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Textbook of Environmental Microbiology -

The Craft and Science of Coffee - Britta Folmer 2016-12-16
The Craft and Science of Coffee follows the coffee plant from its origins in East Africa to its current role as a global product that influences millions of lives though sustainable development, economics, and consumer desire. For most, coffee is a beloved beverage. However, for some it is also an object of scientifically study, and for others it is approached as a craft, both building on skills and experience. By

combining the research and insights of the scientific community and expertise of the crafts people, this unique book brings readers into a sustained and inclusive conversation, one where academic and industrial thought leaders, coffee farmers, and baristas are quoted, each informing and enriching each other. This unusual approach guides the reader on a journey from coffee farmer to roaster, market analyst to barista, in a style that is both rigorous and experience based, universally relevant and personally engaging. From on-farming processes to consumer benefits, the reader is given a deeper appreciation and understanding of coffee's complexity and is invited to form their own educated opinions on the ever changing situation, including potential routes to further shape the coffee future in a responsible manner. Presents a novel synthesis of coffee research and real-world experience that aids understanding, appreciation, and potential action. Includes contributions from a multitude of experts who address complex subjects with a conversational approach. Provides expert discourse on the coffee calue chain, from agricultural and production practices, sustainability, post-harvest processing, and quality aspects to the economic analysis of the consumer value proposition. Engages with the key challenges of future coffee production and potential solutions.

Environmental Microbiology - Ralph Mitchell 2010-01-08

The bestselling reference on environmental microbiology—now in a new edition This is the long-awaited and much-anticipated revision of the bestselling text and reference. Based on the latest information and investigative techniques from molecular biology and genetics, this Second Edition offers an in-depth examination of the role of microbiological processes related to environmental deterioration with an emphasis on the detection and control of

environmental contaminants. Its goal is to further our understanding of the complex microbial processes underlying environmental degradation, its detection and control, and ultimately, its prevention. Features new to this edition include: A completely new organization with topics such as pathogens in developing countries, effects of genetically modified crops on microbial communities, and transformations of toxic metals Comprehensive coverage of key topics such as bacteria in the greenhouse and low-energy waste treatment New coverage relating core book content to local, regional, and global environmental problems Environmental Microbiology, Second Edition is essential reading for environmental microbiologists and engineers, general environmental scientists, chemists, and chemical engineers who are interested in key current subjects in environmental microbiology. It is also appropriate as a textbook for courses in environmental science, chemistry, engineering, and microbial ecology at the advanced undergraduate and graduate levels.

Industrial Microbiology and Biotechnology - Pradeep Verma 2022-03-07

Industrial microbiology utilizes microorganisms to produce industrially important products in a more sustainable way, as opposed to the traditional chemical and energy intensive processes. The present book is an attempt to provide its readers with compiled and updated information in the area of Industrial Microbiology and Biotechnology. This book provides the basics of microbiology and how it has been exploited at an industrial scale. The book focuses on the role of biotechnological advances that directly impact the industrial production of several bioactive compounds using microbes-based methods under a controlled and regulated environment. On one hand, this book presents detailed information on the basics of microbiology such as

types of microbes and their applications, bioreactor design, fermentation techniques, strain improvement strategies, etc. At the same time it also provides recent and updated information on industrial production, recovery, and applications of enzymes, alcohols, organic acids, steroids as a drug precursor, etc., using microbial biotechnological approaches. The book presents an overview of modern technological advances for the generation of energy (biomethane, bioethanol, and bioelectricity) and resource recovery from waste. It also highlights the application of CRISPR-based technologies in the industrial microbiology sector. This book is developed with the motive to benefit students, academicians, as well as researchers. The book will also find interests among microbiologists, biotechnologists, environmentalists, and engineers working in the application of the microbes-based approach for the development of greener technologies.

Environmental Microbiology - Ian L. Pepper 2011-10-13
For microbiology and environmental microbiology courses, this leading textbook builds on the academic success of the previous edition by including a comprehensive and up-to-date discussion of environmental microbiology as a discipline that has grown in scope and interest in recent years. From environmental science and microbial ecology to topics in molecular genetics, this edition relates environmental microbiology to the work of a variety of life science, ecology, and environmental science investigators. The authors and editors have taken the care to highlight links between environmental microbiology and topics important to our changing world such as bioterrorism and national security with sections on practical issues such as bioremediation, waterborne pathogens, microbial risk assessment, and environmental biotechnology. WHY ADOPT THIS EDITION? New chapters

on: Urban Environmental Microbiology Bacterial Communities in Natural Ecosystems Global Change and Microbial Infectious Disease Microorganisms and Bioterrorism Extreme Environments (emphasizing the ecology of these environments) Aquatic Environments (now devoted to its own chapter- was combined with Extreme Environments) Updates to Methodologies: Nucleic Acid - Based Methods: microarrays, phyloarrays, real-time PCR, metagomics, and comparative genomics Physiological Methods: stable isotope fingerprinting and functional genomics and proteomics-based approaches Microscopic Techniques: FISH (fluorescent in situ hybridization) and atomic force microscopy Cultural Methods: new approaches to enhanced cultivation of environmental bacteria Environmental Sample Collection and Processing: added section on air sampling

