

Evolutionary Biology Textbook

Evolutionary Developmental Biology, Volume 141 focuses on recent research in evolutionary developmental biology, the science studying how changes in development cause the variations that natural selection operate on. Several new hypotheses and models are presented in this volume, and these concern how homology may be properly delineated, how neural crest and placode cells emerged and how they formed the skull and jaw, and how plasticity and developmental symbiosis enable normal development to be regulated by environmental factors. •New models for homology •New hypotheses for the

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generation of chordates • New models for the roles of plasticity and symbionts in normal development

Trace the evolutionary history of fourteen different species of finches on the Galapagos Islands that were studied by Charles Darwin.

*A major new textbook. A concise and clear introduction to evolutionary biology. This book introduces what is essential and exciting in evolutionary biology. It covers whole field and emphasises the important concepts for the student. Care has been taken to express complex and stimulating ideas in simple language, while the frequent examples and running summaries make reading fun. Its logical structure means that it can be read straight through, one chapter per sitting. **

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*Concise, clear, and states what is important * Concentrates on the central concepts and illustrates them with telling examples * Running summaries in the margins make navigation easy * Suitable for a one-year or one-semester course in evolution * Summaries at chapter ends * Each chapter's links to neighbouring chapters are explained Evolution: an introduction takes a fresh approach to classical topics such as population genetics and natural selection, and gives an overview of recent advances in hot areas such as sexual selection, genetic conflict, life history evolution, and phenotypic plasticity. Detail of contents The Prologue is unique and uniquely motivating. It makes four central points about evolution in the*

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form of four case studies told as brief stories. Chapters 1-3 describe natural selection and the essential difference between adaptive and neutral evolution with unmatched clarity and simplicity. Chapter 4 emphasizes the essential message of population genetics without burdening the students with any of the unessential details and places unique emphasis on the role of the genetic system in constraining the response to selection. Chapter 6 is not found in any other evolution textbook, although there are a number of recent books on the subject, and it therefore provides an introductory overview of a topic that has been the object of much recent interest and promises to generate much more insight: the expression of genetic variation

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analysed with the concept of reaction norms. Chapters 7-9 cover sex, life histories, and sexual selection in greater depth than they are dealt with in any other introductory textbook but without introducing advanced technical language and analysis. Chapters 6-9 thus give unprecedented coverage to phenotypic evolution in an introductory text. Chapter 10 on multilevel selection and genetic conflict is unique in introductory textbooks. Rolf Hoekstra has achieved a wonder of clarity and concision on the essentials of this exciting topic. Chapters 11 and 12 on speciation and systematics are, by comparison, pretty standard, but they continue the policy of clarity and concision with the focus on essentials. Chapter 13 on the history

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of the planet and of life is a completely new approach unabashedly designed to motivate students to think about deep time, geology, paleontology, and fossils. Chapter 14 on the major transitions in evolution is also not found in any other introductory textbook. It documents the conceptual issues raised in the history of life briefly and in a form that will stimulate the gifted. Chapter 15 profiles the chief insights made possible by molecular systematics in the form of four case studies ranging from deep time to recent European history. It has standard content but unique structure. A strong point is the way mitochondrial Eve is contrasted with transpecies polymorphism to show students how to think about inferences

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with molecular evidence. Chapter 16 briefly presents the principle comparative methods and the kinds of insights that can be achieved with them. It is not unique - Ridley covers this ground well - but the examples used are new and the essential features of the methods - including potential pitfalls - are quite clearly described. Chapter 17 places evolutionary thought into the context both of the natural sciences and of society at large.

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

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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,

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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 Principles of Evolutionary Medicine Urban Evolutionary Biology The Comparative Method in Evolutionary Biology 21st Century Applications of Evolutionary Biology

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The Origins and Mechanisms of Diversity

Traces scholarly thought from the nineteenth-century birth of evolutionary biology to the mapping of the human genome through forty-eight essays, arranged in chronological order, each preceded by a one-page essay that explains the significance of the chosen work.

