of: corrosion rates of steel in major river systems and atmospheric corrosion rates, the corrosion behavior of materials such as weathering steels and newer stainless alloys, and the corrosion behavior and engineering approaches to corrosion control for nonmetallic materials. New chapters include: high-temperature oxidation of metals and alloys, nanomaterials, and dental materials, anodic protection. Also featured are chapters dealing with standards for corrosion testing, microbiological corrosion, and electrochemical noise.

Volume 2

Microbial Action on Hydrocarbons

Bioremediation and Phytoremediation Technologies in Sustainable Soil Management

Biodiversity and Sustainable Exploitation

Volume 2: Rhizosphere, Microbiome and Agro-ecology

Environmental Microbiology: Fundamentals and Applications

This book offers practical concepts of EOR processes and summarizes the fundamentals of bioremediation of oil-contaminated sites. The first section presents a simplified description of EOR processes to boost the recovery of oil or to displace and produce the significant amounts of oil left behind in the reservoir during or after the course of any primary and secondary recovery process; it highlights the emerging EOR technological trends and the areas that need research and development; while the second section focuses on the use of biotechnology to remediate the inevitable environmental footprint of crude oil production; such is the case of accidental oil spills in marine, river, and land environments. The readers will gain useful and practical insights in these fields.

The discipline of microbiology that deals with an amazingly diverse group of simple organisms, such as viruses, archaea, bacteria, algae, fungi, and protozoa, is an exciting field of Science. Starting as a purely descriptive field, it has transformed into a truly experimental and interdisciplinary science inspiring a number of investigators to generate th a wealth of information on the entire gamut of microbiology. The later part of 20 century has been a golden era with molecular information coming in to unravel interesting insights ofthe microbial world. Ever since they were brought to light through a pair of ground glasses by the Dutchman, Antony van Leeuwenhoek, in later half of 17th century, they have been studied most extensively throughout the next three centuries, and are still revealing new facets of life and its functions. The interest in them, therefore, continues even in the 21 st century. Though they are simple, they provide a wealth of information on cell biology, physiology, biochemistry, ecology, and genetics and biotechnology. They, thus, constitute a model system to study a whole variety of subjects. All this provided the necessary impetus to write several valuable books on the subject of microbiology. While teaching a course of Microbial Genetics for the last 35 years at Delhi University, we strongly felt the need for authentic compiled data that could give exhaustive background information on each of the member groups that constitute the microbial world.

"This book offers the latest scientific research on applied microbiology ... The topics covered in this single volume include biodegradation of pollutants, water, soil and plant microorganisms, biosurfactants, antimicrobial natural products, antimicrobial susceptibility, antimicrobial resistance, human pathogens, food microorganisms, fermentation, biotechnologically relevant enzymes and proteins, microbial physiology, metabolism and gene expression ..."-Page 4 of cover.

The areas we deal with in biochemical engineering have expanded to include many various organisms and humans. This book has gathered together the information of these expanded areas in biochemical engineering in Japan. These two volumes are composed of 15 chapters on microbial cultivation techniques, metabolic engineering, recombinant protein production by transgenic avian cells to biomedical engineering including tissue engineering and cancer therapy. Hopefully, these volumes will give readers a glimpse of the past and also a view of what may happen in biochemical engineering in Japan.

