

Evolutionary Ecology Concepts And Case Studies

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Pillars of Evolution Douglas W. Morris 2011-07-14 Pillars of Evolution provides a fresh and provocative perspective on adaptive evolution. Readers new to the study of evolution will find a refreshing new insight that establishes evolutionary biology as a rigorous and predictive science, whilst practicing biologists will discover a provocative book that challenges traditional approaches. The book begins by leading readers through the mechanics of heredity, reproduction, movement, survival, and development. With that framework in place, it then explores the numerous ways that traits emerge from the interactions between genetics, development, and the environment. The key message is that adaptive changes in traits (and their underlying allelic frequencies) evolve through the traits' functions and their connection with fitness. The complex mappings from genes-to-traits-to-fitness are characterized in the structure of evolution. A single "structure matrix" describes why individuals vary in the values of adaptive traits, their ability to perform the function of those traits, and in the fitness they accrue. Fitness depends on how organisms interact with and perceive their environment in time and space. These relationships are made explicit in spatial, temporal, and organizational scale that also sets the stage for the crucially important role that ecology always plays in evolution. The ecological hallmarks of density- and frequency-dependent interactions allow the authors to explore new and exciting insights into evolution's dynamics. The theories and principles are then brought together in a final synthesis on adaptation. The book's unique approach unites genetic, development, and environmental influences into a single comprehensive treatment of the eco-evolutionary process.

Epidemiology Nuno Lunet 2012-03-13 This special issue resulted from the invitation made to selected authors to contribute with an overview of a specific subject of their choice, and is based on a collection of papers chosen to exemplify some of the interests, uses and views of the epidemiology across different areas of research and practice. Rather than the comprehensiveness and coherence of a conventional textbook, readers will find a set of independent chapters, each of them of a great interest in their own specialized areas within epidemiology. Taken together, they illustrate the contrast between the attempt to extend the limits of applicability of epidemiological research, and the "regular" scientific activity in this field or an applied epidemiology. Epidemiologists with different levels of expertise and interests will be able to find informative and inspiring readings among the chapters of this book.

Ecological Paradigms Lost Beatrix Beisner 2005-08-23 This edited volume in the Theoretical Ecology series addresses the historical development and evolution of theoretical ideas in the field of ecology. Not only does Ecological Paradigms Lost recount the history of the discipline by practitioners of the science of ecology, it includes commentary on these historical reflections by philosophers of science. Even though the theories discussed are, in many cases, are at the forefront of research, the language and approach make this material accessible to non-theoreticians. The book is structured in 5 major sections including population ecology, epidemiology, community ecology, evolutionary biology and ecosystem ecology. In each section a chapter by an eminent, experienced ecologist is complemented by analysis from a newer, cutting-edge researcher.

Reflection on the past and future of ecology A historical overview of major ideas in the field of ecology Pairing of historical views by ecologists along with a philosophical commentary directed at the practicing scientists' views by a philosopher of science Historical analysis by practicing ecologists including anecdotal experiences that are rarely recorded Based on a very popular symposium at the 2002 Ecological Society of America annual meeting in Tucson, AZ

The Geographic Mosaic of Coevolution John N. Thompson 2005-06-15 Coevolution is one of the most important ecological and genetic processes organizing the earth's biodiversity: most plants and animals require coevolved interactions with other species to survive and reproduce.

Package Price Agroecology Stephen R. Gliessman 2021-02-25 Stephen Gliessman's complementary volumes, Agroecology: The Ecology of Sustainable Food Systems, Third Edition and Field and Laboratory Investigations in Agroecology, Third Edition are now available together for one low price. Completely revised, updated, and reworked, the third edition of Agroecology presents new data, material, case studies, and options, as well as more emphasis on topics such as the values, beliefs, and ethics of sustainable food systems. The new edition of Field and Laboratory Investigations in Agroecology facilitates hands-on, experimental learning that involves close observation, creative interpretation, and constant questioning of findings.

Evolution's Wedge David W. Pfennig 2012-10-25 Despite Darwin's emphasis, competition's role in diversification remains controversial and largely underappreciated.