Although biologists recognize evolutionary ecology by name, many only have a limited understanding of its conceptual roots and

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historical development. Conceptual Breakthroughs in Evolutionary Ecology fills that knowledge gap in a thought-provoking and readable format. Written by a world-renowned evolutionary ecologist, this book embodies a unique blend of expertise in combining theory and experiment, population genetics and ecology. Following an easily-accessible structure, this book encapsulates and chronologizes the history behind evolutionary ecology. It also focuses on the

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integration of age-structure and density-dependent selection into an understanding of life-history evolution. Covers over 60 seminal breakthroughs and paradigm shifts in the field of evolutionary biology and ecology Modular format permits ready access to each described subject Historical overview of a field whose concepts are central to all of biology and relevant to a broad audience of biologists, science historians, and philosophers of science Research conducted over

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the last fifteen years has placed in question many of the traditional conclusions about the evolution of human female sexuality. Women have not lost estrus, as earlier researchers thought, but it is simply concealed, resulting in two functionally distinct sexualities with markedly different ends in each phase. At the fertile phase of the cycle, women prefer male traits that may mark superior genetic quality, and at infertile phases, they prefer men willing to invest resources in a mate. Thus,

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women's peri-ovulatory sexuality functions to obtain a sire of superior genetic quality, and is homologous with estrus in other vertebrates. This model sheds light on male human sexuality as well: men perceive and respond to women's estrus, including by increased mate guarding. Men's response is limited, compared to other vertebrate males, implying coevolutionary history of selection on females to conceal estrus from men and selection on men to detect it. Research

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indicates that women's concealed estrus is an adaptation to copulate conditionally with men other than the pair-bond partner. Women's sexual ornaments-the estrogen-facilitated features of face and body-are honest signals of individual quality pertaining to future reproductive value.

This unique book looks at the biology of aging from a fundamentally new perspective, one based on evolutionary theory rather than traditional concepts which emphasize molecular

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and cellular processes. The basis for this approach lies in the fact that natural selection, as a powerful determining force, tends to decline in importance with age. Many of the characteristics we associate with aging, the author argues, are more the result of this decline than any mechanical imperative contained within organic structures. This theory in turn yields the most fruitful avenues for seeking answers to the problem of aging, and should be recognized as the intellectual core of

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gerontology and the foundation for future research. The author ably surveys the vast literature on aging, presenting mathematical, experimental, and comparative findings to illustrate and support the central thesis. The result is the first complete synthesis of this vital field.

Evolutionary biologists, gerontologists, and all those concerned with the science of aging will find it a stimulating, strongly argued account.

**The Land of the Orang-utan
and the Bird of Paradise**

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Evolutionary Developmental Biology

The Evolutionary Biology of Plants

Second Edition

Essential Readings in Evolutionary Biology

Evolutionary Theory is for graduate students, researchers, and advanced undergraduates who want an understanding of the mathematical and biological reasoning that underlies evolutionary theory. The book covers all of the major theoretical approaches used to study the mechanics of evolution, including classical one- and two-locus models, diffusion theory, coalescent theory, quantitative genetics, and game theory. There are also chapters on theoretical approaches to

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the evolution of development and on multilevel selection theory. Each subject is illustrated by focusing on those results that have the greatest power to influence the way that we think about how evolution works. These major results are developed in detail, with many accompanying illustrations, showing exactly how they are derived and how the mathematics relates to the biological insights that they yield. In this way, the reader learns something of the actual machinery of different branches of theory while gaining a deeper understanding of the evolutionary process. Roughly half of the book focuses on gene-based models, the other half being concerned with general phenotype-based theory. Throughout, emphasis is placed on the

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fundamental relationships between the different branches of theory, illustrating how all of these branches are united by a few basic, universal, principles. The only mathematical background assumed is basic calculus. More advanced mathematical methods are explained, with the help of an extensive appendix, when they are needed.

Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than

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being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, *Concepts of Biology* is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and everyday applications of the concepts at hand. We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in

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most syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts.

"Provine's thorough and thoroughly admirable examination of Wright's life and influence, which is accompanied by a very useful collection of Wright's papers on evolution, is the best we have for any recent figure in evolutionary biology."—Joe Felsenstein, *Nature* "In *Sewall Wright and Evolutionary Biology* . . . Provine has produced an intellectual biography which serves to

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chart in considerable detail both the life and work of one man and the history of evolutionary theory in the middle half of this century. Provine is admirably suited to his task. . . . The resulting book is clearly a labour of love which will be of great interest to those who have a mature interest in the history of evolutionary theory."-John Durant,
;ITimes Higher Education
Supplement;X

Biological evolution, the theory of natural selection and of common descent, is a triumph both of human reasoning and scientific undertaking. The biological discipline of evolution contains both a chronicle of human endeavour and the story of life on Earth. This book is concerned with living forms and how they developed

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from 'simple and unpromising beginnings'. It considers evolution as both process and product. The author, an experienced teacher and educator, employs a historical narrative, used to convey the idea of 'change with modification' and to emphasise the relevance of evolution to contemporary bioscience. Biological evolution has now become part of the scientific orthodoxy and this accessible text will assist undergraduate students in the biological sciences within any ongoing debate.

How and Why Species Multiply
Sewall Wright and Evolutionary
Biology

Biological Evolution

Evolutionary Biology of Aging

An Introduction

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Douglas Futuyma presents an overview of current thinking on theories of evolution, aimed at an undergraduate audience. The application of evolutionary biology addresses a wide range of practical problems in medicine, agriculture, the environment, and society. Such cutting-edge applications are emerging due to recent advances in DNA sequencing, new gene editing tools, and computational methods. This book is about

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applied evolution – the application of the principles of and information about evolutionary biology to diverse practical matters. Although applied evolution has existed, unrecognized, for a very long time, today's version has a much wider scope. Evolutionary medicine has formed into its own discipline. Evolutionary approaches have long been employed in agriculture and in conservation biology.

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But Darwin's reach now extends beyond just these three fields. It now also includes forensic biology and the law. Ideas from evolutionary biology can be used to inform policy regarding foreign affairs and national security. Applied evolution is not only interdisciplinary, but also multidisciplinary. Consequently, this book is for experts in one field who are interested in expanding their evolutionary horizons.

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It is also for students, at the undergraduate and graduate levels. One of the public relations challenges faced by evolutionary biology is that most people do not see it being all that relevant to their daily lives. Even many who accept evolution do not grasp how far Darwin's reach extends. This book will change that perception. Key Features: Emphasizes the expanding role evolutionary biology has in today's world.

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Includes examples from medicine, law, agriculture, conservation, and even national security
Summarizes new technologies and computational methods that originated as innovations based in part or whole on evolutionary theory.
Current. Has extensive coverage of the COVID-19 pandemic and other recent topics. Documents the important role evolution plays in everyday life.

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Illustrates the broadly interdisciplinary nature of evolutionary theory.

Related Titles Rogers, S. O. Integrating

Molecular Evolution (ISBN 9780367869526)

DeSalle, R. et al.

Phylogenomics: A Primer (ISBN 9780367028497)

Bard, J. Evolution: The Origins and Mechanisms of Diversity (ISBN

9780367357016) The

applications of evolutionary biology are far too numerous to include in just one book. Plus, new

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scientific findings emerge almost every day underscoring the central role evolution plays in our lives. The author has established a blog site to highlight these fascinating discoveries. Please visit <https://darwinsreach.blog> to be inspired by "... endless forms most beautiful and most wonderful [that] have been, and are being evolved." (the last line of Charles Darwin's *The Origin of Species*). Evolution is the single unifying principle of