Metagenomics and Microbial Ecology

Microbial Genomics in Sustainable Agroecosystems

Microbial Interventions in Agriculture and Environment

An Evolutionary Approach

Microbial Ecology

Halophiles

An authoritative overview of the ecological activities of microbes in the biosphere
Environmental Microbiology and Microbial Ecology presents a broad overview of microbial activity and microbes' interactions with their environments and communities. Adopting an integrative approach, this text covers both conventional ecological issues as well as cross-disciplinary investigations that combine facets of microbiology, ecology, environmental science and engineering, molecular biology, and biochemistry. Focusing primarily on single-cell forms of prokaryotes — and cellular forms of algae, fungi, and protozoans — this book enables readers to gain insight into the fundamental methodologies for the characterization of microorganisms in the biosphere. The authors draw from decades of experience to examine the environmental processes mediated by microorganisms and explore the interactions between microorganisms and higher life forms. Highly relevant to modern readers, this book examines topics including the ecology of microorganisms in engineered environments, microbial phylogeny and interactions, microbial processes in relation to environmental pollution, and many more. Now in its second edition, this book features updated references and major revisions to chapters on assessing microbial communities, community relationships, and their global impact. New content such as effective public communication of research findings and advice on scientific article review equips readers with practical real-world skills. Explores the activities of microorganisms in specific environments with case studies and actual research data
Highlights how prominent microbial biologists address significant microbial ecology issues
Offers guidance on scientific communication, including scientific presentations and grant preparation
Includes plentiful illustrations and examples of microbial interactions, community structures, and human-bacterial connections
Provides chapter summaries, review questions, selected reading lists, a complete glossary, and critical thinking exercises
Environmental Microbiology and Microbial Ecology is an ideal textbook for graduate and advanced undergraduate courses in biology, microbiology, ecology, and environmental science, while also serving as a current and informative reference for microbiologists, cell and molecular biologists, ecologists, and environmental professionals.

This collection of essays discusses fascinating aspects of the concept that microbes are at the root of all ecosystems. The content is divided into seven parts, the first of those emphasizes that microbes not only were the starting point, but sustain the rest of the biosphere and shows how life evolves through a perpetual struggle for habitats and niches. Part II explains the ways in which microbial life persists in some of the most extreme environments, while Part III presents our understanding of the core aspects of microbial metabolism. Part IV examines the duality of the microbial world, acknowledging that life exists as a balance between certain processes that we perceive as being environmentally supportive and others that seem environmentally destructive. In turn, Part V discusses basic aspects of microbial symbioses, including interactions with other microorganisms, plants and animals. The concept of microbial symbiosis as a driving force in evolution is covered in Part VI. In closing, Part VII explores the adventure of microbiological research, including some reminiscences from and perspectives on the lives and careers of microbe hunters. Given its mixture of science and philosophy, the book will appeal to scientists and advanced students of microbiology, evolution and ecology alike.

In the ten years since the publication of Modern Soil Microbiology, the study of soil microbiology has significantly changed, both in the understanding of the diversity and function of soil microbial communities and in research methods. Ideal for students in a variety of disciplines, this second edition provides a cutting-edge examination of a fascinating discipline that encompasses ecology, physiology, genetics, molecular biology, and biotechnology, and makes use of biochemical and biophysical approaches. The chapters cover topics ranging from the fundamental to the applied and describe the use of advanced methods that have provided a great thrust to the discipline of soil microbiology. Using the latest molecular analyses, they integrate principles of soil microbiology with novel insights into the physiology of soil microorganisms. The authors discuss the soil and rhizosphere as habitats for microorganisms, then go on to describe the different microbial groups, their adaptive responses, and their respective processes in interactive and functional terms. The book highlights a range of applied aspects of soil microbiology, including the nature of disease-suppressive soils, the use of biological control agents, biopesticides and bioremediation agents, and the need for correct statistics and experimentation in the analyses of the data obtained from soil systems.

Bioremediation is a rapidly advancing field and the technology has been applied successfully to remediate many contaminated sites. The goal of every soil remediation method is to enhance the degradation, transformation, or detoxification of pollutants and to protect, maintain and sustain environmental quality. Advances in our understanding of the ecology of microbial communities capable of breaking down various pollutants and the molecular and biochemical mechanisms by which biodegradation occurs have helped us in developing practical soil bioremediation strategies. Chapters dealing with the application of biological methods to soil remediation are contributed from experts – authorities in the area of environmental science including microbiology and molecular biology – from academic institutions and industry.