Predator Ecology John P. DeLong 2021 Predator-prey interactions are ubiquitous, govern the flow of energy up trophic levels, and strongly influence the structure of ecological systems. They are typically quantified using the functional response - the relationship between a predator's foraging rate and the availability of food. As such, the functional response is central to how all ecological communities function - since all communities contain foragers - and a principal driver of the abundance, diversity, and dynamics of ecological communities. The functional response also reflects all the behaviors, traits, and strategies that predators use to hunt prey and that prey use to evade predation. It is thus both a clear reflection of past evolution, including predator-prey arms races, and a major force driving the future evolution of both predator and prey. Despite their importance, there have been remarkably few attempts to synthesize or even briefly review functional responses. This novel and accessible book fills this gap, clearly demonstrating their crucial role as the link between individuals, evolution, and community properties, representing a highly-integrated and measurable aspect of ecological function. It provides a clear entry point for students, a refresher for more advanced researchers, and a motivator for future research. Predator Ecology is an advanced textbook suitable for graduate students and researchers in ecology and evolutionary biology seeking a broad, up-to-date, and authoritative coverage of the field. It will also be of relevance and use to mathematical ecologists, wildlife biologists, and anyone interested in predator-prey interactions.

Foundations of Economic Evolution Carsten Herrmann-Pillath 2013-01-01 This book is an ambitious intellectual enterprise to build a naturalistic foundation for economics, with amazingly vast knowledge of physical, biological, social sciences and philosophy. Readers will discover that approaches and insights emergent in institutional studies, (social)-neuroscience, network theory, ecological economics, bio-culture dualistic evolution, etc. are persuasively placed in a grand unified frame. It is written in a good Hayekian tradition. I recommend this book particularly to young readers who aspire to go beyond a narrowly specified discipline in the age of expanding communicability of knowledge and ideas. Masahiko Aoki, Stanford

University, US

Carsten Herrmann-Pillath's new book is an in-depth application of natural philosophy to economics that draws up an entirely new framework for economic analysis. It offers path-breaking insights on the interactions between human economic activity and nature and outlines a convincing solution to the long-standing reductionism controversy. A must-read for everyone interested in the philosophical underpinnings of economics as a science. — Ulrich Witt, Max Planck Institute of Economics, Jena, Germany

Big picture philosophy of economics drifted into a dull cul-de-sac as it became obsessively focused on falsifiability and rationality. In this book Carsten Herrmann-Pillath pushes the field back onto the open highway by locating economics in the larger frameworks of metaphysics, evolutionary dynamics and information theory. This is large-scale, ambitious synthesis of ideas of the kind we expect from time to time to see devoted to physics and biology. Why should economics merit anything less? But of course this kind of intellectual tapestry must await the appearance of an unusually devoted scholar with special patience and eccentric independence from the pressure for quick returns that characterizes academic life. In the person of Herrmann-Pillath this scholar has appeared. No one who wants to examine economics whole and in its richest context should miss his virtuoso performance in this book. — Don Ross, University of Cape Town, South Africa and Georgia State University, US

Herrmann-Pillath's work attempts to bring to bear upon the discipline of economics perspectives from other discourses which have been burgeoning recently — namely, thermodynamics, evolutionary biology, and semiotics, aiming at a consilience contextualized by economic activity and problems. This marks the work as a contemporary example of natural philosophy, which is now at the doorstep of a revival. The overall perspective is that human economic activity is an aspect of the ecology of the earth's surface, viewing it as an evolving physical system mediated through distributed mentality as expressed in technology evolution. Knowledge is taken to be physical with a performative function, as in Peirce's pragmatism. Thus, the social meanings of expectations, prices, and credit are found to be rooted in energy flows. The work draws its foundation from Hegel and C.S. Peirce and its immediate guidance from Hayek, Veblen and Georescu-Roegen. The author generates an energetic theory of economic growth, guided by Odum's maximum power principle. Economic discourse itself is reworked in the final chapter, in light of the examinations of the previous chapters, naturalizing economics within an extremely powerful contemporary framework. — Stanley N. Salthe, Binghamton University, US