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biology and core to everything in the life sciences. More than a century of work by scientists from across the biological spectrum has produced a detailed history of life across the phyla and explained the mechanisms by which new species form. This textbook is unique in describing both this history and the mechanisms of speciation at a level providing students the tools needed to read the research literature on

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evolution. Students will therefore learn about cladistics, molecular phylogenies, the molecular-genetical basis of evolutionary change including the important role of protein networks, symbionts and holobionts, together with the core principles of developmental biology. The book also includes introductory appendices that provide background knowledge on, for example, the diversity of life today,

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fossils, the geology of Earth and the history of evolutionary thought. Key Features Summarizes the origins of life and the evolution of the eukaryotic cell and of Urbilateria, the last common ancestor of invertebrates and vertebrates. Reviews the history of life across the phyla based on the fossil record and computational phylogenetics. Explains evo-devo and the generation of anatomical novelties. Illustrates

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the roles of small populations, genetic drift, mutation and selection in speciation. Documents human evolution using the fossil record and evidence of dispersal across the world leading to the emergence of modern humans. Evolutionary science is critical to an understanding of integrated human biology and is increasingly recognised as a core discipline by medical and public health

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professionals. Advances in the field of genomics, epigenetics, developmental biology, and epidemiology have led to the growing realisation that incorporating evolutionary thinking is essential for medicine to achieve its full potential. This revised and updated second edition of the first comprehensive textbook of evolutionary medicine explains the principles of evolutionary biology from a medical

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perspective and focuses on how medicine and public health might utilise evolutionary thinking. It is written to be accessible to a broad range of readers, whether or not they have had formal exposure to evolutionary science. The general structure of the second edition remains unchanged, with the initial six chapters providing a summary of the evolutionary theory relevant to understanding human health and disease,

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using examples specifically relevant to medicine. The second part of the book describes the application of evolutionary principles to understanding particular aspects of human medicine: in addition to updated chapters on reproduction, metabolism, and behaviour, there is an expanded chapter on our coexistence with micro-organisms and an entirely new chapter on

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cancer. The two parts are bridged by a chapter that details pathways by which evolutionary processes affect disease risk and symptoms, and how hypotheses in evolutionary medicine can be tested. The final two chapters of the volume are considerably expanded; they illustrate the application of evolutionary biology to medicine and public health, and consider the ethical and societal issues of an

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**evolutionary
perspective. A number of
new clinical examples
and historical
illustrations are
included. This second
edition of a novel and
popular textbook
provides an updated
resource for doctors and
other health
professionals, medical
students and biomedical
scientists, as well as
anthropologists
interested in human
health, to gain a better
understanding of the
evolutionary processes**

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**underlying human health
and disease.**

Icons of Evolution

Evolutionary Biology

The Tangled Bank

The Recurrence of

Similarity in Evolution

**The Evolutionary Biology
of Species**

Evolutionary genetics is the study of how genetic variation leads to evolutionary change. With the recent explosion in the availability of whole genome sequence data, vast quantities of genetic data are being generated at an ever-increasing pace with the

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result that programming has become an essential tool for researchers. Most importantly, a thorough understanding of evolutionary principles is essential for making sense of this genetic data. This up-to-date textbook covers all the major components of modern evolutionary genetics, carefully explaining fundamental processes such as mutation, natural selection, genetic drift, and speciation, together with their consequences. The book also draws on a rich literature of exciting and inspiring

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examples to demonstrate the diversity of evolutionary research, including an emphasis on how evolution and selection has shaped our own species. Furthermore, at the end of each chapter, study questions are provided to motivate the reader to think and reflect on the concepts introduced. Practical experience is essential when it comes to developing an understanding of how to use genetic and genomic data to analyze and address interesting questions in the life sciences and how to interpret results in

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meaningful ways. In addition to the main text, a series of online tutorials using the R language serves as an introduction to programming, statistics, and the analysis of evolutionary genetic data. The R environment stands out as an ideal all-purpose, open source platform to handle and analyze such data. The book and its online materials take full advantage of the authors' own experience in working in a post-genomic revolution world, and introduce readers to the plethora of molecular and analytical methods that

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have only recently become available.