Processes in Microbial Ecology

Proceedings of the Symposium on the Ecology and Management of Dead Wood in Western Forests

Introduction to Enhanced Oil Recovery (EOR) Processes and Bioremediation of Oil-Contaminated Sites

Volume 1: Fundamental Aspects and Contaminated Sites

Advances in Microbial Ecology

Microbes in Applied Research

The widespread presence and activity of micro-organisms makes it impossible to study life sciences without some understanding of microorganisms. Human Microbiology provides a concise review of the biology of the three important groups of micro-organisms that infect humans: bacteria, viruses and fungi. Divided into two parts, it summarises the key features that characterise the physiology of microorganisms e.g. structure and function, growth and division, microbial death and the principles of taxonomy, and examines the common themes that are found in micro-organisms that cause disease in man, the transmission, epidemiology and pathogenicity of microbial diseases. With the overwhelming volume of information published on individual species of bacteria, viruses and fungi, Human Microbiology emphasises the important concepts and themes that occur in the organisms that are pathogenic to humans. The conventional approach to studying medical microbiology tends to result in exhaustive lists of microbes arranged by genus and their associated diseases. To promote understanding of the principles of medical microbiology and avoid memory lessons, the important concepts are discussed with reference to key examples.

The most definitive manual of microbes in air, water, and soil and their impact on human health and welfare. • Incorporates a summary of the latest methodology used to study the activity and fate of microorganisms in various environments. • Synthesizes the latest information on the assessment of microbial presence and microbial activity in natural and artificial environments. • Features a section on biotransformation and biodegradation. • Serves as an indispensable reference for environmental microbiologists, microbial ecologists, and environmental engineers, as well as those interested in human diseases, water and wastewater treatment, and biotechnology.

Given the universal interest in whether extraterrestrial life has developed or could eventually develop, it is vital that an examination of planetary habitability go beyond simple assumptions. This book has resulted from a workshop at the International Space Science Institute (ISSI) which brought together experts to discuss the multi-faceted problem of how the habitability of a planet co-evolves with the geology of the surface and interior, the atmosphere, and the magnetosphere.

This volume combines theory with current global practices involved in the biological control of diseases in 12 major crops. It highlights the day-to-day challenges of organic crop management for cost-effective real-world application.

Origin, Properties, Management

Manual of Environmental Microbiology

Polar Microbiology

Form and Function in Prokaryotes

Principles of Microbiology

From Genomes to Biogeochemistry

This 4-volume set focuses on the use of microbial bioremediation and phytoremediation to clean up pollutants in soil, such as pesticides, petroleum hydrocarbons, metals, and chlorinated solvents, which reduce the soil's fertility and renders it unfit for plant growth.

Volume 1: Fundamental Aspects and Contaminated Sites begins with an overview of phytoremediation and the role of environmental factors. It goes on to introduce soil assessment techniques and offers methods of remediation designed to combat soil and agricultural degradation. It discusses soils contaminated by heavy metals; microbial and phytoremediation-based removal of polycyclic aromatic hydrocarbons (PAHs) from coal, crude oil, and gasoline; microbial bioremediation and amelioration of pesticide-contaminated soils; phytoremediation techniques for biomedical waste contaminated sites; as well as biomediation processes for human waste sites. Biopesticides are also explained as an alternative to conventional pesticides. Other volumes in the 4-volume set: • Volume 2: Microbial Approaches and Recent Trends • Volume 3: Inventive Techniques, Research Methods, and Case Studies • Volume 4: Degradation of Pesticides and Polychlorinated Biphenyls Together, these four volumes provide in-depth coverage of the mechanisms, advantages, and disadvantages of the bioremediation and phytoremediation technologies for safe and sustainable soil management.

