

*Oxford Series in Ecology and Evolution*

# **The Ecology of Adaptive Radiation**

Dolph Schluter



# Ecology Of Adaptive Radiation

**Giorgio Bertorelle**



## **Ecology Of Adaptive Radiation:**

**The Ecology of Adaptive Radiation** Dolph Schluter, 2000-08-31 Adaptive radiation is the evolution of diversity within a rapidly multiplying lineage. It can cause a single ancestral species to differentiate into an impressively vast array of species inhabiting a variety of environments. Much of life's diversity has arisen during adaptive radiations. Some of the most famous recent examples include the East African cichlid fishes, the Hawaiian silverswords, and of course Darwin's Galapagos finches. This book evaluates the causes of adaptive radiation. It focuses on the ecological theory of adaptive radiation, a body of ideas that began with Darwin and was developed through the early part of the 20th Century. This theory proposes that phenotypic divergence and speciation in adaptive radiation are caused ultimately by divergent natural selection arising from differences in environment and competition between species. In *The Ecology of Adaptive Radiation*, the author re-evaluates the ecological theory along with its most significant extensions and challenges in the light of all the recent evidence. This important book is the first full exploration of the causes of adaptive radiation to be published for decades, written by one of the world's best young evolutionary biologists.

**Lizards in an Evolutionary Tree** Jonathan Losos, 2009-08-15 Adaptive radiation, which results when a single ancestral species gives rise to many descendants each adapted to a different part of the environment, is possibly the single most important source of biological diversity in the living world. One of the best studied examples involves Caribbean Anolis lizards. With about 400 species, Anolis has played an important role in the development of ecological theory and has become a model system exemplifying the integration of ecological, evolutionary, and behavioral studies to understand evolutionary diversification. This major work, written by one of the best known investigators of Anolis, reviews and synthesizes an immense literature. Jonathan B. Losos illustrates how different scientific approaches to the questions of adaptation and diversification can be integrated and examines evolutionary and ecological questions of interest to a broad range of biologists.

**The Ecology of Adaptive Radiation in Darwin's Finches** Luis Fernando De León Reyna, 2010

**Ecological Speciation** Patrik Nosil, 2012-03-15 It then reviews the three components of ecological speciation and discusses the geography and genomic basis of the process.

**Current Themes in Theoretical Biology** Thomas A.C. Reydon, Lia Hemerik, 2005-02-18 This book originated as a Festschrift to mark the publication of Volume 50 of the journal *Acta Biotheoretica* in 2002 and the journal's 70th anniversary in 2005. In it, eleven previously unpublished research papers have been collected that reflect the entire scope of topics on which *Acta Biotheoretica* publishes. *Acta Biotheoretica* is a journal on theoretical biology published by Kluwer Academic Publishers that has its roots in the Dutch tradition of theoretical biology. From the perspective of this tradition, theoretical biology is understood as encompassing a broad spectrum of disciplines ranging from mathematical biology to philosophy of biology. To reflect the Dutch roots of the journal, all papers have been invited from authors that work in The Netherlands. This book is aimed at an audience of theoretical and mathematical biologists, philosophers of biology, and philosophers of science and biologists in general.

**Frontiers in**

**Ecology and Evolution 2019 Highlights** Mark A. Elgar, 2020-02-27 A measure of the success of a journal is that each new issue or digital alert includes a couple of papers that pique your interest perhaps adding a new perspective to your research questions The collection of papers in this *Frontiers in Ecology and Evolution 2019 Highlights* eBook represents a sample of published papers that attracted the interest of the Specialty Chief Editors and members of the editorial office While the collection is largely eclectic it does represent the breadth and methods of enquiry that are published in *Frontiers in Ecology and Evolution* We hope that some of the contributions in this collection similarly interest you

**The Theory of Island Biogeography Revisited** Jonathan B. Losos, Robert E. Ricklefs, 2009-10-19 Robert H MacArthur and Edward O Wilson's *The Theory of Island Biogeography* first published by Princeton in 1967 is one of the most influential books on ecology and evolution to appear in the past half century By developing a general mathematical theory to explain a crucial ecological problem the regulation of species diversity in island populations the book transformed the science of biogeography and ecology as a whole In *The Theory of Island Biogeography Revisited* some of today's most prominent biologists assess the continuing impact of MacArthur and Wilson's book four decades after its publication Following an opening chapter in which Wilson reflects on island biogeography in the 1960s fifteen chapters evaluate and demonstrate how the field has extended and confirmed as well as challenged and modified MacArthur and Wilson's original ideas Providing a broad picture of the fundamental ways in which the science of island biogeography has been shaped by MacArthur and Wilson's landmark work *The Theory of Island Biogeography Revisited* also points the way toward exciting future research