Berta and Sumich have succeeded yet again in creating superior marine reading! This book is a succinct yet comprehensive text devoted to the systematics, evolution, morphology, ecology, physiology, and behavior of marine mammals. The first edition, considered the leading text in the field, is required reading for all marine biologists concerned with marine mammals. Revisions include updates of citations, expansion of nearly

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every chapter and full color photographs. This title continues the tradition by fully expanding and updating nearly all chapters.

Comprehensive, up-to-date coverage of the biology of all marine mammals Provides a phylogenetic framework that integrates phylogeny with behavior and ecology

Features chapter summaries, further readings, an appendix, glossary and an extensive bibliography Exciting new color photographs and additional distribution maps

The Princeton Guide to Evolution is a comprehensive,

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concise, and authoritative reference to the major subjects and key concepts in evolutionary biology, from genes to mass extinctions. Edited by a distinguished team of evolutionary biologists, with contributions from leading researchers, the guide contains some 100 clear, accurate, and up-to-date articles on the most important topics in seven major areas: phylogenetics and the history of life; selection and adaptation; evolutionary processes; genes, genomes, and phenotypes; speciation and

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macroevolution; evolution of behavior, society, and humans; and evolution and modern society. Complete with more than 100 illustrations (including eight pages in color), glossaries of key terms, suggestions for further reading on each topic, and an index, this is an essential volume for undergraduate and graduate students, scientists in related fields, and anyone else with a serious interest in evolution. Explains key topics in some 100 concise and authoritative articles written by a team of leading evolutionary

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biologists Contains more than 100 illustrations, including eight pages in color Each article includes an outline, glossary, bibliography, and cross-references Covers phylogenetics and the history of life; selection and adaptation; evolutionary processes; genes, genomes, and phenotypes; speciation and macroevolution; evolution of behavior, society, and humans; and evolution and modern society

Why do unrelated organisms sometimes appear almost identical in details of the anatomy, behavior,

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physiology, and ecology?
Homoplasy assembles leaders
in evolutionary biology to
explore issues of parallelism,
convergence, and reversals.

This innovative book is
certain to provoke discussion
of homoplasy compelling
evidence for particular
theories of evolutionary
change The first book on this
increasingly interesting
subject Includes authoritative
treatments from leading
experts expressing a variety
of viewpoints

Evolution

Concepts of Biology

Concepts, Analysis, and

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Practice

Modern Phylogenetic
Comparative Methods and
Their Application in
Evolutionary Biology
Homoplasy

Urban Evolutionary Biology fills an important knowledge gap on wild organismal evolution in the urban environment, whilst offering a novel exploration of the fast-growing new field of evolutionary research. The growing rate of urbanization and the maturation of urban study systems worldwide means interest in the urban environment as an agent of evolutionary change is rapidly increasing. We are presently witnessing the emergence of a new

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field of research in evolutionary biology. Despite its rapid global expansion, the urban environment has until now been a largely neglected study site among evolutionary biologists. With its conspicuously altered ecological dynamics, it stands in stark contrast to the natural environments traditionally used as cornerstones for evolutionary ecology research. Urbanization can offer a great range of new opportunities to test for rapid evolutionary processes as a consequence of human activity, both because of replicate contexts for hypothesis testing, but also because cities are characterized by an array of easily quantifiable

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environmental axes of variation and thus testable agents of selection. Thanks to a wide possible breadth of inference (in terms of taxa) that may be studied, and a great variety of analytical methods, urban evolution has the potential to stand at a fascinating multi-disciplinary crossroad, enriching the field of evolutionary biology with emergent yet incredibly potent new research themes where the urban habitat is key. *Urban Evolutionary Biology* is an advanced textbook suitable for graduate level students as well as professional researchers studying the genetics, evolutionary biology, and ecology of urban environments. It is also highly relevant to urban

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ecologists and urban wildlife practitioners.