Uncovers the Key Role Microbes Play in the Transformation of Oxidizable and Reducible MineralsMany areas of geomicrobial processes are receiving serious attention from microbiologists, specifically the role microbes play in the formation and degradation of minerals and fossil fuels and elemental cycling. Most notably, the latest research finds that

Amazonian Dark Earths are not only a testament to the vanished civilizations of the Amazon Basin, but may provide the answer to how the large, sophisticated societies were able to sustain intensive agriculture in an environment with mostly infertile soils. Locally known as Terra Preta de Indio or Indian black earth, these anomalous soils are even today fertile and highly productive. Though clearly associated with pre-European settlements questions remain whether the Dark Earths were intentionally produced or merely a by-product of habitation activities. This publication provides a comprehensive review of our current understanding of these fascinating soils: their origin, properties, and management through time. These new and multidisciplinary perspectives by leading experts on Amazonian Dark Earths may pave the way for the next revolution of soil management in the humid tropics.

Microbial communities and their functions play a crucial role in the management of ecological, environmental and agricultural health on the Earth. Microorganisms are the key identified players for plant growth promotion, plant immunization, disease suppression, induced resistance and tolerance against stresses as the indicative parameters of improved crop productivity and sustainable soil health. Beneficial belowground microbial interactions with the rhizosphere help plants mitigate drought and salinity stresses and alleviate water stresses under the unfavorable environmental conditions in the native soils. Microorganisms that are inhabitants of such environmental conditions have potential solutions for them. There are potential microbial communities that can degrade xenobiotic compounds, pesticides and toxic industrial chemicals and help remediate even heavy metals, and thus they find enormous applications in environmental remediation. Microbes have developed intrinsic metabolic capabilities with specific metabolic networks while inhabiting under specific conditions for many generations and, so play a crucial role. The book Microbial Interventions in Agriculture and Environment is an effort to compile and present a great volume of authentic, high-quality, socially-viable, practical and implementable research and technological work on microbial implications. The whole content of the volume covers protocols, methodologies, applications, interactions, role and impact of research and development aspects on microbial interventions and technological outcomes in prospects of agricultural and environmental

domain including crop production, plan–soil health management, food & nutrition, nutrient recycling, land reclamation, clean water systems and agro–waste management, biodegradation & bioremediation, biomass to bioenergy, sanitation and rural livelihood security. The covered topics and sub-topics of the microbial domain have high implications for the targeted and wide readership of researchers, students, faculty and scientists working on these areas along with the agri-activists, policymakers, environmentalists, advisors etc. in the Government, industries and non-government level for reference and knowledge generation.

Handbook of Green Chemistry

Understanding Bacteria

November 2–4, 1999, Reno, Nevada

Amazonian Dark Earths

Techniques and Applications

Advances in Applied Bioremediation

John Dupré explores recent revolutionary developments in biology and considers their relevance for our understanding of human nature and society. He reveals how the advance of genetic science is changing our view of the constituents of life, and shows how an understanding of microbiology will overturn standard assumptions about the living world.

Maintaining the qualities that sent previous editions into multiple printings, this edition continues to explore the role that microbes have played in specific geological processes. The author discusses acidophilic iron-oxidizing bacteria, acidophilic iron- and metal sulfide-oxidation, and the geomicrobiology of bauxites. He covers geomicrobial methods, mineral formation and transformation, biodegradation or transformation of organics and inorganics, carbonates, silicates, phosphates, metal-oxides, and metal-sulfides, and practical applications of geomicrobial processes. The book includes end-of-chapter summaries, 2800 up-to-date literature citations, and a glossary.

Based on the thesis that insights into both evolution and ecology can be obtained through the study of microorganismsm, Microbial Ecology examines microbiology through the lens of evolutionary ecology. Measured from a microbial perspective, this text covers such topics as optimal foraging, genome, reduction, novel evolutionary mechanisms, bacterial speciation, and r and K selection. Numerous aspects of microbial existence are also discussed and include: species competition, predation, parasitism, mutualism, microbial communication through quorum sensing and other. The result is a context for understanding microbes in nature and a framework for microbiologists working in industry, medicine, and the environment. Applies evolutionary ecological concepts to microbes Addresses individual, population and community ecology Presents species concepts and offers insights on the origin of life and modern microbial ecology Examines topics such as species interactions, nutrient cycling, quorum sensing and cheating