[Patterns and Processes of Speciation in Ancient Lakes](#) Thomas Wilke, Risto Väinölä, Frank Riedel, 2009-04-02 Ancient lakes are exceptional freshwater environments that have continued to exist for hundreds of thousands of years They have long been recognized as centres of biodiversity and hotspots of evolution During recent decades speciation in ancient lakes has emerged as an important and exciting topic in evolutionary biology The contributions in this volume deal with patterns and processes of biological diversification in three prominent ancient lake systems Of these the famous East African Great Lakes already have a strong tradition of evolutionary studies but the two other systems have so far received much less attention The exceptional biodiversity of the European sister lakes Ohrid and Prespa of the Balkans has long been known but has largely been neglected in the international literature until recently The rich biota and problems of its evolution in the two central lake systems on the Indonesian island of Sulawesi in turn have only lately started to draw scientific attention This volume aims at deepening the awareness of the unusual biological diversity in ancient lakes in general and of the role of these lakes as natural laboratories for the study of speciation and diversification in particular It should stimulate further research that will lead to a better understanding of key evolutionary processes in these lakes and to knowledge that might help in mitigating the deterioration of their diversity in the future

**Developmental Plasticity and Evolution** Mary Jane West-Eberhard, 2003-03-13 West Eberhard widely recognized as one of the most incisive thinkers in evolutionary biology

assesses all the evidence for our current understanding of the role of changes in body plan and development for the process of speciation The process of evolution is systematically reassessed to integrate the insights coming from developmental genetics

The Ecology of Adaptive Radiation of Dabbling Ducks (Anas Spp.) David Brent Gurd, 2005 The ecological theory of adaptive radiation proposes that three processes are responsible for the evolution of a single ancestor into a clade of species divergence in phenotype between contrasting environments divergence in phenotype caused by negative interspecific interactions and ecological speciation I tested for evidence of these processes among sympatric dabbling ducks *Anas* spp a putative adaptive radiation Divergent selection between environments requires a trade off in the ability of phenotypes to exploit resources in different environments I tested whether variation in bill morphology imposes a performance trade off when ducks filter feed in environments containing different size frequency distributions of prey and indigestible detritus Experiments demonstrated that ducks could avoid ingesting detritus when prey and detritus differ in size Foraging models based on filter feeding biomechanics predict prey size selection causes a decline in filtration rates and that the form of this trade off depends on interspecific differences in bill morphology To test these models I used them to predict the results of manipulative foraging experiments on 2 species reported in the literature There was overall agreement between model predictions and reported differences in filtration rates particle retention probabilities and ingestion rates both between species and due to variation in prey size presence of detritus and surgical manipulation of bill morphology Extension of these models to five additional species predicts that interspecific variation in the foraging trade off should result in interspecific partitioning of prey by size when detritus is present To determine if phenotypic divergence is the result of negative interspecific interactions I tested for a negative correlation between frequencies of interspecific aggression and phenotypic divergence Comparison of observed frequencies to the predictions of a null model indicated aggression differed between species pairs Divergence in body size body length lamellar density and divergence of species along a prey size axis predicted by the biomechanical models were all negatively correlated with frequency of aggression even after controlling for phylogenetic distance Variation in aggression accounted for by phenotype and phylogeny were additive indicating ecology and evolutionary history contribute independently to species interactions These results provide evidence that dabbling ducks represent an adaptive radiation

**Species and Speciation in the Fossil Record** Warren D. Allmon, Margaret M.

Yacobucci, 2016-10-05 Although the species is one of the fundamental units of biological classification there is remarkably little consensus among biologists about what defines a species even within distinct sub disciplines The literature of paleobiology in particular is littered with qualifiers and cautions about applying the term to the fossil record or equating such species with those recognized among living organisms In *Species and Speciation in the Fossil Record* experts in the field examine how they conceive of species of fossil animals and consider the implications these different approaches have for thinking about species in the context of macroevolution After outlining views of the Modern Synthesis of evolutionary

disciplines and detailing the development within paleobiology of quantitative methods for documenting and analyzing variation within fossil assemblages contributors explore the challenges of recognizing and defining species from fossil specimens and offer potential solutions Addressing both the tempo and mode of speciation over time they show how with careful interpretation and a clear species concept fossil species may be sufficiently robust for meaningful paleobiological analyses Indeed they demonstrate that the species concept if more refined could unearth a wealth of information about the interplay between species origins and extinctions between local and global climate change and greatly deepen our understanding of the evolution of life

The Year in Evolutionary Biology 2009, Volume 1168 Carl D. Schlichting, Timothy A. Mousseau, 2009-07-27 This volume features an important collection of review articles highlighting the top science and developments in the field of evolutionary biology NOTE Annals volumes are available for sale as individual books or as a journal For information on institutional journal subscriptions please visit [www.blackwellpublishing.com](http://www.blackwellpublishing.com) nyas ACADEMY MEMBERS Please contact the New York Academy of Sciences directly to place your order [www.nyas.org](http://www.nyas.org) Members of the New York Academy of Science receive full text access to the Annals online and discounts on print volumes Please visit <http://www.nyas.org/MemberCenter/Join.aspx> for more information about becoming a member

Population Genetics for Animal Conservation Giorgio Bertorelle, 2009-05-28 Illustrates the power and utility of the synergy between population genetics and conservation biology in animal conservation