Everything you were taught about evolution is wrong.

Evolution presents foundational concepts through a contemporary framework of population genetics and phylogenetics that is enriched by current research and stunning art. In every chapter, new critical thinking questions and expanded end-of-chapter problems emphasizing data interpretation reinforce the Second Edition's focus on helping students think like evolutionary biologists.

The impact of evolutionary theory on the philosophy of science has been no less profound than its

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impact on the science of biology itself. Advances in this theory provide a rich set of examples for thinking about the nature of scientific explanation and the structure of science. Many of the developments in our understanding of evolution resulted from contributions by both philosophers and biologists engaging over theoretical questions of mutual interest. This volume traces some of the most influential exchanges in this field over the last few decades. Focal topics include the nature of biological functions, adaptationism as an explanatory and methodological doctrine, the levels of selection debate, the concepts of

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fitness and drift, and the relationship of evolutionary to developmental biology.

Evolutionary Genetics

Philosophy of Evolutionary Biology

Marine Mammals

Evolutionary Theory

The Princeton Guide to Evolution

Covers the genetic, developmental, and ecological mechanisms of evolutionary change, the major features of evolutionary history as revealed by phylogenetic and paleontological studies, and material on adaptation, molecular evolution, co-evolution, and human evolution.

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Evolutionary biology has increasingly relied upon tools developed in molecular biology that allow for the structure and function of macromolecules to be used as data for exploring the patterns and processes of evolutionary change. Integrated Molecular Evolution, Second Edition is a textbook intended to expansively and comprehensive review evolutionary studies now routinely using molecular data. This new edition has been thoroughly updated and expanded, and provides a basic summary of evolutionary biology as well as a review of current phylogenetics and

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phylogenomics. Reflecting a burgeoning pedagogical landscape, this new edition includes nearly double the number of chapters, including a new section on molecular and bioinformatic methods. Dedicated chapters were added on: Evolution of the genetic code Mendelian genetics and population genetics Natural selection Horizontal gene transfers Animal development and plant development Cancer Extraction of biological molecules Analytical methods Sequencing methods and sequencing analyses Omics Phylogenetics and phylogenetic networks Protein

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**trafficking Human genomics
More than 400 illustrations
appear in this edition,
doubling the number included
in the first edition, and over
100 of these diagrams are now
in color. The second edition
combines and integrates
extensive summaries of
genetics and evolutionary
biology in a manner that is
accessible for students at
either the graduate or
undergraduate level. It also
provides both the basic
foundations of molecular
evolution, such as the
structure and function of DNA,
RNA and proteins, as well as
more advanced chapters**

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reviewing analytical techniques for obtaining sequences, and interpreting and archiving molecular and genomic data.

Many changes that occur during the embryonic development of an individual animal can be seen as a parallel to changes that have occurred in species or groups of species during evolutionary time. This book covers the interaction between developmental and evolutionary changes in animals.

Provides a comprehensive synthesis of modern evolutionary biology as it

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relates to plants. This text recounts the saga of plant life from its origins to the radiation of the flowering plants. Through computer-generated "walks" it shows how living plants might have evolved.

The Evolutionary Ecology of Invasive Species

The Radiation of Darwin's Finches

Integrated Molecular Evolution

Mathematical and Conceptual Foundations

The Evolutionary Biology of Human Female Sexuality

Phylogenetic comparative approaches are powerful

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analytical tools for making evolutionary inferences from interspecific data and phylogenies. The phylogenetic toolkit available to evolutionary biologists is currently growing at an incredible speed, but most methodological papers are published in the specialized statistical literature and many are incomprehensible for the user community. This textbook provides an overview of several newly developed phylogenetic comparative methods that allow to investigate a broad array of questions on how phenotypic characters evolve along the branches of phylogeny and how

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such mechanisms shape complex animal communities and interspecific interactions. The individual chapters were written by the leading experts in the field and using a language that is accessible for practicing evolutionary biologists. The authors carefully explain the philosophy behind different methodologies and provide pointers – mostly using a dynamically developing online interface – on how these methods can be implemented in practice. These “conceptual” and “practical” materials are essential for expanding the qualification of both students and scientists, but

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also offer a valuable resource for educators. Another value of the book are the accompanying online resources (available at: <http://www.mpcm-evolution.com>), where the authors post and permanently update practical materials to help embed methods into practice.