Microorganisms comprise the greatest genetic diversity in the natural ecosystem, and characterization of these microbes is an essential step towards discovering novel products or understanding complex biological mechanisms. The advancement of metagenomics coupled with the introduction of high-throughput, cost-effective NGS technology has expanded the possibilities of microbial research in various biological systems. In addition to traditional culture and biochemical characteristics, omics approaches (metagenomics, metaproteomics, and metatranscriptomics) are useful for analyzing complete microbial communities and their functional attributes in various environments. Metagenomics and Microbial Ecology: Techniques and Applications explores the most recent advances in metagenomics research in the landscape of next-generation sequencing technologies. This book also describes how advances in sequencing technologies are used to study invisible microbes as well as the relationships between microorganisms in their respective environments. Features: Covers a wide range of concepts, investigations, and technological advancement in metagenomics at the global level. Highlights the novel and recent approaches to analyze microbial diversity and its functional attributes. Features a range of chapters that present an introduction to the field and functional insight into various ecosystems.

Human Microbiology

Defensive Mutualism in Microbial Symbiosis

Recent Progress of Biochemical and Biomedical Engineering in Japan I

Geomicrobiology

Processes of Life

Current Advances and Challenges

Microbial ecology is the study of interactions among microbes in natural environments and their roles in biogeochemical cycles, food web dynamics, and the evolution of life. Microbes are the most numerous organisms in the biosphere and mediate many critical reactions in elemental cycles and biogeochemical reactions.

Because microbes are essential players in the carbon cycle and related processes, microbial ecology is a vital science for understanding the role of the biosphere in global warming and the response of natural ecosystems to climate change. This novel textbook discusses the major processes carried out by viruses, bacteria, fungi, protozoa and other protists - the microbes - in freshwater, marine, and terrestrial ecosystems. It focuses on biogeochemical processes, starting with primary production and the initial fixation of carbon into cellular biomass, before exploring how that carbon is degraded in both oxygen-rich (oxic) and oxygen-deficient (anoxic) environments. These biogeochemical processes are affected by ecological interactions, including competition for limiting nutrients, viral lysis, and predation by various protists in soils and aquatic habitats. The book neatly connects processes occurring at the micron scale to events happening at the global scale, including the carbon cycle and its connection to climate change issues. A final chapter is devoted to symbiosis and other relationships between microbes and larger organisms. Microbes have huge impacts not only on biogeochemical cycles, but also on the ecology and evolution of more complex forms of life, including Homo sapiens..