Microbial Life of Cave Systems - Annette Summers Engel 2015-10-16

The earth's subsurface contains abundant and active microbial biomass, living in water, occupying pore space, and colonizing mineral and rock surfaces. Caves are one type of subsurface habitat, being natural, solutionally- or collapse-enlarged openings in rock. Within the past 30 years, there has been an increase in the number of microbiology studies from cave environments to understand cave ecology, cave geology, and even the origins of life. By emphasizing the microbial life of caves, and the ecological processes and geological consequences attributed to microbes, this book provides the first authoritative and comprehensive account of the microbial life of caves for students, professionals, and general readers.

Diversity and Benefits of Microorganisms from the Tropics - João Lucio de Azevedo 2017-06-10

This book addresses the diversity of tropical microorganisms and its applications in agriculture,

renewable energy production and environmental protection. It covers several tropical habitats such as rain forests, mangroves, sea and river waters and describes how microorganisms isolated from these regions can be used to control insects and plant diseases, to improve sugar cane and biofuels production among other applications. The book also aims to bring researchers' attention to the potential of tropical microorganisms for biotechnological purposes, an area that is still far from being well explored.

The Perfect Slime - Hans-Curt Flemming 2016-09-15

The Perfect Slime presents the latest state of knowledge and all aspects of the Extracellular Polymeric Substances, (EPS) matrix – from the ecological and health to the antifouling perspectives. The book brings together all the current material in order to expand our understanding of the functions, properties and characteristics of the matrix as well as the possibilities to strengthen or weaken it. The EPS matrix represents the immediate environment in which biofilm organisms live. From their point of view, this matrix has paramount advantages. It allows them to stay together for extended periods and form synergistic microconsortia, it retains extracellular enzymes and turns the matrix into an external digestion system and it is a universal recycling yard, it protects them against desiccation, it allows for intense communication and represents a huge genetic archive. They can remodel their matrix, break free and eventually, they can use it as a nutrient source. The EPS matrix can be considered as one of the emergent properties of biofilms and are a major reason for the success of this form of life. Nevertheless, they have been termed the "black matter of biofilms" for good reasons. First of all: the isolation methods define the results. In most cases, only water soluble EPS components are investigated; insoluble ones such as cellulose or amyloids

are much less included. In particular in environmental biofilms with many species, it is difficult to impossible isolate, separate the various EPS molecules they are encased in and to define which species produced which EPS. The regulation and the factors which trigger or inhibit EPS production are still very poorly understood. Furthermore: bacteria are not the only microorganisms to produce EPS. Archaea, Fungi and algae can also form EPS. This book investigates the questions, What is their composition, function, dynamics and regulation? What do they all have in common?

Advances in Grape and Wine Biotechnology - Antonio Morata 2019-09-04

Advances in Grape and Wine Biotechnology is a collection of fifteen chapters that addresses different issues related to the technological and biotechnological management of vineyards and winemaking. It focuses on recent advances in the field of viticulture with interesting topics such as the development of a microvine model for research purposes, the mechanisms of cultivar adaptation and evolution in a climate change scenario, and the consequences of vine water deficit on yield components. Other topics include the metabolic profiling of different Saccharomyces and non-Saccharomyces yeast species and their contribution in modulating the sensory quality of wines produced in warm regions, the use of new natural and sustainable fining agents, and available physical methods to reduce alcohol content. This volume will be of great interest to researchers and vine or wine professionals.

Microbes in Extreme Environments - Rodney A. Herbert 1986

Novel microorganisms which are capable of growth at environmental extremes have long been a rich resource for fundamental research. Of more recent interest is the recognition and exploitation of their genetic and biotechnological potential. This volume provides a much-

needed summary of fundamental and applied research in the field.

Microbes and Microbial Technology - Iqbal Ahmad 2011-02-01

This book focuses on successful application of microbial biotechnology in areas such as medicine, agriculture, environment and human health.

