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QUANTITATIVE BIOLOGY LIFE FROM THE NUMBERS

By Gavin Conant

ISBN 9781041170167

Published 2026 by CRC Press

BOOK DESCRIPTION

Biology at all scales has become a data-driven science, with large-scale datasets driving fields from population genomics to ecology. Practicing biologists have no choice but to use computational approaches, statistics, modeling, and other data science tools in their research. However, undergraduate biology education still primarily focuses on nonquantitative descriptions. This book provides students whose background is in biology with an introduction to modeling biological systems using mathematical, computational, and statistical tools. It is based on a series of hands-on analyses conducted with open-source tools that allow the students to discover for themselves emergent properties of biological systems that are not evident without using model-based approaches. The goal of this book is to provide a "turn-key" introductory quantitative biology course suitable for all biology students. The book provides the narrative for the analyses and discussions to be done in class, with support from the included website, slides, and test material.

TABLE OF CONTENTS

Preface. Acknowledgments. Chapter 1: On the Road: Dynamical Models of Infectious Diseases and Physical Systems. Chapter 2: Outbreaks: Modeling an Infectious Disease Outbreak with Differential Equations. Chapter 3: Building a Better Cat: Building a Predator–Prey Model and Chaos. Chapter 4: Survival of the Fastest: Modeling Competition between Species and between Cells. Chapter 5: Emergence: Genetic Dominance as an Emergent Property of Biochemical Models. Chapter 6: Growing Too Big: Full-Cell Metabolic Models. Chapter 7: Shrinking Too Small: Noise in Biochemical Systems. Chapter 8: Time and Chance: Probability and Random Variables. Chapter 9: Is It Normal?: Sampling, Statistics, and the Central Limit Theorem. Chapter 10: Lather, Rinse, Repeat: A Gentle Introduction to Computer Programming. Chapter 11: Agents of Change: Computational Models of Genetic Drift. Chapter 12: Ducks in a Row: Bioinformatics and Algorithmic Approaches to Biological Data. Chapter 13: Life on a Tree: Phylogenetics. Chapter 14: Life in a Net: Network Tools for Modeling Complex Systems from a Cell to an Ecosystem. Chapter 15: Scale: Metabolic Rate, Body Size, and Fractal Geometry. Chapter 16: Bits: Life as an Information Transfer Process. Glossary. Index.



MICROBIAL ECOLOGY

By Bhagwan Narayan Rekadwad

ISBN 9781041136965

Published 2026 by CRC Press

BOOK DESCRIPTION

"Microbial Ecology: Culture-dependent Methods" is a comprehensive guide to studying microbial diversity. The book details methods for sampling and characterizing microbes from soil and water, covering both physicochemical and microbiological aspects. It delves into the cultivation, isolation, and preservation of bacteria and archaea, including cryopreservation and freeze-drying. Subsequent chapters focus on molecular techniques like DNA extraction, PCR, 16S rRNA gene sequencing, and bioinformatic analysis, along with advanced methods such as MLST, qPCR, and Whole Genome Sequencing. The book also covers sequence deposition and provides protocols for DGGE, making it an invaluable resource for microbial ecologists.

TABLE OF CONTENTS

Samples and Sampling Methods for the Study of Microbial Diversity from Soil and Water

Physicochemical Characterization of Soil and Water Samples

Microbiological Characterization of Soil and Water Samples

Cultivation, Isolation, and Pure Culture of Bacteria and Archaea

Short-term and Long-term Preservation of Microorganisms at Extremely Low Temperatures

Long-term Preservation of Microorganisms using Freeze-drying

Biochemical Characterization of Bacteria

Tests for Screening: Aminopeptidase, KOH Test, and Antimicrobial Resistance

Bacterial DNA Extraction

A Detailed Method of Bacterial DNA Extraction using Sonication

DNA Quantification and Agarose Gel Electrophoresis

Amplification of the 16S rRNA using Polymerase Chain Reaction (PCR)

PEG-NaCl Purification of PCR Products: Principles, Protocols, and Applications

16S rRNA Gene Sequencing Method and Bioinformatic Analysis

Software Tools for Sequence Analysis and Identification

Deposition of Sequence Data in INSDC, ENA, and DDBJ Repositories

Deposition of Pure Cultures in International Culture Collections

Primer Design for Polymerase Chain Reactions (PCRs) and Sequencing PCRs

Loop-Mediated Isothermal Amplification (LAMP) Assay for Rapid Microbial Gene Detection

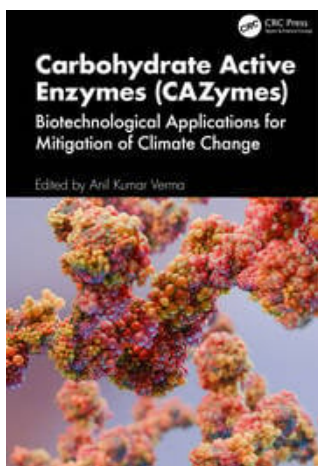
Multilocus Sequence Typing (MLST) for Microbial Identification and Classification

Quantitative Polymerase Chain Reaction (qPCR) Protocol and Applications

Whole Genome Sequencing (WGS) of Bacteria

Bacterial and Archaeal Genome Annotation

Denaturing Gradient Gel Electrophoresis (DGGE) Protocol and its Applications in Microbial Ecology



CARBOHYDRATE ACTIVE ENZYMES (CAZYMES) BIOTECHNOLOGICAL APPLICATIONS FOR MITIGATION OF CLIMATE CHANGE

By Anil Kumar Verma

ISBN 9781032889078

Published 2026 by CRC Press

BOOK DESCRIPTION

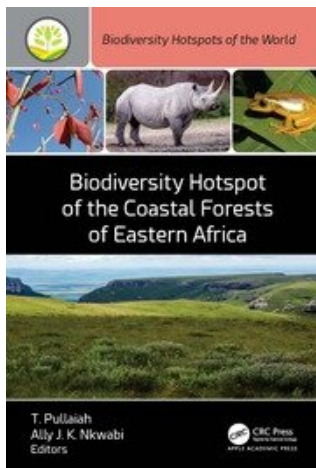
This book provides a comprehensive exploration of CAZymes in addressing the climate crisis where the biotechnological advances in utilizing this diverse enzyme group for climate change mitigation have been examined. An overview of the CAZymes from their sources, structure, diversity, biological significance, and potential for alleviation climate change have been discussed. It further implicates the use of CAZymes in sustainable practices for their application in various sectors from food and agriculture to textile and pharmaceutical industries as well as medicine and combating climate change.

- Provides a detailed analysis of CAZymes for their structural and functional diversity
- Reviews the application of CAZymes in biorefineries for the generation of biofuel and value-added products
- Discusses other applications of CAZymes in agriculture and industrial sectors as biological replacements for harmful chemicals
- Addresses the role of the CAZymes in mitigating climate change
- Explains climate change with respect to the various causes and the evidence

This book is aimed at researchers in bioengineering, enzymology, and carbohydrates.

TABLE OF CONTENTS

0. Front Matter. 1. Climate Change and Global Warming: Evidence, Causes and Significance Of Carbohydrate-Active Enzymes for Its Alleviation. 2. Analyzing the Structural Diversity of Carbohydrate-Active Enzymes and Their Functional Role in Various Domains of Life. 3. Nano-CAZymes synergy: A novel prospect. 4. Exploring the various novel sources of carbohydrate-active enzymes (CAZymes). 5. Integrating Carbohydrate Active Enzymes in Biorefineries: Pioneering Sustainable Development through Circular Economy. 6. Emerging Roles of Carbohydrate-Active Nanoenzymes in Biomedical Applications. 7. Bioprospection and engineering of lignin and chitin degrading enzymes for industrial applications. 8. Scaling up the Production of Carbohydrate-active Enzymes for Biotechnological Application. 9. Structure, Classes, Databases, and Bioinformatics Tools Associated with Carbohydrate-Active Enzymes. 10. Carbohydrate Active Enzymes Inhibitors: Mechanisms and Mitigation. 11. Carbohydrate-Active Enzymes: Role In Food And Agriculture.



BIODIVERSITY HOTSPOT OF THE COASTAL FORESTS OF EASTERN AFRICA

By T. Pullaiah, Ally J. K. Nkwabi

ISBN 9781998511082

Published 2026 by Apple Academic Press

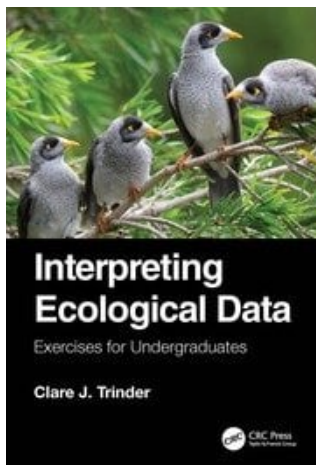
BOOK DESCRIPTION

Biodiversity is declining at an alarming rate due to anthropogenic activities around the world. This book is part of the new series Biodiversity Hotspots of the World, which highlights the 36 hotspot regions of the world that are Earth's most biologically rich but threatened terrestrial regions, each defined by having at least 1,500 endemic plant species and having lost at least 70% of its original natural vegetation.

This volume covers the Coastal Forests of Eastern Africa Biodiversity Hotspot, which stretches along the eastern edge of Africa and includes parts of Somalia, Kenya, Tanzania, and Mozambique. All islands lying immediately offshore are also part of the hotspot—Pemba, Zanzibar, Mafia and the Bazaruto Archipelago among them. While it is difficult to document the biodiversity of this inhospitable terrain, the coastal forests have exceptionally rich biodiversity and high endemism, with 11,000 species of plants and animals, including 1000 species of seaweed, 3000 species of mollusks, and 1500 species of fish. Anthropogenic activities including deforestation, fragmentation of habitats, pollution, increased human population, climate change, and poaching of wildlife pose serious threats to the biodiversity of the region.

TABLE OF CONTENTS

1. Geography, Climate, and Soil Along the Coastal Forest of East Africa
2. The Vegetation Types of Coastal Forests of Eastern Africa Biodiversity Hotspot
3. Mangrove Diversity, Conservation, and Challenges Along the Coastal Biodiversity Hotspot of Eastern Africa
4. Pteridophytes Richness Along the Coastal Forest of Eastern Africa
5. Angiosperms Diversity in East Africa: An Insight from the Tanzania Coast
6. Diversity of Invertebrates in the Coastal Forests of Eastern Africa
7. Biodiversity, Challenges, and Preservation Efforts for Insects in the Coastal Regions of East Africa
8. Amphibian Species of the Coastal Ecoregion of Eastern Africa: Richness, Distribution, and Conservation
9. Reptile Species of the Coastal Ecoregion of Eastern Africa: Richness, Distribution, and Conservation
10. Bird Diversity of Coastal Forests of Eastern Africa Biodiversity Hotspot
11. Distribution and Abundance of Mammals Along the Biodiversity Hotspot of the Coastal Forests of Eastern Africa
12. Small Mammal Distribution and Diversity Along the Coastal Forests of Eastern Africa
13. The Coastal Forests of East Africa: Insights on Threats and Conservation
14. Remote Sensing Applications in Miombo and Coastal Mosaic Forest of Tanzania: Ecological Conditions, and Anthropogenic Disturbances in the Selous-Niassa Wildlife Corridor, Tanzania
15. Impacts of Climate Change Along the Eastern Africa Coastal Forests



INTERPRETING ECOLOGICAL DATA EXERCISES FOR UNDERGRADUATES

By Clare J. Trinder

ISBN 9781041081746

Published 2026 by CRC Press

BOOK DESCRIPTION

With over 70 exercises containing more than 270 questions, *Interpreting Ecological Data: Exercises for Undergraduates* allows students to apply ecological theory learned in classes to new, 'real' data from the scientific literature. Rather than simply rote learning word-perfect answers, students are empowered to apply their knowledge and develop critical thinking skills: core attributes for science undergraduates.

The book covers ecological principles such as predation, competition, mutualism, food webs and biogeochemical cycling. With numerous examples on each theme, students can gain plenty of practice across a wide range of topics, providing a solid foundation for their ecological knowledge and developing transferable skills in data interpretation. Almost all the exercises use 'real' data from published papers, sometimes messy and not always supporting the hypotheses they were designed to investigate—just like in real life! The answers are all included in the final chapter, with detailed explanations where relevant.

The exercises can also be used for assessment, enabling students to demonstrate their understanding, and lecturers can quickly convert them for use in lectures, workshops or assessments. Most importantly, *Interpreting Ecological Data: Exercises for Undergraduates* aims to stimulate student enthusiasm for ecology and what researchers actually do, starting an unexpected and exciting new journey.

TABLE OF CONTENTS

- 1 Biodiversity
- 2 Communities and disturbance
- 3 Energy, matter and decomposition
- 4 Intraspecific competition and life histories
- 5 Interspecific competition
- 6 Mutualism and parasitism
- 7 Predation and herbivory
- 8 Food webs and complex interactions
- 9 Impacts of climate change
- 10 References, answers and explanations



ADVANCES AND APPLICATIONS IN BIOTECHNOLOGY

By Arti Gupta, Ali Asghar Rastegari

ISBN 9781032590745

Published 2026 by CRC Press

BOOK DESCRIPTION

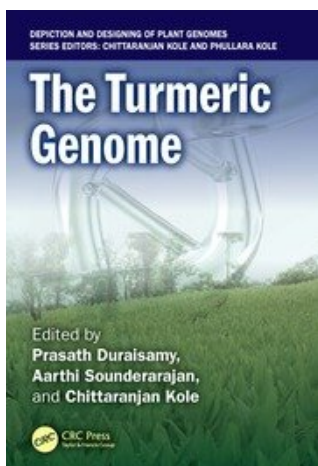
Advances and Applications in Biotechnology: Volume 1—Prospects of Farm Animals and Future Developments explores the dynamic and evolving role of livestock in global agriculture, emphasizing sustainable practices, molecular innovations, and emerging technologies. Against the backdrop of increasing environmental pressures and rising food security concerns, this volume highlights the transformative potential of biotechnology in farm animal research and management.

The book aims to integrate traditional livestock knowledge with advanced scientific strategies, offering readers a multidimensional view of animal agriculture. It addresses challenges in genetics, health, nutrition, welfare, climate resilience, and productivity, fostering dialogue between researchers, technologists, and practitioners.

Encompassing a broad scope—from glycoproteomics and immunity to species-specific developments—this volume navigates cutting-edge discoveries and practical applications across farm animal systems. Contributors offer global perspectives rooted in rigorous research and collaborative expertise.

TABLE OF CONTENTS

- Chapter 1. Farm Animals Biotechnology as a Driver of Change: Breeding and Genetics
- Chapter 2. Current and Evolving Trends in Artificial Insemination of Animal Species
- Chapter 3. Artificial Insemination in Animal Species: Current and Future Trends
- Chapter 4. Livestock at the Crossroads: Sustainability in a Global Agri-Food Landscape Through Application of Biotechnology
- Chapter 5. Advancements of Plant and Animal Biotechnology
- Chapter 6. Plant and Animal Biotechnology Innovation Action Plan: Main Opportunities and Challenges
- Chapter 7. Prospects of Integrated Farming System
- Chapter 8. Relevance of Quality Assurance Process under Environmental Governance
- Chapter 9. Sustainable Animal Feed for Safer Animal Farming
- Chapter 10. Inevitability of Balanced Life and the Growth of Farming Animals



THE TURMERIC GENOME

By Prasath Duraisamy, Aarthi Sounderajan,
Chittaranjan Kole

ISBN 9781041108023

Published 2025 by CRC Press

BOOK DESCRIPTION

The Turmeric Genome is the first comprehensive compilation of research deliberations focused on whole genome sequencing of turmeric (*Curcuma longa* L.). This book serves as a valuable starting point for researchers working on turmeric and covers recent advancements in whole genome sequencing, structural and functional genomics, as well as molecular markers and breeding. It also includes fundamental information about the crop itself.

Turmeric is well known for its high nutritional value and is deeply rooted in traditional and indigenous medicinal systems across many turmeric-growing regions. Widely used as a spice for its flavour and as a natural colouring agent, turmeric also finds applications in cosmetics, as a condiment, and as a dye. Despite being cultivated and utilized for over 4000 years, turmeric continues to hold untapped potential for novel uses. This book highlights recent developments in turmeric research, including chapters on bioinformatics tools for turmeric genome and the assembly of complex plant genomes.

TABLE OF CONTENTS

Chapter 1: Turmeric, The Golden Spice of Life: History, Economic Importance and Global Status

Chapter 2: Turmeric: Medicinal and Pharmacological Potential

Chapter 3: Phytochemistry of Turmeric

K. Anees and Ansheef Ali

Chapter 4: Turmeric Botany and Cytogenetics

Chapter 5: Genetic Diversity of Turmeric

Chapter 6: Breeding Progress and Future Challenges in Turmeric

Chapter 7: Turmeric Tissue Culture and Genetic Engineering

Chapter 8: Molecular Marker Resources in Turmeric

Chapter 9: Genome Sequencing of Turmeric: An Indian Initiative

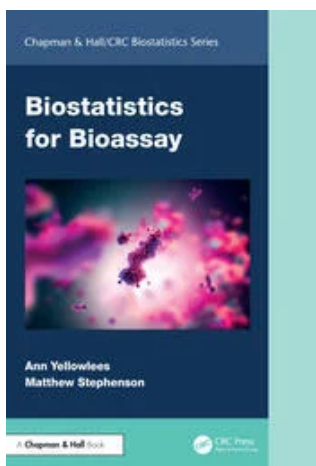
Chapter 10: Whole Genome Sequencing of Turmeric: A Chinese Initiative

Chapter 11: Sequencing and Assembly of Complex Genomes: Issues and Strategies

Chapter 12: Current Progress in Transcriptomics and Metabolomics in Turmeric

Chapter 13: Bioinformatics Tools and Turmeric Genome

Chapter 14: The Way Forward for Turmeric Improvement



BIOSTATISTICS FOR BIOASSAY

By Ann Yellowlees, Matthew Stephenson

ISBN 9781032579726

Published 2024 by Chapman & Hall

BOOK DESCRIPTION

In recent decades, there has been enormous growth in biologics research and development, with the accompanying development of biological assays for emerging products. In parallel, there have been substantial advances in statistical methodology, as well as technological advances in computer power, enabling new techniques to be implemented via statistical software. Biostatistics for Bioassay presents an overview of the statistical analysis techniques that are needed in order to report the results of biological assays. These assays are needed for testing all biological medicines, such as vaccines and cell therapies, to allow them to be released for use. Beginning with consideration of the performance characteristics required of a bioassay, including accuracy, precision, and combinations of these two attributes, the book builds a framework for statistical bioassay design.

TABLE OF CONTENTS

I Potency and its measurement: bioassays and their performance

1. Introduction - bioassays and potency
2. Bioassay performance requirements
3. Bioassay design

II Estimation of potency: the statistical analysis of bioassay runs

4. Statistical models for characterising the dose-response relationship
5. Choosing the dose-response relationship for bioassay data
6. Assay data analysis
7. Bioassay suitability criteria

III Validation, monitoring and modifications

8. Qualification and validation of bioassays
9. Monitoring the performance of a bioassay procedure
10. Bioassay updates and modifications



INTEGRATED PEST MANAGEMENT

By Habib Ali, Zhihang Zhuo

ISBN 9781032850993

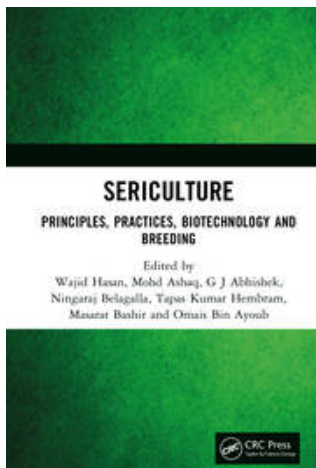
Published 2025 by CRC Press

BOOK DESCRIPTION

This book provides an overview of recent trends in entomology, encompassing advances in biological control, pheromone-based techniques, genetic control, and precision agriculture. It examines recent developments in pest detection, cultural, biological, and chemical control methods, and their practical applications in agriculture and food processing systems. It also discusses the increasing use of molecular techniques in pest management, such as RNA interference and gene editing, while highlighting the importance of data-driven decision-making. Additionally, it emphasizes the use of remote sensing and other technologies to monitor pest populations and predict outbreaks. This book further underscores the role of integrated pest management (IPM) in sustainable agriculture, addressing the necessity to balance pest management with environmental protection and the preservation of beneficial organisms. The book chapters explore future trends and prospects in entomology, including the utilization of artificial intelligence, robotics, and other emerging technologies. This book serves as a valuable resource for researchers and practitioners of entomology aiming to enhance pest management practices and promote sustainable agriculture.

TABLE OF CONTENTS

1. Advances in Pest Detection and Monitoring in Integrated Pest Management
2. Advances in Cultural Control to Sustainable Management of Insect Pests
3. Advances in Biological Control
4. Innovations in Chemical Solutions for Pest Management
5. Advances in Pest Control in Agriculture and Food Processing
6. Integrated Pest Management in Industrial Forest Plantation: Focus on *Acacia crassiparva* and *Eucalyptus pellita*
7. Advancements in the Management of Household Pests
8. Recent Advancements to Tackle Grasshopper/Locust
9. Threats to Pollinators and Agricultural Systems
10. Advances in Plant Quarantine and Biosecurity
11. Future Directions and Opportunities for IPM Research and Development
12. Integrated Approaches to Pest Management in Litchi Orchards: Innovations and Strategies for Sustainable Production
13. Recent Advancements in Integrated Pest Management
14. Genome Advances in Pest Management
15. Climate Change Resilience and Entomology: Navigating the Challenges Ahead
16. Nanotechnology in Entomology: Tiny Solutions for Big Challenges
17. Innovations in Biological Pest Control
18. Metamorphosis of IPM: Integrating Pest Management for Sustainable Agriculture



SERICULTURE PRINCIPLES, PRACTICES, BIOTECHNOLOGY AND BREEDING

By Wajid Hasan, Mohd Ashaq

ISBN 9781041205647

Published 2025 by CRC Press

BOOK DESCRIPTION

This volume explores themes in sericulture, integrating historical perspectives with cutting-edge scientific advancements. Topics include mulberry cultivation, silkworm biology, disease management, silk processing, biotechnological applications, and advanced breeding techniques. The book offers valuable insights for students, academics, practitioners, and policymakers. The book emphasizes sustainable practices, genetic innovation, and market considerations, making it an indispensable reference for the evolving field of sericulture.

- Comprehensive discussion on sericulture, from mulberry cultivation to silk processing.
- Integrates traditional practices with biotechnology and genetic advancements.
- Focus on sustainable and eco-friendly practices for long-term industry viability.
- Valuable reference for students, researchers, practitioners, and policymakers.

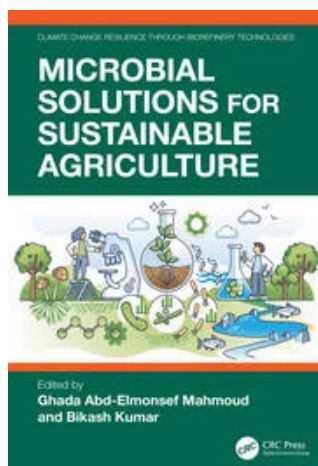
TABLE OF CONTENTS

Part I: Foundations of Sericulture

Part II: Sericulture Techniques

Part III: Sericulture and Biotechnology

Part IV: Silkworm Breeding and Future Trends



MICROBIAL SOLUTIONS FOR SUSTAINABLE AGRICULTURE

By Ghada Abd-Elmonsef Mahmoud, Bikash Kumar

ISBN 9781032863542

Published 2025 by CRC Press

BOOK DESCRIPTION

This book explains microbial roles for agricultural sustainability, especially under climate changes, including the role of microorganisms in sustainable agriculture. Major coverage entails microbial enzymatic roles in agriculture, microbial phytohormones as promising sustainable plant bioagents, and phosphate-, potassium-, and calcium-solubilizing microbes as alternative biofertilizers. It introduces microbial solutions to mitigate the biotic and abiotic stress, with high attention to rising temperature and water limitation due to the climate changes.

TABLE OF CONTENTS

Chapter 1

Role of micro-organisms and biofertilizers in improving water productivity for sustainable agriculture

Chapter 2

Plant growth promoter mechanisms under biotic and abiotic stresses and nutrient uptake

Chapter 3

Microbiome Engineering: A Pathway to Sustainable Agricultural Productivity

Chapter 4

Advancing agricultural productivity: integrating multi-omics approaches

Chapter 5

CRISPR/Cas9-mediated modifications in sustainable agriculture

Chapter 6

Mitigation of plant abiotic stress via microbial applications

Chapter 7

Plant-Microbe Abetted Mitigation of Hazardous Pollutants: Towards a Green and Clean Agroecosystem

Chapter 8

Phytoremediation of Polluted Soil and Waters

Chapter 9

Agricultural Bioinputs in Soil Bioremediation and Enhancing Phytoremediation

Chapter 10

Agricultural Land Pollution in Indonesia: Land Restoration and Reclamation Strategies

Chapter 11

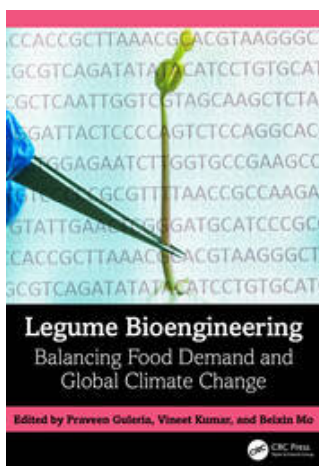
Soil Carbon Sequestration and its Role in Agriculture

Chapter 12

Role of nanoparticles and nano-based approaches for sustainable agriculture

Chapter 13

Wastewater Re-using in Irrigation for Agricultural Sustainability and Electricity Production



LEGUME BIOENGINEERING

By J Middleton

ISBN 9781032757445

Published 2025 by CRC Press

BOOK DESCRIPTION

Legume Bioengineering: Balancing Food Demand and Global Climate Change offers a comprehensive guide to enhancing legume productivity and resilience in the face of global food insecurity and climate change. This book explores the impact of environmental stresses on the legume genome, transcriptome, proteome, and metabolome, and presents cutting-edge biotechnological solutions to mitigate these effects. With contributions from 15 international experts across nine countries, it uniquely combines molecular insights with socioeconomic perspectives, making it a timely resource for advancing sustainable agriculture.

TABLE OF CONTENTS

Chapter 1. Legume: Introduction and Utilization

Chapter 2. Legume: Need to Address Nutritional Security and Worldwide Hunger

Chapter 3. Legume Production and Utilization in West Africa: Challenges and Opportunities

Chapter 4. Chickpea: Genetic and Genomic Resources and Their Utilization

Chapter 5. Heightening Legume Production in the Wake of Changing Climate and Increasing Environmental Stress

Chapter 6. Building Resilience in Legumes: Strategies to Mitigate Environmental Stresses for Sustainable Agriculture

Chapter 7. Physiological Responses Induced by Altered Secondary Metabolism of Legumes in Response to Climate Variability

Chapter 8. Application of Genome Editing Technology for the Development of Climate-Resilient Soybeans (Glycine Max L. Merrill)

Chapter 9. Epigenetic Modifications in Legumes in Response to Climate Change

Chapter 10. Legume Microbiome and Mitigation of Global Climate Change

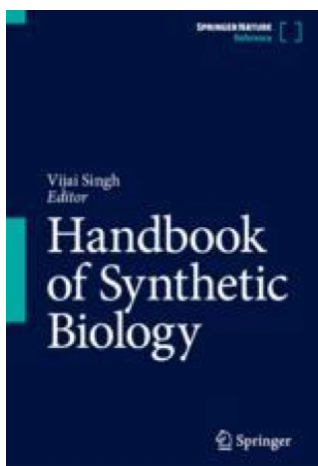
Chapter 11. Role of Legume miRNAs in Stress Adaptations: Small Size but Big Player

Chapter 12. The Nodule Nexus: Present Status, Strategies, and Applications of Legume Engineering

Chapter 13. From Fields to Pharmacies: Legume Engineering Impact on Food Security and Hunger Relief in the Pharmaceutical Realm

Chapter 14. Biotechnological Innovations in Legumes: Progress, Challenges, and Sustainable Solutions for Agriculture

Chapter 15. Enhancing Sustainability: Genetic Engineering of Legumes, Consumer Acceptance, and Environmental Impact Analysis



HANDBOOK OF SYNTHETIC BIOLOGY

By Vijai Singh

ISBN 978-981-95-3956-7

Published 2026 by SPRINGER

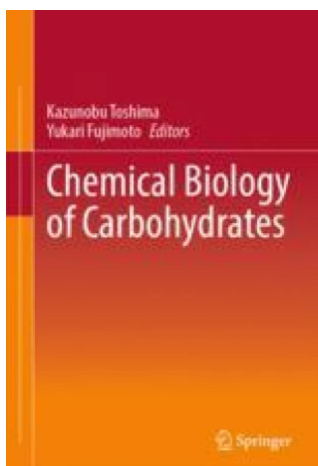
BOOK DESCRIPTION

This reference work presents a comprehensive and authoritative overview of the rapidly evolving field of synthetic biology. It brings together the foundational concepts, technological innovations, and wide-ranging applications that define this discipline. By applying engineering principles to biological systems, synthetic biology enables the design of novel biological parts, systems, and functions. The handbook explores recent breakthroughs ranging from synthetic circuits for diagnostics and therapeutics to engineered biomaterials and biomolecules, positioning itself as a valuable, one-stop reference for this interdisciplinary science.