Pollution is one of the most serious issues facing mankind and other life forms on earth. Environmental pollution leads to the degradation of ecosystems, loss of services, economic losses, and various other problems. The eco-friendliest approach to rejuvenating polluted ecosystems is with the help of microorganism-based bioremediation. Microorganisms are characterized by great biodiversity, genetic and metabolic machinery, and by their ability to survive, even in extremely polluted environments. As such, they are and will remain the most important tools for restoring polluted ecosystems / habitats. This three-volume book sheds light on the utilization of microorganisms and the latest technologies for cleaning up polluted sites. It also discusses the remediation or degradation of various important pollutants such as pesticides, wastewater, plastics, PAHs, oil spills etc. The book also explains the latest technologies used for the degradation of pollutants in several niche ecosystems. Given its scope, the book will be of interest to teachers, researchers, bioremediation scientists, capacity builders and policymakers. It also offers valuable additional reading material for undergraduate and graduate students of microbiology, ecology, soil science, and the environmental sciences. Edited by the inventor of the 12 principles of Green Chemistry, Paul Anastas, the complete 12-volumes of Handbook of Green Chemistry will provide a one-stop resource covering green catalysis, green solvents, green products and green processes. Handbook of Green Chemistry covers highly topical areas in green chemistry such as feedstocks, green chemical engineering, green catalysis (homogeneous, heterogeneous and biocatalysis), separation techniques and solvents like supercritical fluids, ionic liquids and reactions in water. It covers the big environmental and product design issues faced by chemists such as how to make nanoscience greener, design safer, sustainable and less toxic chemicals and make chemical synthesis a greener and more sustainable process. In the final 3 volumes, Handbook of Green Chemistry will cover green products, the chemical engineering behind their processing and what makes a green product, vital in now this is key selling point for industry. Handbook of Green Chemistry publishes in four sets of three volumes. The first three sets are available to purchase now: Handbook of Green Chemistry: Green Catalysis Paul T. Anastas (Series Editor), Robert H. Crabtree (Editor) ISBN: 978-3-527-31577-2 Hardcover | 1082 pages | January 2009 Handbook of Green Chemistry: Green Solvents Paul T. Anastas (Series Editor), Walter Leitner (Editor), Philip G. Jessop (Editor), Chao-Jun Li (Editor), Peter Wasserscheid (Editor), Annegret Stark (Editor) ISBN: 978-3-527-31574-1 Hardcover | 1412 pages | April 2010 Handbook of Green Chemistry: Green Processes Paul T. Anastas (Series Editor), Chao-Jun Li (Volume Editor) Hardcover | 1300 pages | April 2012 ISBN: 978-3-527-31576-5 The remaining set, Handbook of Green Chemistry: Green Products , will publish in May 2015. Introductory Offer! Order the full Hanbook of Green Chemistry, 12 Volume Set before 31st August 2015 and take advantage of the special introductory price as listed at the top of this webpage. Prices will revert to £1605.00/€1890.00/\$2720.00 thereafter.

Advances in Microbial Ecology was established by the International Committee on Microbial Ecology (ICOME) to provide a vehicle for in-depth, critical, and even provocative reviews to emphasize recent trends in the important field of microbial ecology. Advances in Microbial Ecology is now recognized as a major source of infor mation and inspiration both for practicing and for prospective microbial ecologists. Most reviews appearing in Advances have been prepared by leaders in particular areas follow ing invitations issued by the Editorial Board. Individuals are encouraged, however, to submit outlines of unsolicited contributions to any member of the Editorial Board for consideration for publication in Advances. With the publication of Volume 12 of Advances in Microbial Ecology there will be a change of Editor and the entire Editorial Board. The current Editor wishes to thank the present Editorial Board, Ron Atlas, Bo Barker J~rgensen, and Gwyn Jones, as well as past members of the Board, for their assistance and encourage ment over the years. The new Editor of Advances in Microbial Ecology will be Gwyn Jones, with Bernhard Schink, Warwick F. Vincent, and David M. Ward as members of the Editorial Board. The outgoing Board wish the new Board every success in continu ing the traditions established by Martin Alexander, the founding Editor of Advances in Microbial Ecology. The topics featured in Volume 12 of Advances include some related to the meta bolic activities of bacteria; namely, bioremediation of oil spills, by R. M. Atlas and R.

Environmental Microbiology and Microbial Ecology

BIOS Instant Notes in Microbiology

Essays in the Philosophy of Biology

Fundamentals and Applications

Geology and Habitability of Terrestrial Planets

Geomicrobiology, Fourth Edition,

The book discusses ways to overcome the side effects of using hydrocarbon-based products as energy sources. Hydrocarbons produce raw crude oil waste of around 600,000 metric tons per annum, with a range of uncertainty of 200,000 metric tons per year. The various chapters in this book focus on approaches to reduce these wastes through the application of potential microbes, in a process called bioremediation. The book is a one-stop reference resource on the methods, mechanisms and application of the bio-composites, in the laboratory and field. Focusing on resolving a very pressing environmental issue, it not only provides details of existing challenges, but also offers deeper insights into the possibility of solving problems using hydrocarbon bioremediation.

