

An Introduction To Molecular Ecology

Insect Molecular Biology and Ecology
 An Introduction to Ecological Genomics
 Molecular Approaches To Ecology And Evolution
 Molecular Evolution and Population Genetics for Marine Biologists
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 An Interactive Introduction to Organismal and Molecular Biology
 Molecular Approaches in Natural Resource Conservation and Management
 Evolutionary Genetics
 An Introduction to Behavioural Ecology

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[Insect Molecular Biology and Ecology](#) Oxford University Press

Phytoplankton ecology has developed from an understanding of taxonomy, species dynamics and functional roles, and species interactions with the surrounding environment. New and emerging technologies enable a paradigm shift in the ways we monitor and understand phytoplankton in a range of environments. *Advances in Phytoplankton Ecology: Applications of Emerging Technologies* is a practical guide to these new technologies and explores their application with case studies to show how recent advances have changed our understanding of phytoplankton ecology. Part one of this book explores how traditional taxonomy and species identification has changed, moving from morphological to molecular techniques. Part two explores the new technologies for remote and automatic monitoring and sensor technology and applications for management. Part three explores the explosion of omics techniques and their application in species identification, functional populations, trait characterization, interspecific interactions, and interaction with their environment. This book is an invaluable guide for marine and freshwater ecology researchers to how new technologies can enhance our understanding of ecology. Combines traditional techniques with new technologies and methods Explores the influence of new technology on our understanding of phytoplankton ecology Provides practical applications of each technique through case studies in each chapter

An Introduction to Ecological Genomics Springer Nature

Developed as an introduction to new molecular genetic techniques, *Insect Molecular Genetics* also provides literature, terminology, and additional sources of information to students, researchers, and professional entomologists. Although most molecular genetics studies have employed *Drosophila*, this book applies the same techniques to other insects, including pest insects of economic importance. As a text, as a reference, as a primer, and as a review of a vast and growing literature, *Insect Molecular Genetics* is a valuable addition to the libraries of entomologists, geneticists, and molecular biologists. Features offered by this unique reference source: Detailed illustrations Suggested readings at the end of each chapter Glossary of molecular genetic terms

Molecular Approaches To Ecology And Evolution John Wiley & Sons

Aquatic Photosynthesis is a comprehensive guide to understanding the evolution and ecology of photosynthesis in aquatic environments. This second edition, thoroughly revised to bring it up to date, describes how one of the most fundamental metabolic processes evolved and transformed the surface chemistry of the Earth. The book focuses on recent biochemical and biophysical advances and the molecular biological techniques that have made them possible. In ten chapters that are self-contained but that build upon information presented earlier, the book starts with a reductionist, biophysical description of the photosynthetic reactions. It then moves through biochemical and molecular biological patterns in aquatic photoautotrophs, physiological and ecological principles, and global biogeochemical cycles. The book considers applications to ecology, and refers to

historical developments. It can be used as a primary text in a lecture course, or as a supplemental text in a survey course such as biological oceanography, limnology, or biogeochemistry.

[Molecular Evolution and Population Genetics for Marine Biologists](#) Columbia University Press

Microorganisms are distributed across every ecosystem, and microbial transformations are fundamental to the operation of the biosphere. Microbial ecology is the study of this interaction between microorganisms and their environment, and arguably represents one of the most important areas of biological research. Yet for many years our study of microbial flora was severely limited: the primary method of culturing microorganisms on media allowed us to study only between 0.1 and 10% of the total microbial flora in any given environment. *Molecular Microbial Ecology* gives a comprehensive guide to the recent revolution in the study of microorganisms in the environment. Details are given on molecular methods for isolating some of the previously uncultured and numerically dominant microbial groups. PCR-based approaches to studying prokaryotic systematics are described, including ribosomal RNA analysis and stable isotope probing. Later chapters cover DNA hybridisation techniques (including fluorescent in situ hybridisation), as well as genomic and metagenomic approaches to microbial ecology. Gathering together some of the world's leading experts, this book provides an invaluable introduction to the modern theory and molecular methods used in studying microbial ecology.