Synthetic biology is an exponentially growing field that employs the application of engineering principles to biology. It is transformative field at the intersection of biology, engineering, and computation. It allows precise control and design of biological systems through synthetic promoters, ribosome binding sites, genetic circuits, and other engineered components. These capabilities are driving innovations in health, environment, and energy.

The handbook is organized into five sections. Section I: highlights the fundamentals of synthetic biology, section II: Advances in synthetic biology, section III: Applications of synthetic biology, section IV: synthetic biology for human disease and section V: synthetic biology ethics and regulations. Each section is consistently organized, so that the handbook introduces synthetic biology - from historical backgrounds and the fundamentals, over the description of the methods and technology, to their applications. Each chapter provides accessible, well-structured insights for readers across disciplines.

This handbook is designed for a diverse audience—including researchers, students, clinicians, industry experts, and policymakers. It serves as both an introductory guide and a detailed reference, offering rich, easy-to-understand content enhanced by clarity, depth, and broad coverage. This is a foundational resource for anyone looking to engage with the future of synthetic biology.



CHEMICAL BIOLOGY OF CARBOHYDRATES

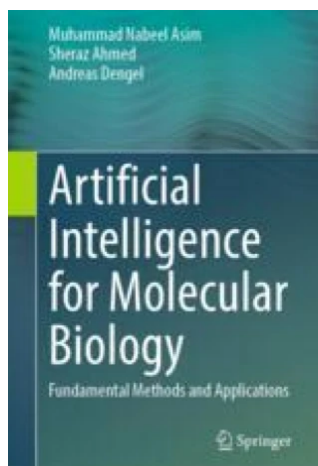
By Yukari Fujimoto

ISBN 978-981-95-5334-1

Published APRIL 2026 by SPRINGER

BOOK DESCRIPTION

This book introduces the emerging field of chemical biology of carbohydrates, presenting significant advances in the study of carbohydrate chemistry and biology. Leading experts in Japan provide comprehensive explanations of their research, integrating both chemical and biological perspectives. The volume highlights research strategies, experimental approaches, and the challenges encountered in this interdisciplinary field, offering readers insight into the development of scientific ideas and methodologies. Although focused on Japanese research, the content is relevant to an international audience. Designed for graduate students, researchers, and educators, this book provides authoritative, up-to-date knowledge and serves as a valuable resource for teaching, research guidance, and exploring new directions in carbohydrate chemistry and biology.



ARTIFICIAL INTELLIGENCE FOR MOLECULAR BIOLOGY

By Muhammad Nabeel Asim

ISBN 978-3-031-90449-3

Published 2025 by SPRINGER

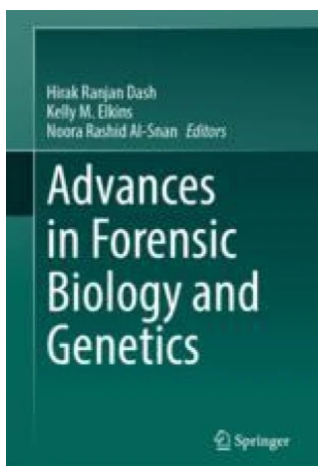
BOOK DESCRIPTION

Molecular biology is at the forefront of scientific discovery, unraveling the intricacies of life at the most fundamental level. As biological systems become increasingly complex and data-rich, artificial intelligence (AI) has emerged as a pivotal tool for unlocking new insights and enhancing our understanding of these systems. This first volume focuses on the core principles of molecular biology while introducing AI-driven approaches to genomic and proteomic sequence analysis. It serves as a foundation for integrating computational methodologies into the study of biological systems.

The chapters in this volume are structured to provide a comprehensive overview of the essential concepts, tools, and methodologies in molecular biology, enriched by the latest advancements in AI:

1. **Fundamentals of Molecular Biology:** This chapter delves into the foundational elements of molecular biology, exploring the central dogma, gene expression regulation, cellular organization, and the evolution of genome studies. It also highlights the role of computational biology in complementing traditional experimental techniques.
2. **DNA, RNA, & Protein Structures:** Understanding the structural intricacies of DNA, RNA, and proteins is crucial for comprehending their functions. This chapter outlines their fundamental properties and sets the stage for discussing AI-driven sequence analysis.
3. **Exploration of AI-Driven Genomic and Proteomic Sequence Analysis Landscape:** This section provides an in-depth look at how AI is reshaping the field of sequence analysis. Topics include representation learning, feature engineering, predictive modeling, and an evaluation of performance metrics for AI-driven pipelines.
4. **Insights of Biological Databases:** Biological data is the backbone of molecular biology research. This chapter discusses the structure, organization, and utilization of key databases, emphasizing data formats, redundancy issues, and retrieval systems.
5. **DNA & RNA Sequence Representation Learning Methods:** Representing nucleotide sequences in ways that AI models can process effectively is a critical challenge. This chapter explores various encoding methods, from nucleotide distributions to Fourier transformations, providing a robust toolkit for researchers.
6. **Protein Sequence Representation Learning Methods:** Similar to nucleic acid sequences, encoding protein sequences requires sophisticated techniques. This section details diverse methodologies, including physicochemical properties, z-scales, and context-aware encodings.
7. **CRISPR System and AI Applications:** CRISPR technology has revolutionized genetic editing, and AI is accelerating its potential. This chapter examines AI-driven approaches to CRISPR-related tasks, from predictive modeling to dataset development, emphasizing the synergy between these transformative technologies.

Through this volume, readers will gain a solid understanding of molecular biology and its convergence with AI. The interdisciplinary approach ensures that the biological complexities are complemented by computational rigor, laying the groundwork for the second volume, which delves deeper into advanced AI applications in molecular biology.



ADVANCES IN FORENSIC BIOLOGY AND GENETICS

By Hirak Ranjan Dash

ISBN 978-981-96-4584-8

Published 2025 by SPRINGER

BOOK DESCRIPTION

The book explores the interdisciplinary field that merges biochemistry, cell biology, molecular biology, and genetics to unravel the mysteries of biological evidence in forensic investigations. Delving into the core of this dynamic discipline, the book unveils how forensic biological scientists leverage a diverse range of techniques to address complex questions posed by investigative agencies.

The book meticulously covers different facets of forensic biology, from uncovering the origins of crucial body fluids to predicting the post-mortem time interval, while deciphering the cause and manner of death to individualizing biological samples. This book consolidates the latest breakthroughs in forensic biology and genetics, embracing both human and non-human DNA analyses, helpful for the forensic biological scientists. Chapters are written by researchers and practitioners from around the world.

This book serves as an indispensable resource for investigating officers, forensic scientists, medical practitioners, researchers, and students.



CONCEPTS IN REPRODUCTION FROM EVOLUTION OF MECHANISMS TO CLINICAL IMPACT

By Mark A. Johnson

ISBN 9780367708931

Published 2026 by CRC Press

BOOK DESCRIPTION

Concepts in Reproduction integrates the principal mechanisms of reproduction among eukaryotes, with a focus on animals and plants. The text emphasizes processes and approaches that evolved to address specific problems inherent in reproduction using examples from morphology, functional studies, and genetic studies. The many high-quality figures complement the text and provide visual storyboards. Footnotes and boxes are used throughout to provide depth and to enrich understanding. Information is compartmentalized to guide new readers through complex material while offering in-depth coverage of significant and impactful topics for experts.

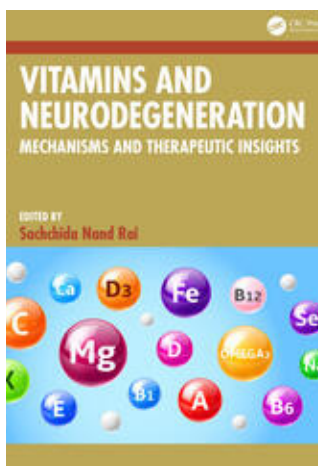
Key Features

- Accessibility for a broad audience, using figures that complement the text to explain key concepts and mechanisms
- Integrative presentation that emphasizes the science behind the story
- Breadth of coverage to promote comparative thought
- Rich multiple choice questions that span the content

Concepts in Reproduction is recommended for advanced undergraduate students, new graduate students, and investigators or clinicians seeking breadth in their knowledge in the field. The book provides foundational knowledge of fertilization, gametogenesis, primordial germ cell formation, and ontogeny of reproductive organs. Key principles of developmental biology, genetics, endocrinology, protein biochemistry, and molecular and cellular biology are included to tell holistic stories of reproduction among eukaryotes. Later chapters tackle how the field applies these findings to address societal issues.

TABLE OF CONTENTS

1. Eukaryotes and Sexual Reproduction
2. Meiosis
3. Diversity in Reproduction
4. Hormones and Signaling
5. The Egg
6. Sperm
7. Supporting Cells
8. Sperm-Egg Interaction
9. The Egg-to-Embryo Transition
10. Formation of Primordial Germ Cells
11. Primordial Germ Cells Migrate to the Gonad
12. Germ-line Stem Cells
13. Sex Determination
14. The Ovary: Where Female Gametes are Made
15. Making Male Gametes
16. Hermaphroditism & Sex Transitioning
17. Neuroendocrine Control of Reproduction
18. A Lifetime of Reproduction
19. Mechanisms of Mate Attraction
20. Development of Permanent Reproductive Structures
21. Reproductive Structures and their Functions



VITAMINS AND NEURODEGENERATION

By Sachchida Nand Rai

ISBN 9781041168508

Published 2026 by CRC Press

BOOK DESCRIPTION

This book examines the neurobiological impact of vitamins in the pathophysiology and prevention of neurodegenerative diseases, offering an integrative perspective on nutritional modulation of brain health. It explores the antioxidant, anti-inflammatory, and neurotrophic mechanisms of vitamins, alongside their pharmacokinetics, bioavailability, and blood–brain barrier transport. With a focus on age-associated deficiencies, impaired absorption, and cognitive decline, it highlights mechanistic links between micronutrient status and neuronal integrity. It also investigates synergistic interactions with cofactor minerals, polyunsaturated fatty acids, and polyphenols, as well as the influence of gut microbiota on vitamin-mediated neuroprotection. Specific emphasis is placed on the therapeutic implications of vitamins in Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis (ALS), Huntington's disease, and multiple sclerosis (MS).

TABLE OF CONTENTS

Chapter 1 Neurodegenerative Diseases and the Role of Nutrition Chapter 2 Mechanisms of Vitamin Action in the Nervous System: Antioxidant, Anti-inflammatory, and Neurotrophic Functions Chapter 3 Pharmacokinetics, Bioavailability, and Blood–Brain Barrier Transport of Vitamins Chapter 4 Epidemiology of Vitamin Deficiency, Age-Related Absorption, and Cognitive Decline Chapter 5 Antioxidant Vitamins (A, C, and E) in Neuroprotection Chapter 6 The B Vitamins and Cognitive Health: Methylation, Mitochondrial Function, and Neuronal Integrity Chapter 7 Vitamins D and K: Immunomodulatory and Vascular Protective Roles in Brain Aging Chapter 8 Nutritional Interactions: Cofactor Minerals, PUFA, Polyphenols, and Vitamin Synergy in Brain Health Chapter 9 Gut–Brain Axis: Microbiota–Vitamin Interactions and Their Role in Neurodegeneration Chapter 10 Vitamin–Drug and Nutrient–Nutrient Interactions in Neurological Disorders Chapter 11 Vitamins in Alzheimer's and Parkinson's Disease: Mechanistic and Therapeutic Perspectives Chapter 12 Vitamins in Other Neurodegenerative Disorders (ALS, Huntington's Disease, and MS): Challenges and Future Opportunities



INTEGRATIVE APPROACH TO FUNGAL INFECTIONS AND BIOPROSPECTING FOR DRUG DISCOVERY: TWO VOLUME SET

By Karan Kumar

ISBN 9781041279372

Published 2026 by CRC Press

BOOK DESCRIPTION

Research into plant-based antifungals offers a viable alternative to discover potent, eco-friendly, and sustainable treatments. Natural antifungal compounds offer a promising solution, as they tend to have fewer side effects and reduced risk of resistance development compared to synthetic alternatives. This book delves into the application of metagenomics in identifying and harnessing the microbial communities associated with medicinal plants. By integrating bioprospecting techniques with cutting-edge genomic technologies, this work opens up promising new avenues to provide insights into the potential of natural products for developing novel antifungal therapies.

TABLE OF CONTENTS

Part 1: Medicinal Plants, Antifungals and Metagenomics

Chapter 01: Fungal Infections: An Emerging Global Threat to Human Health, Current Trends and Challenges

Chapter 02: Medicinal Plants and Their Antifungal Potential: Ancient Knowledge and Modern Science

Chapter 03: Antimicrobial Peptides from Medicinal Plants: New Frontiers in Management of Multidrug Resistance Fungus

Chapter 04 Microbial Allies: The Role of Endophytes in the Production of Antifungal Compounds

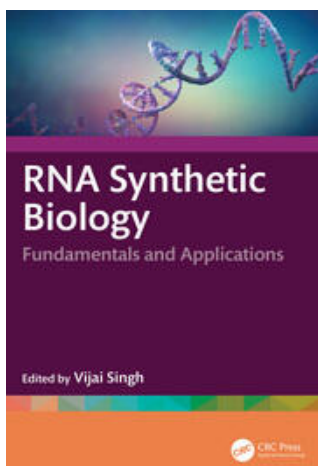
Chapter 05: Study of Deep Learning and Bioprospecting for Black Fungus Identification and Treatment

Part 2: Comprehending Pathobiology of Fungus

Chapter 06: Genetic and Molecular Mechanisms Driving Antifungal Resistance in Emerging Fungal Species

Chapter 07: Deciphering the Role of Biofilm in Fungal Pathogenesis

Chapter 08: Metagenomic Perspectives on the Human Gut Ecosystem and Disease Associations



RNA SYNTHETIC BIOLOGY

By Vijai Singh

ISBN 9781032660806

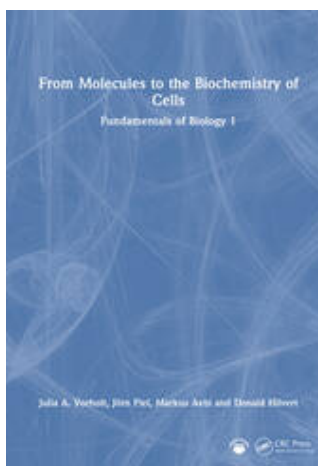
Published 2026 by CRC Press

BOOK DESCRIPTION

This book discusses the fundamental principles and applications of RNA synthetic biology. The initial section of the book provides fundamental concepts, including RNA synthetic biology, the use of computational biology tools for RNA design, the SELEX (Systematic Evolution of Ligands by EXponential enrichment) method, artificial intelligence for the design and prediction of RNA circuits, RNA structure prediction and folding algorithms, non-coding RNA, and in vitro selection of functional RNA. This book also highlights the practical applications of RNA synthetic biology, offering design, construction, and testing of riboswitches, riboregulators, RNA-based biosensors, CRISPR for RNA detection, RNA editing, application in nanotechnology, RNA economics, and ethics and regulatory issues. This book is intended for researchers and students of molecular biology, genetics, synthetic biology, and RNA biology.

TABLE OF CONTENTS

Chapter 1: Introduction to RNA based circuits and devices. Chapter 2: Computational Tools for Design and Analysis of RNAs. Chapter 3: Artificial intelligence for design and predict. Chapter 4: RNA circuits RNA structure prediction and folding algorithms. Chapter 5: Non-coding RNAs and their regulatory roles. Chapter 6: Various Approaches to in vitro Selection of Functional RNA: in silico Tests. Chapter 7: Design of riboswitches and its uses. Chapter 8: Design, characterization and applications of riboregulators. Chapter 9: CRISPR-based RNA detection. Chapter 10: CRISPR-based RNA editing and regulation. Chapter 11: RNA Nanotechnology and applications. Chapter 12: RNA economics, ethics and regulatory issue.



FROM MOLECULES TO THE BIOCHEMISTRY OF CELLS

FUNDAMENTALS OF BIOLOGY 1

By Donald Hilvert

ISBN 9781032518398

Published 2026 by CRC Press

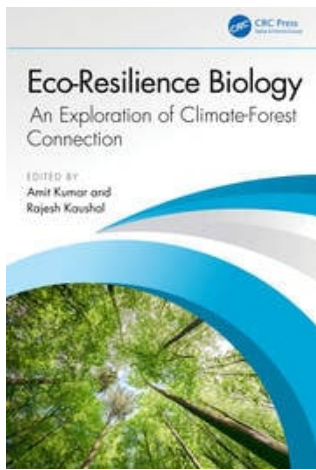
BOOK DESCRIPTION

This textbook introduces biology as an interdisciplinary science, linking physics and chemistry to biological processes that operate within the laws of thermodynamics. Based on an evolutionary narrative, the focus is on the molecular composition and the biochemistry of cells. By grounding biology in its molecular foundations, this approach reveals unifying principles underlying life's diversity and provides a conceptual framework for biological complexity. Core concepts include macromolecular structure and function, information encoding and decoding, and universal principles of energy conversion.

This textbook is designed for students seeking an integrated introduction to biology that connects molecular mechanisms to cellular structures.

TABLE OF CONTENTS

1. Evolving Life
2. The Building Blocks of Life
3. Biopolymers and Membranes
4. The Central Dogma
5. Enzyme Catalysis
6. Energy Metabolism
7. Anabolism
8. Biogeochemical Cycles



ECO-RESILIENCE BIOLOGY

By Amit Kumar, Rajesh Kaushal

ISBN 9781032962122

Published 2025 by CRC Press

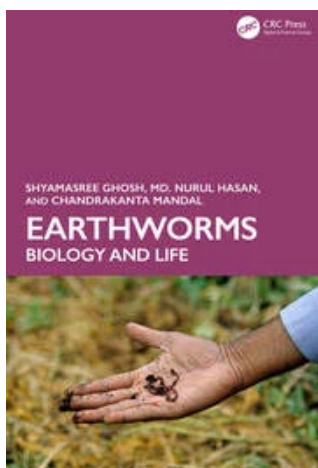
BOOK DESCRIPTION

The book *Eco-Resilience Biology: An Exploration of Climate-Forest Connection* offers comprehensive information on the dynamic interactions between forest ecosystems and changing climate regimes. As climate change accelerates, understanding the resilience mechanisms within forest biomes becomes critical for ensuring biodiversity, ecosystem services, and sustainable human livelihoods. This book aims to bridge the knowledge gap by exploring eco-resilience from biological, ecological, and climate perspectives, providing an integrated framework for students, researchers, and policymakers.

With an emphasis on interdisciplinary insights, this volume delves into how forest species adapt and respond to climatic stressors through physiological plasticity, functional trait shifts, and ecological feedback loops. It investigates both natural resilience and the potential for enhancing adaptive capacity through human interventions like forest management, conservation planning, and restoration ecology. Unlike existing works, this book uniquely blends empirical case studies, theoretical models, and cutting-edge scientific findings to present a holistic view of forest resilience.

TABLE OF CONTENTS

1. Introduction to Resilience of Forest Ecosystems and Its Role in Climate Change
2. Exploring the Dynamics of Forests in Climate Change: Insights and Impacts
3. Interplay of Biotic and Abiotic Components for Forest Functioning and Productivity
4. Forest Community Structure and Species Migration in the Changing Climatic Conditions
5. Significance of Forest Biodiversity in Fostering Eco-resilience
6. Significance of Plant Functional Traits for Ecosystem Regulation and Mitigating Climate Change Mitigation
7. Carbon Mitigation Potential and Carbon Sequestration in Forestry Ecosystem
8. Forestry and Agroforestry Interventions for Climate Change Mitigation
9. Significance of Functional Traits in Nutrient Cycling and Soil Interaction
10. Adaptation and Mitigation to Climate Change through Agroforestry
11. Forest Adaptation Potential to Maintain the Flow of Ecosystem Services
12. Forests and Climate: Synergies for Sustainable Development
13. Challenges of the Forestry Sector in Adaptation and Mitigation to Climate Change
14. Exploring the Prospects of Climate-Forest Nexus for Sustainable Landscapes
15. Synergistic Impacts of Climate and Land Use Land Cover (LULC) Changes on the Hydrology of Forested Landscapes



EARTHWORMS

By Chandrakanta Mandal

ISBN 9781041060772

Published 2026 by CRC Press

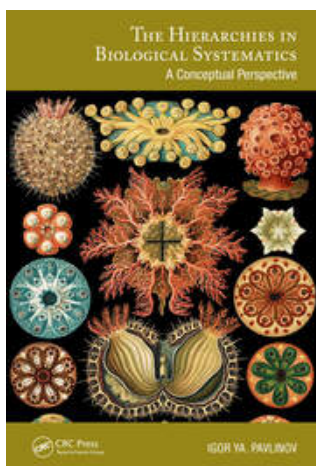
BOOK DESCRIPTION

Earthworms: Biology and Life is a scientifically rich and comprehensive exploration of earthworm biology, diversity, and ecological significance, with a particular emphasis on the Indian subcontinent and its global context. The book begins with an overview of the global distribution and biogeography of Clitellata and Megadrili, then transitions into a detailed account of India's terrestrial and aquatic earthworm fauna. By blending regional richness with global insights, the book offers readers a nuanced understanding of species diversity, ecological roles, and habitat specialization across forest floors, agricultural lands, and freshwater ecosystems.

What sets this book apart is its integrated approach to the anatomy, physiology, and behavior of earthworms, combined with modern perspectives on their ecological importance, such as the role of gut microbiomes, vermicomposting technologies, and bioindicator functions. It synthesizes classical taxonomy with recent molecular studies, ensuring both foundational and contemporary scientific coverage. The inclusion of applied aspects like sustainable agriculture, waste management, and conservation underscores its relevance to both research and real-world applications.

TABLE OF CONTENTS

Int'l. Global Distribution of Earthworm Species and Families: Geographical Range of Clitellata and Megadrili 2. Terrestrial Earthworms of India 3. Habitat and Ecology of Terrestrial Earthworms 4. Life Cycle of Earthworms 5. Aquatic Oligochaeta of India 6. Endemic Aquatic Oligochaeta of India 7. Exotic Earthworm Species in India 8. Semiaquatic Earthworm Fauna 9. Morphology and Anatomy, Behaviour 10. Feeding and Digestion of Earthworms 11. Studies on Earthworm Gut Microbiome 12. Economic Importance of Earthworms 13. Earthworms as Bioindicators 14. Vermicomposting: A Sustainable Approach to Waste and Soil Health 15. Earthworm Evolution and Diversity 16. Threats and Conservation of Earthworms 17. Climate Change and Earthworm Ecosystems 18. Human and Environmental Interaction with Earthworms



THE HIERARCHIES IN BIOLOGICAL SYSTEMATICS

By Igor Ya. Pavlinov

ISBN 9781032982120

Published 2026 by CRC Press

BOOK DESCRIPTION

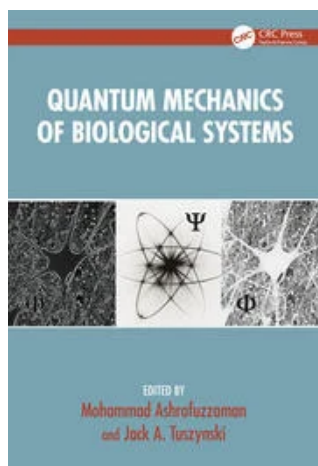
The Hierarchies in Biological Systematics: A Conceptual Perspective examines the diverse hierarchies shaping the field of biology. From the overarching cognitive frameworks to the specific classifications that define biological taxonomy, this book is a comprehensive analysis of hierarchical structures and their inherent complexities.

Through a conceptual lens, the author explores the fundamental parameters of hierarchies, their fuzziness, and the principles guiding their substantiation, elaboration, and implementation. The book also delves into the ongoing debate between ranked and rankless taxonomic hierarchies, highlighting the author's view of the unique rationality of ranked systems while critically assessing their limitations.

Whether you are a researcher, student, or professional in biological systematics, this book offers valuable insights into the conceptual underpinnings of hierarchical classifications and their role in advancing scientific understanding.

TABLE OF CONTENTS

- Chapter 1 A Historical Consideration
- Chapter 2 Some Philosophical Considerations
- Chapter 3 The Hierarchies as They Are
- Chapter 4 The Hierarchies Representations
- Chapter 5 Two Important Conceptual Pyramids: Species and Homology
- Chapter 6 Taxonomic Hierarchy and Nomenclature



QUANTUM MECHANICS OF BIOLOGICAL SYSTEMS

By Jack A. Tuszynski

ISBN 9781032592954

Published 2026 by CRC Press

BOOK DESCRIPTION

Quantum Mechanics of Biological Systems is a growing field of biology in which quantum mechanics principles are utilised to address key biological processes. This field not only reveals underlying mechanisms active in molecular biology but also helps us translate the information to applied medical research, aiming at the discovery of means to deal with the molecular-level origins of various pathologies. Beginning with a brief history of quantum biology, this book explores some of the ways in which quantum mechanics methods have made huge breakthroughs in addressing the molecular basis of diseases and drug discovery. Included in this book are chapters on the role of neutron scattering in protein energy landscapes, modelling of photosynthetic spectra, quantum processes of life and quantum and tempus theories of food science. Also discussed is the quantum mechanical understanding of genetic correlation and evolution. A history of the development of quantum biology is provided too. This book will appeal to undergraduate and graduate students, as well as academics working in the fields of Physics, Chemistry, Biochemistry, Mathematics, Oncology, Bioinformatics, Biomedical Engineering, Electrical Engineering, Medicine, Pharmacology and Biology.

TABLE OF CONTENTS

Chapter 1: Introduction

Chapter 2: A Brief History of Quantum Biology

Chapter 3: The Quantization Paradigm in Physics and Biology: Cell Metabolism, Brain Dynamics and the Biological “Planck” Quantum of Action

Chapter 4: Chaos to Coherence: A Path to Molecular Organization

Chapter 5: Protein Energy Landscapes Probed by Neutron Scattering

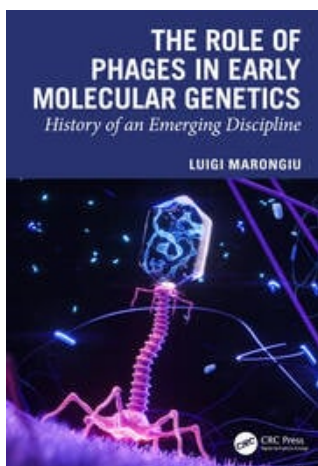
Chapter 6: Modeling of Photosynthetic Spectra

Chapter 7: Toward Verification of Quantum Brain Dynamics

Chapter 8: Quantum Processes of Life

Chapter 9: Quantum Mechanical View of Genetic Code

Chapter 10: Quantum and Tempus Theories of Functional Food Science



THE ROLE OF PHAGES IN EARLY MOLECULAR GENETICS

By Luigi Marongiu

ISBN 9781041109877

Published 2025 by CRC Press

BOOK DESCRIPTION

In the shadow of global conflicts—from World War II through the tensions of the Cold War—an extraordinary scientific revolution was quietly unfolding. A brilliant collective of geneticists and microbiologists, known as the Phage Group, harnessed the power of bacterial viruses to unlock the very structure of genes, giving birth to Molecular Biology as we know it today.