This book offers the first comprehensive, in-depth treatment of microbial diversity for undergraduate and graduate students. Using a global approach, Microbial Diversity illustrates the impact of microorganisms on ecological and Earth system phenomena. Accompanied by a devoted website with resources for both instructors and students:

www.blackwellpublishing.com/ogunseitai Uses key ecological and global phenomena to show the continuity of microbial contribution. Illustrates the importance of microbial diversity for the understanding of global physiochemical and biological processes. Presents analyses of microscopic, culture, molecular, and phylogenetic systematic methods. Shows the relevance of microbial diversity to global environmental problems, such as climate change and ozone depletion. Features numerous illustrations, including over 60 4-color photographs of microbes.

This book offers the latest scientific research on applied microbiology presented at the IV International Conference on Environmental, Industrial and Applied Microbiology (BioMicroWorld2011) held in Spain in 2011. A wide-ranging set of topics including agriculture, environmental, food, industrial and medical microbiology makes this book interesting not only for microbiologists, but also for anyone who likes to keep up with cutting-edge research in microbiology and microbial biotechnology. Readers will find a major collection of knowledge, approaches, methods and discussions on the latest advances and challenges in applied microbiology in a compilation of 136 chapters written by active researchers in the field from around the world. The topics covered in this single volume include biodegradation of pollutants, water, soil and plant microorganisms, biosurfactants, antimicrobial natural products, antimicrobial susceptibility, antimicrobial resistance, human pathogens, food microorganisms, fermentation, biotechnologically relevant enzymes and proteins, microbial physiology, metabolism and gene expression mainly, although many other subjects are also discussed. Sample Chapter(s) A microcosm study on the die-off response of the indicator bacteria, Enterococcus faecium and Enterococcus faecalis (267 KB) Contents:Agriculture, Soil, Environmental and Marine-Aquatic MicrobiologyFood MicrobiologyIndustrial Microbiology. Methods. Quantitative Models and BioinformaticsMedical and Pharmaceutical Microbiology. Antimicrobial Agents and ChemotherapyMicrobial Physiology, Metabolism and Gene ExpressionBiotechnologically Relevant Enzymes and Proteins Readership: Professionals, microbiologists, clinicians, (bio)chemists, physicists, and engineers. Keywords:Microorganisms;Applied Microbiology;Environmental Microbiology;Industrial Microbiology;Microbial Biotechnology;BioMicroWorld2011 Conference Proceedings Book;Mendez-VilasKey Features:The topics covered in this single volume include biodegradation of pollutants, water, soil and plant microorganisms, biosurfactants, antimicrobial natural products, antimicrobial susceptibility, antimicrobial resistance, human pathogens, food microorganisms, fermentation, biotechnologically relevant enzymes and proteins, metabolism and gene expression mainly, although many other subjects are also discussed

Pollution has accompanied polar exploration since Captain John Davis’ arrival on the Antarctic continent in 1821 and has become an unavoidable consequence of oil spills in our polar regions. Fortunately, many of the organisms indigenous to Polar ecosystems have the ability to degrade pollutants. It is this metabolic capacity that forms the basis for bioremediation as a potential treatment for the hydrocarbons that contaminate the pristine polar environments. The only book to cover the breadth of microbial ecology and diversity in polar regions with an emphasis on bioremediation, Polar Microbiology: The Ecology, Biodiversity, and Bioremediation Potential of Microorganisms in Extremely Cold Environments examines the diversity of polar microorganisms and their ability to degrade petroleum hydrocarbon contaminants in polar terrestrial and aquatic environments. Providing a unique perspective of these microorganisms in extremely cold temperatures, the book focuses on their taxonomy, physiology, biochemistry, population structure, bioremediation potential, and potential for biotechnology applications. Leading investigators in the field provide complete coverage of the microbiology relevant to the study of biodiversity and biodegradation of pollutants in the Arctic and Antarctic, including: Microbial extremophiles living in cold and subzero temperature environments Genetics and physiology of cold adaptation of microorganisms Biodegradative microbial consortia in a defined closed environment Molecular characterization of biodegradative microbial populations Molecular approaches to assess biodegradation of petroleum hydrocarbons Environmental impact of hydrocarbon contamination Microbial biodiversity across Antarctic deserts By bringing together the current state of scientific knowledge and research on microbial community structures in extremely cold temperatures, this thought provoking resource is the ideal starting point for the research that must be done if we are to effectively reduce human’s eco-footprint on our polar regions.