[Molecular Ecology and Evolution: The Organismal Side](#) Cambridge University Press

The *Evolutionary Ecology of Invasive Species* offers new insights into the mechanisms that underlie rapid evolution in these species. The book provides a comprehensive overview of achievements in the field during the boom of information over the past two decades and includes discussions of possible future directions for the study of evolution in invasive species. Written by an international expert in invasion ecology, population genetics, and evolutionary biology, the book explores the roles of preadaptation, phenotypic plasticity, selection, and stochastic processes in driving rapid evolution. The book draws insights from a wide spectrum of invasive microbes, plants, and animals, covering many of the planet's biogeographic regions and discusses the evolutionary consequences for native species in response to biological invasions. A valuable resource to researchers and students in evolutionary biology, invasive species biology, and global change biology, this text suggests future research directions related to the evolutionary biology, impacts, and management of invasive species. Highlights the most recent advances and developments in using evolutionary principles to study and manage invasive species Offers new and often overlooked insights in processes that govern rapid evolution Discusses key stages of population demography that underlie rapid evolutionary change in invasive species, including their introduction, naturalisation, and dispersal

[Ecological Principles and Environmental Issues](#) John Wiley & Sons

Computational biology is a rapidly expanding field, and the number and variety of computational methods used for DNA and protein sequence analysis is growing every day. These algorithms are extremely valuable to biotechnology companies and to researchers and teachers in universities. This book explains the latest computer technology for analyzing DNA, RNA, and protein sequences. Clear and easy to follow, designed specifically for the non-computer scientist, it will help biologists make better choices on which algorithm to use. New techniques and demonstrations are elucidated, as are state-of-the-art problems, and more advanced material on the latest algorithms. The primary audience for this volume are molecular biologists working either in biotechnology companies or academic research environments, individual researchers and the institutions they work for, and students. Any biologist who relies on computers should want this book. A secondary audience will be computer scientists developing techniques with applications in biology. An excellent reference for leading techniques, it will also help introduce computer scientists to the biology problems. This is an outstanding work which will be ideal for the increasing number of scientists moving into computational biology.

[Hermaphroditism](#) Springer Science & Business Media

Research in modern experimental and theoretical population genetics has been strengthened by advances in molecular techniques for the analysis of genetic variability. The evolutionary relationships of organisms may be investigated by comparing DNA sequences. This book covers chapters on population genetics, DNA polymorphism, genetic homeostasis, an

[An Introduction to Marine Ecology](#) Oxford University Press, USA

Four years ago we edited a volume of 36 papers entitled *Molecular Approaches to Ecology and Evolution* (Schierwater et al., 1994), in which we attempted to put together a diverse array of papers that demonstrated the impact that the technological revolution of molecular biology has had on the field of evolutionary biology and ecology. The present volume borrows from that theme but attempts to focus more sharply on the impact that molecular biology has had on our understanding of different hierarchical levels important in evolutionary and ecological studies. Because DNA sequence variation is at the heart of every paper in the present volume, we feel it necessary to examine how DNA has affected study at various levels of biological organization. The majority of the chapters in the present volume follow themes established in the earlier volume; all chapters by authors in the previous volume are either fully updated or entirely new and expand into areas that we felt were important for a more complete understanding of the impact of DNA technology on ecology and evolution. The collection of papers in this volume cover a diverse array of ecological and evolutionary questions and demonstrates the breadth of coverage molecular technology has imparted on modern evolutionary biology. There are also a broad range of hierarchical questions approached by the 17 papers in this volume.

[Cellular and Molecular Approaches in Fish Biology](#) John Wiley & Sons

Brown Trout: Biology, Ecology and Management A comprehensive guide to the most current research, history, genetics and ecology of the brown trout including challenging environmental problems The brown trout is an iconic species across its natural European distribution and has been introduced throughout the World. Brown Trout offers a comprehensive review of the scientific information and current research on this major fish species. While the brown trout is the most sought species by anglers, its introduction to various waters around the world is causing serious environmental problems. At the same time, introduction of exogenous brown trout lineages threatens conservation of native gene pools of populations in many regions. The authors summarize the important aspects of the brown trout's life history and ecology and focus on the impact caused by the species. The text explores potential management strategies in order to maintain numerous damaged populations within its natural distributional range and to ameliorate its impacts in exotic environments. The authors include information on a wide-range of topics such as recent updates in