As antimicrobial resistance threatens global health, phages have reemerged as critical subjects of scientific inquiry, yet their pivotal role in the genetic discoveries of the 1940s–1960s remains largely overlooked—until now. *The Role of Phages in Early Molecular Genetics: History of an Emerging Discipline* bridges history, physics, and virology, offering both scientists and general readers a compelling narrative of how these microscopic entities revolutionized our understanding of life itself.

TABLE OF CONTENTS

Preface. Acknowledgments. About the Author. Chapter 1 Prologue. Chapter 2 London and Paris. Chapter 3 Berlin, Gottingen, and Copenhagen. Chapter 4 Rome and Los Angeles. Chapter 5 Nashville and Bloomington. Chapter 6 New York. Chapter 7 West Coast. Chapter 8 Homecoming. Bibliography. Index



BIOSIMILARS AND INTERCHANGEABLE BIOLOGICS

By Sarfaraz K. Niazi

ISBN 9781032869971

Published 2025 by CRC Press

BOOK DESCRIPTION

This new edition explores the strategic planning side of biosimilar drugs and targets the issues surrounding biosimilars that are linked to legal matters. This includes an examination of new regulatory requirements in terms of principal patents and intellectual property, regulatory pathways, and concerns about affordability on a global scale.

Biosimilars and Interchangeable Biologics: Strategic Elements, Second edition, examines the science, technology, finance, legality, ethics, and politics of biosimilar drugs. The book presents a global strategy on how to build, take to market, and manage the next generation of biosimilars throughout their life cycle. Updated throughout, the book covers strategic planning elements that include an overall understanding of the history and the current status of the science and art of biosimilars. As the perception of biosimilars has changed over the last several years, the author provides detailed descriptions of the new legal, regulatory, and commercial characteristics that must be considered. He also addresses the utilization of biosimilars and related biological drugs in expanding world markets, and reviews new strategies and tactics to enable users to create a universal dossier. Finally, there is also an examination of newer technologies that will help reduce the capital costs of manufacturing and bringing biosimilars to market.

TABLE OF CONTENTS

Chapter 1 Introduction to Biosimilar and Interchangeable Products - Evolution, Challenges, and Future Directions Chapter 2 Intellectual Property and Patent Landscape for Biosimilars - Global Perspectives and Strategic Implications Chapter 3 European Regulatory Framework for Biosimilar Medicines - Comprehensive Guide to EMA Requirements and Assessment Paradigms Chapter 4 EMA Approved Biosimilars: Evolution, Innovation, and the Path Forward Chapter 5 FDA Regulatory Framework for Biosimilars: Evolution of the BPCIA and Contemporary Regulatory Landscape Chapter 6 Global Regulatory Landscape for Biosimilars - Contemporary Framework Evolution and Emerging Market Transformation Chapter 7 Global Regulatory Requirements for Biosimilar Approval, Contemporary Framework Evolution and Strategic Assessment Chapter 8 Quality Characterization and Analytical Comparison of Biosimilar Monoclonal Antibodies: A Japanese Perspective Assessment Chapter 9 Quality Characterization and Regulatory Assessment of Biosimilar Monoclonal Antibodies: United States and European Union Perspectives Chapter 10 Quality Characterization and Regulatory Assessment of Non-Antibody Biological Drug Biosimilars - Contemporary Tri-Jurisdictional Analysis and Advanced Methodological Frameworks Chapter 11 Quality and Lifecycle Management for Biosimilar and Biological Products - Contemporary Framework Evolution and Advanced Technological Integration Chapter 12 US Biosimilar Commercialization - Contemporary Market Dynamics and Strategic Evolution in the Post-Patent Cliff Era Chapter 13 Global Biosimilar Commercialization - Contemporary International Market Dynamics and Strategic Excellence in the Era of Regulatory Harmonization



FUNGAL BIOFILMS

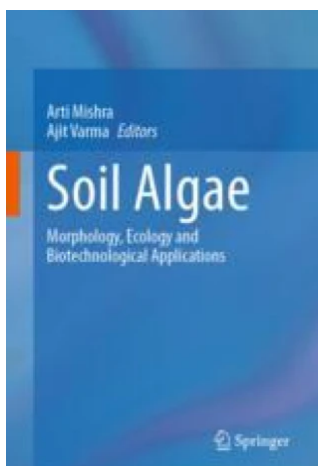
By David Andes

ISBN 978-3-031-93314-1

Published 2025 by SPRINGER

BOOK DESCRIPTION

This book provides a comprehensive and up-to-date compendium of critical information for those working in the field of fungal biofilms, and those entering the field. The WHO has published a list of critical high-priority fungal pathogens, many of which are capable of forming biofilms. The editors have brought together a team of world experts to impart their knowledge of specific elements of fungal biofilm biology and their clinical underpinning. The book covers critical areas of state-of-the-art research that are shaping the direction of travel within the biofilm research community. It focuses on the basic biology of how biofilms are formed and controlled, through applied areas of research where we can effectively manage these complex infections.



SOIL ALGAE

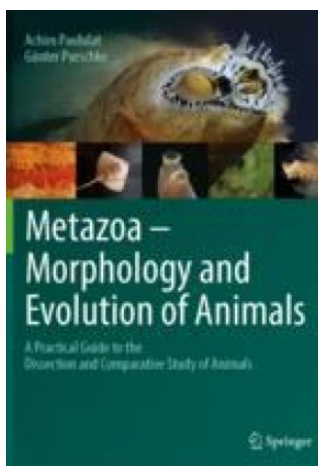
• By Arti Mishra,
ISBN 978-981-97-9872-8
Published 2025 by SPRINGER

BOOK DESCRIPTION

This book collates updated knowledge about algal species which are present in the terrestrial environment particularly in soil. Contributions in this volume covers different topics such as morphology, ecology and applications of soil algae. Ecological significance of soil algae and their biotechnological importance are the key features of this book.

Algae are ubiquitous and occur in almost all terrestrial environments and in soil, they majorly belong to the member of Chlorophycophyta, Cyanochloronta, Rhodophycophyta Euglenophycophyta, and Chrysophycophyta. The role of soil algae as fertilizer and for reclaiming the saline soil is well studied. Algae in soil benefits agricultural production, increase water retention capacity, reduced soil erosion, reduction of nutrient runoff, and provides nutrients. The added algae increase soil biodiversity, organic biomass, and the total humus content of the soil, beneficial for healthy soil. These soil algae diversities also have many biotechnological and industrial importance.

This book is of interest and use to researchers of phycology, molecular biology, agriculture and biotechnology and also to scientists working on soil biology, agronomy and crop research. Also, the book serves as reading material for undergraduate and graduate students of microbiology, agriculture, molecular biology, and biotechnology. Researchers from biotechnological and biofertilizers companies will also find this to be a useful read.



METAZOA - MORPHOLOGY AND EVOLUTION OF ANIMALS

By Günter Purschke

ISBN 978-3-662-69903-4

Published 2025 by SPRINGER

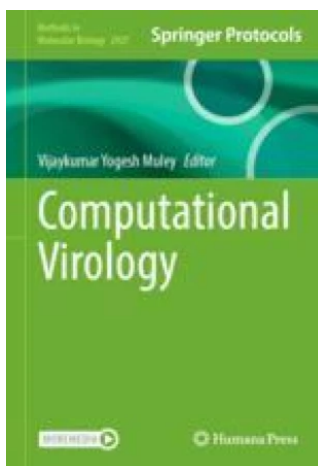
BOOK DESCRIPTION

Over the course of evolution, multicellular animals - Metazoa - have successfully colonized every conceivable habitat on our planet, thanks to their ability to survive and adapt under adverse or changing conditions. But how is an animal's body structured to accomplish this? What organs do animals have, how do they perceive their environment, and what is the evolutionary relationship between these seemingly so different organisms?

This volume, designed as a modern practical book, presents the most important body plans of selected animals. It is intended to help all Biology students to recognize and understand the basic body shapes and structures in the respective animal groups, including the main features that have contributed to their evolutionary success, the similarities and differences, and the many different solutions that evolution has come up with for given biological problems.

The authors have consistently used focused, compact text and photographs that not only show the animals' most important external features but also explain the dissection process step by step.

The authors hope that this new book will help all Biology students successfully complete their practical zoology course and gain new insights into the morphology and evolution of animals.



COMPUTATIONAL VIROLOGY

By Vijaykumar Yogesh Muley

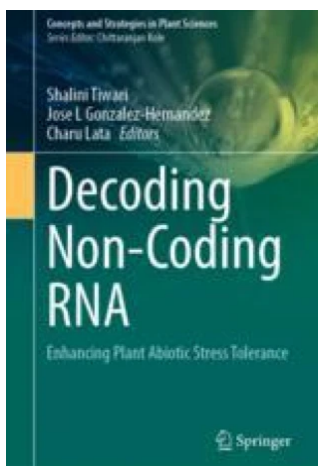
ISBN 978-1-0716-4545-1

Published 2025 by SPRINGER

BOOK DESCRIPTION

This volume explores computational methods for the rapid analysis of viral infections and strategies for their mitigation, which have significantly advanced the understanding of viral pathogenesis and host responses. Beginning with methods for identifying viral genomes from metagenomic sequencing data, the book progresses to topics such as next-generation sequencing to study host responses against viral infections, virus-host protein interactions to identify therapeutic targets, viral taxonomy, zoonotic transmission, reverse zoonosis, and antivirals, including their mechanisms of action, focusing on virus entry and life cycle. Practical workflows for identifying potential drug-like compounds from resources such as PubChem are also covered. Written for the highly successful Methods in Molecular Biology series, chapters include detailed implementation advice to ensure successful experimental results.

Authoritative and practical, Computational Virology provides researchers, students, and professionals in virology, bioinformatics, artificial intelligence, and systems biology with critical insights into the challenges posed by viral pathogens.



DECODING NON-CODING RNA

By Charu Lata

ISBN 978-981-96-9858-5

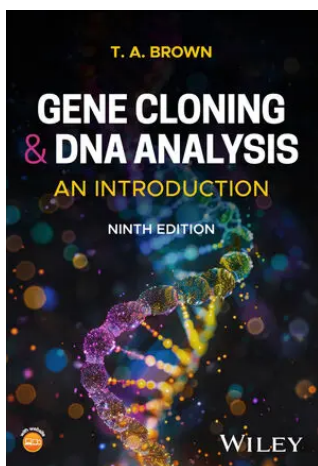
Published 2025 by SPRINGER

BOOK DESCRIPTION

This book offers an in-depth exploration of non-coding RNA and its critical role in enhancing plant abiotic stress tolerance. It provides a comprehensive overview of non-coding DNA's structural and functional diversity and its regulatory mechanisms in stress responses.

The chapters cover topics such as epigenetic regulation, mobile genetic elements, and genomic profiling techniques. It covers latest research on non-coding RNA-mediated regulation, transcriptional regulatory elements controlling stress-responsive gene expression, and the role of long non-coding RNAs (lncRNAs) in fine-tuning gene expression networks under stress conditions. The book also discusses chromatin modifications, transposon-mediated regulation, high-throughput sequencing approaches for identifying stress-responsive ncRNAs, and CRISPR-based functional analysis. In addition to exploring these advanced topics, the book highlights practical implications for crop improvement strategies.

Researchers in plant biology, genomics, molecular biology, and agricultural sciences will find this book particularly beneficial. It is also an essential resource for educators looking to provide their students with up-to-date information on cutting-edge research techniques. By offering both theoretical perspectives and practical case studies from renowned experts worldwide, this volume equips readers with actionable knowledge to address real-world challenges in agriculture.



GENE CLONING AND DNA ANALYSIS: AN INTRODUCTION, 9TH EDITION

By T. A. Brown

ISBN 978-1-394-29256-1

Published 2024 by WILEY

BOOK DESCRIPTION

Gene Cloning and DNA Analysis is a comprehensive introductory text that explores all of the topics vital for a complete understanding of gene cloning and DNA analysis. Presented in full color, the text's easy-to-follow layout and over 250 clear illustrations make the material simple and accessible for a diverse readership.

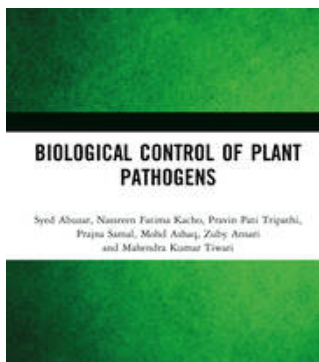
This newly revised and updated Ninth Edition highlights new developments in DNA sequencing technology and provides extended coverage on DNA editing including CRISPR methodology and its applications in gene therapy and plant genetic engineering.

This edition also contains updates on topics including optical mapping of DNA molecules, studying transcriptomes in situ, RNA interference methods for silencing genes in crop plants, studying kinship by DNA profiling, and using ancient DNA to study human prehistory and palaeogenomics.

Gene Cloning and DNA Analysis also discusses topics such as:

- The strategies used by researchers and industry practitioners to assemble telomere-to-telomere chromosome sequences
- The synthesis of recombinant vaccines for diseases such as COVID-19 and hepatitis B
- Interbreeding between Neanderthals and Homo sapiens
- The ethical issues raised by the use of gene cloning and DNA editing in pharming, gene therapy and plant genetic modification

The Ninth Edition of Gene Cloning and DNA Analysis continues to be an essential reference for undergraduate and graduate students within the fields of genetics and genomics, molecular biology, biochemistry, immunology, and applied biology, as well as professionals in all areas of biological science.



BIOLOGICAL CONTROL OF PLANT PATHOGENS

By Kumar Tiwari

ISBN 9781041247258

Published 2026 by CRC Press

BOOK DESCRIPTION

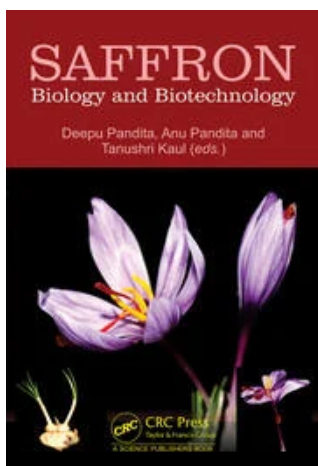
This book covers biological control in plant pathology from foundational concepts to commercial applications. It examines biological interactions, environmental factors, pathogen-antagonist relationships, and bioagent production systems, and also includes:

- Comprehensive coverage of biological control foundations and principles in plant pathology
- Detailed analysis of biological interactions including competition, mycoparasitism, and antibiosis
- Systematic examination of factors governing biocontrol success in different environments
- In-depth study of pathogen-antagonist relationships and bioagent compatibility
- Practical guidance on commercial production and delivery systems for biocontrol agents

The book also includes integration strategies for modern farming, biopesticide applications, and regulatory standards for researchers, plant pathologists, and agricultural professionals.

TABLE OF CONTENTS

1. Concept of Biological Control and Its Foundations
 - Definitions and Importance of Biological Control in Plant Pathology
 - Principles of Plant Disease Management with Bioagents
 - History of Biological Control in Agriculture
 - Merits and Demerits of Biological Control Approaches
2. Biological Interactions in Plant-Pathogen Control
 - Overview of Types of Biological Interactions
 - Competition and Mycoparasitism in Biological Control
 - Exploitation for Hypovirulence and Rhizosphere Colonization
 - Competitive Saprophytic Ability and Antibiosis
 - Induced Resistance and Mycorrhizal Associations
 - Operational Mechanisms in Biological Control and Their Relevance
3. Factors Governing Biological Control
 - Role of Physical Environment in Biocontrol Success
 - Influence of Agroecosystem on Pathogen and Antagonist Dynamics
 - Operational Mechanisms and Their Impact on Biological Control
 - Cultural Practices Enhancing Biocontrol Efficacy
4. Relationships Between Pathogens, Antagonists, and Bioagents
 - Ecological and Biochemical Dynamics of Pathogen-Antagonist Relationships
 - Biocontrol Agents and Their Comparative Approaches
 - Resident vs Introduced Antagonists in Biological Control
 - Biological Control of Soil-Borne and Foliar Diseases
 - Compatibility of Bioagents with Agrochemicals and Other Microbial Antagonists
5. Commercial Production and Delivery Systems of Bioagents
 - Techniques and Processes for Commercial Production of Antagonists
 - Delivery Systems for Biocontrol Agents
 - Application Strategies and Monitoring of Biocontrol Efficacy
 - Challenges in Scaling Production and Deployment
6. Integration of Biological Control in Modern Farming Systems
 - Role of Biological Control in Integrated Disease Management (IDM)
 - Integration of Biocontrol Agents in Integrated Pest Management (IPM)
 - Biological Control in Organic Farming Systems
7. Biopesticides and Market Applications
 - Overview of Biopesticides in Plant Pathogen Control
 - Biopesticides Available in the Market and Their Applications
 - Regulatory Standards and Quality Control of Biocontrol Agents



SAFFRON BIOLOGY AND BIOTECHNOLOGY

By Tanushri Kaul

ISBN 9781032517445

Published 2026 by CRC Press

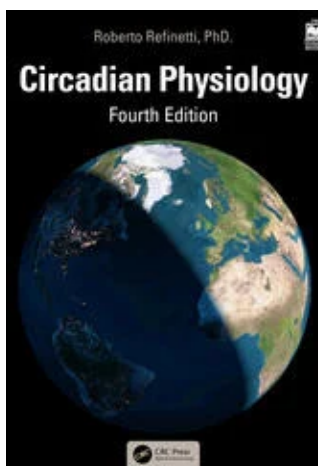
BOOK DESCRIPTION

Crocus sativus L. (family-Iridaceae) or Saffron is often called “Red Gold or Gold Condiment” as it is flavourful, aromatic and it is very expensive. This volume offers a comprehensive overview of Saffron Cultivation and Ecology, Genetics and Cytogenetics, Role of Saffron Bioactive compounds in Nutrition and Medicine, Economic Importance, Beneficial Effects, Applications, Safety Evaluation and Limitations of Saffron. Further, Transcriptomics, Post transcriptomics, Metabolomics, Computational Biology, Molecular Markers, Genome Editing, Microbiome and Endophytic interactions, Micropropagation and Phytochemistry and uses of Saffron as a Medicinal and Aromatic plant are discussed. Genomics and Transcriptomics provide deeper insights into the genes responsible for the production of saffron metabolites. Further, the integra tome omics frameworks give an insight into the systemic and comprehensive saffron biology and future genetic progress by tools of genome editing, epigenetics, breeding and micro-propagation.

The area of saffron biology is an important research area and, this volume will provide readers with comprehensive and updated. It will be most recent updated compilation on saffron biology and biotechnology. It will appeal to saffron farmers, the food and pharmaceutical industries, researchers, scholars, and anyone interested in the science of saffron.

TABLE OF CONTENTS

1. Saffron (*Crocus sativus* L.): The Red Gold
2. Cultivation and Ecology of Saffron
3. Genetics and Cytogenetics of Saffron
4. Saffron: Nature's Golden Elixir - The Emerging Role of Saffron Bioactives in Nutrition and Medicine
5. Economic Importance of Saffron
6. Beneficial Effects, Applications, Safety Evaluation and Limitations of the Medicinal Plant *Crocus sativus* (Saffron)
7. Saffron Transcriptomics
8. Saffron Post-Transcriptome
9. Metabolomic Analysis of Saffron: An Overview of the Current Status
10. Computational Biology of Saffron: An Expensive Spice
11. Molecular Markers of Saffron
12. Genome Editing in Saffron
13. Microbiome and Endophytic Interactions of Saffron
14. Micropropagation as an Aid to Saffron Conservation
15. Saffron: Phytochemistry and uses in Human Health and Diseases



CIRCADIAN PHYSIOLOGY

By Roberto Refinetti, PhD.

ISBN 9781032298559

Published 2026 by CRC Press

BOOK DESCRIPTION

Since the Nobel Prize for Physiology and Medicine was awarded to researchers of circadian rhythms in 2017, no serious biomedical researcher (and no responsible physician) can be excused for not being aware of the importance of the circadian organization of bodily processes. Now in its fourth edition, *Circadian Physiology* offers a thorough review of principles and applications of research on circadian rhythms and serves as a comprehensive introduction to the field for life scientists, as a valuable reference book for circadian researchers, as a primer for health practitioners, and as an all-inclusive textbook for university students.

TABLE OF CONTENTS

History and Methods. Early Research on Circadian Rhythms. Research Methods in Circadian Physiology. Analysis of Circadian Rhythmicity. Phenomenology. Ultradian and Infradian Rhythms. Daily and Circadian Rhythms. Mechanisms. Endogenous Mechanisms. Photic Environmental Mechanisms. Nonphotic Environmental Mechanisms. Integration of Mechanisms. Homeostasis and Circadian Rhythmicity. Physical Substrates. Receptors. Pacemakers. Afference and Efference. Applications. Optimal Timing on Earth and in Space. Jet Lag and Shift Work. Human Medicine. Pet Selection and Veterinary Medicine. Appendix A: Assessment of Learning. Appendix B: Dictionary of Circadian Physiology. Appendix C: Organisms Used.



FORENSIC BIOTECHNOLOGY

By Hirak Dash

ISBN 9781032755007

Published 2026 by CRC Press

BOOK DESCRIPTION

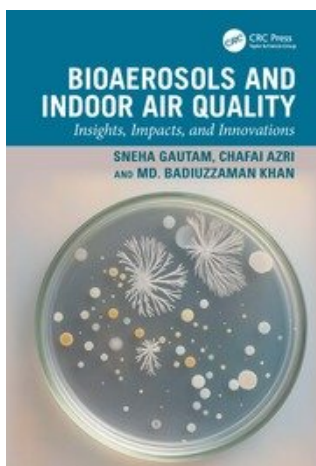
Forensic Biotechnology: The Basics and Beyond provides a comprehensive exploration of biotechnology's transformative role in modern forensic science. This essential resource covers the field through carefully structured chapters, beginning with foundational concepts including sample collection, preservation, and data interpretation, then progressing through practical applications such as microbial forensics, wildlife forensics, and DNA barcoding. The book advances to sophisticated topics including DNA mixture interpretation, forensic DNA phenotyping, epigenetic signatures, and proteomics. It concludes with a critical examination of DNA evidence admissibility in courtroom proceedings.

Beyond technical expertise, the book tackles the ethical, legal, and social implications of biotechnology in forensic investigations, including privacy concerns and scientific evidence admissibility. It provides in-depth analysis of cutting-edge techniques including polymerase chain reaction (PCR), short tandem repeat (STR) analysis, mitochondrial DNA analysis, next-generation sequencing (NGS), and advanced molecular biology methods. Coverage examines both the strengths and limitations of various forensic biotechnology methodologies, ensuring readers develop a balanced understanding of current capabilities and constraints in the field.

Enhanced with real-world case studies and practical examples, the book serves as an educational resource and professional reference guide, of vital importance to forensic scientists, attorneys, researchers, and students exploring the impact of biotechnology on justice and criminal investigations.

TABLE OF CONTENTS

1: Forensic Biotechnology: Introduction and Advancements 2: Collection and Preservation of Samples for Forensic DNA Analysis 3: Insights into Body Fluid Identification for Criminal Investigations 4: Introduction to DNA Profiling Techniques 5: Next-Generation Sequencing in Forensic Science: Advancements, Limitations, and Applications 6: From Data to Interpretation: Statistical Software in Forensic DNA Typing 7: Challenges and Limitations of Forensic DNA Profiling Technique 8: Ethical and normative implications of Forensic DNA Technology 9: DNA Barcoding and its Potential Applications in Forensic Investigations 10: Microbial Forensics 11: The Rising Path of Forensic Archaeology: An Indian Perspective 12: Wildlife Forensics: From the Science of Conservation to the Courtroom 13: Forensic DNA Phenotyping: Techniques, Successes, and Future Directions 14: Streamlining Forensic DNA Analysis with RAPID DNA Typing: Current Developments and Future Directions 15: Exploring the Role of Epigenetic Factors in Forensic Science 16: Mass spectrometry in forensic DNA analysis: A new frontier 17: Role of Proteomics in Criminal Investigations 18: Unraveling Injustice: The Impact of DNA Exonerations



BIOAEROSOLS AND INDOOR AIR QUALITY

By Md. Badiuzzaman Khan

ISBN 9781041110118

Published 2026 by CRC Press

BOOK DESCRIPTION

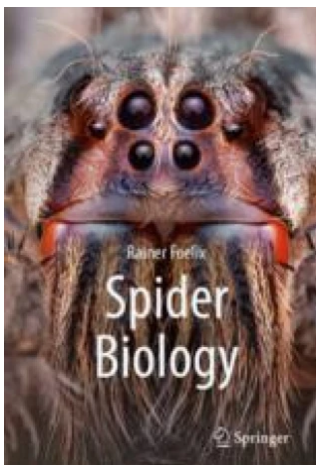
This book provides a detailed exploration of bioaerosols in indoor environments, focusing on their sources, transport mechanisms, health implications, and mitigation strategies. It encompasses the biology, physics, and chemistry of bioaerosols, their interaction with indoor environments, and their influence on human health. It examines the role of heating, ventilation, and air conditioning (HVAC) systems, regulatory frameworks, and emerging technologies in understanding and controlling indoor air bioaerosols. It underscores the importance of proactive bioaerosol management in diverse indoor settings.

- Provides a detailed explanation of bioaerosol transport and mitigation strategies
- Promotes a comprehensive interdisciplinary approach integrating science, engineering, and public health
- Reviews case studies and examples, including real-world applications in healthcare, schools, and residential spaces
- Discusses up-to-date advancements in air purification technologies and HVAC systems
- Includes ancillary materials such as end-of-chapter problems, solutions, lecture slides, and downloadable figures

This book is aimed at senior undergraduates, graduate students, researchers, and professionals in air quality, aerosols, and bioaerosols.

TABLE OF CONTENTS

1. Introduction to Bioaerosols and Indoor Air Quality 2. Sources of Bioaerosols in Indoor Environments 3. Transport Mechanisms of Bioaerosols 4. Microbial Air Contamination in Indoor Spaces 5. Air conditioning Systems and Their Role in Indoor Air Quality 6. Health Implications of Bioaerosol Exposure 7. Monitoring and Measurement Techniques for Bioaerosols 8. Standards and Guidelines for Indoor Air Quality 9. Mitigation Strategies for Bioaerosol Control 10. Advances in Air Purification Technologies 11. Future Directions and Research Opportunities in Bioaerosols and Indoor Air Quality



SPIDER BIOLOGY

By Rainer Foelix

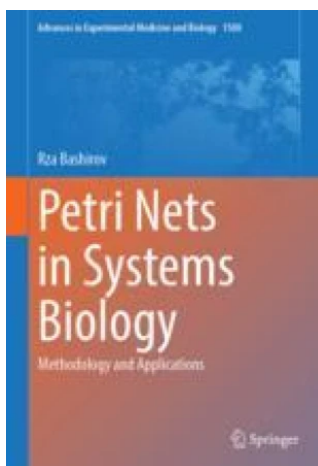
ISBN 978-3-031-96010-9

Published 2025 by SPRINGER

BOOK DESCRIPTION

This book is based on the well-established book *Biology of Spiders* but is completely updated. It focuses on the biology and natural history of spiders in general - it does not deal with the identification of spiders.

Virtually all aspects of spider biology are covered, from anatomy and physiology to neurobiology and behavior, or from spider venom to prey capture, and from silk production to complex web construction. The book will appeal not only to spider enthusiasts, professional arachnologists and zoologists, but to anyone with an interest in biology. It is written in a clear and straightforward style, making it easy to read for the general reader.