Diagnostic Medical Parasitology - Lynne Shore Garcia 2020-08-06

Diagnostic Medical Parasitology covers all aspects of human medical parasitology and provides detailed, comprehensive, relevant diagnostic methods in one volume. The new edition incorporates newly recognized parasites, discusses new and improved diagnostic methods, and covers relevant regulatory requirements and has expanded sections detailing artifact material and histological diagnosis, supplemented with color images throughout the text.

Soil Microbiology, Ecology and Biochemistry - Eldor A. Paul 2014-11-14

The fourth edition of Soil Microbiology, Ecology and Biochemistry updates this widely used reference as the study and understanding of soil biota, their function, and the dynamics of soil organic matter has been revolutionized by molecular and instrumental techniques, and information technology. Knowledge of soil microbiology, ecology and biochemistry is central to our understanding of organisms and their processes and interactions with their environment. In a time of great global change and increased emphasis on biodiversity and food security, soil microbiology and ecology has become an increasingly important topic. Revised by a group of world-renowned authors in many institutions and disciplines, this work relates the breakthroughs in knowledge in this important field to its history as well as future applications. The new edition provides readable, practical, impactful information for its many applied and fundamental disciplines.

Professionals turn to this text as a reference for fundamental knowledge in their field or to inform management practices. New section on "Methods in Studying Soil Organic Matter Formation and Nutrient Dynamics" to balance the two successful chapters on microbial and physiological methodology Includes expanded information on soil interactions with organisms involved in human and plant disease Improved readability and integration for an ever-widening audience in his field Integrated concepts related to soil biota, diversity, and function allow readers in multiple disciplines to understand the complex soil biota and their function

Microbes: The Foundation Stone of the Biosphere - Christon J. Hurst 2021-05-01

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.

Microbial Biodeterioration - Anthony H. Rose 1981

De achteruitgang in waarde of kwaliteit van materialen door micro-organismen wordt voor de volgende stoffen of goederen behandeld: hout, steen, wol, huiden en vellen, metalen, schilderijen en beeldhouwwerk, tabak, brandstoffen en olien, latex verfstoffen, rubber, kruiden en cosmetica, plastics

Applied Microbiology - Sanjai Saxena 2015-03-19

The book is oriented towards undergraduates science and engineering students; postgraduates and researchers pursuing the field of microbiology, biotechnology, chemical - biochemical engineering and pharmacy. Various applications of microorganisms have been covered broadly and have been appropriately reflected in depth in 12 different chapters. The book begins with an insight to the diverse niche of microorganisms which have been explored and exploited in development of various biotechnological products and green processes. Further, how these microorganisms have been genetically modified to improve the desired traits for achieving optimal production of microbially derived products is discussed in the second chapter. Major route of production of microbially derived products and processes is through fermentation technology and therefore due emphasis on different aspects of fermentation technology has been given in the subsequent chapter. The development and deployment of biopesticides and biofertilizers which find tremendous application have been separately discussed under agricultural applications. Application of microbes for the removal of pollutants, recovery of metals and oils has also been discussed under environmental applications. The role of microbial systems in development of fermented foods and beverages have also

been discussed in Chapter 6. The application of microbes in production of commodity chemicals and fine chemicals has also been discussed in separate chapters. A chapter has been dedicated to the tremendous applications of microbially produced enzymes in different industrial sectors. Another unique facet of this book is explaining the different methods by which desired traits of microorganisms have been improved for their efficacious and economical exploitation in the industry. A chapter is dedicated to exploitation of microorganisms in development of vaccines for human and veterinary use. Finally, the last chapter discusses the role of immobilization in optimization of industrial processes and development of microbial biosensors for industrial applications. Thus, this book is a holistic approach providing information on the present applications of microorganisms.

Biodiversity and Biomedicine - Munir Ozturk 2020-07-15

Biodiversity and Biomedicine: Our Future provides a new outlook on Earth's animal, plant, and fungi species as vital sources for human health treatments. While there are over 10 million various species on the planet, only 2 million have been discovered and named. This book identifies modern ways to incorporate Earth's species into biomedical practices and emphasizes the need for biodiversity conservation. Written by leading biodiversity and biomedical experts, the book begins with new insights on the benefits of biologically active compounds found in fungi and plants, including a chapter on the use of wild fruits as a treatment option. The book goes on to discuss the roles of animals, such as amphibians and reptiles, and how the threatened presence of these species must be reversed to conserve biodiversity. It also discusses marine organisms, including plants, animals, and microbes, as essential in contributing to human health. Biodiversity and Biomedicine:

Our Future is a vital source for researchers and practitioners specializing in biodiversity and conservation studies. Students in natural medicine and biological conservation will also find this useful to learn of the world's most bio-rich communities and the molecular diversity of various species. Presents new developments in documenting and identifying species for biodiversity conservation and ethical considerations for biodiversity research Examines biodiversity as an irreplaceable resource for biomedical breakthroughs using available species for medical research Discusses challenges and opportunities for biodiversity protection and research in biosphere reserves