population genetics, evolutionary history, reproductive traits and early ontogeny, life history plasticity in anadromous brown trout and life history of the adfluvial brown trout and much more. This vital resource: Contains the latest research on the biology and ecology of brown trout Includes information on phylogeography, genetics, population dynamics and stock management Spotlights the brown trout's introduction to regions around the world and the serious environmental impacts Offers a comprehensive review of conservation and management techniques Written for salmonid scientists and researchers, fishery and environmental managers, and students of population genetics, ecology and population dynamics, *Brown Trout* explores the most recent findings on the history, ecology and sustainability of this much-researched species.

[Concepts, Analysis, and Practice](#) Oxford University Press

Physiology of the Cladocera, Second Edition, is a much-needed summary of foundational information on these increasingly important model organisms. This unique and valuable review is based on the world's literature, including Russian research not previously widely available, and offers systematically arranged data on the physiology of Cladocera, assisting with explanation of their life and distribution. It features the addition of new sections and a vast amount of new information, such as the latest data on feeding, nutrition, pathological physiology, chemical composition, neurosecretion, and behavior, as well as hormonal regulation, antioxidants, and the biochemical background of effects of natural and anthropogenic factors. Additional expertly updated contributions in genetics and cytology, and a new chapter in embryology, round out the physiological chapters, and provide comprehensive insight into the state of knowledge of Cladocera and their underlying mechanisms. Cladocera crustaceans have become globally studied for many purposes, including genetic, molecular, ecological, environmental, water quality, systematics, and evolutionary biology research. Since the genome of *Daphnia* was sequenced and published, that system has gained much wider exposure, also leading to a rapidly growing awareness of the importance of understanding physiological processes as they relate to evolutionary and ecological genomics as well as ecogenomic toxicology. However, the physiological background on Cladocera has been fragmentary (including on the other 700 known species besides *Daphnia*), despite the extensive literature on species identification and morphology. This work addresses this issue by collecting and synthesizing from the literature the state of knowledge of cladoceran physiology, including discussion on both adequately and inadequately investigated fields, and thus directions of future research. Summarizes fundamental information obtained in recent years, including on steroids, antioxidants, hormones, nanoparticles, and impact of wastewater of pharmaceutical industries Provides the foundational information needed for scientists and practitioners from a variety of fields, including conservation and evolutionary biology, genomics, ecology, ecotoxicology, comparative physiology, limnology, zoology-carcinology, and water quality assessment Features coverage of both Daphniids and representatives of other families, with attention drawn to little-studied aspects of their physiology, especially of those living in the littoral zone Includes guidance to the literature on cladoceran physiology in four languages Discusses advantages and shortcomings of Cladocera as experimental animals and indicators of water quality

[Aquatic Photosynthesis](#) Garland Science

Ecological Genetics addresses the fundamental problems of which of the many molecular markers should be used and how the resulting data should be analysed in clear, accessible language, suitable for upper-level undergraduates through to research-level professionals. A very accessible straightforward text to deal with this difficult topic - applying modern molecular techniques to ecological processes. Written by active researchers and teachers within the field. There will be an accompanying web site managed by the authors, comprising of worked examples, test data sets and hyperlinks to relevant web pages.

[Environmental DNA](#) Academic Press

Molecular approaches have opened new windows on a host of ecological and evolutionary disciplines, ranging from population genetics and behavioral ecology to conservation biology and systematics. *Molecular Markers, Natural History and Evolution* summarizes the multi-faceted discoveries about organisms in nature that have stemmed from analyses of genetic markers provided by polymorphic proteins and DNAs. The first part of the book introduces rationales for the use of molecular markers, provides a history of molecular phylogenetics, and describes a wide variety of laboratory methods and interpretative tools in the field. The second and major portion of the book provides a cornucopia of biological applications for molecular markers, organized along a scale from micro-evolutionary topics (such as forensics, parentage, kinship, population structure, and intra-specific phylogeny) to macro-evolutionary themes (including species relationships and the deeper phylogenetic structure in the tree of life). Unlike most prior books in molecular evolution, the focus is on organismal natural history and evolution, with the macromolecules being the means rather than the ends of scientific inquiry. Written as an intellectual stimulus for the advanced undergraduate, graduate student, or the practicing biologist desiring a wellspring of research ideas at the interface of molecular and organismal biology, this book presents material in a manner that is both technically straightforward, yet rich with concepts and with empirical examples from the world of nature.