PETRI NETS IN SYSTEMS BIOLOGY

By Rza Bashirov

ISBN 978-3-032-20040-2

Published 2026 by SPRINGER

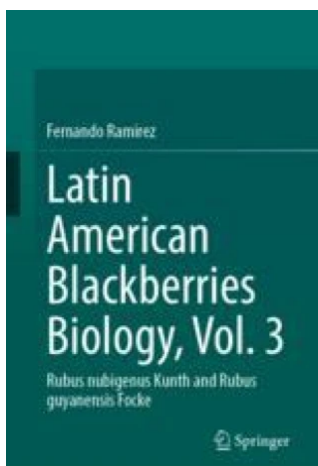
BOOK DESCRIPTION

Petri Nets in Systems Biology presents a rigorous and coherent framework for modeling and analyzing complex biological systems. Positioned at the intersection of computer science, biomedicine, bioinformatics, and target-based drug discovery, the book demonstrates how Petri nets naturally capture key characteristics of biological processes, including concurrency, synchronization, causality, stochastic, and fuzzy behavior.

The book introduces fundamental Petri net concepts and progressively extends them to address core problems in systems biology, such as the modeling of metabolic networks, gene regulatory systems, signal transduction pathways, and cellular control mechanisms. Both qualitative and quantitative analysis techniques are covered, including invariant analysis, reachability, structural properties, stochastic modeling, and hybrid extensions.

A strong emphasis is placed on modularity, compositional modeling, and biological interpretability, enabling readers to construct scalable and reusable models that remain closely aligned with underlying biological knowledge. Through carefully selected running examples and case studies, the book illustrates how Petri net technologies can be used to simulate system dynamics, analyze regulatory structure, and gain insight into emergent behaviors of complex biological networks.

Intended for researchers, graduate students, and advanced practitioners, Petri Nets in Systems Biology serves as both an accessible introduction and a comprehensive reference. It provides the theoretical foundations and practical tools necessary for applying Petri nets to contemporary challenges in computational and systems biology.



LATIN AMERICAN BLACKBERRIES BIOLOGY, VOL. 3

By Fernando Ramirez

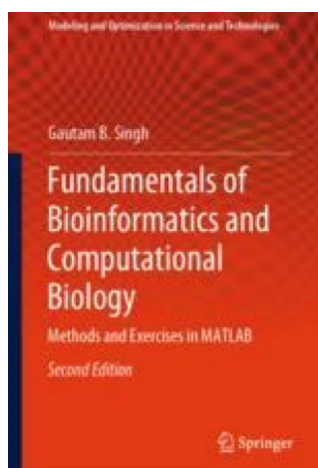
ISBN 978-3-032-21015-9

Published 2026 by SPRINGER

BOOK DESCRIPTION

Latin American Blackberries Biology Vol. 3 is the first comprehensive work dedicated to the highland blackberry species *Rubus nubigenus* Kunth and *Rubus guyanensis* Focke—underutilized plants from South America with significant potential for breeding programs, plant repositories, cultivation, and the production of health-related compounds such as antioxidants. These species also yield edible fruits with commercial, medicinal, and ethnobotanical applications.

Addressing a critical knowledge gap, this book explores key aspects of *Rubus* biology, including floral morphology, pollination, fruit and pyrene characteristics, overall plant morphology, genetic diversity, breeding potential, and biogeography. It brings together field observations, newly obtained data, and high-quality photographs that meticulously document the plants and their environments.



FUNDAMENTALS OF BIOINFORMATICS AND COMPUTATIONAL BIOLOGY

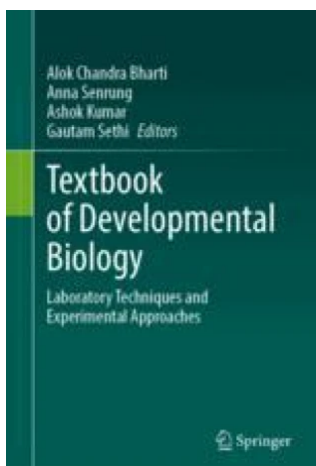
By Gautam B. Singh

ISBN 978-3-031-75693-1

Published 2025 by SPRINGER

BOOK DESCRIPTION

This book comprehensively covers all the core bioinformatics topics and includes practical examples completed using the MATLAB bioinformatics and machine learning toolboxes™. It is primarily intended as a textbook for engineering and computer science students attending advanced undergraduate and graduate courses in bioinformatics and computational biology. The book develops bioinformatics concepts from the ground up, starting with an introductory chapter on molecular biology and genetics to enable physical science students to appreciate the challenges in biological data management, sequence analysis, and systems biology. The book is divided into five parts. The first one includes a survey of existing biological databases and tools that have become essential in today's biotechnology research. The second part covers methodologies for retrieving biological information, including fundamental algorithms for sequence comparison, scoring, and determining evolutionary distance. The third part of the book focuses on modeling biological sequences and patterns as Markov chains, covering core principles for analyzing and searching for sequences of significant motifs and biomarkers and developing stochastic ergodic hidden Markov models for biological sequence families. The fourth one is dedicated to systems biology and covers phylogenetic analysis and evolutionary tree computations, as well as gene expression analysis with microarrays. In turn, the last part of the book includes an introduction to machine-learning algorithms for bioinformatics and outlines strategies for developing intelligent diagnostic machine-learning applications, RNA sequence data, and deep learning systems for mass spectrometry data. All in all, this book offers a unique hands-on reference guide to bioinformatics and computational biology. This second edition has been updated to cover additional and most recent databases, and machine learning and deep learning applications in RNA sequence and mass-spectrometry data analysis. Moreover, it presents significant enhancements to the chapter dedicated to microarray analysis, and more practical examples, with additional end-of-chapter problems.



TEXTBOOK OF DEVELOPMENTAL BIOLOGY

By Gautam Sethi

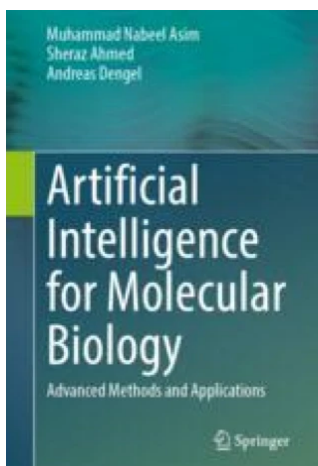
ISBN 978-981-95-7268-7

Published 2026 by SPRINGER

BOOK DESCRIPTION

This book provides an in-depth exploration of the key concepts in developmental biology, offering a clear understanding of embryonic development. It explains frogs' complex developmental stages, from cleavage to tadpole stages, both externally and internally through diagrams, microscopic and pictorial images of permanent slides. Likewise, the exploration extends to chick embryos, carefully scrutinizing stages categorized by the Hamburger and Hamilton classification, providing information on advanced developmental milestones during incubation times. Moreover, the book provides a firsthand glimpse into the dynamic processes of embryogenesis by demonstrating chick embryo culture from fertilized eggs through pictures and videos. Furthermore, by observing the real time pictures of life cycle and developmental phases of *Drosophila*, Zebrafish, *Caenorhabditis elegans*, and *Spodoptera litura* which are cultivated from stock cultures, readers will obtain important knowledge on genetic and morphological changes. Moreover, detailed sections of the placenta, depicted through photomicrographs and slides, enrich the understanding of mammalian development.

This book is a useful resource for both undergraduate and postgraduate students in Life Sciences, as well as for teaching and research. It offers a comprehensive understanding of developmental processes and provides straightforward methods for maintaining model organisms in the laboratory for further exploration.



ARTIFICIAL INTELLIGENCE FOR MOLECULAR BIOLOGY

• By Andreas Dengel
 ISBN 978-3-031-90453-0
 Published 2025 by SPRINGER

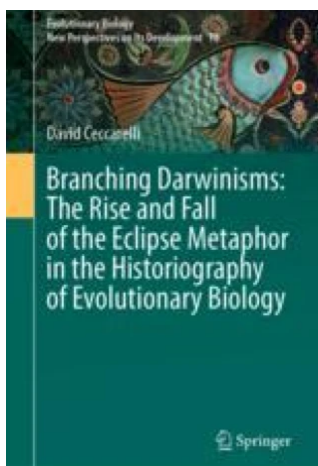
BOOK DESCRIPTION

The integration of artificial intelligence (AI) into molecular biology has brought about a paradigm shift, enabling researchers to tackle some of the most challenging problems in life sciences. This second volume builds upon the foundational principles explored in Volume I, delving into advanced AI methodologies and their applications in understanding biological sequences at a granular level. From word embeddings to language models, this volume examines the state-of-the-art techniques driving progress in molecular biology.

The chapters in this volume are structured to provide an in-depth exploration of AI methods and their transformative impact on DNA, RNA, protein, and peptide analysis:

1. **Word Embedding Methods:** This chapter explores the evolution of word embedding techniques, including foundational models like Word2Vec, FastText, and GloVe, as well as advanced graph-based embeddings such as DeepWalk, Node2Vec, and Struc2Vec. These embeddings have revolutionized sequence representation, providing powerful tools for analyzing biological data.
2. **Large Language Models:** Language models have reshaped the landscape of computational biology. This chapter examines models like ULMFiT, BERT, and cutting-edge tools like AlphaFold and RNAFormer, which have set new benchmarks in structure prediction and sequence analysis.
3. **AI-Driven Insights into DNA Sequence Analysis Landscape:** AI has unlocked new possibilities in DNA analysis. This chapter reviews methodologies, datasets, and predictive pipelines, offering insights into the performance and distribution of research across various benchmarks.
4. **AI-Driven Insights into RNA Sequence Analysis Landscape:** RNA, with its unique roles and complexities, benefits significantly from AI approaches. This chapter investigates datasets, predictive pipelines, and performance metrics specific to RNA analysis.
5. **AI-Driven Insights into Protein Sequence Analysis Landscape:** Proteins, central to numerous biological processes, are analyzed using AI-driven techniques. This chapter discusses embedding-based and language model-based methods, as well as the resources and benchmarks available for protein analysis.
6. **AI-Driven Revolution in Peptide Classification Landscape:** Peptides, due to their diverse biological roles, pose unique challenges. This chapter provides a thorough examination of peptide classification, exploring AI methodologies, datasets, evaluation strategies, and the state-of-the-art performance of predictive models.

Volume II provides a detailed narrative of how advanced AI methodologies are transforming the study of molecular biology. Each chapter bridges the gap between theoretical advancements and practical applications, equipping researchers and practitioners with the knowledge needed to drive innovation in this interdisciplinary field.



BRANCHING DARWINISMS: THE RISE AND FALL OF THE ECLIPSE METAPHOR IN THE HISTORIOGRAPHY OF EVOLUTIONARY BIOLOGY

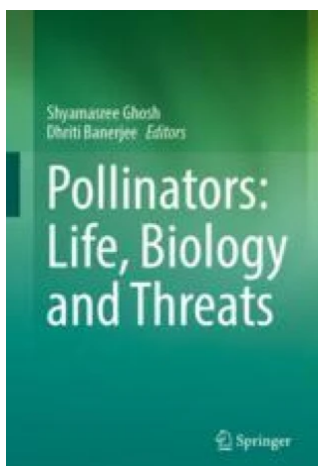
By David Ceccarelli

ISBN 978-3-032-13043-3

Published 2026 by SPRINGER

BOOK DESCRIPTION

This book offers a meta-historical analysis of the “eclipse of Darwinism” narrative in evolutionary biology. It examines major historiographical labels – such as “Darwinism,” “anti-Darwinian,” “eclipse of Darwinism,” and “modern synthesis” – highlighting their varying uses in past and current historiography. This analysis not only invites a rethinking of how evolutionary biology’s development is periodized but also clarifies how historical narratives shape modern scientific practice by revealing the link between scientific practice and historical interpretation. Using a historical and epistemological perspective, the volume explores both the history of the “eclipse” period and how evolutionary biologists and historians have written that history. Its methodology integrates the study of historiographical traditions with analyses of scientific writings, popular accounts, and personal correspondence among scholars. The book concludes that the “eclipse” metaphor has lost heuristic value and that dividing biology into pre- and post-synthetic phases is misleading. Darwinism neither entered the 1880s–1920s as a unified program nor simply fragmented into isolated strands. Instead, evolutionary studies comprised diverse traditions that branched out and progressively specialized.



EXPOLLINATORS: LIFE, BIOLOGY AND THREATS

By Dhriti Banerjee

ISBN 978-981-95-0358-2

Published 2025 by SPRINGER

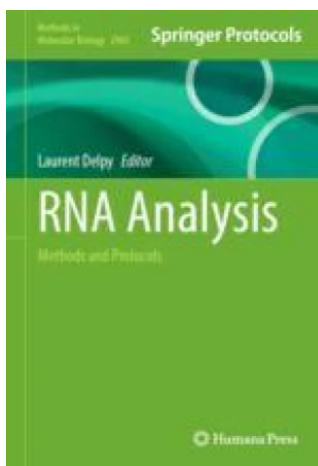
BOOK DESCRIPTION

This book explores the critical role of dipterans (flies) in global food production, plant reproduction, and ecological services. It highlights the diversity of pollinating dipterans worldwide, with a focus on their importance in India.

Chapters cover key pollinator groups such as syrphid flies (hoverflies), thick-headed flies, bees (honeybees, bumblebees, solitary bees), and butterflies, explaining their impact on plant health and reproduction. Special attention is given to non-syrphid dipterans, which are vital in high-altitude and subarctic regions where bee populations are limited.

The book also examines threats like climate change, habitat loss, land-use changes, and invasive species, along with recent research on insect immunity and antiviral defenses in honeybees.

It is a valuable resource for researchers, academicians, and anyone interested in pollinators and their conservation.



RNA ANALYSIS

By Laurent Delpy

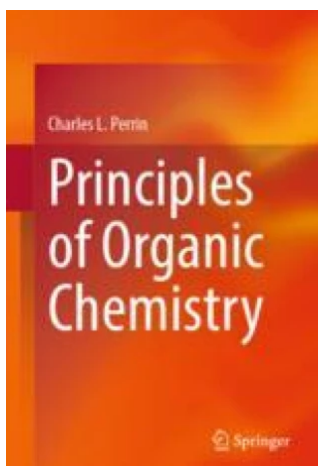
ISBN 978-1-0716-4725-7

Published 2024 by SPRINGER

BOOK DESCRIPTION

This volume explores the latest technologies for RNA analysis, covering fundamental techniques and innovative approaches that expand our understanding of RNA biology. The chapters in this book are organized into four parts: reverse transcription and RNA capture methods; high-throughput sequencing methods; RNA maturation: splicing, polyadenylation, and epitranscriptomic modifications; and RNA surveillance: nonsense-mediated mRNA decay. These chapters aim to provide detailed protocols for select techniques used by molecular and computational biologists to isolate, amplify, detect, modify, and analyze RNA to gain insight into a wide range of cellular functions. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls.

Cutting-edge and comprehensive, RNA Analysis: Methods and Protocols is a valuable resource for students, technicians, and senior scientists who want to learn more about this dynamic field of RNA research.



PRINCIPLES OF ORGANIC CHEMISTRY

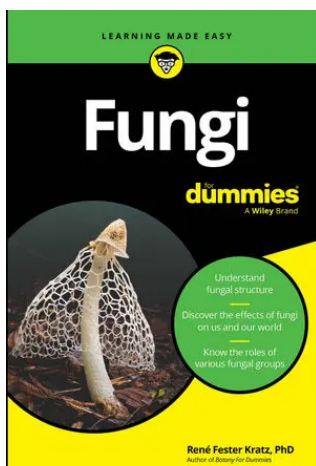
By Charles L. Perrin

ISBN 978-3-032-11323-8

Published 2026 by SPRINGER

BOOK DESCRIPTION

This book covers the fundamental principles of organic chemistry, along with a brief survey of some reactions of the most important functional groups and a concise introduction to spectroscopy. The intent is to provide an overview of organic chemistry sufficient for students of biology and biochemistry.



FUNGI FOR DUMMIES

By Rene Fester Kratz

ISBN 978-1-394-34483-3

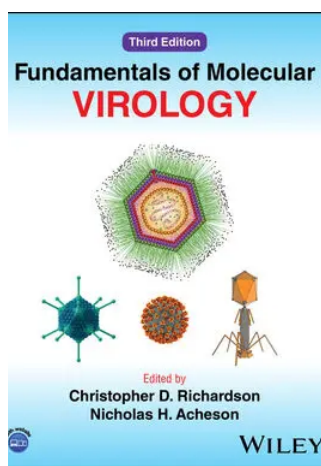
Published 2025 by WILEY

BOOK DESCRIPTION

Fungi For Dummies gives you an in-depth view of the wide world of mycology. With this science-focused yet clear and readable book, you'll dig deep into the science of the fascinating organisms that help this planet thrive. Learn about fungi classifications and structures, their uses in and beyond medicine, their importance to environmental sustainability, and how they have shaped human cultures around the world. Go beyond the typical mushroom field guide and get a thorough introduction to the study of mycology that tracks a typical undergraduate course in the field.

- Grasp the basics of mycology, including how fungi grow and how they differ from plants
- Discover the role fungi play in ecosystems around the world
- Learn to classify the different biological structures that appear in fungi
- Know the various fungal groups and their roles in nature and in human endeavors

Perfect for those who want or need to get a grasp on mycology, Fungi For Dummies is an approachable introduction to this essential organism group.



FUNDAMENTALS OF MOLECULAR VIROLOGY, 3RD EDITION

By Christopher D. Richardson

ISBN 978-1-119-88586-3

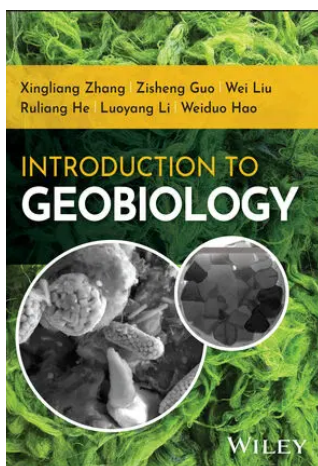
Published 2024 by WILEY

BOOK DESCRIPTION

Fundamentals of Molecular Virology is a textbook designed for university students learning about viruses at the undergraduate or graduate levels. Chapters contributed by prominent virologists cover many of the major virus families. Each chapter is designed to tell a story about the viruses covered, including information on discovery, diseases and pathogenesis, virus structure, steps in replication, and interaction with cellular signaling pathways. This approach portrays the "personality" of each virus, helping students to learn the material and build up their knowledge of virology starting with smaller and simpler viruses and proceeding to more complex viruses.

Major importance is given to viruses that infect humans and cause disease, but coverage is broad, including viruses of bacteria, Archaea, algae, invertebrates, and plants. Information boxes highlight applications and research directions of particular significance. Chapters conclude with sections presenting fundamental concepts, review questions, and lists of key terms, which are defined in a glossary at the end of the book.

This 3rd edition of Fundamentals of Molecular Virology includes detailed information on the recent COVID-19 pandemic and mRNA vaccine technology, additional sections on pathogenic herpesviruses, and updates on recent outbreaks of Zika virus, Ebola virus and mpox diseases. New chapters describe hepatitis C virus, rhabdoviruses, viruses of invertebrates, oncolytic viruses, and virus-mediated gene therapy. All chapters, including those on innate and adaptive immune responses to virus infections, virus vaccines, and antiviral agents, were revised and updated.



INTRODUCTION TO GEOBIOLOGY

By Weiduo Hao

ISBN 978-1-394-34619-6

Published 2026 by WILEY

BOOK DESCRIPTION

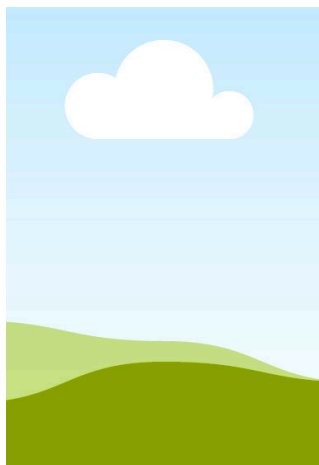
Exploring the geological basis for life on Earth, Introduction to Geobiology systematically examines the interaction between the geosphere and the biosphere, including its evolutionary history.

In this didactically written text, readers will learn about the various modes of interaction between living and inorganic environments, emphasizing the geological significance of metabolism and the basis of life in extreme environments, the geobiological role and geological record of microbial ecosystems, and the material and energy cycles between the geosphere and the biosphere. The book also explores the geological imprint of biological processes such as biomineralization, biosedimentary diagenesis, and biological weathering of minerals and rocks, as well as the co-evolution process between organisms and the environment.

Based on a highly successful course taught by the authors for more than 20 years, Introduction to Geobiology includes information on:

- Domains and kingdoms of cellular life, classification of organisms according to their metabolism
- Ecological and metabolic diversity in marine and terrestrial environments, including extreme environments
- Using microbial ecosystems as a model for exploring life beyond earth
- Oxygen, carbon, nitrogen, sulfur, phosphorus, and iron cycles
- Bioerosion, macroborers and microborers, biological and lichen weathering, and soil development

Introduction to Geobiology is an excellent textbook for senior undergraduate and graduate students in geology or microbiology seeking to learn about geobiology and the origin of life on Earth. It also provides a strong foundation for the study of astrobiology: the conditions under which life on other planets may develop.



ESSENTIALS OF CARBOHYDRATE CHEMISTRY AND BIOCHEMISTRY, 4TH EDITION

By Thisbe K. Lindhorst

ISBN 978-3-527-35063-6

Published 2026 by WILEY

BOOK DESCRIPTION

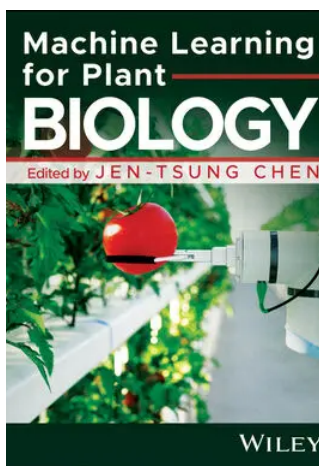
From synthesis to biological function, this widely acclaimed textbook introduces the entire range of modern carbohydrate chemistry and chemical biology. The increasing recognition of the role of carbohydrates in biology, pharmacology and medicine is reflected in greatly expanded sections on glycobiology and glycomimetics.

The new edition also features a new set of illustrations, many of which are now in color, as well as story-telling text boxes providing context within science and society.

"This book is aptly named: it is a well organized, well written presentation of the essentials of carbohydrate chemistry and their relationship to biochemistry."

TABLE OF CONTENTS

- 1 Structure of saccharides
- 2 Protecting groups for carbohydrates
- 3 O-Glycoside synthesis
- 4 Important modifications of the sugar ring
- 5 Structure and biosynthesis of glycoconjugates
- 6 Glycobiology



MACHINE LEARNING FOR PLANT BIOLOGY

By Jen-Tsung Chen

ISBN 978-1-394-32961-8

Published 2024 by WILEY

BOOK DESCRIPTION

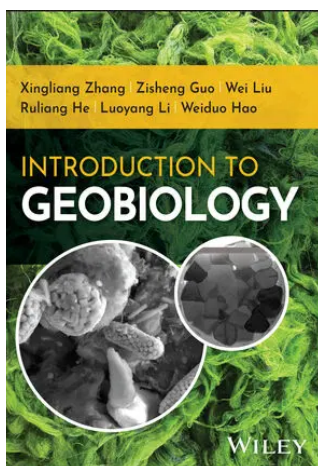
A comprehensive and current summary of machine learning-based strategies for constructing digital plant biology

Machine Learning for Plant Biology provides a comprehensive summary of the latest developments in machine learning (ML) technologies, emphasizing their role in analyzing complex biological networks of plants and in modeling the responses of major crops to biotic and abiotic stresses. The combinatorial strategies discussed in this book enable readers to further their understanding of plant biology, stress physiology, and protection.

Machine Learning for Plant Biology includes information on:

- Intelligent breeding for stress-resistant and high-yield crops, contributing to sustainable agriculture, the Sustainable Development Goals (SDGs), and the Paris Agreement
- Interactions between plants, pathogens, and environmental stresses through omics approaches, functional genomics, genome editing, and high-throughput technologies
- State-of-the-art AI tools, including machine and deep learning models, as well as generative AI
- Applications include species identification, systems biology, functional genomics, genomic selection, phenotyping, synthetic biology, spatial omics, plant disease diagnosis and protection, and plant secondary metabolism

Machine Learning for Plant Biology is an essential reference on the subject for scientists, plant biologists, crop breeders, and students interested in the development of sustainable agriculture in the face of a changing global climate.



INTRODUCTION TO GEOBIOLOGY

By Xingliang Zhang

ISBN 978-1-394-34619-6

Published 2026 by WILEY

BOOK DESCRIPTION

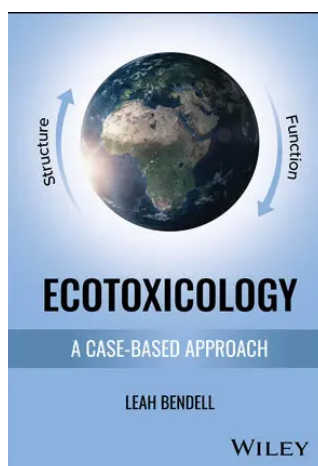
Exploring the geological basis for life on Earth, Introduction to Geobiology systematically examines the interaction between the geosphere and the biosphere, including its evolutionary history.

In this didactically written text, readers will learn about the various modes of interaction between living and inorganic environments, emphasizing the geological significance of metabolism and the basis of life in extreme environments, the geobiological role and geological record of microbial ecosystems, and the material and energy cycles between the geosphere and the biosphere. The book also explores the geological imprint of biological processes such as biomineralization, biosedimentary diagenesis, and biological weathering of minerals and rocks, as well as the co-evolution process between organisms and the environment.

Based on a highly successful course taught by the authors for more than 20 years, Introduction to Geobiology includes information on:

- Domains and kingdoms of cellular life, classification of organisms according to their metabolism
- Ecological and metabolic diversity in marine and terrestrial environments, including extreme environments
- Using microbial ecosystems as a model for exploring life beyond earth
- Oxygen, carbon, nitrogen, sulfur, phosphorus, and iron cycles
- Bioerosion, macroborers and microborers, biological and lichen weathering, and soil development

Introduction to Geobiology is an excellent textbook for senior undergraduate and graduate students in geology or microbiology seeking to learn about geobiology and the origin of life on Earth. It also provides a strong foundation for the study of astrobiology: the conditions under which life on other planets may develop.



ECOTOXICOLOGY: A CASE-BASED APPROACH

By Leah Bendell

ISBN 978-1-394-19744-6

Published 2025 by WILEY

BOOK DESCRIPTION

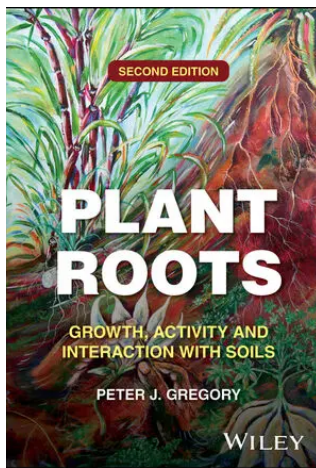
Ecotoxicology: A Case-based Approach follows a “learning by doing” approach, building a deeper understanding of this multi-faceted discipline through the guided analysis of five carefully selected case studies that between them address both local and global anthropogenic impacts on ecosystem structure and function.

The book is divided into three sections. Section I covers the definition, history and methodology of ecotoxicology. Section II comprises five case studies, each detailing a selected anthropogenic stress, showing how the ecotoxicological approach has been used to explain its environmental impact and by doing so has provided mitigation and restoration strategies. The final section highlights future directions of ecotoxicology. To aid in reader learning, each chapter includes a test bank and reading list for further study.

Written by a highly experienced instructor with more than 30 years of studying and teaching the subject, Ecotoxicology includes case studies on:

- Acid rain in the past and in the present
- Finfish and shellfish aquaculture
- The extraction of bitumen from the oil sands of Alberta, Canada
- The release of toxic metals such as mercury, lead and cadmium, and the dumping of chemical wastes and other contaminants of concern in the Great Lakes area

Ecotoxicology: A Case-based Approach is an essential guide for upper undergraduate and postgraduate students in ecology and environmental sciences, as well as professionals and policy makers concerned with the conservation and sustainable management of natural resources.