Microorganisms and Bioterrorism - Burt Anderson 2007-05-26

The purpose of this book is to bring together, in a single volume, the most up-to-date information concerning microbes with potential as bioterrorist weapons. The primary audience includes microbiologists, including bacteriologists, virologists and mycologists, in academia, government laboratories and research institutes at the forefront of studies concerning microbes which have potential as bioterrorist weapons, public health physicians and researchers and scientists who must be trained to deal with bioterrorist attacks as well as laboratory investigators who must identify and characterize these microorganisms from the environment and from possibly infected patients.

Wastewater Microbiology - Gabriel Bitton 2011-06-09

Wastewater Microbiology focuses on microbial contaminants found in wastewater, methods of detection for these contaminants, and methods of cleansing water of microbial contamination. This classic reference has now been updated to focus more exclusively on issues particular to wastewater, with new information on fecal contamination and new molecular methods. The book features new methods to

determine cell viability/activity in environmental samples; a new section on bacterial spores as indicators; new information covering disinfection byproducts, UV disinfection, and photoreactivation; and much more. A PowerPoint of figures from the book is available at ftp://ftp.wiley.com/public/sci_tech_med/wastewater_microbiology.

Environmental Microbiology of Aquatic and Waste Systems - Nduka Okafor 2011-06-21

This book places the main actors in environmental microbiology, namely the microorganisms, on center stage. Using the modern approach of 16S ribosomal RNA, the book looks at the taxonomy of marine and freshwater bacteria, fungi, protozoa, algae, viruses, and the smaller aquatic animals such as nematodes and rotifers, as well as at the study of unculturable aquatic microorganisms (metagenomics). The peculiarities of water as an environment for microbial growth, and the influence of aquatic microorganisms on global climate and global recycling of nitrogen and sulphur are also examined. The pollution of water is explored in the context of self-purification of natural waters. Modern municipal water purification and disease transmission through water are discussed. Alternative methods for solid waste disposal are related to the economic capability of a society. Viruses are given special attention. By focusing on the basics, this primer will appeal across a wide range of disciplines.

Chemistry of Advanced Environmental Purification Processes of Water - Erik Sogaard 2014-04-11

Chemistry of Advanced Environmental Purification Processes of Water covers the fundamentals behind a broad spectrum of advanced purification processes for various types of water, showing numerous applications through worked examples. Purification processes for groundwater, soil water, reusable water, and raw

water are examined where they are in use full-scale, as a pilot approach, or in the laboratory. This book also describes the production of ceramic particles (nanochemistry) and materials for the creation of filtration systems and catalysts that are involved. Uses chemistry fundamentals to explain the mechanisms behind the various purification processes Explains in detail process equipment and technical applications Describes the production of ceramic particles and other new materials applicable to filtration systems Includes worked examples

Environmental Biotechnology - Jeyabalan Sangeetha 2016-10-14

With focus on the practical use of modern biotechnology for environmental sustainability, this book provides a thoughtful overview of molecular aspects of environmental studies to create a new awareness of fundamental biological processes and sustainable ecological concerns. It covers the latest research by prominent scientists in modern biology and delineates recent and prospective applications in the sub-areas of environmental biotechnology with special focus on the biodegradation of toxic pollutants, bioremediation of contaminated environments, and bioconversion of organic wastes toward a green economy and sustainable future.

Automation: Genomic and Functional Analyses - Alister G. Craig 1999-02

Evaluation and functional analysis, to provide insight into this "new age" of research based on genomic and chemical screening. Key Features * Describes automated procedures used in microbiology and molecular biology * Includes developments in robotics and vision systems * Features automation in library picking, presentation and analysis * Discusses paralogous duplications in microbial genomes * Covers deciphering genomes through automated large-scale sequencing * Describes and stresses the need for functional analyses *

Internationally acclaimed contributors, including Professor Leroy Hood.