Uhlig’s Corrosion Handbook

Microbial Ecology of Soil and Plant Growth

Microbial Rejuvenation of Polluted Environment

Microbial Diversity

Biological Control of Crop Diseases

Environmental Microbiology

The 4th edition of Microbial Ecology features enhanced coverage of biofilms, thermal vent communities, extreme habitats, starvation response, molecular methods for studying microbial ecology and biodiversity, biodegradation and bioremediation.

This book is a treatise on microbial ecology that covers traditional and cutting-edge issues in the ecology of microbes in the biosphere. It emphasizes on study tools, microbial taxonomy and the fundamentals of microbial activities and interactions within their communities and environment as well as on the related food web dynamics and biogeochemical cycling. The work exceeds the traditional domain of microbial ecology by revisiting the evolution of cellular prokaryotes and eukaryotes and stressing the general principles of ecology. The overview of the topics, authored by more than 80 specialists, is one of the broadest in the field of environmental microbiology.

This well-referenced, inquiry-driven text presents an up-to-date and comprehensive understanding of the emerging field of environmental microbiology. Coherent and comprehensive treatment of the dynamic, emerging field of environmental microbiology Emphasis on real-world habitats and selective pressures experienced by naturally occurring microorganisms Case studies and “Science and the Citizen” features relate issues in the public’s mind to the underlying science Unique emphasis on current methodologies and strategies for conducting environmental microbiological research, including methods, logic, and data interpretation BIOS Instant Notes in Microbiology, Fourth Edition, is the perfect text for undergraduates looking for a concise introduction to the subject, or a study guide to use before examinations. Each topic begins with a summary of essential facts-an ideal revision checklist-followed by a description of the subject that focuses on core information, with cle

Modern Soil Microbiology, Second Edition

Microbes: The Foundation Stone of the Biosphere

The Ecology, Biodiversity and Bioremediation Potential of Microorganisms in Extremely Cold Environments

Anemones and fish, ants and acacia trees, fungus and trees, buffaloes and oxpeckers--each of these unlikely duos is an inimitable partnership in which the species’ coexistence is mutually beneficial. More specifically, they represent examples of defensive mutualism, when one species receives protection against predators or parasites in

exchange for offering shelter or food to its partner species. Explores the Diverse Range of Defensive Mutualisms Involving Microbial Symbionts The past 20 years, since this phenomenon first began receiving attention, have been marked by a deluge of research in a variety of organism kingdoms and much has been discovered about this intriguing behavior. Defensive Mutualism in Microbial Symbiosis includes basic ecological and biological information on defensive mutualisms, explores how they function, and evaluates how they have evolved. It also looks at the implications of symbiosis defensive compounds as a new frontier in bioexploration for drug and natural product discovery--the first book to explore this possibility. Chapters Written by Field Authorities The book expands the concept of defensive mutualisms to evaluate defense against environmental abiotic and biotic stresses. Addressing the topic of defensive mutualisms in microbial symbiosis across this wide spectrum, it includes chapters on defensive mutualistic associations involving multiple kingdoms of organisms in terrestrial and aquatic ecosystems--plant, animal, fungi, bacteria, and protozoans. Defensive Mutualism in Microbial Symbiosis unifies scattered findings into a single compendium, providing a valuable reference for field researchers and those in academia to assimilate and acquire a knowledgeable perspective on defensive mutualism, particularly those involving microbial partners.