Published by Sinauer Associates, an imprint of Oxford University Press. Extensively rewritten and reorganized, this new edition of Evolution--featuring a new coauthor: Mark Kirkpatrick (The University of Texas at Austin)--offers additional expertise in evolutionary genetics and genomics, the fastest-

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developing area of evolutionary biology. Directed toward an undergraduate audience, the text emphasizes the interplay between theory and empirical tests of hypotheses, thus acquainting students with the process of science. It addresses major themes--including the history of evolution, evolutionary processes, adaptation, and evolution as an explanatory framework--at levels of biological organization ranging from genomes to ecological communities.

By presenting evolutionary biology as an ongoing research effort, this best-seller aims to help readers think like scientists. The

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authors convey the excitement and logic of evolutionary science by introducing principles through recent and classical studies, and by emphasizing real-world applications. Features a new chapter on Phylogenomics and the Molecular Basis of Adaptation (Ch. 15). Offers an earlier presentation of Reconstructing Evolutionary Trees, reflecting the growing importance of this topic in the field. Includes the latest research and examples, giving students access to the most current developments in the field. Includes full-color photographs, diagrams and data-graphics throughout, developed by the

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author. Undergraduate courses in evolution

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

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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

The Malay Archipelago

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An Introduction to Molecular Evolution and Phylogenetics

Concepts and Practice Darwin's Reach

'Species' are central to understanding the origin and dynamics of biological diversity; explaining why lineages split into multiple distinct species is one of the main goals of evolutionary biology.

However the existence of species is often taken for granted, and precisely what is meant by species and whether they really exist as a pattern of nature has rarely been modelled or critically tested. This

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novel book presents a synthetic overview of the evolutionary biology of species, describing what species are, how they form, the consequences of species boundaries and diversity for evolution, and patterns of species accumulation over time. The central thesis is that species represent more than just a unit of taxonomy; they are a model of how diversity is structured as well as how groups of related organisms evolve. The author adopts an intentionally broad approach, stepping back from the details to consider what species constitute, both theoretically and

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empirically, and how we detect them, drawing on a wealth of examples from microbes to multicellular organisms.

Used widely in non-majors biology classes, The Tangled Bank is the first textbook about evolution intended for the general reader. Zimmer, an award-winning science writer, takes readers on a fascinating journey into the latest discoveries about evolution. In the Canadian Arctic, paleontologists unearth fossils documenting the move of our ancestors from sea to land. In the outback of Australia, a zoologist tracks some of the world's deadliest snakes to

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decipher the 100-million-year evolution of venom molecules. In Africa, geneticists are gathering DNA to probe the origin of our species. In clear, non-technical language, Zimmer explains the central concepts essential for understanding new advances in evolution, including natural selection, genetic drift, and sexual selection. He demonstrates how vital evolution is to all branches of modern biology—from the fight against deadly antibiotic-resistant bacteria to the analysis of the human genome. From Darwin onward, it has been second nature for

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evolutionary biologists to think comparatively, because comparisons establish the generality of evolutionary phenomena. Do large genomes slow down development? What lifestyles select for large brains? Are extinction rates related to body size? These are all questions for the comparative method, and this book is about how such questions can be answered. It examines how the comparative method complements other approaches, identifies the biological causes of similarity among species, and discusses methods for reconstructing phylogenetic trees, along with many other

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topics. The book will interest all students, professionals, and researchers in evolutionary biology, ecology, genetics and related fields.

Human Evolutionary Biology
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