An Oscar-winning performance in the theatre of consilience. It's hard to know which to praise first: Carsten Herrmann-Pillath's humility or his ambition. He says his book is not a great intellectual feat because he pursues the humble task of putting together the ideas of others. When he finally gets to economics he tries to be as simple as possible and to conceive of economics in terms of the basics, at undergraduate level, so to say. On the other hand, the scale of his ambition is to rethink the foundations of economics from first principles, while, at the same time, holding a running dialogue between contemporary sciences and classic philosophy. He's much too modest, of course, because Foundations is a major achievement, but his modesty points to what makes it such a powerful treatise: the book is not about his preferences or prejudices; it is a scientific approach that aims at establishing truthful propositions about reality. That is much harder to achieve than grand theories or complicated mathematics, because it amounts to a new modern synthesis of the field — an achievement on a par with Julian Huxley's, whose own modern synthesis of evolutionary theories in the 1940s allowed for the explosive growth of the biosciences over the next decades. The structure of the book is simple enough, providing a framework for the naturalistic turn in economics. Starting from material existence, causation and evolution, Herrmann-Pillath takes us through four fundamental concepts — individuals, networks, institutions and technology — before coming finally to the realm of economics proper, i.e. markets. However, Herrmann-Pillath believes that the foundations of economics cannot be found within economics but only in dialogue with other sciences, or what he calls the theatre of consilience. It's a theatre in which various characters come and go, where dialogue ebbs and flows, conflicts arise and are resolved, and where individual actions can be seen as concepts as, leading to higher levels of meaning as the plot unfolds. The magic of theatre, of course, is that the point of intelligibility, where the characters, actions and narrative resolve into meaningfulness, is projected out of the drama itself, into the spectator. That's you, dear reader. So it is with economics as a discipline. Economics is a player in a much larger performance about what constitutes knowledge, and how we know that. It is also a player in the economy it seeks to explain. To understand why money, firms, growth, prices, markets and other staples of economic thought emerge and function the way they do, it is necessary to situate the analysis beyond economics (and the economy), and to engage with developments across the human, evolutionary and complexity sciences. This is what Herrmann-Pillath does, analyzing a breathtaking range of illuminating and sometimes challenging work along the way. We are treated to new ideas about the externalized brain, the evolution of knowledge in the Earth System (i.e. not just among humans), the role of signs and performativity in these processes, as well as that of energetic transformations. But Herrmann-Pillath is not satisfied with the modest task of bringing the best of modern scientific thought to bear on economic concepts and performances; he really does harbor a deeper purpose. The clue is in his apparently quixotic desire to hang on to philosophical insights associated with pre-evolutionary thinkers like Aristotle and Hegel, and his apparently eccentric desire to place the semiotic philosophy of C.S. Peirce at center stage. But the patient observer will see that he is not seeking to change the facts by imposing idealist notions on them after the event. Instead, he is arguing for a change in the way we perform ourselves in the face of these facts. He is looking for a modern-day equivalent of Confucius or Socrates: one who can imagine values and beliefs that define the human species in a new way. For those who have eyes to see, as the drama unfolds, it may be that we have found such a figure in Carsten Herrmann-Pillath himself, modesty, ambition and all. This is Cultural Science as it should be done. — John Hartley, Curtin University, Australia and Cardiff University, UK

Evolution Brian Hall 2011-08-24 If you want to know whether evolution is a science, how life began, what Charles Darwin really said about evolution, why a fungus is more closely related to humans than to a plant, how experiments in evolution can be carried out, why birds are flying dinosaurs, how we manipulate the evolution of other species, and if you want a clear treatment of the processes that result in evolution, then this is the book for you! Written for those with a minimal science background, Evolution: Principles and Processes provides a concise introduction of evolutionary topics for the one-term course. Using an engaging writing style and a wealth of full-color illustrations, Hall covers all topics from the origin of universe, Earth, the origin of life, and on to how humans influence the evolution of other species. He brings together the principles and processes that explain evolutionary change and discusses the patterns of life that have resulted from the operation of evolution over the past 3.5 billion years. This overview, coupled with numerous case studies and examples, helps readers understand and truly appreciate the origin and diversity of life.

De wetenschap van het leven. Over eenheid in biologische diversiteit Bert De Groef 2009 Overzicht van de biologische grondslagen van het leven.

The Structural Links between Ecology, Evolution and Ethics Donato Bergandi 2013-01-06 Evolutionary biology, ecology and ethics: at first glance, three different objects of research, three different worldviews and three different scientific communities. In reality, there are both structural and historical links between these disciplines. First, some topics are obviously common across the board. Second, the emerging need for environmental policy management has gradually but radically changed the relationship between these disciplines. Over the last decades in particular, there has emerged a need for an interconnecting meta-paradigm that integrates more strictly evolutionary studies, biodiversity studies and the ethical frameworks that are most appropriate for allowing a lasting co-evolution between natural and social systems. Today such a need is more than a mere luxury, it is an epistemological and practical necessity.

EVOLUTION Michael Ruse 2009-01-01 Spanning evolutionary science from its inception to its latest findings, from discoveries

and data to philosophy and history, this book is the most complete, authoritative, and inviting one-volume introduction to evolutionary biology available. Clear, informative, and comprehensive in scope, *Evolution* opens with a series of major essays dealing with the history and philosophy of evolutionary biology, with major empirical and theoretical questions in the science, from speciation to adaptation, from paleontology to evolutionary development (evo devo), and concluding with essays on the social and political significance of evolutionary biology today. A second encyclopedic section travels the spectrum of topics in evolution with concise, informative, and accessible entries on individuals from Aristotle and Linnaeus to Louis Leakey and Jean Lamarck; from T. H. Huxley and E. O. Wilson to Joseph Felsenstein and Motoo Kimura; and on subjects from altruism and amphibians to evolutionary psychology and Piltdown Man to the Scopes trial and social Darwinism. Readers will find the latest word on the history and philosophy of evolution, the nuances of the science itself, and the intricate interplay among evolutionary study, religion, philosophy, and society. Appearing at the beginning of the Darwin Year of 2009, the 200th anniversary of the birth of Charles Darwin and the 150th anniversary of the publication of the *Origin of Species*—this volume is a fitting tribute to the science Darwin set in motion.