PLANT ROOTS: GROWTH, ACTIVITY AND INTERACTION WITH SOILS, 2ND EDITION

By Peter J. Gregory

ISBN 978-1-118-94992-4

Published 2025 by WILEY

BOOK DESCRIPTION

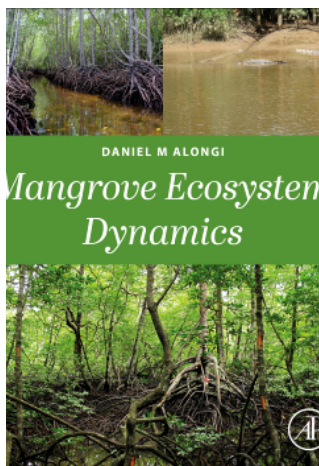
Plant Roots draws together information from plant and soil literature to illustrate how roots interact with soil, both to modify it and to obtain from it the resources required for the whole plant to grow. Emphasis is placed on whole plants and root systems, with appropriate references to the growing body of literature on plant molecular and cellular levels.

This newly revised and updated Second Edition maintains its balance between introducing the founding ideas and science underlying the topic while covering the most recent updates underpinned by new scientific methods and understanding. The author reviews recent advances in genomics, phenomics, other -omics technologies, computer modelling, and the study of 'model plants' such as *Arabidopsis thaliana* and rice which have led to major advances in understanding how roots grow and function. New crop varieties contributing to increased crop production, especially in nutrient poor and/or water-limited soils, are described together with new ways of managing root systems to improve crop performance and efficiency of resource use.

Sample topics discussed in Plant Roots include:

- The anatomy and growth of primary roots
- The development and properties of the rhizosphere
- Heterogeneity of structure, nutrient availability, and microbial communities experienced in field soils
- Differences in anatomy and morphology between different types (classes) of root and their consequences for activity as absorbers of water and nutrients
- How crops, forests, natural plant communities and the resources supporting them might be managed more effectively

Plant Roots is an essential source of reference aimed at students and professionals who already have some background knowledge of soils and plants and are seeking to understand cutting-edge updates in the field.



MANGROVE ECOSYSTEM DYNAMICS

By Daniel M Alongi

ISBN 9780443238215

Published 2026 by ELSEVIER

BOOK DESCRIPTION

Mangrove Ecosystem Dynamics presents a comprehensive account of the various functions of mangrove habitats, from spatial dynamics of intertidal ecosystems to nutrient and biogeochemical cycling in sediments, tidal and coastal waters, and dependent species. This process-oriented approach is necessary to further understand the role of these dynamic habitats in the coastal ocean, and as a next step towards developing adequate strategies for mangrove conservation, management, and sustainable use.

Written by a leading expert in mangrove biology and tropical marine ecology, this book takes an energetics approach to summarize the latest developments and knowledge in the field of mangrove ecology. Initial chapters discuss the fundamentals of intertidal environments and the spatial and temporal dynamics of mangrove habitats. Latter chapters address recent advances in food web energetics in tidal waters, exploring benthic invertebrate, planktonic, fish, and arboreal food webs. Final sections detail decomposition of organic matter, nutrient cycling, and carbon sequestration.

Mangrove Ecosystem Dynamics addresses rapidly emerging and vital issues of climate change, blue carbon, sustainable management and restoration, and the connectivity and interdependence between mangroves and other coastal habitats and species. This new work offers a comprehensive functional view of the current and future state of mangrove ecosystems that will greatly benefit coastal and marine biologists, resource managers, conservationists, and students alike.

TABLE OF CONTENTS

Part I: Introduction

1. The World of Mangrove Forest Ecosystems
2. Physical Forces in the Intertidal Seascape

Part II: Forests in Space and Time

3. Regeneration and Growth
4. Landscape Dynamics
5. The Role of Disturbance
6. Forest Succession

Part III: Energetics of Trees and Canopies

7. Tree Physiology
8. Primary Productivity

Part IV: Trophic Ecology and Energy Flow

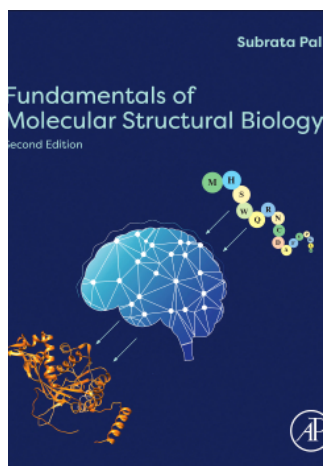
9. Planktonic Food Webs
10. Arboreal Food Webs
11. Benthic Food Webs
12. Fisheries

Part V: Decomposition and Nutrient Processes

13. Decomposition of Litter, Wood, and Roots
14. Carbon Oxidation in Intertidal Soils and Sediments
15. Micro- and Macronutrient Processes

Part VI: Ecosystem Biogeochemistry

16. Material Exchanges
17. Carbon Balance
18. Whole-Ecosystem Fluxes
19. Blue Carbon and Climate Change Mitigation
20. Synthesis



FUNDAMENTALS OF MOLECULAR STRUCTURAL BIOLOGY

By Subrata Pal

ISBN 9780443339806

Published 2026 by Academic Press

BOOK DESCRIPTION

Fundamentals of Molecular Structural Biology, Second Edition reviews the mathematical and physical foundations of molecular structural biology, covering the latest advancements. The book begins with historical perspectives before exploring mathematical concepts, physical aspects of chemistry, the chemical basis of biology, structural analysis, visualization, protein folding, transcription, RNA processing, cell signaling, and computational molecular biology. Additionally, this new edition delves into AI fundamentals and applications, including AlphaFold and RoseTTAFold. This fully updated edition provides a detailed overview of the fundamental concepts across molecular structural biology and acts as an ideal guide for researchers and advanced students.

Given the increasingly interdisciplinary nature of this subject, this book provides early career researchers and those shifting into an adjacent field a "fundamentals" resource to get them up-to-speed on the foundations of a particular field.

TABLE OF CONTENTS

1. Introduction: A historical perspective
2. Mathematical preliminaries
3. Physical basis of chemistry
4. Chemical basis of biology
5. Biomacromolecules
6. Structure analysis and visualization
7. Protein Folding
8. DNA synthesis: Replication
9. Transcription
10. RNA processing
11. Translation
12. DNA damage and repair
13. Recombination
14. Membrane structure and function
15. Fundamentals of structural genomics
16. Cell signaling and systems biology
17. Macromolecular assemblies
18. Computational molecular biology
19. Artificial intelligence (AI) applications



MICROBIAL STRESS BIOLOGY

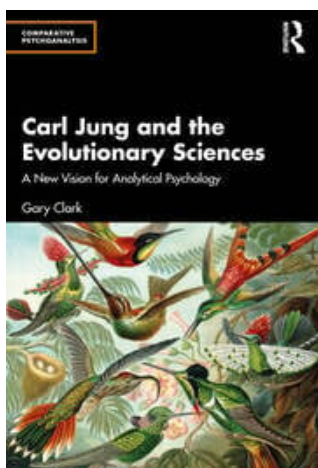
By Samiksha Joshi,
ISBN 9780443416965

Published 2026 by Academic Press

BOOK DESCRIPTION

Microbial Stress Biology offers a comprehensive understanding of the adaptation strategies of microbes at the biochemical and molecular level in response to stressful conditions, while also detailing the molecular mechanisms that enable microbial organisms to survive and persist under these adverse circumstances. The book discusses a wide array of topics related to microbial adaptation, covering fundamental biological responses to stress, microbial adaptations at cellular, genomic, and proteomic levels, as well as specific adaptations and regulations to various environmental stress factors such as pH fluctuations, chemicals, and extreme thermal conditions.

Sections also highlight the application of omics technology and predictive modeling in understanding microbial stress biology for various fields, including biotechnology, medicine, bioremediation, and industrial processes. This book is an informative resource for those in microbiology, molecular biology, biotechnology, and other related fields who are searching for a better understanding of how microbes are able to sense and respond to distinct stressors at both molecular and cellular levels.



CARL JUNG AND THE EVOLUTIONARY SCIENCES

By Gary Clark

ISBN 9781032624518

Published 2024 by Routledge

BOOK DESCRIPTION

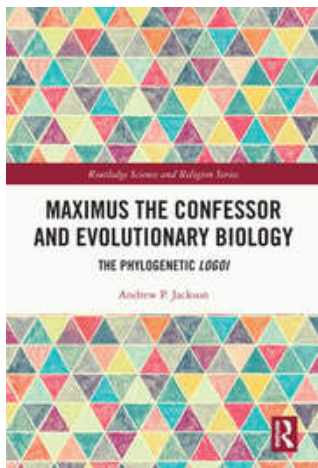
This book reevaluates Carl Jung's ideas in the context of contemporary research in the evolutionary sciences.

Recent work in developmental biology, as well as experimental and psychedelic neuroscience, have provided empirical evidence that supports some of Jung's central claims about the nature and evolution of consciousness. Beginning with a historical contextualisation of the genesis of Jung's evolutionary thought and its roots in the work of the 19th century Naturphilosophen, the book then outlines a model of analytical psychology grounded in modern theories of brain development and life history theory. The book also explores research on evolved sex based differences and their relevance to Jung's concept of the anima and animus.

Seeking to build bridges between analytical psychology and contemporary evolutionary studies and associated fields, this book will appeal to scholars of analytical and depth psychology, as well as researchers in the evolutionary and brain sciences.

TABLE OF CONTENTS

Introduction 1. Jung and the Condition of Modernity: Evolution, the Naturphilosophen and Evo Devo 2. Fossils, Anthropology and Hominin Brain Phylogeny 3. Analytical Psychology and the Evolution of Sexual Dimorphism 4. Evolutionary Theory and Analytical Psychology 5. Analytical Psychology and the Adaptationist Paradigm: Jung and Altered States of Consciousness 6. Anthropology and Analytical Psychology



MAXIMUS THE CONFESSOR AND EVOLUTIONARY BIOLOGY

By Andrew P. Jackson

ISBN 9781032763293

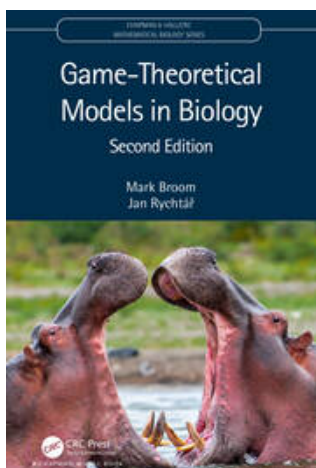
Published 2024 by Routledge

BOOK DESCRIPTION

This book brings Maximus the Confessor's logoi doctrine into dialogue with modern-day evolutionary biology. It explores the extent to which the logoi, as described by Maximus, exhibit features that are concordant with evolution before going on to consider more discordant aspects that cannot be ignored. The author addresses the curious resonance between the logoi and evolution in a systematic way through a close reading of primary textual material allied with a deep understanding of both the classical Darwinian and 'extended' evolutionary syntheses. The study joins with other Maximian interpreters in attesting to the incarnational and theophanic nature of the logoi, but seeks to extend this distinctively Eastern Christo-cosmology into the problematic territory of biological evolution, a territory historically dominated by Western scholarship. The book will be of interest to scholars of religion and science, as well as Patristics and the Eastern Orthodox theological traditions.

TABLE OF CONTENTS

1. Introduction 2. The Evolutionary logoi 3. The Christo-forming logoi
4. The Purposeful logoi 5. The Good logoi 6. Conclusions



GAME-THEORETICAL MODELS IN BIOLOGY

By Mark Broom, Jan Rychtář

ISBN 9780367456689

Published 2022 by Chapman & Hall

BOOK DESCRIPTION

Covering the major topics of evolutionary game theory, *Game-Theoretical Models in Biology, Second Edition* presents both abstract and practical mathematical models of real biological situations. It discusses the static aspects of game theory in a mathematically rigorous way that is appealing to mathematicians. In addition, the authors explore many applications of game theory to biology, making the text useful to biologists as well.

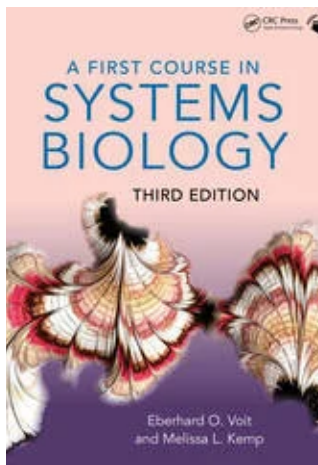
The book describes a wide range of topics in evolutionary games, including matrix games, replicator dynamics, the hawk-dove game, and the prisoner's dilemma. It covers the evolutionarily stable strategy, a key concept in biological games, and offers in-depth details of the mathematical models. Most chapters illustrate how to use Python to solve various games.

Important biological phenomena, such as the sex ratio of so many species being close to a half, the evolution of cooperative behaviour, and the existence of adornments (for example, the peacock's tail), have been explained using ideas underpinned by game theoretical modelling. Suitable for readers studying and working at the interface of mathematics and the life sciences, this book shows how evolutionary game theory is used in the modelling of these diverse biological phenomena.

In this thoroughly revised new edition, the authors have added three new chapters on the evolution of structured populations, biological signalling games, and a topical new chapter on evolutionary models of cancer. There are also new sections on games with time constraints that convert simple games to potentially complex nonlinear ones; new models on extortion strategies for the Iterated Prisoner's Dilemma and on social dilemmas; and on evolutionary models of vaccination, a timely section given the current Covid pandemic.

Features

- Presents a wide range of biological applications of game theory.
- Suitable for researchers and professionals in mathematical biology and the life sciences, and as a text for postgraduate courses in mathematical biology.
- Provides numerous examples, exercises, and Python code.



A FIRST COURSE IN SYSTEMS BIOLOGY

By Eberhard Voit, Melissa L. Kemp

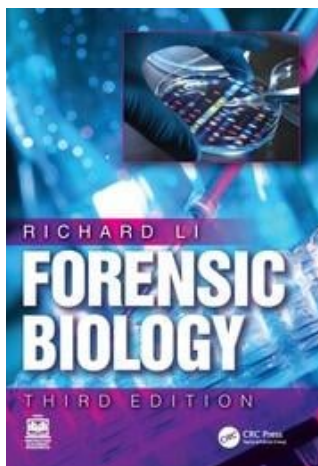
ISBN 9781032515458

Published 2025 by Garland Science

BOOK DESCRIPTION

A First Course in Systems Biology, Third Edition is an introduction to the growing field of systems biology for advanced undergraduates and graduate students. Its focus is the design and analysis of computational models and their applications to diverse biomedical phenomena, from simple networks and kinetics to complex pathway systems, signal transduction, personalized medicine, and interacting populations. The book begins with the fundamentals of computational modeling, then reviews features of the molecular inventories that bring biological systems to life and ends with case studies that reflect some of the frontiers in systems biology. In this way, the First Course provides the reader with a comprehensive background and with access to methods for executing standard tasks of biomedical systems analysis, exposure to the modern literature, and a foundation for launching into specialized projects that address biomedical questions with theoretical and computational means.

This third edition has been thoroughly updated. It provides an introduction to agent-based and multiscale modeling, a deeper account of biological design principles, and the optimization of metabolic flux distributions. This edition also discusses novel topics of synthetic biology, personalized medicine, and virtual clinical trials that are just emerging on the horizon of this field.



FORENSIC BIOLOGY

By Richard Li

ISBN 9781032913414

Published 2025 by CRC Press

BOOK DESCRIPTION

Forensic Biology, Third Edition, provides students with a general understanding of forensic biology, particularly in forensic serology and forensic DNA analysis, and addresses rapid advancements in the field over the past few years.

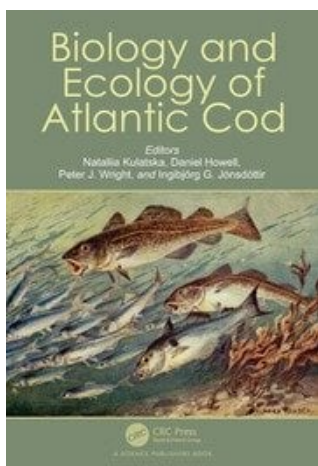
The book is divided into 26 chapters that are designed to be covered in a single-semester course for students majoring in forensic science, with the aim of equipping students with the knowledge needed to understand and apply new real-world techniques and methods to prepare them for entry into the field.

The third edition:

- Provides clear explanations of the principles involved in forensic identification and the analysis of biological evidence
- Explains the techniques used in forensic body fluid identification and DNA profiling, both in the field and in the laboratory
- Discusses the benefits and limitations of various forensic biology techniques
- Includes over four hundred color illustrations
- Includes over three thousand in-text citations

This updated and comprehensive volume on forensic biology is suitable for use both in the classroom and as a reference for practicing professionals.





BIOLOGY AND ECOLOGY OF ATLANTIC COD

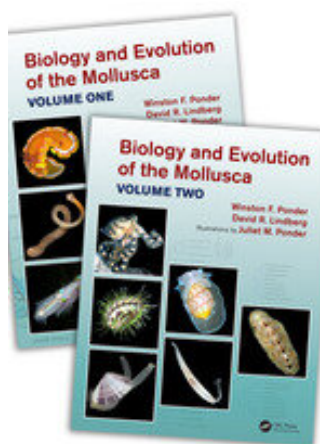
By Nataliia Kulatska

ISBN 9780367638283

Published 2024 by CRC Press

BOOK DESCRIPTION

Atlantic cod is an important fish species in human history and continues to be a major influence on North Atlantic fisheries management, as stock collapses and recoveries impact coastal communities and shelf sea food webs. This book provides an overview of Atlantic cod biology and ecology, focussing on regional differences in life-history and stock dynamics that affect productivity and the challenges faced by management. By comparing the success of management approaches and the local influence of changing climate and food webs, the book highlights the different pressures facing stocks and identifies knowledge gaps across the species' range.



BIOLOGY AND EVOLUTION OF THE MOLLUSCA

By Juliet Mary Ponder

ISBN 9780367862107

Published 2024 by CRC Press

BOOK DESCRIPTION

The phylum Mollusca is the second largest group of animals and occur in virtually all habitats. Many non-marine molluscs are threatened with more recorded extinctions than all tetrapod vertebrates combined. This two-volume set will provide the first general account of molluscs in decades and will include hundreds of colour figures. General chapters bring together a diverse and extensive literature, while taxon chapters provide overviews of their evolution, phylogeny and classification as well as more specific and detailed coverage of their biology (reproduction, feeding and digestion, excretion, respiration etc.), their long fossil record, and their natural history.

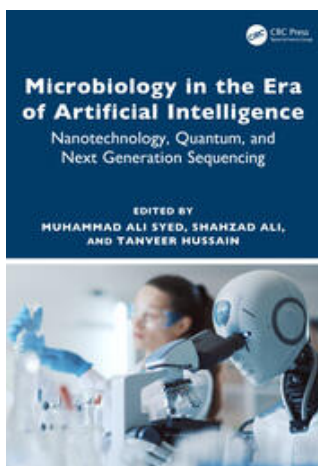
TABLE OF CONTENTS

Volume One

- Chapter 1 - Introducing Molluscs
- Chapter 2 - Overview of Molluscan Physiology and Genomics
- Chapter 3 - Shell, Body, and Muscles
- Chapter 4 - The Mantle Cavity and Respiration
- Chapter 5 - Feeding and Digestion
- Chapter 6 - Circulatory and Excretory Systems
- Chapter 7 - Nervous System, Sense Organs, Learning and Behaviour
- Chapter 8 - Reproduction and Development
- Chapter 9 - Natural History and Ecology
- Chapter 10 - Molluscs and Humans
- Chapter 11 - Research on Molluscs – Some Historical, Present, and Future Directions

Volume Two

- Chapter 12 - Molluscan Relationships
- Chapter 13 - Early History and Extinct Groups
- Chapter 14 - Polyplacophora, Monoplacophora, and Aplacophora
- Chapter 15 - The Bivalvia
- Chapter 16 - The Scaphopoda
- Chapter 17 - The Cephalopoda
- Chapter 18 - Gastropoda I—Introduction and the Stem Groups
- Chapter 19 - Gastropoda II—The Caenogastropoda
- Chapter 20 - Gastropoda III—The Heterobranchia
- Chapter 21 - Molluscan Research—Present and Future Directions



MICROBIOLOGY IN THE ERA OF ARTIFICIAL INTELLIGENCE

By Muhammad Ali Syed

ISBN 9781032712376

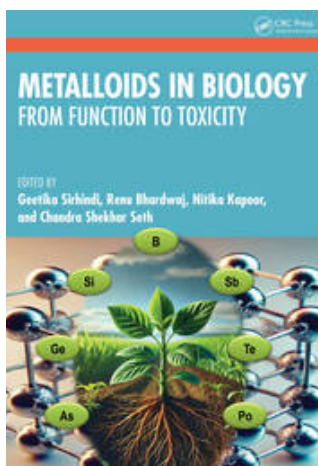
Published 2025 by CRC Press

BOOK DESCRIPTION

Written by leading experts, the book covers a broad range of topics pertaining to the myriad uses of artificial intelligence in microbiology. The book explores how AI and computation can play a key role in understanding and uncovering microscopic mysteries that defy other means of microbiological study. Like other fields of life science, the impact of next generation sequencing and bioinformatics are revolutionizing microbiology. In addition, the emerging role of quantum and nanotechnology in understanding the nature of microbial life is also explored. A special feature of the book is fascinating discussion of the transformation currently underway from classic microbiology to next generation microbiology. This is a must-read book for microbiology students and researchers who want to be at the forefront of this exciting field.

Key Features:

- Provides an overview and perspectives on the future of microbiology
- Documents recent advances in microbiology
- Contributions from an international team of leading researchers
- Reviews the emerging role of applications from other fields like nanotechnology, artificial intelligence, and genomics
- Stimulates academics and researchers to pursue multidisciplinary research



METALLOIDS IN BIOLOGY

By Geetika Sirhind

ISBN 9781032673561

Published 2025 by CRC Press

BOOK DESCRIPTION

Metalloids belong to class of elements that exhibit physiochemical characteristics intermediating between those of metals and non-metals. Some are quasi-essential for the overall growth and development of plants. Silicon, for instance, enhances plant structural integrity, while boron is crucial for cell wall formation, and selenium acts as an antioxidant but some are toxic, like germanium (Ge) and arsenic (As), as they threaten the soil ecosystem and human health. Metalloid toxicity hinges on their cellular concentrations, where low levels aid plant development, whereas high levels cause harmful effects. Thus, it is crucial to encompass the underlying detoxification mechanisms behind metalloid uptake by root system, their transport to other tissues, and their redistribution within and between cells. This book provides a comprehensive elucidation of the valuable insights of metalloids in green agriculture emphasizing management strategies to mitigate their adverse effects through various detoxification pathways, including cell complexation, cell wall binding, efflux, vacuolar sequestration and ultimately redistribution.

Key features: 1. Explores databases of metalloid distribution in plants and other habitats. 2. Deliberates about metalloid transporters and detoxification strategies in plants. 3. Describes interaction of metalloids with microbes and their impact on ecophysiology. 4. Unravels the mysteries of metalloid stress in plants by using multi-omics approaches. 5. Covers biological applications of metalloids in sustainable agricultural practices and in human health.

This book is aimed to give updated and scientific insights to readers and researchers associated with plant stress physiology, agricultural sciences and environmentalists working for the well-being of the environment. Apart from these, the present book will also be boon for scientists, farmers, teachers and undergraduate and post graduate students as it provides a detailed account of distribution, biochemistry, detoxification mechanisms, and biological applications of metalloids.



BOTANICAL GARDENS AND PLANT CONSERVATION

By T. Pullaiah, David A. Galbraith

ISBN 9781032252148

Published 2023 by CRC Press

BOOK DESCRIPTION

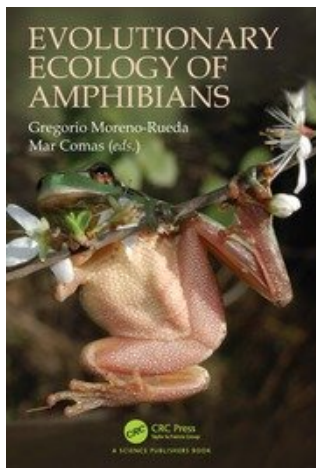
Approaching the contributions of a world-wide sector of scientific institutions to addressing the extinction crisis, *Botanical Gardens and their Role in Plant Conservation* brings together a diversity of perspectives. There are over 3,600 botanical gardens world-wide, where trees, shrubs, herbs, and other plants are studied and managed in collections. They are foremost among efforts to conserve the diversity of living plant species and ensure that crucial biodiversity is available for the future of humanity.

This book is a showcase for plant conservation, restoration, biodiversity, and related scientific and educational work of botanical gardens around the world, featuring both thematic overview chapters and numerous case studies that illustrate the critical role these institutions play in fighting extinction and ensuring plant diversity is available for sustainable use.

Features:

- A wide range of case studies derived from practical experience in a diversity of institutional, national, and biogeographical settings
- Reviews of topics such as networking amongst institutions, the importance of global policy agreements such as the Convention on Biological Diversity and the Global Strategy for Plant Conservation
- Profiles of botanical gardens contributions at the national level to conservation priorities
- Real-world examples of programs in plant conservation for both critically endangered wild plant diversity and unique horticultural or cultural germplasm

Botanical Gardens and their Role in Plant Conservation includes contributions from institutions from Africa, Asia, Australia, Europe, and the Americas, and institutions of all sizes and histories, from long-established national gardens to new gardens offering their perspectives on developing their roles in this vital undertaking.



EVOLUTIONARY ECOLOGY OF AMPHIBIANS

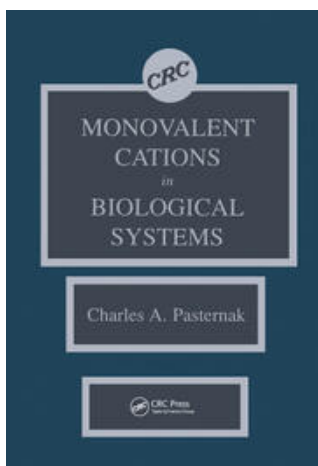
By Gregorio Moreno-Rueda, Mar Comas

ISBN 9780367553975

Published 2024 by CRC Press

BOOK DESCRIPTION

Amphibians are the oldest tetrapod group and show an astonishing diversity in lifestyles, many of them being unique. However, globally, they are on a decline. Hence, their study is fundamental to understanding the evolution of diversity and conserving them. This book, authored by experts from around the world, summarizes the current knowledge on the evolutionary ecology of amphibians. The book treats biological concepts related to the evolution, ecology, physiology, immunology, behaviour, and morphology of amphibians in their different states. This book constitutes an actualized work indispensable for evolutionary ecologists and herpetologists.



MONOVALENT CATIONS IN BIOLOGICAL SYSTEMS

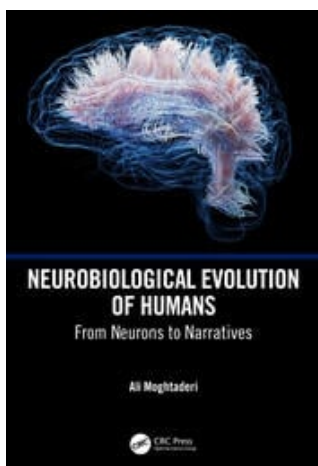
By Charles A. Pasternak

ISBN 9780849347757

Published 1990 by CRC Press

BOOK DESCRIPTION

This unique volume provides an integrated overview of the subject of monovalent cations, specifically aimed at students and researchers. It is divided into two parts: the first deals with the processes by which monovalent cations are transported across biological membranes; the second deals with the processes that are affected by changes in intracellular cations. Each chapter describes in simple biochemical terms the interaction between one or more monovalent cations and a particular biological system of importance to current understanding of body function in health and disease. This useful publication is invaluable to students and researchers in biochemistry, physiology, neurology, pharmacology, anesthesiology, cardio-pulmonology, hematology, laboratory medicine, endocrinology, gastroenterology, internal medicine, psychiatry, urology, biomedical physics and medical nutrition.