Algal Culturing Techniques - Robert A. Andersen 2005-03-04
Algal Culturing Techniques is a comprehensive reference on all aspects of the isolation and cultivation of marine and freshwater algae, including seaweeds. It is divided into seven parts that cover history, media preparation, isolation and purification techniques, mass culturing techniques, cell counting and growth measurement techniques, and reviews on topics and applications of algal culture techniques for environmental investigations. Algal Culturing Techniques was developed to serve as both a new textbook and key reference for phycologists and others studying aquatic systems, aquaculture and environmental sciences. Students of algal ecology, marine botany, marine phycology, and microbial ecology will enjoy the hands-on methodology for culturing a variety of algae from fresh and marine waters. Researchers in industry, such as aquaculture, pharmaceutical, foodstuffs, and biotechnology companies will find an authoritative and comprehensive reference. * Sponsored by the Phycological Society of America * Features color photographs and illustrations throughout * Describes culturing methods ranging from the test tube to outdoor ponds and coastal seaweed farms * Details isolation techniques ranging from traditional micropipette to automated flow cytometeric methods * Includes purification, growth, maintenance, and cryopreservation techniques * Highlights methods for estimating algal populations, growth rates, isolating and measuring algal pigments, and detecting and culturing algal viruses * Features a comprehensive appendix of nearly 50 algal culture medium recipes * Includes a glossary of phycological terms

Coccolithophores - Hans R. Thierstein 2013-03-09
This introduction to one of the most common phytoplankton

types provides broad coverage from molecular and cellular biology all the way to its impact on the global carbon cycle and climate. Individual chapters focus on coccolithophore biology, ecology, evolutionary phylogeny and impact on current and past global changes. The book addresses fundamental questions about the interaction between the biota and the environment at various temporal and spatial scales.

Microbiological Analysis of Food and Water - N.F. Lightfoot 1998-04-22

With the help of leading Quality Assurance (QA) and Quality Control (QC) microbiology specialists in Europe, a complete set of guidelines on how to start and implement a quality system in a microbiological laboratory has been prepared, supported by the European Commission through the Measurement and Testing Programme. The working group included food and water microbiologists from various testing laboratories, universities and industry, as well as statisticians and QA and QC specialists in chemistry. This book contains the outcome of their work. It has been written with the express objective of using simple but accurate wording so as to be accessible to all microbiology laboratory staff. To facilitate reading, the more specialized items, in particular some statistical treatments, have been added as an annex to the book. All QA and QC tools mentioned within these guidelines have been developed and applied by the authors in their own laboratories. All aspects dealing with reference materials and interlaboratory studies have been taken in a large part from the projects conducted within the BCR and Measurement and Testing Programmes of the European Commission. With so many different quality control procedures, their introduction in a laboratory would appear to be a formidable task. The authors recognize that each laboratory manager will choose

the most appropriate procedures, depending on the type and size of the laboratory in question. Accreditation bodies will not expect the introduction of all measures, only those that are appropriate for a particular laboratory. Features of this book: • Gives all quality assurance and control measures to be taken, from sampling to expression of results • Provides practical aspects of quality control to be applied both for the analyst and top management • Describes the use of reference materials for statistical control of methods and use of certified reference materials (including statistical tools).

Desk Encyclopedia of Microbiology - Moselio Schaechter 2010-04-19

The Desk Encyclopedia of Microbiology, Second Edition is a single-volume comprehensive guide to microbiology for the advanced reader. Derived from the six volume e-only Encyclopedia of Microbiology, Third Edition, it bridges the gap between introductory texts and specialized reviews. Covering topics ranging from the basic science of microbiology to the current "hot" topics in the field, it will be invaluable for obtaining background information on a broad range of microbiological topics, preparing lectures and preparing grant applications and reports. * The most comprehensive single-volume source providing an overview of microbiology to non-specialists * Bridges the gap between introductory texts and specialized reviews. * Provides concise and general overviews of important topics within the field making it a helpful resource when preparing for lectures, writing reports, or drafting grant applications

Plant Biochemistry - Hans-Walter Heldt 2005

1 A Leaf Cell Consists of Several Metabolic Compartments 2 The Use of Energy from Sunlight by Photosynthesis is the Basis of Life on Earth 3 Photosynthesis is an Electron Transport Process 4 ATP is Generated by Photosynthesis 5 Mitochondria are the Power Station of the

Cell 6 The Calvin Cycle Catalyzes Photosynthetic CO2 Assimilation 7 In the Photorespiratory Pathway Phosphoglycolate Formed by the Oxygenase Activity of RubisCo is Recycled 8 Photosynthesis Implies the Consumption of Water 9 Polysaccharides are Storage and Transport Forms of Carbohydrates Produced by Photosynthesis 10Nitrate Assimilation is Essential for the Synthesis of Organic Matter 11 Nitrogen Fixation Enables the Nitrogen in the Air to be Used for Plant Growth 12 Sulfate Assimilation Enables the Synthesis of Sulfur Containing Substances 13 Phloem Transport Distributes Photoassimilates to the Various Sites of Consumption and Storage 14 Products of Nitrate Assimilation are Deposited in Plants as Storage Proteins 15 Glycerolipids are Membrane Constituents and Function as Carbon Stores 16 Secondary Metabolites Fulfill Specific Ecological Functions in Plants 17 Large Diversity of Isoprenoids has Multiple Funtions in Plant Metabolism 18 Phenylpropanoids Comprise a Multitude of Plant Secondary Metabolites and Cell Wall Components 19 Multiple Signals Regulate the Growth and Development of Plant Organs and Enable Their Adaptation to Environmental Conditions 20 A Plant Cell has Three Different Genomes 21 Protein Biosynthesis Occurs at Different Sites of a Cell 22 Gene Technology Makes it Possible to Alter Plants to Meet Requirements of Agriculture, Nutrition, and Industry.