Evolutionary Genetics Charles W. Fox 2006-04-27 Charles Fox and Jason Wolf have brought together leading researchers to produce a cutting-edge primer introducing readers to the major concepts in modern evolutionary genetics. This book spans the continuum of scale, from studies of DNA sequence evolution through proteins and development to multivariate phenotypic evolution, and the continuum of time, from ancient events that lead to current species diversity to the rapid evolution seen over relatively short time scales in experimental evolution studies. Chapters are accessible to an audience lacking extensive background in evolutionary genetics but also current and in-depth enough to be of value to established researchers in evolution biology.

Handbook of Evolutionary Research in Archaeology Anna Marie Prentiss 2019-06-03 *Evolutionary Research in Archaeology* seeks to provide a comprehensive overview of contemporary evolutionary research in archaeology. The book will provide a single source for introduction and overview of basic and advanced evolutionary concepts and research programs in archaeology. Content will be organized around four areas of critical research including microevolutionary and macroevolutionary process, human ecology studies (evolutionary ecology, demography, and niche construction), and evolutionary cognitive archaeology. Authors of individual chapters will address theoretical foundations, history of research, contemporary contributions and debates, and implications for the future for their respective topics. As appropriate, authors present or discuss short empirical case studies to illustrate key arguments.

Environmental Stress, Adaptation and Evolution K. Bijlsma 2013-03-08 Most organisms and populations have to cope with hostile environments, threatening their existence. Their ability to respond phenotypically and genetically to these challenges and to evolve adaptive mechanisms is, therefore, crucial. The contributions to this book aim at understanding, from an evolutionary perspective, the impact of stress on biological systems. Scientists, applying different approaches spanning from the molecular and the protein level to individuals, populations and ecosystems, explore how organisms adapt to extreme environments, how stress changes genetic structure and affects life histories, how organisms cope with thermal stress through acclimation, and how environmental and genetic stress induce fluctuating asymmetry, shape selection pressure and cause extinction of populations. Finally, it discusses the role of stress in evolutionary change, from stress induced mutations and selection to speciation and evolution at the geological time scale. The book contains reviews and novel scientific results on the subject. It will be of interest to both researchers and graduate students and may serve as a text for graduate courses.

Integrative Organismal Biology Lynn B. Martin 2014-11-13 *Integrative Organismal Biology* synthesizes current understandings of the causes and consequences of individual variation at the physiological, behavioral and organismal levels. Emphasizing key topics such as phenotypic plasticity and flexibility, and summarizing emerging areas such as ecological immunology, oxidative stress biology and others, *Integrative Organismal Biology* pulls together information from diverse disciplines to provide a synthetic view of the role of the individual in evolution. Beginning with the role of the individual in evolutionary and ecological processes, the book covers theory and mechanism from both classic and modern perspectives. Chapters explore concepts such as phenotypic plasticity, genetic and epigenetic variation, physiological and phenotypic variation, homeostasis, and gene and physiological regulatory networks. A concluding section interweaves these concepts through a series of case studies of life processes such as aging, reproduction, and immune defense. Written and edited by leaders in the field, *Integrative Organismal Biology* will be an important advanced textbook for students and researchers across a variety of subdisciplines of integrative biology.

Strickberger's Evolution Brian K. Hall 2011-06-07 Thoroughly updated and reorganized, *Strickberger's Evolution, Fourth Edition*, presents biology students with a basic introduction to prevailing knowledge and ideas about evolution, discussing how, why, and where the world and its organisms changed throughout history. Keeping consistent with Strickberger's engaging writing style, the authors carefully unfold a broad range of philosophical and historical topics that frame the theories of today including cosmological and geological evolution and its impact on life, the origins of life on earth, the development of molecular pathways from genetic systems to organismic morphology and function, the evolutionary history of organisms from microbes to animals, and the numerous molecular and populational concepts that explain the earth's dynamic evolution. Important Notice: The digital edition of this book is missing some of the images or content found in the physical edition.