NEUROBIOLOGICAL EVOLUTION OF HUMANS

By Ali Moghtaderi

ISBN 9781032885537

Published 2024 by CRC Press

BOOK DESCRIPTION

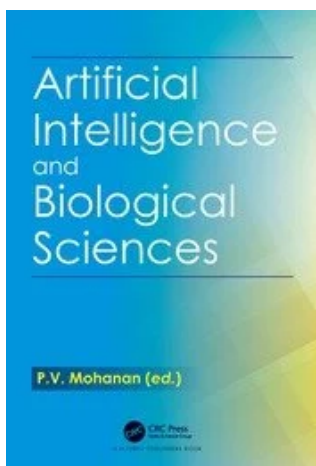
Our perception of the brain structure and function as an organ full of secrets and mysteries must change, and it is necessary to consider it as a part of the body that is constantly evolving and developing to maintain homeostasis for the entire human organism. New fossils, imaging methods, molecular genetics, comparative anatomy, evolutionary psychology, cognitive concepts in neuroscience, and neurology have made it possible to address questions of the neurological evolution of humans. This book integrates disparate findings from those disciplines in a succinct history by explaining how evolutionary process occurred, reshaped our brain, reconstructed our mind, and finally changed our "selves."

Key Features

- Explains complex scientific concepts in neurobiology using lucid prose and maintaining a clear narrative
- Provides well-documented arguments supported by hundreds of references and citations
- Documents a complex history which unfolded over millions of years
- Offers new approaches intended to transform ideas, opinions, and intellectual foundations of the brain

TABLE OF CONTENTS

About the Authors. Preface. Introduction. PART I Human History. Chapter 1 Genesis. Chapter 2 Darwin's View. Chapter 3 Bipedalism. Chapter 4 Aquaman. Chapter 5 Tools and Skulls. PART II Neurobiology. Chapter 6 Sweet Dreams. Chapter 7 Cognitive Organ. Chapter 8 Plastic Brain. Chapter 9 Lopsided Ape. Chapter 10 Feelings and Sensations. Chapter 11 Emotion and Self. Chapter 12 Consciousness, Mind, and Molecules. Chapter 13 Speech and Language. Chapter 14 Talking Body. Chapter 15 The Little Horse. Chapter 16 Time Flows. References. Index.



ARTIFICIAL INTELLIGENCE AND BIOLOGICAL SCIENCES

By P.V. Mohanan

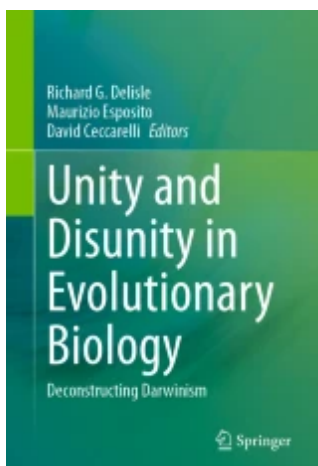
ISBN 9781032781204

Published 2025 by CRC Press

BOOK DESCRIPTION

Advancements of AI in medical and biological sciences have opened new ways for drug development. Novel therapeutic molecules and their target action can be easily predicted and can be modified. AI helps in disease detection and diagnosis faster. The breakthrough of AI is made especially in the area of personalized precision medicine, host-pathogen interaction and predictive epidemiology. These approaches could help in faster decision-making with minimal errors that can improve risk analysis, especially disease diagnosis and selecting treatment strategy. In agricultural practices, an exact combination of fertilizers, pesticides, herbicides, soil management, water requirement analysis, yield prediction and overall crop management can be modified by implementing AI interventions. AI could provide a better improvement in agriculture, medical research, pharmaceuticals and bio-based industries for a sustainable life.

The key features of this book are: AI in medical Sciences, biotechnology and drug discovery; Application of AI in Digital Pathology, cytology and bioinformatics; Overview of AI, Machine Learning and Deep Learning; Impact of Artificial Intelligence in Society; Artificial Intelligence in Pharmacovigilance; and Ethics in Artificial Intelligence. The volume aims to comprehensively cover the application of AI in biological sciences. It is a collection of contributions from different authors who have several years of experience in their specific areas. The book will be useful for pharma companies, CROs, product developers, students, researchers, academicians, policymakers and practitioners.



UNITY AND DISUNITY IN EVOLUTIONARY BIOLOGY

By Richard G. Delisle

ISBN 978-3-031-42628-5

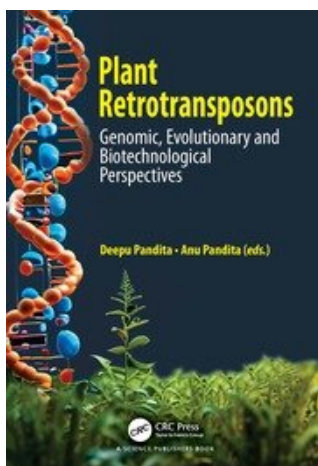
Published 2024 by SPRINGER

BOOK DESCRIPTION

It is not uncommon to see in major areas of research concerned with science that historical studies are accompanied by the rise of complementary or contradictory historiographies. With time, it seems, scholars discover new approaches to study topics, thus questioning old concepts, traditions, periodizations and historical labels. Apparently, this has not been the case in evolutionary thought. In that area, the main historiographic labels such as Darwinian Revolution, Eclipse of Darwinism, and Modern Synthesis have been in place and largely uncontested for about 50 years. Such labels seem to work as irrefutable, and often hidden, premises of many historical reconstructions, philosophical analyses, and scientific conceptualizations.

This volume aims to move beyond this state of affair, opening new thinking avenues by revisiting the traditional historiography and laying the groundwork for establishing a “new historiography” that considers the intertwined threads that compose evolutionary biology. Notably, evolutionary studies seem to have been marked by the tension between unification attempts and the proliferation of approaches, methodologies, and styles of thinking. As the contributors to this volume illustrate, research traditions branched off throughout the history of evolutionary thought, before and after Charles Darwin. The resulting complexity challenges traditional thinking categories, throwing a somewhat different light on a more recent label like the Extended Evolutionary Synthesis.

More than 40 years after the now classic, *The Evolutionary Synthesis: Perspectives on the Unification of Biology* (1980), edited by Ernst Mayr and William Provine, the contributors to this volume aim to reevaluate where evolutionary biology stands today.



PLANT RETROTRANSPOSONS

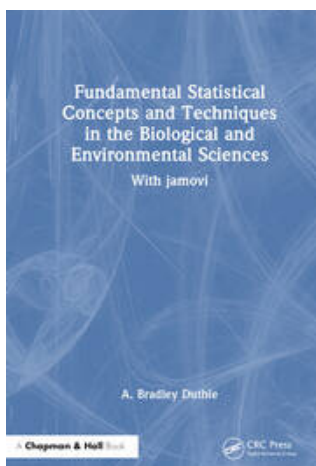
By Deepu Pandita, Anu Pandita

ISBN 9781032663456

Published 2025 by CRC Press

BOOK DESCRIPTION

This book provides an up-to-date outlook on the origin, evolution, structure, genomic organization, expression, regulation and transposition mechanism of retrotransposons in the plant genome and computational tools and algorithms to analyze retrotransposons across different species, and their use as genetic tools in crop breeding and improvement. The book also highlights the biotechnological applications of the retrotransposon transposable elements. Previously dismissed as parasites/selfish or JUNK DNA, these elements are now recognized as “Just Unexplored Novel Know-how”. Retrotransposons play crucial roles in gene function, genomic organization, mutations, stress responses, genome regulation, epigenomics, diversity, evolution, and plant speciation. Leveraging these as biotechnological tools can help develop climate-smart crops for sustainable agriculture.



FUNDAMENTAL STATISTICAL CONCEPTS AND TECHNIQUES IN THE BIOLOGICAL AND ENVIRONMENTAL SCIENCES

By A. Bradley Duthie

ISBN 9781032692371

Published 2024 by Chapman & Hall

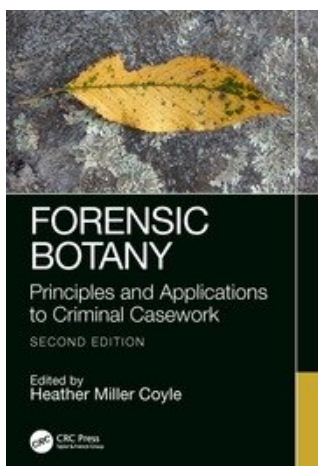
BOOK DESCRIPTION

Fundamental Statistical Concepts and Techniques in the Biological and Environmental Sciences: With jamovi is an introductory textbook for learning statistics. It starts with the very basics and prioritises helping the reader to develop a conceptual understanding of statistics, and apply the most fundamental statistical tools. New concepts are introduced with examples designed to be familiar to the reader, serving as a useful starting point for exploring more abstract concepts.

Key Features:

- Designed to be accessible for students learning statistics in biological and environmental sciences.
- Utilizes the statistical software jamovi to explore new concepts.
- Prioritizes good statistical judgement over adherence to protocols.

This book will be useful to students beginning their study of statistical concepts in biological and environmental sciences, whilst also acting as an insightful resource for teachers using jamovi in the classroom. Fundamental Statistical Concepts and Techniques in the Biological and Environmental Sciences: With jamovi is a valuable resource for anyone who wishes to understand and apply statistical techniques commonly used in the biological and environmental sciences.



FORENSIC BOTANY

By Heather Miller Coyle

ISBN 9781439866740

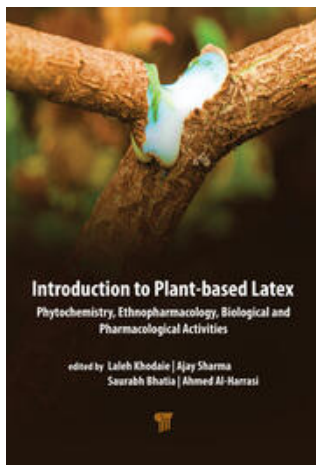
Published 2024 by CRC Press

BOOK DESCRIPTION

Forensic Botany: Principles and Applications to Criminal Casework, Second Edition updates what, at the time, was the very first book published on the subject. This latest edition offers a concise introduction to plant identification, biology, genetics, and how to utilize and apply botanical evidence in criminal cases.

In recent years, forensic botany and the use of various plant and plant-derived evidence have been increasingly utilized in criminal investigations and court cases. Likewise, forensic palynology and other such terms have entered the vernacular as botanical sciences have widened the applications in which such evidence can help solve cases. This includes the use of current and emergent genetic markers and DNA technology, toxicology, diatoms, and pollen. The numerous advances since the last edition was published necessitated added coverage of the technology and testing capabilities that have achieved new levels as the field has developed. The chapters are written by some of the top experts in the field. Every chapter in the Second Edition is fully updated, with several new chapters focusing on Random Amplified Polymorphic DNA (RAPD), Restriction Fragment Length Polymorphism (RFLP), and Amplified Fragment Length Polymorphism (AFLP), plant-derived toxins and forensic toxicology, identifying ancient plants used in burial practices for dating sites, digested plants as evidence, and more.

Forensic Botany, Second Edition provides scientists working with DNA, trace evidence, and botanical evidence—as well as investigators and legal professionals—with a thorough understanding of the latest advances and current capabilities in utilizing such evidence in investigating and adjudicating criminal cases.



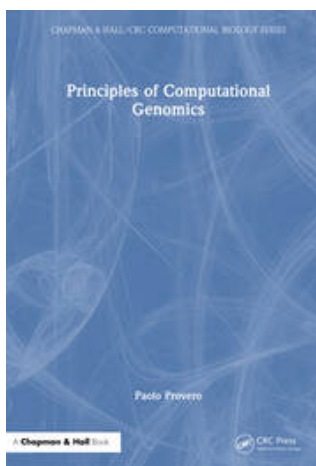
INTRODUCTION TO PLANT-BASED LATEX

By Laleh Khodaie,
ISBN 9789815129120

Published 2025 by Jenny Stanford Publishing

BOOK DESCRIPTION

Latex-bearing plants have been known for their contribution to human health. Latex, a complex mixture produced in some plants, acts as a reservoir of secondary metabolites with high medicinal value. This semisolid exudation from plants contains several chemical components that are synthesized via different biosynthetic pathways and acts as their first line of defense. Recently, chemical components derived from natural plant latex and their synthetic analogs have been used in medicine as analgesics, antimicrobial agents, antiproliferatives, and anticancer drugs. Several ethnobotanical studies of latex plants have revealed the pharmacological potential of latex. However, the continuous exploitation of laticiferous plants for industrial and medicinal use has placed them at risk of extinction. Thus, several researchers have developed potential cultivation methods to conserve these plants. This book presents the uses of latex and discusses prospects for its potential utilization in the pharmaceutical sector, agriculture, and industry. The recent advancement in plant-based latex has accelerated the development in all areas of natural products. This book illustrates cutting-edge advances in the field of plant-based latex and is a useful reference for teachers, undergraduate and postgraduate students, research scholars, and general readers.



PRINCIPLES OF COMPUTATIONAL GENOMICS

By Paolo Provero

ISBN 9781032584003

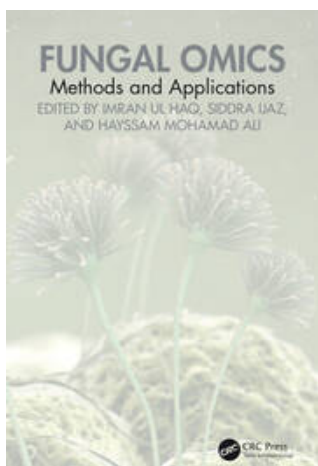
Published 2025 by Chapman & Hall

BOOK DESCRIPTION

The advent of high-throughput experimental assays, and in particular of next-generation sequencing, has revolutionized life sciences by enabling the generation of data at the scale of the whole genome. Extracting biologically useful or clinically actionable information from this data requires analytical methods quite different from the ones used to analyze low-throughput experimental results. The development of these methods is the goal of computational biology.

Understanding the principles on which these methods are based is thus necessary for all students and researchers in life sciences. This book provides the conceptual framework needed to understand computational genomics enough to be able to follow the arguments in recent papers, or to collaborate with computational scientists in research projects. In particular, it introduces the mathematical and statistical basis of the methods in some depth. The main focus is on the analysis of next-generation-sequencing assays, both for the interpretation of the DNA sequence per se (sequence alignment, phylogenetic tree reconstruction, genetic variants) and for the study of gene regulation and epigenomics (gene expression, transcription factor binding, chromatin states, 3D structure of the genome). The final chapter discusses the associations of genetic variants with phenotypes and diseases, and their biological interpretation.

Principles of Computational Genomics provides a solid foundation for understanding the many parts of computational genomics, including those not treated directly in the book. It will be of great benefit to students and researchers across the life sciences.



FUNGAL OMICS

By Imran Ul Haq, Siddra Ijaz, Hayssam Ali

ISBN 9781032587424

Published 2025 by CRC Press

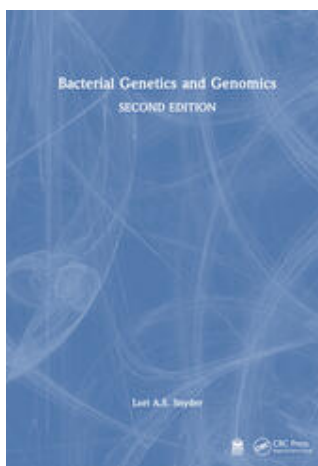
BOOK DESCRIPTION

Fungal Omics: Methods and Applications provides a comprehensive account of trends and developments of fungal “omics” approaches. It presents literature on various “omics” applications and includes information on plant taxonomy; genetics, epigenetics, biotechnological and industrial applications. It begins with basic concepts, extending to complex and in-depth knowledge, and finally, describes the fungal genome and all “omics” comprehensively.

Features:

- Covers almost every aspect of fungal omics under a single source.
- Features trends in phytomycology and fungal biology studies using modern molecular tools.
- Contains information on improved methods in genetics, genomics, and metabolomics in different fungal species.

Highlights include integrative “omics” strategies as well as trends in phytomycology and fungal biology using modern molecular tools. With detailed information on improved methods in genetics, genomics, and metabolomics, Fungal Omics: Methods and Applications is an invaluable resource for scientists, researchers, and students in the evolving fields of fungal omics and life sciences.



BACTERIAL GENETICS AND GENOMICS

By Lori Snyder, Lori A.S. Snyder

ISBN 9781032461786

Published 2024 by Garland Science

BOOK DESCRIPTION

Understanding of bacterial genetics and genomics is fundamental to understanding bacteria and higher organisms, as well. Novel insights in the fields of genetics and genomics are challenging the once clear borders between the characteristics of bacteria and other life. Biological knowledge of the bacterial world is being viewed under a new light with input from genetic and genomics. Replication of bacterial circular and linear chromosomes, coupled (and uncoupled) transcription and translation, multiprotein systems that enhance survival, wide varieties of ways to control gene and protein expression, and a range of other features all influence the diversity of the microbial world. This text acknowledges that readers have varied knowledge of genetics and microbiology. Therefore, information is presented progressively, to enable all readers to understand the more advanced material in the book.

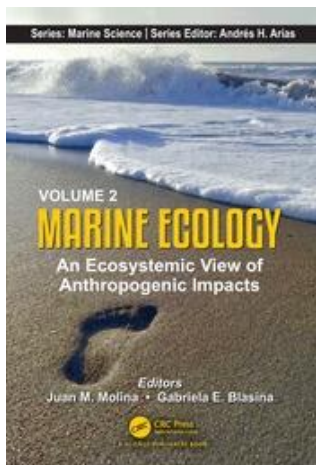
This second edition of Bacterial Genetics and Genomics updates the information from the first edition with advances made over the past five years. This includes descriptions for 10 types of secretion systems, bacteria that can be seen with the naked eye, and differences between coupled transcription-translation and the uncoupled runaway transcription in bacteria. Topic updates include advances in bacteriophage therapy, biotechnology, and understanding bacterial evolution.

Key Features

- Genetics, genomics, and bioinformatics integrated in one place
- Over 400 full-colour illustrations explain concepts and mechanisms throughout and are available to instructors for download
- A section dedicated to the application of genetics and genomics techniques, including a chapter devoted to laboratory techniques, which includes useful tips and recommendations for protocols, in addition to troubleshooting and alternative strategies
- Bulleted key points summarize each chapter
- Extensive self-study questions related to the chapter text and several discussion topics for study groups to explore further

This book is extended and enhanced through a range of digital resources that include:

- Interactive online quizzes for each chapter
- Flashcards that allow the reader to test their understanding of key terms from the book
- Useful links for online resources associated with Chapters 16 and 17



VOLUME 2: MARINE ECOLOGY

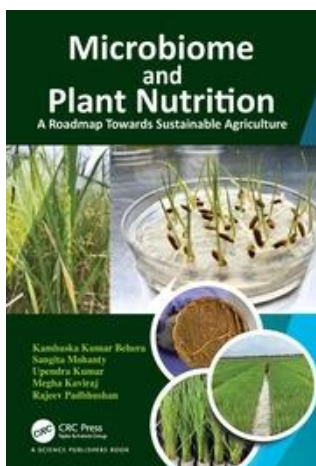
By Juan M. Molina, Gabriela E. Blasina

ISBN 9780367456603

Published 2025 by CRC Press

BOOK DESCRIPTION

Marine systems face a multitude of anthropogenic stressors such as climate change, recreational and commercial fishing, aquaculture practices, pollution, and coastal urbanization. These stressors exert escalating pressure on marine ecosystems, leading to noticeable changes in habitat conditions as well as alterations in the abundance and diversity of their communities. Understanding the impacts of these stressors proves challenging due to their interactions with various factors, such as species richness, environmental fluctuations, system openness, stressor tolerance, and the occurrence rate and intensity of each stressor. Therefore, a comprehensive analysis of the entire ecosystem is crucial. It is essential to consider the unique characteristics of each marine environment when assessing the cumulative stress that affects them. This book provides insights into the functioning of marine ecosystems and their responses to both natural and human-induced drivers within the framework of sustainable marine resource utilization. This book will make a valuable contribution to the scientific community, serving as a resource to inform decision-makers and the general public about the current state of knowledge regarding the marine environment and the human footprints on our seas.



MICROBIOME AND PLANT NUTRITION

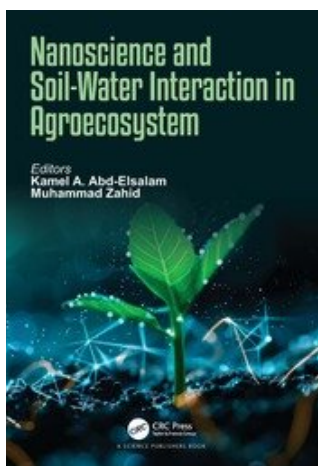
By Kambaska Kumar Behera

ISBN 9780367529819

Published 2024 by CRC Press

BOOK DESCRIPTION

The book titled “Microbiome and Plant Nutrition: A Roadmap Towards Sustainable Agriculture” is expected to direct many emerging research pathways needed at local and global levels for sustainable agricultural package and practices. This volume incorporates thirteen seminal chapters on issue based research and their practical applications covering latest information and progress in different areas of microbial supplemented crop nutrition for sustainable agriculture. The book highlights the frontier issues and applications of plant-microbe interaction in crop nutritional strategy with topics like System biology of plant microbe interaction, Plant growth-promoting rhizobacteria: a context for sustainable agriculture, Plant growth-promoting endophytes: a context for sustainable agriculture, The role of the mycorrhiza in nutrient uptake, Plant nitrogen, phosphorus and sulphur nutrition: a microbial perspective, Carbon and nitrogen turnover in soils and plant rhizo-deposition, Root exudates: a link to plant-microbe nutritional interactions and insight into the metabolic and nutrition network pathway of plant-microbe interaction, Commercialization perspective of bio-stimulants for sustainable agriculture, Interconnection of plants with microbiomes in changing climate: a functional extension of the host and heavy metal dynamics in rice soil: an alleviation through microbial intervention approach. This book will be very useful for the scholars, biotechnologists, agricultural scientists, plant nutritionists, researchers, teachers and students in the emerging field of soil-microbiome and plant nutrition dynamics in the resilient climatic agriculture era.

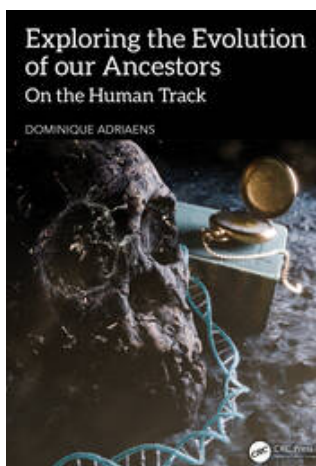


NANOSCIENCE AND SOIL-WATER INTERACTION IN AGROECOSYSTEM

By Kamel A. Abd-Elisalam,
ISBN 9781032551562
Published 2025 by CRC Press

BOOK DESCRIPTION

This book discusses how important nanotechnology is for increasing agricultural production through better management of the soil and water. The book looks at how soil characteristics, water retention, and nutrient availability may all be improved by nanoparticles. It draws attention to the use of nanoparticles in precision agriculture as well as their potential for cleaning up polluted soils. The book provides creative answers to problems like water shortages and soil degradation by fusing nanoscience with conventional methods, eventually advancing sustainable farming methods. The significance of nanotechnology in building resilient agroecosystems for future food security is highlighted by this interdisciplinary approach.



EXPLORING THE EVOLUTION OF OUR ANCESTORS

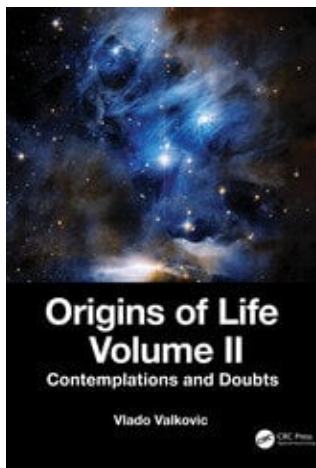
By Dominique Adriaens

ISBN 9781032971223

Published 2025 by CRC Press

BOOK DESCRIPTION

This is a captivating evolutionary narrative of the human body, exploring the pivotal traits that make humans unique as a species. It provides a better understanding of why we look the way we do, through an evolutionary morphological lens, by delving into the functional explanations for the unique characteristics of us and our ancestors and the evolutionary pathways that shaped them. Integrating changes in anatomy with functional shifts, but also with underlying genetic and environmental transformations that drove our evolution. The main body of the book focuses around four fundamental themes that have evolutionary sculpted us of who we are today, ever since the shared origin with the chimpanzee: diet, brain, locomotion and skin. This book not only promises to enrich our understanding of human evolution but also challenges us to reconsider what it means to be human in the light of our ancient lineage and ongoing evolutionary journey.



ORIGINS OF LIFE VOLUME II

By Vladivoj Valkovic

ISBN 9781032432731

Published 2024 by CRC Press

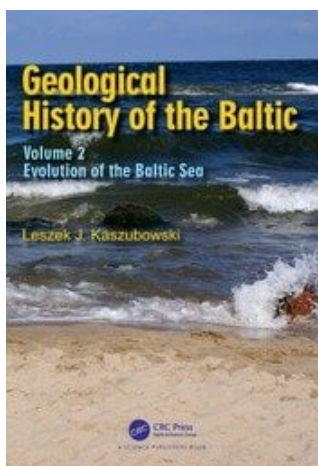
BOOK DESCRIPTION

In Origins of Life Volume II, life and its origin are inspected from traditional and unexpected points of view. The book takes an interdisciplinary approach, discussing astrobiology; chemical evolution; and how the Universe accommodates life, molecular biology, and philosophy. It is an open-minded approach, fully referenced throughout, and each chapter includes a further reading section for anyone wishing to learn more about that perspective on the origins of life.

First, everything started, with the Big Bang, from nothing. It appears now that everything was aiming toward our existence, some 13.75×10^9 years later, being capable of understanding it all. We did it using powerful tools: science, philosophy, and religion. Although we appreciate the contributions made by philosophy and religion, our contemplations and doubts are based on the plentiful scientific evidence provided.

The reader will be guided from make-up of the "life stage" (Universe), tools and materials needed for the living matter to be formed in the small part of the Universe, which one could call Human Neighborhood, or the Local Universe. It contains galaxies, galaxy clusters, and voids, and the Milky Way and its satellites influencing each other during this time span.

The book is easy to read, accompanied by numerous references; it could be of use to the expert in the field as well as for curious minds with a scientific, philosophical, or religious background.



GEOLOGICAL HISTORY OF THE BALTIC

By Leszek J. Kaszubowski

ISBN 9781032876511

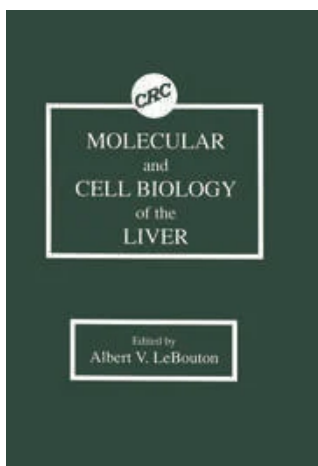
Published 2025 by CRC Press

BOOK DESCRIPTION

This book presents the geological evolution of the Baltic Sea area since its inception, i.e., from the Late Glacial to the present day. The geological history of all evolutionary stages of the Baltic Sea is discussed in detail, from the Baltic Ice Lake, through the Yoldia Sea, Ancylus Lake, Littorina Sea and Lymnaea Sea, to the Mya Sea as the modern stage of the Baltic Sea development. The author presents palaeoecological and palaeosedimentological analyses of various evolutionary stages of the Baltic Sea. Detailed paleogeographic maps of the development of the Littorina Sea, Lymnaea Sea and Mya Sea are displayed, with particular focus on the Polish Baltic Sea area. Moreover, characteristic geological cross-sections and synthetic stratigraphic profiles representing individual areas of the Polish Baltic Sea coast are also shown. Each transgressive cycle of the various developmental stages of the Baltic Sea is characterized in terms of the average rate of marine transgression, the fluctuation of Baltic levels and the average rate of marine abrasion of the then cliff and spit shores, as well as the evolutionary changes of the area. In addition, the lithostratigraphic characteristics of the various marine sediment complexes and dune sediments (brown dune spits, yellow dune spits, light yellow-grey dune spits and grey dune spits) are also presented. Individual chapters address key aspects of:

- Litho-stratigraphical analysis of the Baltic Ice Lake deposits.
- Litho-stratigraphical analysis of the Yoldia Sea deposits.
- Litho-stratigraphical analysis of the Ancylus Lake deposits.
- Paleogeography, litho-stratigraphy and transgressive cycles of the Littorina Sea.
- Paleogeography, litho-stratigraphy and transgressive cycles of the Lymnaea Sea.
- Paleogeography, litho-stratigraphy and transgressive cycles of the Mya Sea.
- New stratigraphic division of the southern Baltic deposits along the Polish coast.