Microbial Biotechnology - Alexander N. Glazer 2007-10-01

Knowledge in microbiology is growing exponentially through the determination of genomic sequences of hundreds of microorganisms and the invention of new technologies such as genomics, transcriptomics, and proteomics, to deal with this avalanche of information. These genomic data are now exploited in thousands of applications, ranging from those in medicine, agriculture,

organic chemistry, public health, biomass conversion, to biomining. Microbial Biotechnology. Fundamentals of Applied Microbiology focuses on uses of major societal importance, enabling an in-depth analysis of these critically important applications. Some, such as wastewater treatment, have changed only modestly over time, others, such as directed molecular evolution, or 'green' chemistry, are as current as today's headlines. This fully revised second edition provides an exciting interdisciplinary journey through the rapidly changing landscape of discovery in microbial biotechnology. An ideal text for courses in applied microbiology and biotechnology courses, this book will also serve as an invaluable overview of recent advances in this field for professional life scientists and for the diverse community of other professionals with interests in biotechnology.

Introduction to Psychoneuroimmunology - Jorge H. Daruna 2012-02-24

Health is maintained by the coordinated operation of all the biological systems that make up the individual. The Introduction to Psychoneuroimmunology, Second Edition, presents an overview of what has been discovered by scientists regarding how bodily systems respond to environmental challenges and intercommunicate to sustain health. The book touches on the main findings from the current literature without being overly technical and complex. The result is a comprehensive overview of psychoneuroimmunology, which avoids oversimplification, but does not overwhelm the reader. Single authored for consistency of breadth and depth, with no redundancy of coverage between chapters Covers endocrine-immune modulation, neuro-immune modulation, and the enhancing or inhibiting processes of one or more systems on the others Expanded use of figures, tables, and text boxes

Marine Nitrogen Fixation - Jonathan P. Zehr 2021-04-02 This book aims to serve as a centralized reference document for students and researchers interested in aspects of marine nitrogen fixation. Although nitrogen is a critical element in both terrestrial and aquatic productivity, and nitrogen fixation is a key process that balances losses due to denitrification in both environments, most resources on the subject focuses on the biochemistry and microbiology of such processes and the organisms involved in the terrestrial environment on symbiosis in terrestrial systems, or on largely ecological aspects in the marine environment. This book is intended to provide an overview of N2 fixation research for marine researchers, while providing a reference on marine research for researchers in other fields, including terrestrial N2 fixation. This book bridges this knowledge gap for both specialists and non-experts, and provides an in-depth overview of the important aspects of nitrogen fixation as it relates to the marine environment. This resource will be useful for researchers in the specialized field, but also useful for scientists in other disciplines who are interested in the topic. It would provide a possible text for upper division classes or graduate seminars.

Microbiological Activity for Soil and Plant Health Management - Ravindra Soni 2021-11-24 Plants and the soil they grow in, are confronted with severe biotic and abiotic stresses viz. nutrient starvation, salt stress, drought, flooding, xenobiotic contamination, in order to sustain in an ecosystem. They also shape the microbial composition in their vicinity by modulating their secretions. This book discusses the pressing demand for novel and potential microorganisms to support an environment-friendly and cost-effective way of stress management in the plants. The book summarizes the processes and mechanisms involved in microbe-assisted

plant and soil stress management. It discusses the challenges and opportunities in the application of microbial interactions in plant health. It describes in detail the nutrient dynamics of different soil systems. It includes important topics like agriculturally important genes and enzymes, rhizosphere modeling & engineering, genetically engineered bio-inoculants etc. It also talks about the application of next-generation technologies, omics and nano-based technologies. In the recent years, more than 50% of agricultural production relies on chemical fertilizers, leading to serious health issues and environmental concerns. This book provides natural solutions to these environmental concerns. This book is useful for researchers and students in the field of microbiology, agriculture, soil biology and plant sciences.