Ecology 1997

Encyclopedia of Ecology 2014-11-03 The groundbreaking *Encyclopedia of Ecology* provides an authoritative and comprehensive coverage of the complete field of ecology, from general to applied. It includes over 500 detailed entries, structured to provide the user with complete coverage of the core knowledge, accessed as intuitively as possible, and heavily cross-referenced. Written by an international team of leading experts, this revolutionary encyclopedia will serve as a one-stop-shop to concise, stand-alone articles to be used as a point of entry for undergraduate students, or as a tool for active researchers looking for the latest information in the field. Entries cover a range of topics, including: Behavioral Ecology Ecological Processes Ecological Modeling Ecological Engineering Ecological Indicators Ecological Informatics Ecosystems Ecotoxicology Evolutionary Ecology General Ecology Global Ecology Human Ecology System Ecology The first reference work to cover all aspects of ecology, from basic to applied Over 500 concise, stand-alone articles are written by prominent leaders in the field Article text is supported by full-color photos, drawings, tables, and other visual material Fully indexed and cross referenced with detailed references for further study Writing level is suited to both the expert and non-expert Available electronically on ScienceDirect shortly upon publication

Evolutionary Behavioral Ecology David Westneat 2010-04 *Evolutionary Behavioral Ecology* presents a comprehensive treatment of the evolutionary and ecological processes shaping behavior across a wide array of organisms and a diverse set of behaviors and is suitable as a graduate-level text and as a sourcebook for professional scientists.

Evolutionary Ecology Charles W. Fox 2001 This text unifies conceptual and empirical advances in evolutionary ecology, and the focus is on current concepts in evolutionary ecology and the empirical study of these concepts. The book is divided into five sections: an overview of the major topics in evolutionary biology for ecologists, sections on life histories, behavior, coevolution, and adaptation to anthropogenic change. (Midwest).

Using the Biological Literature Diane Schmidt 2014-04-14 The biological sciences cover a broad array of literature types, from younger fields like molecular biology with its reliance on recent journal articles, genomic databases, and protocol manuals to

classic fields such as taxonomy with its scattered literature found in monographs and journals from the past three centuries. Using the *Biological Literature: A Practical Guide, Fourth Edition* is an annotated guide to selected resources in the biological sciences, presenting a wide-ranging list of important sources. This completely revised edition contains numerous new resources and descriptions of all entries including textbooks. The guide emphasizes current materials in the English language and includes retrospective references for historical perspective and to provide access to the taxonomic literature. It covers both print and electronic resources including monographs, journals, databases, indexes and abstracting tools, websites, and associations—providing users with listings of authoritative informational resources of both classical and recently published works. With chapters devoted to each of the main fields in the basic biological sciences, this book offers a guide to the best and most up-to-date resources in biology. It is appropriate for anyone interested in searching the biological literature, from undergraduate students to faculty, researchers, and librarians. The guide includes a supplementary website dedicated to keeping URLs of electronic and web-based resources up to date, a popular feature continued from the third edition.

Evolutionary Ecology of Plant-Herbivore Interaction Juan Núñez-Farfán 2020-07-30 Plant-herbivore interactions are a central topic in evolutionary ecology. Historically, their study has been a cornerstone for coevolutionary theory. Starting from classic ecological studies at the phenotypic level, it has since expanded to molecular and genomic approaches. After a historical perspective, the book's subsequent chapters cover a wide range of topics: from populations to ecosystems; plant- and herbivore-focused studies; in natural and in man-modified ecosystems; and both micro- and macro-evolutionary levels. All chapters include valuable background information and empirical evidence. Given its scope, the book will be of interest to both students and researchers, and will hopefully stimulate further research in this exciting field of evolutionary biology.

Migration Hugh Dingle 2014 Migration, broadly defined as directional movement to take advantage of spatially distributed resources, is a dramatic behaviour and an important component of many life histories that can contribute to the fundamental structuring of ecosystems. In recent years, our understanding of migration has advanced radically with respect to both new data and conceptual understanding. It is now almost twenty years since publication of the first edition, and an authoritative and up-to-date sequel that provides a taxonomically comprehensive overview of the latest research is therefore timely. The emphasis throughout this advanced textbook is on the definition and description of migratory behaviour, its ecological outcomes for individuals, populations, and communities, and how these outcomes lead to natural selection acting on the behaviour to cause its evolution. It takes a truly integrative approach, showing how comparisons across a diversity of organisms and biological disciplines can illuminate migratory life cycles, their evolution, and the relation of migration to other movements. *Migration: The Biology of Life on the Move* focuses on migration as a behavioural phenomenon with important ecological consequences for organisms as diverse as aphids, butterflies, birds and whales. It is suitable for senior undergraduate and graduate level students taking courses in behaviour, spatial ecology, 'movement ecology', and conservation. It will also be of interest and use to a broader audience of professional ecologists and behaviourists seeking an authoritative overview of this rapidly expanding field.