The book will be useful for students and scientists of marine geology, oceanography, geography and environmental engineering. It will also be of practical use for all specialists dealing with marine basins and coastal zones, including marine geologists, coastal geologists and geomorphologists, geographers, as well as engineering geologists, geotechnicians and civil engineers. The book is generally related to the discipline of marine geology, and deals directly with the Baltic Sea basin.



MOLECULAR & CELL BIOLOGY OF THE LIVER

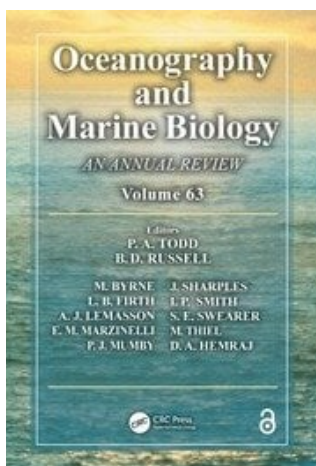
By Albert V. LeBouton

ISBN 9780849388910

Published 1993 by CRC Press

BOOK DESCRIPTION

Molecular and Cell Biology of the Liver features the latest research findings regarding liver structure and function. A unique feature of the book is the brief science reviews that are included in each chapter which provide essential background information to allow readers to better grasp the subject matter within a chapter. The book covers liver biology from the molecular level to groups of liver cells and explains how groups of hepatocytes interact in similar microenvironments. Other important cell types found in the liver are also examined. Illustrations ranging from electron micrographs to fully rendered drawings act as visual aids to help readers understand complex structural-functional interactions. Molecular and Cell Biology of the Liver will benefit hepatologists, gastroenterologists, cell biologists, anatomists, toxicologists, and other researchers interested in liver structure and function.



OCEANOGRAPHY AND MARINE BIOLOGY

By B.D. Russell, P. A. Todd

ISBN 9781032964768

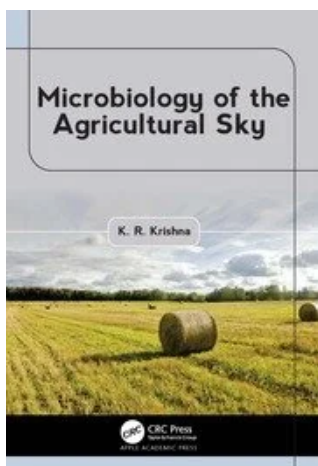
Published 2024 by Cha

BOOK DESCRIPTION

The ever-increasing interest in work in oceanography and marine biology and its relevance to global environmental issues, especially global climate change and its impacts, creates a demand for authoritative refereed reviews summarising and synthesising the results of both historical and recent research. *Oceanography and Marine Biology: An Annual Review* continues to answer that need after six decades of publication.

Volume 63 features a review of the factors affecting resilience and recovery of the coral reefs of the Andaman Sea, a systematic review of the 2014-2016 Northeast Pacific marine heatwave, an exploration of coexisting mangrove-coral habitats, a discussion of the problems and solutions in European cephalopod fisheries, a dive into the aquaculture of Rabbit fishes, an examination of how historical land reclamation and coastal urbanisation continue to shape Britain's Ocean City and, finally, an examination of transferable stressors in small cetaceans.

An international Editorial Board ensures global relevance and expert peer review, with editors from Australia, Denmark, Hong Kong, Ireland, Singapore and the UK. The series volumes find a place in the libraries of not only marine laboratories and oceanographic institutes but also universities worldwide. Three of the seven peer-reviewed contributions in Volume 63 are available to read Open Access via the webpage and on OAPEN.



MICROBIOLOGY OF THE AGRICULTURAL SKY

By K. R. Krishna

ISBN 9781774916322

Published 2024 by Apple Academic Press

BOOK DESCRIPTION

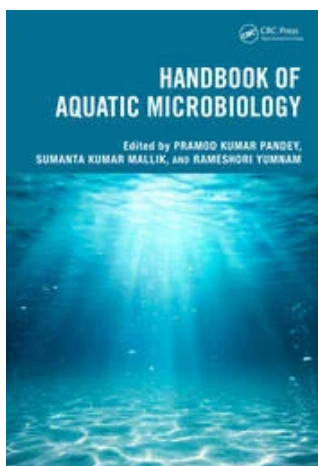
Unknown to most people, there are innumerable microbial species that accomplish vital ecosystem functions while residing in a suspended state in the troposphere or resting on crop canopies. These microbial species, if utilized properly, can improve agriculture. At the same time, harmful microbes can also devastate crops easily. This new book, *Microbiology of the Agricultural Sky*, explores a number of microbes present in the agrarian sky and details their identities, roles in nature, and usefulness to crops as well as other biotic factors.

The volume first provides an introduction that details the historical aspects of microbes relating to their discovery and identification of their role in agrarian ecosystems. The book then gives detailed explanations of microbes in the atmosphere, with information on the general distribution, spread distance, and intercontinental migration of microbes in the atmosphere. It discusses aeolian dust microbes above agrarian regions and the role of aerial microbes in nutrient dynamics. The book also explains the functions of microbes that reside on crop canopies and the importance of the plant's phyllosphere. It looks at microbial flora and how a region's bio-geochemical functions affect crops. Also discussed is the role of aerial microbes in inducing epidemics and pandemics among different crops. The final chapter details farm procedures that can be adopted in the outfield and in animal houses and how they impact atmospheric microbes.

Key features:

- Highlights the relevance of the agrarian sky and its microbial component, detailing the wide range of functions that microbes accomplish in the aerospace
- Presents a timeline of discoveries about aeromicrobiology and the agrarian sky
- Discusses aerial microbes on crop canopies and their influence on plant pathogens, including beneficial nutrients, need for crop protection, etc.
- Looks at the microbiology of the agrarian sky and the spread of crop diseases locally and via the intercontinental migration of microbes
- Discusses farm procedures and their impact on microbes in the troposphere and the agricultural fields beneath it

This first-of-its-kind book provides extensive information on microorganisms that can be traced in the agrarian sky and their relevance to agriculture. The easy-to-read style of the book makes it suitable for farmers, agricultural science professors, students, and researchers. It will be useful for farm specialists dealing with airborne diseases, GHG emissions, and agronomic procedures as well.



HANDBOOK OF AQUATIC MICROBIOLOGY

By Pramod Kumar Pandey

ISBN 9781032526805

Published 2024 by CRC Press

BOOK DESCRIPTION

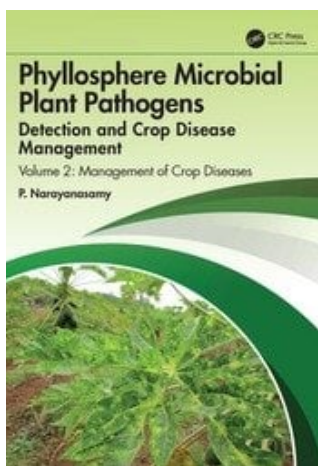
Short Blurb This handbook covers the different aspects of the aquatic environment, microbiology, and microbial applications. It highlights the role of microorganisms as pollution indicators and as bio-control agents. The book covers the impact of pollution on microorganisms, biofilms, cyanobacterial blooms, and the metagenomics approach to isolate microbes.

Standard Blurb

This comprehensive handbook covers the different aspects of the aquatic environment, microbiology, and microbial applications. The world's aquatic environment is facing a serious threat due to inappropriate planning, implementation, and management. This book compiles effective strategies for managing the aquatic environment. It highlights the role of microorganisms as pollution indicators, in bioremediation, and as bio-control agents. The book also covers the impact of pollution on microorganisms, biofilms, cyanobacterial blooms, and the metagenomics approach to isolate microbes. This book is essential for students and researchers of microbiology, environmental sciences, and biotechnology

Seasonal Blurb This comprehensive handbook covers the different aspects of the aquatic environment, microbiology, and microbial applications. The world's aquatic environment is facing a serious threat due to inappropriate planning, implementation, and management. This book compiles effective strategies for managing the aquatic environment. It highlights the role of microorganisms as pollution indicators, in bioremediation, and as bio-control agents. The book also covers the impact of pollution on microorganisms, biofilms, cyanobacterial blooms, and the metagenomics approach to isolate microbes. This book is essential for students and researchers of Microbiology, Environmental Sciences, and Biotechnology.

- 1 Includes key themes like environmental DNA application, metagenomes, extremophiles, microbial population genetics and statistical aspects of aquatic microbiology
- 2 Discusses the beneficial microbes of the aquatic environment
- 3 Covers applications of microbes in bioremediation, as pollution indicators and as algicidal agents
- 4 Reviews freshwater biogeochemical cycles and sediment microbiology
- 5 Explores microbial communities of biofloc and microbiomes in aquaponics



PHYLLOSHERE MICROBIAL PLANT PATHOGENS: DETECTION AND CROP DISEASE MANAGEMENT

By P. Narayanasamy

ISBN 9781032599212

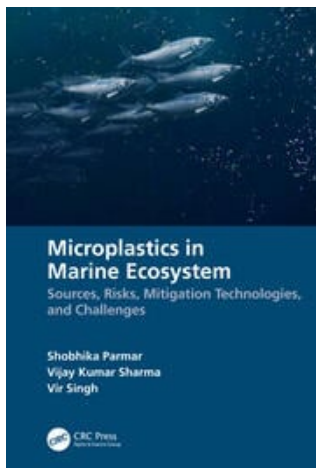
Published 2024 by CRC Press

BOOK DESCRIPTION

This book provides comprehensive knowledge of the methods of detection and identification of phyllosphere microbial pathogens and the management of different kinds of diseases caused by them in various crops. Interactions between pathogens and host plants result in the induction of defense responses expressed via molecular signals, from initiation of infection to systemic progression of pathogen invasion in susceptible plants and contrasting signals in resistant plants, leading to inhibition of pathogen development through activation of preinfectious and postinfectious defense responses. These are critically discussed.

The author describes the intricate and complex competitive activities of the pathogens and host plants in a molecular warfare that the host plant must win to break the link in the pathogens' life cycle, allowing the development of disease management strategies based on the principles of exclusion, eradication, and immunization. Integration of strategies concerning the development of cultivars resistant to pathogens through breeding and biotechnological techniques, application of biotic and abiotic inducers of resistance to pathogens, and use of disease-free seeds and propagules that are complementary to each other along with effective cultural practices are emphasized.

This book presents information gathered through an extensive literature search to help researchers and graduate students in agricultural sciences identify research gaps and successfully complete their research projects



MICROPLASTICS IN MARINE ECOSYSTEM

By Shobhika Parmar, Vijay Kumar Sharma, Vir Singh

ISBN 9781032319308

Published 2023 by CRC Press

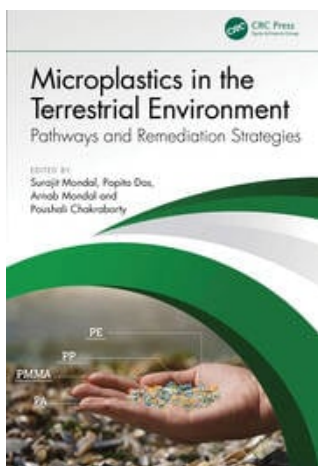
BOOK DESCRIPTION

This book addresses pertinent issues relating to microplastic pollution including its sources and sink of the microplastics and their environmental fate. It focuses on the impacts of microplastic pollution on marine life and human health. Available conventional methods and future solutions for the prevention and control of the marine microplastic pollution, such as bacterial and marine fungus biodegradation, membrane technology, and bioengineered microbes are included along with limitations and future challenges.

Features:

- Provides detailed insight into the marine microplastics pollution, fate, health impacts, and removal technology
- Reviews ecological risks and environmental fate of microplastic pollution to the marine ecosystem
- Describes control and prevention methods of the microplastics pollution
- Covers global legislature for the mitigation of microplastic to the marine environment
- Discusses the role of community participation for the reduction of microplastic emissions

This book is aimed at researchers and professionals in environmental engineering, science, and chemistry, marine pollution, marine and aquatic science.



MICROPLASTICS IN THE TERRESTRIAL ENVIRONMENT

By Surajit Mondal,

ISBN 9781032634104

Published 2024 by CRC Press

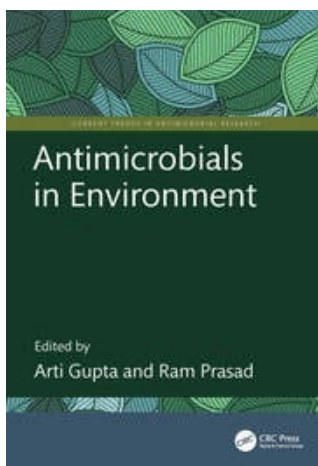
BOOK DESCRIPTION

This book aims to address details and research gaps in the impacts of microplastics in terrestrial ecosystems. It addresses the impact of microplastics on the soil environment, and highlights and discusses their transport behavior, pollution level, and the combined effects of the microplastics with other pollutants on the soil ecology. Furthermore, it also highlights the effects of UV irradiations and mechanical abrasions from soil fauna and various agricultural practices.

Features:

- Covers advances in plastic/micro-/nano-plastic pollution and possible pathways of pollution.
- Demonstrates the mitigation measures to minimize such pollution loads, with a special focus on the application of nanotechnology.
- Explores recycle and value-added products from waste plastic.
- Promotes development of alternate clean energy sources.
- Introduces appropriate alternatives and/or finding strategies to mitigate the existing microplastic crisis using suitable approaches.

This book is aimed at researchers and graduate students in environmental and chemical engineering, as well as remediation



ANTIMICROBIALS IN ENVIRONMENT

By Arti Gupta, Ram Prasad

ISBN 9781032215495

Published 2024 by CRC Press

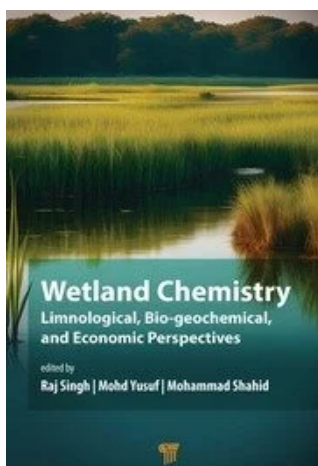
BOOK DESCRIPTION

This book provides a multidisciplinary coverage of all manifestations of antimicrobials and antimicrobial resistance technology to promote eco-friendly processes and techniques for environmental sustainability. It covers various aspects of the multidisciplinary framework, applying principles of microbiology, environmental toxicology, and chemistry to assess the human and ecological risks associated with exposure to antibiotics or antibiotic resistance genes that are environmental contaminants. In addition, it also provides a variety of photographs, diagrams, and tables to help illustrate the material. Bringing together contributions from researchers on different continents with expertise in antibiotic resistance in a range of diverse environmental sections, the book offers a detailed reflection on the paths that make antibiotic resistance a global threat, and the state-of-the-art in antibiotic resistance surveillance and risk assessment in complex environmental conditions.

Students, researchers, scientists, environmentalists, academics, computational biologists, stakeholders, and policymakers can benefit from using *Antimicrobials in Environment* as a resource that addresses microbial biotechnology, microbiology, toxicology, and all disciplines related to antimicrobial research.

Features of the book:

- Covers antimicrobial resistance in the environment with up-to-date research.
- Includes recent references on each plausible antimicrobial resistance in the environment.
- Details the possible spread of antibiotic-resistant bacteria from an ecosystem.
- Describes the public health impact of the use of antibiotics in the environment.
- Presents cutting-edge research on nanotechnology, especially in food packaging, and emergent antimicrobial technologies.
- Highlights the antibiotic resistance in the environment: challenges and outlook.



WETLAND CHEMISTRY

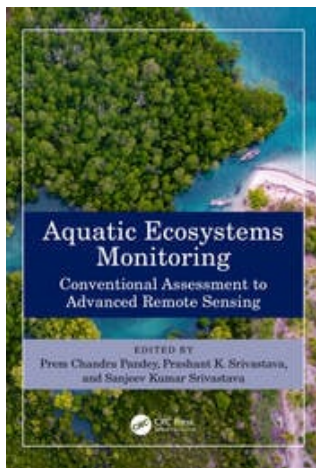
By Mohammad Shahid,

ISBN 9789815129502

Published 2025 by Jenny Stanford Publishing

BOOK DESCRIPTION

This book offers an in-depth examination of wetland ecosystems, delving into their intricacies from three critical perspectives—limnological, bio-geochemical, and economic. It takes an interdisciplinary approach, seamlessly merging insights from limnology and bio-geochemistry to provide readers with a comprehensive understanding of the complex interactions between organisms and chemical processes in wetlands. It notably emphasizes the economic significance of wetlands, advocating for sustainable practices to preserve their value. This aspect makes the book a valuable resource for policymakers, stakeholders, and professionals involved in wetland conservation. It addresses contemporary issues like nutrient cycling, pollutant dynamics, and the role of wetlands in climate regulation by incorporating the latest research and case studies in the field. The book will equip readers with up-to-date insights into the challenges and opportunities surrounding wetland ecosystems.



AQUATIC ECOSYSTEMS MONITORING

By Prem Chandra Pandey,

ISBN 9781032391120

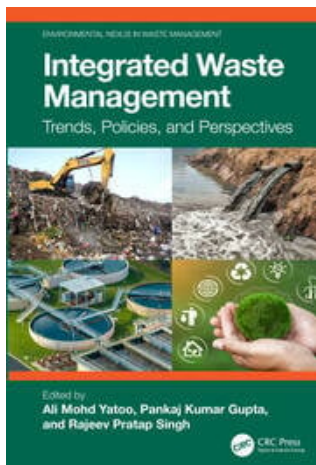
Published 2024 by CRC Press

BOOK DESCRIPTION

This book collates traditional and modern applications of remote sensing in aquatic ecosystem monitoring. It covers conventional assessment methods like sampling, surveying, macroinvertebrates, and chlorophyll estimation for aquatic ecosystem health assessment. Advanced remote sensing technology provides timely spectral information for quantitative and qualitative assessment of water quality, shoreline changes, coral bleaching, and vegetation monitoring. The book covers different types of aquatic ecosystems like wetlands, rivers, lakes, saline, and the brackish lake. It also:

- Reviews the latest applications of remote sensing in the monitoring and assessment of aquatic ecosystems
- Includes traditional methods like cartography, sampling, surveying, phytoplankton assessment, river interlinking, and chlorophyll estimation
- Discusses the application of multi-source data and machine learning in monitoring aquatic ecosystems
- Discusses aquatic ecosystem management, services, threats, and sustainability
- Explores challenges, opportunities, and prospects of future Earth observation applications for aquatic ecosystem monitoring

The book discusses space-borne, airborne, and drone geospatial data. The parts broadly cover aquatic ecosystem monitoring, vegetation management, advanced modeling practices, and challenges. It is meant for scientists, professionals, and policymakers working in environmental sciences, remote sensing, and geology.



INTEGRATED WASTE MANAGEMENT

By Ali Mohd Yatoo

ISBN 9781032417004

Published 2024 by CRC Press

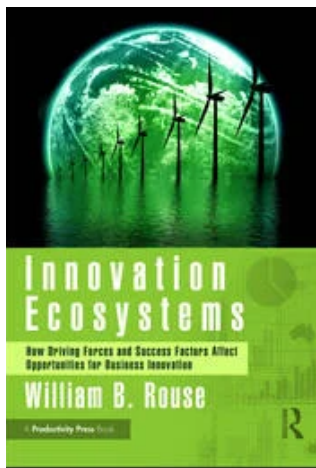
BOOK DESCRIPTION

This book addresses multiple focus areas identified and provides solutions with respect to the circular economy, water pollution, potable water availability, reducing population impact on the environment, and better health by integrated waste management. It explains techniques to handle waste generation, characterization, minimization, collection, separation, treatment, and disposal, and includes chapters that address waste management policy, education, and economic and environmental assessments.

Features:

- Introduces waste management, pollution, and toxicity profile of potentially toxic environmental contaminants and industrial wastes.
- Describes field studies on the application of microbes and plants in bio/phytoremediation of environmental contaminants/industrial wastes.
- Reviews eco-friendly remediation techniques such as phytoremediation, vermi-remediation, nano-remediation, and myco-remediation.
- Presents recent advances and challenges in bioremediation research and applications in environmental management.
- Details underlying tools and techniques for sustainable waste management and (nature-based) solutions in each chapter.

This book is aimed at graduate students and researchers in environmental engineering and waste management.



INNOVATION ECOSYSTEMS

By William B. Rouse

ISBN 9781032830407

Published 2024 by Productivity Press

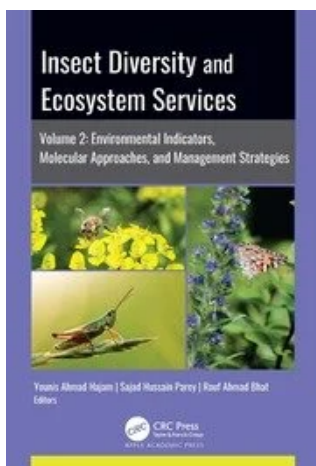
BOOK DESCRIPTION

This book is about geography, economics, society, and innovation. Why did different regions evolve in different ways? What caused economic priorities and activities to go in one direction or another? The author believes that happenstance played a relatively minor role in this process. There were and are driving forces, as well as success factors.

In each ecosystem, ambitious immigrants arrived, displaced native populations, and proceeded to develop and exploit the geography of their ecosystem, which included leveraging water resources for transportation, commerce, irrigation, etc. They often invented the means of development and exploitation, unfortunately including slavery, but also various technical methods, tools, and devices. Inventions that became innovations enabled industries, revenues, profits, and economic growth, initially for the ecosystem and then more broadly.

The impacts of geography and economics are profound. Available resources strongly affect the options available for sustainable economic growth. This growth is fueled by technological innovations that are significantly affected by the physical, economic, and social characteristics of the ecosystem of interest.

The eight case studies in this book illustrate how patterns of these characteristics impact innovation. They also depict changes over centuries, rather than just decades or years. Today's crises are often just blips in the ongoing evolution of an innovation ecosystem. There are ups and downs, but the physical, economic, and social characteristics of the ecosystems dominate their evolution. These factors largely determine what potential innovations are pursued, who leads these pursuits, and why they think they can succeed. People and organizations dominate the factors influencing success.



INSECT DIVERSITY AND ECOSYSTEM SERVICES

By Younis Ahmad Hajam

ISBN 9781774915820

Published 2024 by Apple Academic Press

BOOK DESCRIPTION

This new innovative work on insects and their impact on the ecosystem covers the role of insects in environmental pollution, their use in sustainable agricultural services, and the industrial, forensic, and medical applications of insects and their pure products. The book also covers the entomological and molecular aspects of insects, identifies the gaps in the research, and looks at integrated management strategies for pests.

Volume 1: Importance, Threats, Conservation, and Economic Perspectives, reviews the different insect orders regarding their diversity and importance in providing free ecological services and discusses the diversity patterns of world biogeographic zones and how insects contribute to maintaining ecological diversity.

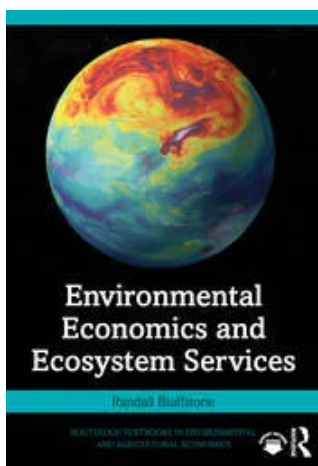
Volume 2: Environmental Indicators, Molecular Approaches, and Management Strategies discusses the role of insects environmental indicators, the effect of pesticides on insect diversity, strategies to control the diversity of insects, medical and forensic importance of insects, exploring new insect species through DNA barcoding, integrated pest management, the role of insect population in agriculture, and eco-friendly pest management approaches, etc.

Some topics covered in the book include:

- Role of insects for the sustainable agricultural development
- Commercial importance of insects and their products
- Food additive roles of insects and formulation of remedies for the reduction of disease pathogenesis
- Management strategies for pest control

Some specific topics include colony collapse disorder of managed honey bee (*Apis mellifera* L.) populations, insects as strong crime indicator tools in forensic sciences, insect-based value-added products, and more.

Together, these two volumes offer important information for researchers, academicians, scientists, industrialists, teachers, entomologists, and students for understanding the contribution of insects towards the sustainability of the ecosystem.



ENVIRONMENTAL ECONOMICS AND ECOSYSTEM SERVICES

By Randall Bluffstone

ISBN 978

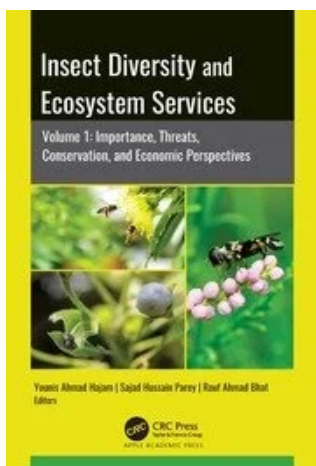
Published 2025 by Routledge

BOOK DESCRIPTION

Environmental Economics and Ecosystem Services provides a rigorous yet accessible introduction to environmental economics, using ecosystem services as the underlying framework. Assuming no prior knowledge of economics, and using a conversational writing style, the focus is on exploring society's linkages with the environment and how economics can help solve key environmental problems.

Structured in three parts, the book first introduces readers to the key theories in environmental economics and ecosystem services, and then explores the challenges of conservation. The final section examines environmental policy options, such as cap-and-trade, behavioral nudges, community-based natural resource management and carbon taxes. There is a strong international focus throughout the book, with real-life examples taken from North America, Europe, Asia, Africa and other regions. Students are supported by a range of pedagogical features, including chapter objectives, chapter summaries, discussion questions and further reading suggestions. In addition, the book offers worked examples, analytical problems and "Challenge Yourself" boxes to develop critical thinking skills. Lecture slides and answers to questions for discussion and practice problems are available for instructors.

This is the ideal text for introductory courses in environmental economics, ecological economics, economics of sustainability, environmental management, environmental policy and ecosystem services.



INSECT DIVERSITY AND ECOSYSTEM SERVICES

By Younis Ahmad Hajam

ISBN 9781774915806

Published 2024 by Apple Academic Press

BOOK DESCRIPTION

This new innovative work on insects and their impact on the ecosystem covers the role of insects in environmental pollution, their use in sustainable agricultural services, and the industrial, forensic, and medical applications of insects and their pure products. The book also covers the entomological and molecular aspects of insects, identifies the gaps in the research, and looks at integrated management strategies for pests.

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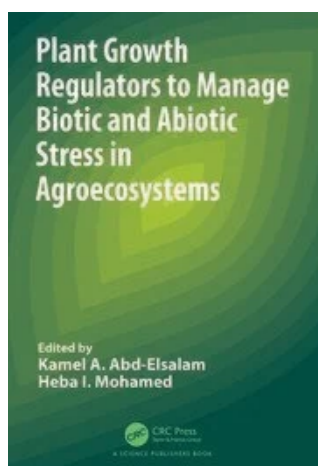
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Together, these two volumes offer important information for researchers, academicians, scientists, industrialists, teachers, entomologists, and students for understanding the contribution of insects towards the sustainability of the ecosystem.