Eco-evolutionary Processes Within Microbial Communities Maria Elena Martino, Alejandro Couce, Andrea Quagliariello, Ricardo S. Ramiro, 2022-11-16

Encyclopedia of Islands Rosemary G. Gillespie, David Clague, 2009-08-19 Islands have captured the imagination of scientists and the public for centuries unique and rare environments their isolation makes them natural laboratories for ecology and evolution This authoritative alphabetically arranged reference featuring more than 200 succinct articles by leading scientists from around the world provides broad coverage of all the island sciences But what exactly is an island The volume editors define it here as any discrete habitat isolated from other habitats by inhospitable surroundings The Encyclopedia of Islands examines many such insular settings oceanic and continental islands as well as places such as caves mountaintops and whale falls at the bottom of the ocean This essential one stop resource extensively illustrated with color photographs clear maps and graphics will introduce island science to a wide audience and spur further research on some of the planet's most fascinating habitats

Book Jacket

**Biodiversity of the Gulf of Guinea Oceanic Islands** Luis M. P. Ceriaco, Ricardo F. de Lima, Martim Melo, Rayna C. Bell, 2022-10-17 This open access book presents a comprehensive synthesis of the biodiversity of the oceanic islands of the Gulf of Guinea a biodiversity hotspot off the west coast of Central Africa Written by experts the book compiles data from a plethora of sources archives museums bibliography official reports and previously unpublished data to provide readers with the most updated information about the biological richness of these islands and the conservation issues they face The Gulf of Guinea Oceanic Islands Principe S o Tom and Annob n and surrounding islets present extraordinary levels of endemism

across different animal fungi and plant groups This very high endemism likely results from the long geological history of the islands and their proximity to the diversity rich continent Many researchers students and conservationists from across the globe are interested in documenting biodiversity on the islands understanding the evolutionary origins of this diversity and mitigating the impacts of global change on this unique archipelago This book aims to be a primer for a broad audience seeking baseline biodiversity information and to serve as a roadmap for future research efforts aiming to fill knowledge gaps in understanding and conserving the unparalleled biodiversity of the Gulf of Guinea islands Evolution's Wedge David W. Pfennig, Karin S. Pfennig, 2012-10-25 Despite Darwin's emphasis competition's role in diversification remains controversial and largely underappreciated *Encyclopedia of Biodiversity, Revised Edition* Stanley Rice, 2020-06-01 Praise for the previous edition makes high level scientific concepts accessible to secondary students Library Journal clearly written and well organized School Library Journal Fulfilling educational benchmarks identified by the National Academy of Sciences this encyclopedia is an excellent choice for both public and academic libraries Recommended Choice a thorough and informative work provides accessible information There is simply no other work that compares to this High school and public libraries will welcome such a well researched title Booklist The text is suitable for high school students but advanced enough for adult readers too presents important biodiversity topics a handy overview for term papers and class presentations Library Journal Biodiversity and ecology are founded in evolutionary science In order to understand why species of organisms occupy different parts of the world it is important to comprehend how they evolved *Encyclopedia of Biodiversity Revised Edition* examines this evolutionary framework with the help of more than 150 entries and five essays averaging at least 2 000 words each High school teachers can use these entries grouped by topic to meet many of the science education goals established by the National Academy of Sciences Written by a leading expert in the field this comprehensive full color encyclopedia makes information about groups of organisms from bacteria to mammals and about ecological concepts and processes such as biogeography and ecological succession clearly and readily available to students and the general public Tables at the end of each entry have a consistent structure allowing readers to see how environmental conditions and biodiversity have changed through evolutionary time Entries include Acid rain and fog Biodiversity in the Jurassic period Darwin's finches Galapagos Islands Peter and Rosemary Grant Life in bogs Natural selection Population genetics Seedless plants Tropical rainforests and deforestation Alfred Russel Wallace Organism and Environment Sonia E. Sultan, 2015-09-10 Over the past decade advances in both molecular developmental biology and evolutionary ecology have made possible a new understanding of organisms as dynamic systems interacting with their environments This innovative book synthesizes a wealth of recent research findings to examine how environments influence phenotypic expression in individual organisms ecological development or eco devo and how organisms in turn alter their environments niche construction A key argument explored throughout the book is that ecological interactions as well as natural selection are shaped by these dual organism

environment effects This synthesis is particularly timely as biologists seek a unified contemporary framework in which to investigate the developmental outcomes ecological success and evolutionary prospects of organisms in rapidly changing environments Organism and Environment is an advanced text suitable for graduate level students taking seminar courses in ecology evolution and developmental biology as well as academics and researchers in these fields

**The Princeton Guide to Evolution** David A. Baum, Douglas J. Futuyma, Hopi E. Hoekstra, Richard E. Lenski, Allen J. Moore, Catherine L. Peichel, Dolph Schluter, Michael C. Whitlock, 2013-11-04 The essential one volume reference to evolution The Princeton Guide to Evolution is a comprehensive 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 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 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



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