Molecular Approaches to Ecology and Evolution R. deSalle 2012-12-06 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.

The Evolution of Personality and Individual Differences David M. Buss 2011 Capturing a scientific change in thinking about personality and individual differences, this volume provides theories and empirical evidence which suggest that personality and individual differences are central to evolved psychological mechanisms and behavioural functioning.

Encyclopedia of Evolutionary Biology 2016-04-14 *Encyclopedia of Evolutionary Biology* is the definitive go-to reference in the field of evolutionary biology. It provides a fully comprehensive review of the field in an easy to search structure. Under the collective leadership of fifteen distinguished section editors, it is comprised of articles written by leading experts in the field, providing a full review of the current status of each topic. The articles are up-to-date and fully illustrated with in-text references that allow readers to easily access primary literature. While all entries are authoritative and valuable to those with advanced understanding of evolutionary biology, they are also intended to be accessible to both advanced undergraduate and graduate students. Broad topics include the history of evolutionary biology, population genetics, quantitative genetics; speciation, life history evolution, evolution of sex and mating systems, evolutionary biogeography, evolutionary developmental biology, molecular and genome evolution, coevolution, phylogenetic methods, microbial evolution, diversification of plants and fungi, diversification of animals, and applied evolution. Presents fully comprehensive content, allowing easy access to fundamental information and links to primary research. Contains concise articles by leading experts in the field that ensures current coverage of each topic. Provides ancillary learning tools like tables, illustrations, and multimedia features to assist with the comprehension process.

Niche Construction F. John Odling-Smee 2013-02-15 The seemingly innocent observation that the activities of organisms bring about changes in environments is so obvious that it seems an unlikely focus for a new line of thinking about evolution. Yet niche construction—as this process of organism-driven environmental modification is known—has hidden complexities. By transforming biotic and abiotic sources of natural selection in external environments, niche construction generates feedback in evolution on a scale hitherto underestimated—and in a manner that transforms the evolutionary dynamic. It also plays a critical role in ecology, supporting ecosystem engineering and influencing the flow of energy and nutrients through ecosystems. Despite this, niche construction has been given short shrift in theoretical biology, in part because it cannot be fully understood within the framework of standard evolutionary theory. Wedding evolution and ecology, this book extends evolutionary theory by formally including niche construction and ecological inheritance as additional evolutionary processes. The authors support their historic move with empirical data, theoretical population genetics, and conceptual models. They also describe new research methods capable of testing the theory. They demonstrate how their theory can resolve long-standing problems in ecology, particularly by advancing the sorely needed synthesis of ecology and evolution, and how it offers an evolutionary basis for the human sciences. Already hailed as a pioneering work by some of the world's most influential biologists, this is a rare, potentially field-changing contribution to the biological sciences.

Approaches to Plant Evolutionary Ecology Gregory Paul Cheplick 2015 Plant evolutionary ecology is a rapidly growing discipline which emphasizes that populations evolve and adapt not in isolation, but in relation to other species and abiotic environmental features such as climate. By combining approaches from the traditional evolutionary and ecological fields of study, evolutionary ecology is connected to branches of population biology, genetics, botany, conservation, and to other fields of applied science, primarily through shared concepts and techniques. However, other books regarding evolutionary ecology

typically focus on animals, creating a substantial need for a synthesis of the scholarly literature with an emphasis on plants. *Approaches to Plant Evolutionary Ecology* is the first book to specifically explore the evolutionary biology of plant populations. Renowned plant ecologist G. P. Cheplick summarizes and synthesizes much of the primary literature regarding evolutionary perspective. The book also provides summaries of both traditional (common gardens, reciprocal transplants) and modern (molecular genetic) approaches used to address questions about plant adaptation to a diverse group of abiotic and biotic factors. Cheplick provides a rigorously written introduction to the rapidly growing field of plant evolutionary ecology that will appeal to undergraduate and graduate students with an interest in ecology and evolution, as well as educators who are teaching courses on related topics. -- from back cover.