PLANT GROWTH REGULATORS TO MANAGE BIOTIC AND ABIOTIC STRESS IN AGROECOSYSTEMS

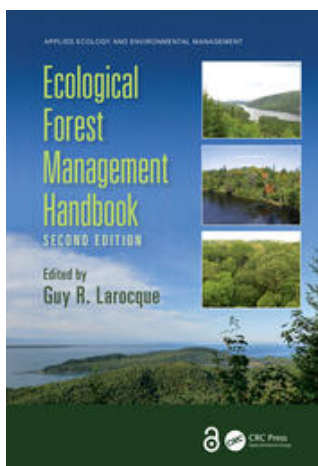
By Kamel A. Abd-Elsalam, Heba I. Mohamed

ISBN 9781032485300

Published 2024 by CRC Press

BOOK DESCRIPTION

Plant Growth Regulators to Manage Biotic and Abiotic Stress in Agroecosystems is a comprehensive book that explores the use of plant growth regulators (PGRs) as effective stress-reduction techniques in agricultural environments. This book investigates the role of PGRs in handling biotic and abiotic stressors, offering useful insights to agriculturalists, researchers, and students. The book provides a comprehensive overview of many PGRs, including their methods of action and impacts on plant growth and development. It describes the use of PGRs to treat plant diseases caused by pathogens such as fungi, bacteria, and viruses. The book also discusses the application of PGRs to improve plant tolerance to adverse climatic circumstances including drought, salt, and extreme temperatures. The authors also underline PGRs' sustainable and environmentally friendly character, which makes them a potential option for chemical therapies. They explore PGRs' potential to improve agricultural yield and resilience, therefore helping food security in a rapidly changing global environment. This book is an excellent resource for learning about the applications and advantages of PGRs in modern agriculture.



ECOLOGICAL FOREST MANAGEMENT HANDBOOK

By Guy R. Larocque

ISBN 9781032555171

Published 2024 by CRC Press

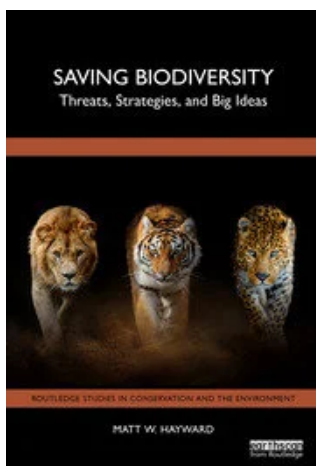
BOOK DESCRIPTION

The second edition of Ecological Forest Management Handbook continues to provide forestry professionals and students with basic principles of ecological forest management and their applications at regional and site-specific levels. Thoroughly updated and revised, the handbook addresses numerous topics and explains that ecological forest management is a complex process that requires broad ecological knowledge. It discusses how to develop adaptive management scenarios to harvest resources in a sustainable way and provide ecosystem services and social functions. It includes new studies on ecological indicators, the carbon cycle, and ecosystem simulation models for various forest types: boreal, temperate, and tropical forests.

NEW IN THE SECOND EDITION

- Provides a comprehensive collection of sustainable forest management principles and their applications
- Covers new ecological indicators that can be applied to address forest environmental issues
- Includes all types of models: empirical, gap, and process-based models
- Explains several basic ecological and management concepts in a clear, easy-to-understand manner

This handbook is intended for researchers, academics, professionals, and undergraduate and graduate students studying and/or involved in the management of forest ecosystems.



SAVING BIODIVERSITY

By Matt W. Hayward

ISBN 9781032960265

Published 2025 by Routledge

BOOK DESCRIPTION

Drawing on the author's personal experiences working across the globe, this book explains why we need to conserve biodiversity, the threats it faces, how we can successfully conserve biodiversity, and some success stories of how we have conserved it.

This is a personal journey from being an environmental vandal to internationally renowned conservationist. The book follows the author's life and career in conservation, from scarring koala-feed trees to being chased by elephants, sniffed by lions, gored by quokkas, and watched by wolves. It mixes robust facts with fun stories to engage a broad audience spanning the general public to academics and enthuse them into promoting the conservation of the plants and animals humanity relies on. Split into five sections, the first explains why we should conserve Nature and the value it holds. Section 2 discusses the threats to biodiversity, and Section 3 describes the author's personal experiences in conserving biodiversity, from creating protected areas and managing invasive species, reintroduction programmes, and the social policies we need to enact to ensure biodiversity persists. Section 4 provides examples of conservation success stories from across the globe, and the book concludes by looking at the big picture issues society needs to address to ensure that future generations get to experience the same degree of beauty of the natural world that we have.

This book is a must read for all concerned with conserving Nature and sustaining our planet.



HANDBOOK OF IRRIGATION HYDROLOGY AND MANAGEMENT

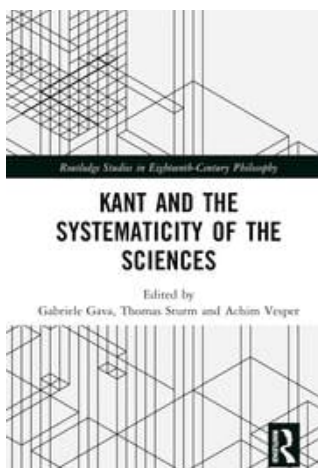
By Saeid Eslamian, Faezeh Eslamian

ISBN 9781032488950

Published 2024 by CRC Press

BOOK DESCRIPTION

The Handbook of Irrigation Hydrology and Management examines and analyzes irrigated ecosystems in which water storage, applications, or drainage volumes are artificially controlled in the landscape and the spatial domain of processes varies from micrometers to tens of kilometers, while the temporal domain spans from seconds to centuries. The continuum science of irrigation hydrology includes the surface, subsurface (unsaturated and groundwater systems), atmospheric, and plant subsystems. Further, it presents numerous considerations including the selection of economically viable cropping patterns, land allocation by crop, water resource allocation by crop, irrigation scheduling, deficit management irrigation, optimizing crop yields, and more.



KANT AND THE SYSTEMATICITY OF THE SCIENCES

By Gabriele Gava, Thomas Sturm, Achim Vesper

ISBN 9780367756888

Published 2025 by Routledge

BOOK DESCRIPTION

This book provides the first comprehensive discussion regarding the role that Kant ascribes to systematicity in the sciences. It considers not only what Kant has to say on systematicity in general, but also how the systematicity requirement for science is specified in different fields of knowledge.

The chapters are divided into three thematic sections. Part 1 is devoted to historical context. The chapters explore precursors of Kant's account of the systematicity of the sciences. Part 2 addresses the application of systematicity to the special sciences—cosmology, physics, chemistry, logic, mathematics, the life sciences and history. Finally, Part 3 explores the systematicity of philosophy.

Kant and the Systematicity of the Sciences will be of interest to scholars and advanced students working on Kant and the history and philosophy of science.



AMPHIBIANS OF ECUADOR

By Luis A. Coloma, William E. Duellman

ISBN 9781032896571

Published 2025 by CRC Press

BOOK DESCRIPTION

Amphibians of Ecuador: Craugastoridae. Volume III is the third in a four-volume series that provides comprehensive, well-illustrated, and authoritative insights, making it an invaluable resource for biologists, conservationists, and others. The series explores, in comprehensive detail, the cultural history and the rich amphibian diversity of Ecuador, providing a thorough review of biogeography, amphibian declines, and conservation.

Volume III specifically focuses on Craugastoridae. Characteristics of each species are listed, defined, and compared to other similar species. Reproductive behavior, where known, is described, as are data on vocalizations. Amphibian distributions are detailed and illustrated with physiographic maps with dots. The volume also addresses the declines, extinctions, and conservation status of each species, noting their occurrence in reserves.

KEY FEATURES:

- Provides detailed and comprehensive accounts for all Craugastoridae species from Ecuador
- New data are incorporated for many species
- Describes with full color maps the distribution of all known taxa
- Includes information on the ecology, reproduction, and behavior of all taxa



AN INTRODUCTION TO THE AMPHIBIANS OF ECUADOR

By Luis A. Coloma, William E. Duellman

ISBN 9780367653569

Published 2024 by CRC Press

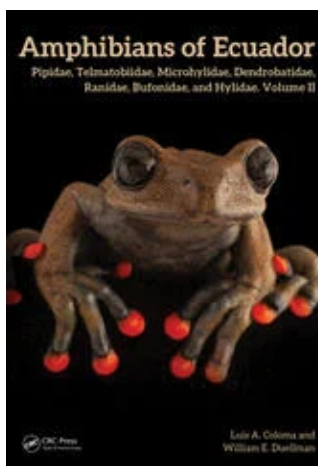
BOOK DESCRIPTION

An Introduction to the Amphibians of Ecuador is the first of four volumes, which are comprehensive, well-illustrated, and authoritative works, making them invaluable to biologists, conservationists, and others. This initial volume delves into the cultural history of amphibians, encompassing ethnobatrachology and folklore, while summarizing the amphibian iconography found in Ecuadorian archaeology. Moreover, it covers topics such as bioprospecting, sustainable management, and biotrade activities. The history and present state of amphibian biology research are also addressed. Furthermore, it explores in comprehensive detail the rich amphibian diversity of Ecuador, providing a thorough review of biogeography, amphibian declines, and conservation.

Subsequent volumes list the characteristics of each species, define each taxon, and compare them to similar other species. Natural history and reproductive behavior, where known, are described, as are data on vocalizations, larvae, and ontogenetic changes. Amphibian distributions are illustrated with physiographic maps with dots. Each volume addresses the declines, extinctions, and conservation status of each species and provides notations of their occurrence in reserves.

KEY FEATURES

- Summarizes the ethnozoological aspects of amphibians
- Provides a thorough history of research
- Introduction to three volumes providing accounts for each of the 3 orders, 19 families, 78 genera, and over 650 species from Ecuador



AMPHIBIANS OF ECUADOR

By Luis A. Coloma, William E. Duellman

ISBN 9781032896472

Published 2025 by CRC Press

BOOK DESCRIPTION

This book is the second of four volumes, which are comprehensive, well-illustrated, and authoritative works invaluable to biologists, conservationists, and others. It explores, in comprehensive detail, the rich amphibian diversity of Ecuador, providing a thorough review of biogeography, amphibian declines, and conservation. This volume covers Pipidae, Telmatobiidae, Microhylidae, Dendrobatidae, Ranidae, Bufonidae, and Hylidae. Characteristics of each species are listed, defined, and compared to similar other species. Reproductive behavior, where known, is described, as are data on vocalizations, larvae, and ontogenetic changes. Amphibian distributions are illustrated with physiographic maps with dots. Each volume addresses the declines, extinctions, and conservation status of each species and provides notations of their occurrence in reserves.

KEY FEATURES

- Provides detailed and authoritative accounts for each species in seven families: Pipidae, Telmatobiidae, Microhylidae, Dendrobatidae, Ranidae, Bufonidae, and Hylidae
- New data are incorporated for many species
- Describes with full-color maps the distribution of all known taxa
- Includes information on the ecology, reproduction, and behavior of all taxa



AMPHIBIANS OF ECUADOR

By Luis A. Coloma, William E. Duellman

ISBN 9781032896458

Published 2025 by CRC Press

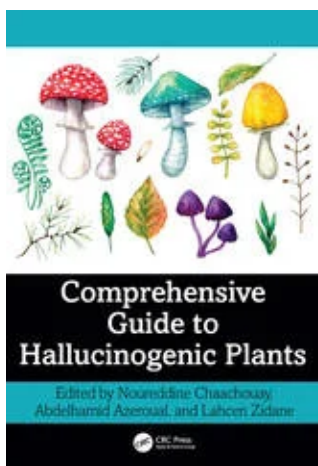
BOOK DESCRIPTION

Amphibians of Ecuador, Volume IV is the final installment in a four-volume series that provides comprehensive, well-illustrated, and authoritative insights into the amphibian species of Ecuador, making it an invaluable resource for biologists, conservationists, and others. The series explores, in comprehensive detail, the cultural history and the rich amphibian diversity of Ecuador, providing a thorough review of biogeography, amphibian declines, and conservation.

Volume IV specifically focuses in Phyllomedusidae, Leptodactylidae, Ceratophryidae, Hemiphractidae, Eleutherodactylidae, Centrolenidae, Gymnophiona, and Caudata. Characteristics of each species are listed, defined, and compared to similar other species. Reproductive behavior, where known, is described as are data on vocalizations, larvae and ontogenetic changes. Amphibian distributions are detailed and illustrated with physiographic maps with dots. The volume also addresses the declines, extinctions, and conservation status of each species, highlighting their occurrence in protected areas.

Key Features:

- Provides detailed and comprehensive accounts for all species from Ecuador of Phyllomedusidae, Leptodactylidae, Ceratophryidae, Hemiphractidae, Eleutherodactylidae, Centrolenidae, Gymnophiona, and Caudata. An Addendum includes accounts of species described from 2023 to 2024.
- New data are incorporated for many species.
- Describes with full color maps the distribution of all known taxa.
- Includes information on the ecology, reproduction, and behavior of all taxa.



COMPREHENSIVE GUIDE TO HALLUCINOGENIC PLANTS

By Nouredine Chaachouay

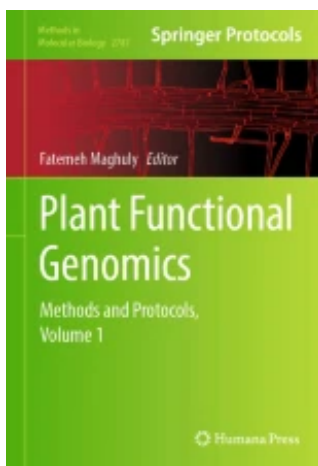
ISBN 9781032591803

Published , 2025 by CRC Press

BOOK DESCRIPTION

Hallucinogens have been traditionally used to encourage spiritual growth, heighten perception, inspire personal development, or expand reality. *Comprehensive Guide to Hallucinogenic Plants* focuses on ethnobotanical aspects of hallucinogenic plant species, featuring history on how they were used in ancient societies, identifying chemical compounds, and explaining modern medicinal uses, as well as conservation initiatives. The book emphasizes the importance of understanding the cultural, countrywide, environmental, and scientific importance of these medicinal plants. Some of the 50 plants covered in this work include: ayahuasca, ginger, kanna, dream herb, iboga, peyote, canary broom, coral tree, catnip, wild rue, kava, mandrake, and golden angel's trumpet. Each chapter includes information on historical plant use and identification of chemical compounds, and explains modern medicinal uses. The text highlights the importance of studying, evaluating, and utilizing these plants not in isolation, but from a global perspective.

Comprehensive Guide to Hallucinogenic Plants appeals to plant scientists, botanists, ethnobotanists, pharmacologists, and those with an interest in alternative or herbal medicine



PLANT FUNCTIONAL GENOMICS

By Fatemeh Maghuly

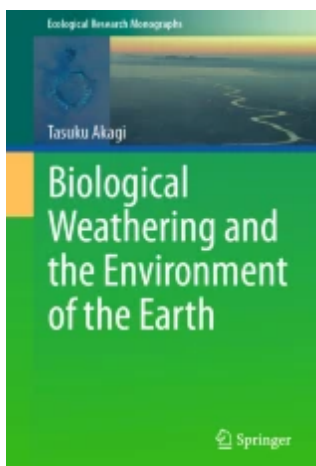
ISBN 978-1-0716-3777-7

Published 2024 by SPRINGER

BOOK DESCRIPTION

This detailed book gathers hands-on techniques to characterize, identify, localize, profile, and determine genome functions in plants. Volume 1 opens with a section exploring protocols to advance our understanding of plant genetics and ecology via phenomics, and it continues with chapters on plant genetics, transcriptomics, and proteomics to unravel plant protein structures and functions, bridging proteomics and phosphoproteomics. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step and readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls.

Authoritative and comprehensive, Plant Functional Genomics: Methods and Protocols serves as an ideal guide to the immense promise of functional genomics, spanning from fundamental evolutionary studies to practical advancements in crop improvement.



BIOLOGICAL WEATHERING AND THE ENVIRONMENT OF THE EARTH

By Tasuku Akagi

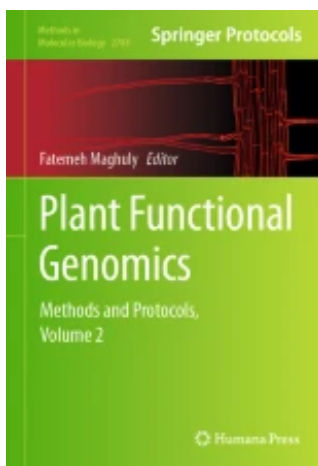
ISBN 978-981-97-4425-1

Published 2024 by SPRINGER

BOOK DESCRIPTION

This book introduces the concept of 'biological weathering.' Weathering, especially chemical weathering, has been recognized as one of the most important processes on Earth because it influences the circulation of elements, including carbon. Weathering has almost always been considered an abiotic process. The book describes the author's experiments, proving that plant involvement in weathering is a strategy for plants to ingest nutrients from rocks. It is also shown through cultivation experiments and observation of natural diatoms that diatoms and silica obligate plankton dissolve silicate minerals and incorporate silicon and other elements into their frustules. The weathering reaction has also been successfully applied to the previously unexplained relationship between carbon and silica in the ocean's interior.

Readers of this book will gain a comprehensive understanding of weathering as a reaction catalyzed by both plants and plankton, occurring not only on land but also ubiquitously in the earth's environment, including the ocean's interior. This new and novel perspective has significant implications for various scientific fields, including biology, marine chemistry, environmental, and paleoenvironmental sciences. The author underscores the immediate relevance of these findings to pressing issues surrounding atmospheric CO₂. The book concludes with a proposal for an efficient and safe method to sequester CO₂ in the atmosphere into the ocean interior, offering a practical solution to a global challenge. The target audience for this book includes students and researchers in ecology, evolutionary biology, geochemistry, environment and plant sciences, atmospheric sciences, and Geo-industries.



PLANT FUNCTIONAL GENOMICS

By JMiddleton

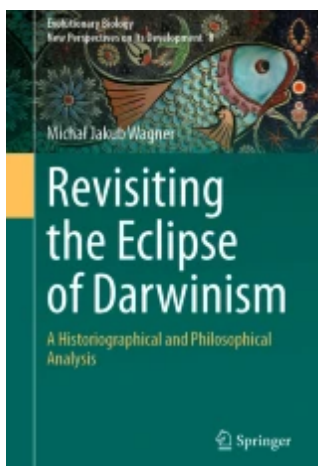
ISBN 978

Published 2024 by SPRINGER

BOOK DESCRIPTION

This detailed book gathers hands-on techniques to characterize, identify, localize, profile, and determine genome functions in plants. Volume 2 opens with metabolomic methods that uncover chemical intricacies, exploring glycome mixtures, cell wall components, and computational metabolomics, and it continues with sections on plant genome validation, computational approaches and bioinformatic tools, and case studies exploring the biological effects of magnetic fields and the study of cyanobacteria. Written for the highly successful Methods in Molecular Biology series, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step and readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls.

Authoritative and comprehensive, Plant Functional Genomics: Methods and Protocols serves as an ideal guide to the immense promise of functional genomics, spanning from fundamental evolutionary studies to practical advancements in crop improvement.



REVISITING THE ECLIPSE OF DARWINISM

By Michał Jakub Wagner

ISBN 978-3-031-72592-0

Published 2024 by SPRINGER

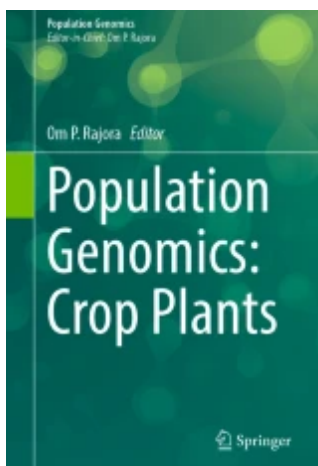
BOOK DESCRIPTION

This book focuses on a critical reexamination of two prominent categories used in modern historiography of biology – “the eclipse of Darwinism” and the “modern synthesis”. The main objective is to critically analyze the main existing interpretations of the “eclipse of Darwinism” and emergence of the “modern synthesis”, with particular emphasis on the philosophical assumptions adopted in these interpretations. Thus, interpretations by Ernst Mayr, Peter Bowler, Mark Largent and modern historians who challenge these perspectives are discussed and critically evaluated.

The analysis of the above interpretations makes it possible to determine how the philosophy of science limits the interpretation of the history of a given field, and also serves as a starting point for proposing an original interpretation of the above period in the history of evolutionary biology. The ultimate goal will therefore be a proposal of a new interpretative perspective to answer following questions: Why did the “eclipse of the Darwinism” occur? How should its origins to be understood? Why did it end (and why did the “modern synthesis” emerge)?

Main thesis of this book is that the “eclipse” was a direct response to inconsistent ontology upon which Darwin built his theory of evolution. Darwin referred to terms and concepts rooted in the philosophy of essentialism, which was problematic, because he tried to apply these essentialist concepts to his vision of the ever-changing nature. Therefore, all of the anti-Darwinian theories characteristic to the “eclipse of Darwinism” and later to the “modern synthesis” were produced in an attempt to reconcile essentialism with evolution and thus to correct Darwin's philosophical “error.”

The book will appeal to biologists, philosophers and historians alike.



POPULATION GENOMICS: CROP PLANTS

By Om P. Rajora

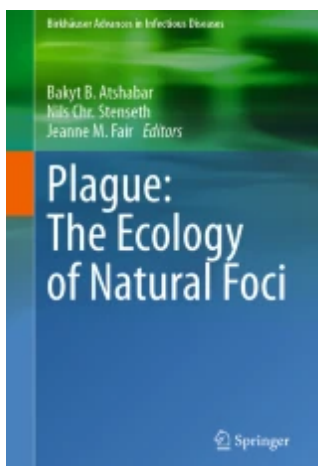
ISBN 978-3-031-63001-9

Published 2024 by SPRINGER

BOOK DESCRIPTION

Population genomics has revolutionized several disciplines of biology, genetic resource conservation and management, and breeding of crop plants by providing key and novel insights into population, evolutionary, ecological and conservation genetics, ecology, evolution and adaptation, and facilitating molecular breeding with an unprecedented power and accuracy. Crop plants have been domesticated from their wild progenitors over several centuries and have undergone severe genetic bottlenecks and selection sweeps. Population genomics research has unraveled novel insights into crop plants origin, evolution, demographic history, center of diversity, domestication history, genetic/genomic diversity and genetic structure of wild and domesticated populations and species, epigenomic diversity, genetic/genomic basis of domestication syndrome, genomic footprints of domestication, selection and breeding, de-domestication, speciation and admixture, taxonomy, phylogeny, ecology, biotic and abiotic stress tolerance, and ecological and climate adaptation. Population genomics has also facilitated the development of pangenomes, conservation and management of genetic diversity including in the pre-breeding and breeding programs, and genomics-assisted breeding via identifying genotype-phenotype associations and genomic selection in crop plants.

This pioneering book presents the advances made and potential of population genomics in addressing the above crop plants aspects of basic and applied significance and brings together leading experts in crop plants population genomics to discuss these topics in major crop plants. Genomic, epigenomic, transcriptomic and plant resources available for population genomics research and challenges, opportunities and future perspectives of crop plants population genomics are also discussed.

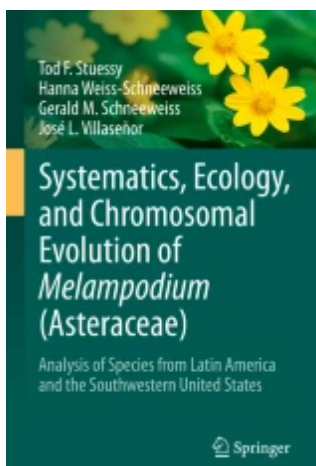


PLAGUE: THE ECOLOGY OF NATURAL FOCI

- By Bakyt B. Atshabar,
ISBN 978-3-031-58830-3
Published 2024 by SPRINGER

BOOK DESCRIPTION

This book provides deep insights into the ecology of the plague bacterium *Yersinia pestis* in natural foci, its diversity, genetic variability and the function of the vector, thus painting a holistic picture of how plague pandemics have evolved and how the bacterium has adapted perfectly to its environment over such a long period of time. The book reviews studies of several generations of scientists from the countries of the former Soviet Union where plague foci are found and presents them for the first time to a global audience. In addition, the book provides comprehensive information on historical plague pandemics and explores future strategies for managing the disease.



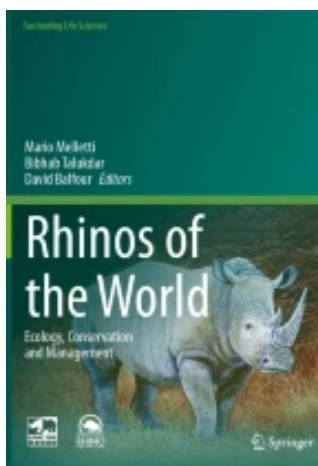
SYSTEMATICS, ECOLOGY, AND CHROMOSOMAL EVOLUTION OF MELAMPODIUM (ASTERACEAE)

By Tod F. Stuessy ,
ISBN 978-3-031-81994-0

Published 2024 by SPRINGER

BOOK DESCRIPTION

Chromosomal change has been important in the evolution of flowering plants. Cytogenetic modifications resulting in dysploid and polyploid alterations of plant genomes have often led to the formation of new species. A genus that represents an excellent example of such changes during its evolutionary history is *Melampodium* (Asteraceae), occurring primarily in Mexico, Central America, and the southwestern United States. This book is a detailed presentation of the diversity of species in *Melampodium*, their ecological requirements and phylogenetic relationships, the biogeographic patterns and migrational pathways, chromosomal diversity, and evolutionary origins of species, especially the tetraploids and hexaploids through allopolyploidy. It is an instructive case study of evolution through chromosomal change in a broadly distributed genus of importance in the ecosystems of Mexico and adjacent regions.



RHINOS OF THE WORLD

By Mario Melletti

ISBN 978

Published 2024 by SPRINGER

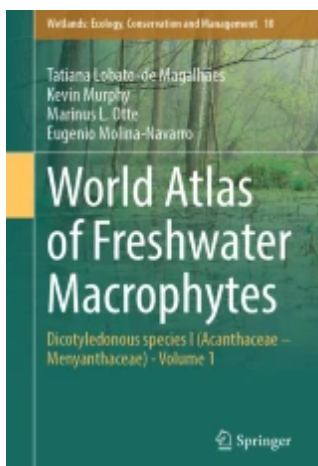
BOOK DESCRIPTION

This book represents the culmination of more than four years of work by many rhino experts, primarily from Africa, Asia, the United States, and Europe, involved in rhino conservation, research and management. It is one of the most comprehensive reference works ever published on the systematics, ecology, conservation status, and management of all rhinoceros species.

Covering all five rhino species worldwide, this volume brings together the contributions of 92 international rhino experts and provides:

- A comprehensive overview of the current state of knowledge on the evolution, phylogeny, systematics, and fossil record of rhinos
- An in-depth look at the ecology and conservation status of each species, with detailed chapters
- A series of case studies on conservation management, poaching, horn trade, and ex-situ programs.

This beautifully illustrated book is an invaluable resource for researchers, wildlife managers and professionals in conservation biology, ecology, and management, as well as the general public. It reveals the fascinating story of rhino evolution, the long history of human interactions with rhinos, and the major threats to these iconic species.



WORLD ATLAS OF FRESHWATER MACROPHYTES

By Tatiana Lobato-de Magalhães

ISBN 978-3-031-52748-7

Published 2024 by SPRINGER

BOOK DESCRIPTION

This book is the first volume of a compendium of the global distribution of some 3500 aquatic macrophyte species occurring in inland freshwater and brackish waterbodies worldwide, highlighting aspects of their ecology including endemism, world rarity, ecozone/ macroregional occurrence, ploidy state, species age, uses, and endangered status. Although similar books exist for local regions (e.g., the Pantanal wetlands of Brazil) none provides complete and detailed information for macrophytes at global scale, so this book provides a novel resource on the distribution and ecology of macrophytes around the world.

The Atlas fills a gap in scientific knowledge of the global ecology of an important group of aquatic plants. It highlights the expansion of invasive species and describes hotspots of endemism and rarity for freshwater macrophytes across the planet. The data included in this book range from karyological to biogeographical studies on macrophytes, within a general theme of understanding the environmental factors that drive the biodiversity, ecology, landscape genetics, and conservation of aquatic plants in freshwater ecosystems. The first volume of the World Atlas of Freshwater Macrophytes: Dicotyledonous species I (Acanthaceae – Menyanthaceae) covers 33 botanical families and 760 species of aquatic macrophytes.

The authors, based in Mexico, Scotland, Spain, and the USA are members of an informal international research network, set up in 2017 by retired aquatic botanist Kevin Murphy, which is dedicated to advancing macroecological knowledge of freshwater macrophytes in the inland freshwater and brackish waterbodies of worldwide wetland ecosystems.

The topic of this book is relevant not only to scholars and academics but also to practitioners in wetland management, decision makers, and aquatic plant hobbyists.