[Introduction to Conservation Genetics](#) Princeton University Press

Insects represent the most abundant and diverse animal group on Earth. The number of described species is more than one million and up to ten million are estimated. Insects have one of the widest distributions in the world because they have adapted to extreme ranges of environments. Molecular ecology studies ecological processes based on the analysis

[Introduction to Molecular Biophysics](#) Elsevier

Ecology and Evolution of Cancer is a timely work outlining ideas that not only represent a substantial and original contribution to the fields of evolution, ecology, and cancer, but also goes beyond by connecting the interfaces of these disciplines. This work engages the expertise of a multidisciplinary research team to collate and review the latest knowledge and developments in this exciting research field. The evolutionary perspective of cancer has gained significant international recognition and interest, which is fully understandable given that somatic cellular selection and evolution are elegant explanations for carcinogenesis. Cancer is now generally accepted to be an evolutionary and ecological process with complex interactions between tumor cells and their environment sharing many similarities with organismal evolution. As a critical contribution to this field of research the book is important and relevant for the applications of evolutionary biology to understand the origin of cancers, to control neoplastic progression, and to prevent therapeutic failures. Covers all aspects of the evolution of cancer, appealing to researchers seeking to

understand its origins and effects of treatments on its progression, as well as to lecturers in evolutionary medicine Functions as both an introduction to cancer and evolution and a review of the current research on this burgeoning, exciting field, presented by an international group of leading editors and contributors Improves understanding of the origin and the evolution of cancer, aiding efforts to determine how this disease interferes with biotic interactions that govern ecosystems Highlights research that intends to apply evolutionary principles to help predict emergence and metastatic progression with the aim of improving therapies

Molecular Ecology and Conservation Genetics of Neotropical Mammals Academic Press

Cellular and Molecular Approaches in Fish Biology is a highly interdisciplinary resource that will bring industry professionals up-to-date on the latest developments and information on fish biology research. The book combines an historical overview of the different research areas in fish biology with detailed descriptions of cellular and molecular approaches and recommendations for research. It provides different points-of-view on how researchers have addressed timely issues, while also describing and dissecting some of the new experimental/analytical approaches used to answer key questions at cellular and molecular levels. Provides detailed descriptions of each research approach, highlighting the tricks of the trade for its effective and successful application Includes the latest developments in fish reproduction, fish nutrition, fish wellbeing, ecology and toxicology Presents hot topic areas of research, including genetic editing, epigenetics and eDNA

Fate, Chance, and the Future of Evolution Elsevier

Sequenced biological macromolecules have revitalized systematic studies of evolutionary history. Molecular Systematics of Fishes is the first authoritative overview of the theory and application of these sequencing data to fishes. This volume explores the phylogeny of fishes at multiple taxonomic levels, uses methods of analysis of molecular data that apply both within and between fish populations, and employs molecule-based phylogenies to address broader questions of evolution. Targeted readers include ichthyologists, marine scientists, and all students, faculty, and researchers interested in fish evolution and ecology and vertebrate systematics. Focuses on the phylogeny and evolutionary biology of fishes Contains phylogenies of fishes at multiple taxonomic levels Applies molecule-based phylogenies to broader questions of evolution Includes methods for critique of analysis of molecular data

Design, Analysis, and Application Elsevier

Molecular Exercise Physiology: An Introduction is the first student-friendly textbook to be published on this key topic in contemporary sport and exercise science. It introduces sport and exercise genetics and the molecular mechanisms by which exercise causes adaptation. The text is linked to real life sport and exercise science situations such as 'what makes people good at distance running?', 'what DNA sequence variations code for a high muscle mass?' or 'by what mechanisms does exercise improve type2 diabetes?' The book includes a full range of useful features, such as summaries, definitions of key terms, guides to further reading, review questions, personal comments by molecular exercise pioneers (Booth, Bouchard) and leading research in the field, as well as descriptions of research methods. A companion website offers interactive and downloadable resources for both student and lecturers. Structured around central themes in sport and exercise science, such as nutrition, endurance training, resistance training, exercise & chronic disease and ageing, this book is the perfect foundation around which to build a complete upper-level undergraduate or postgraduate course on molecular exercise physiology.