Integral Ecology Sean Esbjorn-Hargens, Ph.D. 2011-03-08 Today there is a bewildering diversity of views on ecology and the natural environment. With more than two hundred distinct and valuable perspectives on the natural world—and with scientists, economists, ethicists, activists, philosophers, and others often taking completely different stances on the issues—how can we come to agreement to solve our toughest environmental problems? In response to this pressing need, *Integral Ecology* unites valuable insights from multiple perspectives into a comprehensive theoretical framework—one that can be put to use right now. The framework is based on *Integral Theory*, as well as Ken Wilber's AQAL model, and is the result of over a decade of research exploring the myriad perspectives on ecology available to us today and their respective methodologies. Dozens of real-life applications and examples of this framework currently in use are examined, including three in-depth case studies: work with marine fisheries in Hawai'i, strategies of eco-activists to protect Canada's Great Bear Rainforest, and a study of community development in El Salvador. In addition, eighteen personal practices of transformation are provided for you to increase your own integral ecological awareness. *Integral Ecology* provides the most sophisticated application and extension of *Integral Theory* available today, and as such it serves as a template for any truly integral effort.

Animal Personalities Claudio Carere 2013-03-07 Ask anyone who has owned a pet and they'll assure you that, yes, animals have personalities. And science is beginning to agree. Researchers have demonstrated that both domesticated and nondomesticated animals—from invertebrates to monkeys and apes—behave in consistently different ways, meeting the criteria for what many define as personality. But why the differences, and how are personalities shaped by genes and environment? How did they evolve? The essays in *Animal Personalities* reveal that there is much to learn from our furred and feathered friends. The study of animal personality is one of the fastest-growing areas of research in behavioral and evolutionary biology. Here Claudio Carere and Dario Maestripietri, along with a host of scholars from fields as diverse as ecology, genetics, endocrinology, neuroscience, and psychology, provide a comprehensive overview of the current research on animal personality. Grouped into thematic sections, chapters approach the topic with empirical and theoretical material and show that to fully understand why personality exists, we must consider the evolutionary processes that give rise to personality, the ecological correlates of personality differences, and the physiological mechanisms underlying personality variation.

Agroecology Stephen R. Gliessman 2006-11-15 Providing the theoretical and conceptual framework for this continually evolving field, *Agroecology: The Ecology of Sustainable Food Systems, Second Edition* explores environmental factors and complexities affecting agricultural crops and animals. Completely revised, updated, and reworked, the second edition contains new data, new readings, new issue

Pheromone Communication in Moths Jeremy D. Allison 2016-10-25 Common among moths is a mate-finding system in which females emit a pheromone that induces males to fly upwind along the pheromone plume. Since the chemical pheromone of the domesticated silk moth was identified in 1959, a steady increase in the number of moth species whose pheromone attractants have been identified now results in a rich base for review and synthesis. *Pheromone Communication in Moths* summarizes moth pheromone biology, covering the chemical structures used by the various lineages, signal production and perception, the genetic control of moth pheromone traits, interactions of pheromones with host-plant volatiles, pheromone dispersal and orientation, male pheromones and courtship, and the evolutionary forces that have likely shaped pheromone signals and their role in sexual selection. Also included are chapters on practical applications in the control and monitoring of pest species as well as case studies that address pheromone systems in a number of species and groups of closely allied species. *Pheromone Communication in Moths* is an invaluable resource for entomologists, chemical ecologists, pest-management scientists, and professionals who study pheromone communication and pest management.

Behavioural Responses to a Changing World Ulrika Candolin 2012-06-14 Species are typically adapted to the local environmental conditions in which they have evolved.

Manual of Environmental Microbiology Cindy H. Nakatsu 2020-08-11 The single most comprehensive resource for environmental microbiology, *Environmental microbiology, the study of the roles that microbes play in all planetary environments*, is one of the most important areas of scientific research. The *Manual of Environmental Microbiology, Fourth Edition*, provides comprehensive coverage of this critical and growing field. Thoroughly updated and revised, the *Manual* is the definitive reference for information on microbes in air, water, and soil and their impact on human health and welfare. Written in accessible, clear prose, the manual covers four broad areas: general methodologies, environmental public health microbiology, microbial ecology, and biodegradation and biotransformation. This wealth of information is divided into 18 sections each containing chapters written by acknowledged topical experts from the international community. Specifically, this new edition of the *Manual* contains completely new sections covering microbial risk assessment, quality control, and microbial source tracking. Incorporates a summary of the latest methodologies used to study microorganisms in various environments. Synthesizes the latest information on the assessment of microbial presence and microbial activity in natural and artificial environments. The *Manual of Environmental Microbiology* is an essential reference for environmental microbiologists, microbial ecologists, and environmental engineers, as well as those interested in human diseases, water and wastewater treatment, and biotechnology.