Yogurt in Health and Disease Prevention - Nagendra P. Shah 2017-05-26

Yogurt in Health and Disease Prevention examines the mechanisms by which yogurt, an important source of micro- and macronutrients, impacts human nutrition, overall health, and disease. Topics covered include yogurt consumption's impact on overall diet quality, allergic disorders, gastrointestinal tract health, bone health, metabolic syndrome, diabetes, obesity, weight control, metabolism, age-related disorders, and cardiovascular health. Modifications to yogurt are also covered in scientific detail, including altering the protein to carbohydrate ratios, adding n-3 fatty acids, phytochemical enhancements, adding whole grains, and supplementing with various micronutrients. Prebiotic, probiotic, and synbiotic yogurt component are also covered to give the reader a comprehensive understanding of the various impacts yogurt and related products can have on human health. Health coverage encompasses nutrition, gastroenterology, endocrinology, immunology, and cardiology Examines novel

and unusual yogurts as well as popular and common varieties Covers effects on diet, obesity, and weight control Outlines common additives to yogurts and their respective effects Reviews prebiotics, probiotics, and symbiotic yogurts Includes practical information on how yogurt may be modified to improve its nutritive value

Environmental Biotechnology - Sibi G 2022-11-30

This book approaches the topic of environmental biotechnology in a clear, integrated, and meaningful way, covering both the fundamentals and biochemical processes involved, as well as the technologies themselves within different areas of application. As part of the framework, it also provides a thorough description of the pollution and its control, and the role of microorganisms in a wide range of ecosystems and deterioration processes. Features: Focuses on the role of microorganisms in a wide range of ecosystems and deterioration processes. Explains underlying concepts of environment, interlinks them from an ecological point of view, and describes the approaches for waste treatment. Describes the concepts and fate processes of environmental contaminants, contaminant patterns in soil, groundwater, and surface water. Includes novel research findings and applications of biosurfactants. Discusses biodegradation as a key process in the bioremediation of recalcitrant compounds. This book is aimed at Primarily Senior Undergraduates including Graduate Students and Researchers in Biotechnology, Environmental Science/Engineering, Conservation Biology, Microbiology, Waste Management, and Ecology.

Microorganisms in the Deterioration and Preservation of Cultural Heritage - Edith Joseph 2021-05-05

This open access book offers a comprehensive overview of the role and potential of microorganisms in the

degradation and preservation of cultural materials (e.g. stone, metals, graphic documents, textiles, paintings, glass, etc.). Microorganisms are a major cause of deterioration in cultural artefacts, both in the case of outdoor monuments and archaeological finds. This book covers the microorganisms involved in biodeterioration and control methods used to reduce their impact on cultural artefacts. Additionally, the reader will learn more about how microorganisms can be used for the preservation and protection of cultural artefacts through bio-based and eco-friendly materials. New avenues for developing methods and materials for the conservation of cultural artefacts are discussed, together with concrete advances in terms of sustainability, effectiveness and toxicity, making the book essential reading for anyone interested in microbiology and the preservation of cultural heritage.

Environmental and Pollution Science - Ian L. Pepper 2011-08-09

Environmental and Pollution Science, Second Edition, provides the latest information on the environmental influence of a significant number of subjects, and discusses their impact on a new generation of students. This updated edition of Pollution Science has been renamed to reflect a wider view of the environmental consequences we pay as a price for a modern economy. The authors have compiled the latest information to help students assess environmental quality using a framework of principles that can be applied to any environmental problem. The book covers key topics such as the fate and transport of contaminants, monitoring and remediation of pollution, sources and characteristics of pollution, and risk assessment and management. It contains more than 400 color photographs and diagrams, numerous questions and problems, case studies, and highlighted keywords. This book is ideally suited for

professionals and students studying the environment, especially as it relates to pollution as well as government workers and conservationists/ecologists. * Emphasizes conceptual understanding of environmental impact, integrating the disciplines of biology, chemistry, and mathematics * Topics cover the fate and transport of contaminants; monitoring and remediation of pollution; sources and characteristics of pollution; and risk assessment and management * Includes color photos and diagrams, chapter questions and problems, and highlighted key words

Environmental Microbiology - Ian L. Pepper 2014-03-01

Designed for advanced undergraduate students, graduate students, and environmental professionals, this book builds upon the tremendous success of the previous editions with a comprehensive and up-to-date discussion of environmental microbiology as a discipline that has greatly expanded in scope and interest over the past several decades. From terrestrial and aquatic ecosystems to urban and indoor environments, this edition relates environmental microbiology to a variety of life science, ecology, and environmental science topics including biogeochemical cycling, bioremediation, environmental transmission of pathogens, microbial risk assessment, and drinking water treatment and reuse. The final chapter highlights several emerging issues including microbial remediation of marine oil spills, microbial contributions to global warming, impact of climate change on microbial infectious disease, and the development of antibiotic-resistant bacteria. Presents state-of-the-art research results with key, recent references to document information Emphasizes critical information using "Information Boxes" throughout Includes real-world case studies to illustrate concepts, along with frequent use of graphics,

cartoons and photographs Offers questions at the end of each chapter designed to test key concepts Lecture slides available for instructors online