Molecular Ecology Academic Press

An innovative introduction to ecology and evolution This unique textbook introduces undergraduate students to quantitative models and methods in

ecology, behavioral ecology, evolutionary biology, and conservation. It explores the core concepts shared by these related fields using tools and practical skills such as experimental design, generating phylogenies, basic statistical inference, and persuasive grant writing. And contributors use examples from their own cutting-edge research, providing diverse views to engage students and broaden their understanding. This is the only textbook on the subject featuring a collaborative "active learning" approach that emphasizes hands-on learning. Every chapter has exercises that enable students to work directly with the material at their own pace and in small groups. Each problem includes data presented in a rich array of formats, which students use to answer questions that illustrate patterns, principles, and methods. Topics range from Hardy-Weinberg equilibrium and population effective size to optimal foraging and indices of biodiversity. The book also includes a comprehensive glossary. In addition to the editors, the contributors are James Beck, Cawas Behram Engineer, John Gaskin, Luke Harmon, Jon Hess, Jason Kolbe, Kenneth H. Kozak, Robert J. Robertson, Emily Silverman, Beth Sparks-Jackson, and Anton Weisstein. Provides experience with hypothesis testing, experimental design, and scientific reasoning Covers core quantitative models and methods in ecology, behavioral ecology, evolutionary biology, and conservation Turns "discussion sections" into "thinking labs" Professors: A supplementary Instructor's Manual is available for this book. It is restricted to teachers using the text in courses. For information on how to obtain a copy, refer to: http://press.princeton.edu/class_use/solutions.html

Brown Trout An Introduction to Molecular Ecology

Ecological biochemistry concerns the biochemistry of interactions between animals, plants and the environment, and includes such diverse subjects as plant adaptations to soil pollutants and the effects of plant toxins on herbivores. The intriguing dependence of the Monarch butterfly on its host plants is chosen as an example of plant-animal coevolution in action. The ability to isolate trace amounts of a substance from plant tissues has led to a wealth of new research, and the fourth edition of this well-known text has consequently been extensively revised. New sections have been provided on the cost of chemical defence and on the release of predator-attracting volatiles from plants. New information has been included on cyanogenesis, the protective role of tannins in plants and the phenomenon of induced defence in plant leaves following herbivory. Advanced level students and research workers alike will find much of value in this comprehensive text, written by an acknowledged expert on this fascinating subject. The book covers the biochemistry of interactions between animals, plants and the environment, and includes such diverse subjects as plant adaptations to soil pollutants and the effects of plant toxins on herbivores The intriguing dependence of the Monarch butterfly on its host plants is chosen as an example of plant-animal coevolution in action New sections have been added on the cost of chemical defence and on the release of predators attracting volatiles from plants New information has been included on cyanogenesis, the protective role of tannins in plants and the phenomenon of induced defence in plant leaves following herbivory

Applications of Emerging Technologies CRC Press

DNA can be extracted and sequenced from a diverse range of biological samples, providing a vast amount of information about evolution and ecology. The analysis of DNA sequences contributes to evolutionary biology at all levels, from dating the origin of the biological kingdoms to untangling family relationships. An Introduction to Molecular Evolution and Phylogenetics presents the fundamental concepts and intellectual tools you need to understand how the genome records information about evolutionary past and processes, how that information can be "read", and what kinds of questions we can use that information to answer. Starting with evolutionary principles, and illustrated throughout with biological examples, it is the perfect starting point on the journey to an understanding of the way molecular data is used in modern biology. Online Resource Centre The Online Resource Centre features: For registered adopters of the book: - Class plans for one-hour hands-on sessions associated with each chapter - Figures from the textbook to view and download

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