Evolutionary Ecology of Parasites Robert Poulin 2011-06-27 Parasites have evolved independently in numerous animal lineages, and they now make up a considerable proportion of the biodiversity of life. Not only do they impact humans and other animals in fundamental ways, but in recent years they have become a powerful model system for the study of ecology and evolution, with practical applications in disease prevention. Here, in a thoroughly revised and updated edition of his influential earlier work, Robert Poulin provides an evolutionary ecologist's view of the biology of parasites. He sets forth a comprehensive synthesis of parasite evolutionary ecology, integrating information across scales from the features of individual parasites to the dynamics of parasite populations and the structuring of parasite communities. *Evolutionary Ecology of Parasites* presents an evolutionary framework for the study of parasite biology, combining theory with empirical examples for a broader understanding of why parasites are as they are and do what they do. An up-to-date synthesis of the field, the book is an ideal teaching tool for advanced courses on the subject. Pointing toward promising directions and setting a research agenda, it will also be an invaluable reference for researchers who seek to extend our knowledge of parasite ecology and evolution.

Evolutionary Ecology of Freshwater Animals B. Streit 2013-03-11 Evolutionary ecology includes aspects of community structure, trophic interactions, life-history tactics, and reproductive modes, analyzed from an evolutionary perspective. Freshwater environments often impose spatial structure on populations, e.g. within large lakes or among habitat patches, facilitating genetic and phenotypic divergence. Traditionally, freshwater systems have featured prominently in ecological

research and population biology. This book brings together information on diverse freshwater taxa, with a mix of critical review, synthesis, and case studies. Using examples from bryozoans, rotifers, cladocerans, molluscs, teleosts and others, the authors cover current conceptual issues of evolutionary ecology in considerable depth. The book can serve as a source of critically evaluated ideas, detailed case studies, and open problems in the field of evolutionary ecology. It is recommended for students and researchers in ecology, limnology, population biology, and evolutionary biology.

Evolutionary Ecology Charles W. Fox 2001-10-19 Evolutionary Ecology simultaneously unifies conceptual and empirical advances in evolutionary ecology and provides a volume that can be used as either a primary textbook or a supplemental reading in an advanced undergraduate or graduate course. The focus of the book is on current concepts in evolutionary ecology, and the empirical study of these concepts. The editors have assembled a group of prominent biologists who have made significant contributions to this field. They both synthesize the current state of knowledge and identify areas for future investigation. Evolutionary Ecology will be of general interest to researchers and students in both ecology and evolutionary biology. Researchers in evolutionary ecology that want an overview of the current state of the field, and graduate students that want an introduction the field, will find this book very valuable. This volume can also be used as a primary textbook or supplemental reading in both upper division and graduate courses/seminars in Evolutionary Ecology.

Evolutionary Ecology of Freshwater Animals Bruno Streit 1997 Evolutionary ecology includes aspects of community structure, trophic interactions, life-history tactics, and reproductive modes, analyzed from an evolutionary perspective. Freshwater environments often impose spatial structure on populations, e.g. within large lakes or among habitat patches, facilitating genetic and phenotypic divergence. Traditionally, freshwater systems have featured prominently in ecological research and population biology. This book brings together information on diverse freshwater taxa, with a mix of critical review, synthesis, and case studies. Using examples from bryozoans, rotifers, cladocerans, molluscs, teleosts and others, the authors cover current conceptual issues of evolutionary ecology in considerable depth. The book can serve as a source of critically evaluated ideas, detailed case studies, and open problems in the field of evolutionary ecology. It is recommended for students and researchers in ecology, limnology, population biology, and evolutionary biology.

Discovering Evolutionary Ecology Peter J. Mayhew 2006-01-05 Why are some kinds of organism species-rich and others species-poor? How do new species arise and why do some go extinct? Why do organisms grow and behave the way they do? This book provides an introduction to evolutionary ecology, the science that brings ecology and evolution together to help understand biological diversity. In a concise, readable format, Peter Mayhew covers the entire breadth of the subject, from life histories and the evolution of sex, to speciation and macroecology. Many emerging fields are also introduced, such as metabolic ecology, the evolution of population dynamics, and the evolution of global ecology. Discovering Evolutionary Ecology highlights the connections between these different subject areas, and for the first time paints a picture of a truly integrated field. It illustrates the research tools utilized, and demonstrates how advances in one area can spur on developments elsewhere when scientists combine evolutionary and ecological knowledge. To maximize accessibility, the book assumes only a basic knowledge of biology, includes a comprehensive glossary, and contains almost no maths. Each chapter provides suggestions for further reading, and there is also an extensive reference list. Ideal as an introduction to evolutionary ecology for undergraduates, this book will also interest established researchers, providing a broad and up-to-date context for their work.