The Lactic Acid Bacteria:Volume 1 - B.J.B. Wood 2012-12-06

Historical Background lowe my interest in the lactic acid bacteria (LAB) to the late Dr Cyril Rainbow, who introduced me to their fascinating world when he offered me a place with him to work for a PhD on the carbohydrate meta bolism of some lactic rods isolated from English beer breweries by himself and others, notably Dr Dora Kulka. He was particularly interested in their preference for maltose over glucose as a source of carbohydrate for growth, expressed in most cases as a more rapid growth on the disaccharide, but one isolate would grow only on maltose. Eventually, we showed that maltose was being utilised by 'direct fermen tation' as the older texts called it, specifically by the phosphorolysis which had first been demonstrated for maltose by Doudoroff and his associates in their work on maltose metabolism by a strain of Neisseria meningitidis. I began work on food fermentations when I came to Strathclyde University, and I soon found myself involved again with the bacteria which I had not touched since completing my doctoral thesis. In 1973 lG. Carr, C. V. Cutting and G. c. Whiting organised the 4th Long Ashton Symposium Lactic Acid Bacteria in Beverages and Food and from my participation in that excellent conference arose a friendship with Geoff Carr. The growing importance of these bacteria was subsequently confirmed by the holding, a decade later, of the first of the Wageningen Conferences on the LAB.

Seagrasses of Australia - Anthony W. D. Larkum 2018-07-27

This book takes the place of “Biology of Seagrasses: A Treatise on the Biology of Seagrasses with Special Reference to the Australian Region”, co-edited by A.W.D.

Larkum, A.J. MaCComb and S.A. Shepherd and published by Elsevier in 1989. The first book has been influential, but it is now 25 years since it was published and seagrass studies have progressed and developed considerably since then. The design of the current book follows in the steps of the first book. There are chapters on taxonomy, floral biology, biogeography and regional studies. The regional studies emphasize the importance of Australia having over half of the world's 62 species, including some ten species published for Australia since the previous book. There are a number of chapters on ecology and biogeography; fish biology and fisheries and dugong biology are prominent chapters. Physiological aspects again play an important part, including new knowledge on the role of hydrogen sulphide in sediments and on photosynthetic processes. Climate change, pollution and environmental degradation this time gain an even more important part of the book. Decline of seagrasses around Australia are also discussed in detail in several chapters. Since the first book was published two new areas have received special attention: blue carbon and genomic studies. Seagrasses are now known to be a very important player in the formation of blue carbon, i.e. carbon that has a long turnover time in soils and sediments. Alongside salt marshes and mangroves, seagrasses are now recognized as playing a very important role in the formation of blue carbon. And because Australia has such an abundance and variety of seagrasses, their role in blue carbon production and turnover is of great importance. The first whole genomes of seagrasses are now available and Australia has played an important role here. It appears that seagrasses have several different suites of genes as compared with other (land) plants and even in comparison with freshwater hydrophytes. This difference is leading to important molecular biological studies where the

new knowledge will be important to the understanding and conservation of seagrass ecosystems in Australia. Thus by reason of its natural abundance of diverse seagrasses and a sophisticated seagrass research community in Australia it is possible to produce a book which will be attractive to marine biologists, coastal scientists and conservationists from many countries around the world.

Pollution Science - Ian L. Pepper 1996

This beautifully illustrated text is designed to serve the integrated, rigorous science-based undergraduate curriculum that is emerging in environmental science. Emphasis is placed on a conceptual understanding of environmental impact by integrating the key scientific disciplines that investigate the sources, fate, transport, mitigation, and toxicology of pollutants. Abiotic and biotic processes in the soil/vadose zone, surface waters, and the atmosphere are all examined in the context of existing pollution and the potential to minimize future pollution. Innovative coverage includes the practical problems of remediation, environmental monitoring and risk assessment and management. The book will also serve as an authoritative reference for advanced students and environmental professionals. Key Features * Integrates areas of biology, chemistry, physics, mathematics, and earth sciences related to the fate, mitigation, and transport of pollutants * Evaluates pollution in the soil/vadose zone, the atmosphere, surface water, and groundwater * Written by nationally recognized experts * Richly illustrated and documented with 186 full color illustrations and photographs and 79 tables * Concepts are clearly presented yet maintain rigor