Molecular Markers, Natural History and Evolution

John C. Avise

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Jeffrey S. Levinton

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Molecular Markers, Natural History and Evolution J. C. Avise,2011-09-23 Molecular approaches have opened new windows on a host of ecological and evolutionary disciplines ranging from population genetics and behavioral ecology to conservation biology and systematics Molecular Markers Natural History and Evolution summarizes the multi faceted discoveries about organisms in nature that have stemmed from analyses of genetic markers provided by polymorphic proteins and DNAs The first part of the book introduces rationales for the use of molecular markers provides a history of molecular phylogenetics and describes a wide variety of laboratory methods and interpretative tools in the field The second and major portion of the book provides a cornucopia of biological applications for molecular markers organized along a scale from micro evolutionary topics such as forensics parentage kinship population structure and intra specific phylogeny to macro evolutionary themes including species relationships and the deeper phylogenetic structure in the tree of life Unlike most prior books in molecular evolution the focus is on organismal natural history and evolution with the macromolecules being the means rather than the ends of scientific inquiry Written as an intellectual stimulus for the advanced undergraduate graduate student or the practicing biologist desiring a wellspring of research ideas at the interface of molecular and organismal biology this book presents material in a manner that is both technically straightforward yet rich with concepts and with empirical examples from the world of nature **Molecular Markers, Natural History, and Evolution** John C. Avise,2004-01-01 Genetic markers conservation genetics speciation hybridization PCR **Molecular Markers, Natural History and Evolution** J. C. Avise,2012-12-06 Molecular approaches have opened new windows on a host of ecological and evolutionary disciplines ranging from population genetics and behavioral ecology to conservation biology and systematics Molecular Markers Natural History and Evolution summarizes the multi faceted discoveries about organisms in nature that have stemmed from analyses of genetic markers provided by polymorphic proteins and DNAs The first part of the book introduces rationales for the use of molecular markers provides a history of molecular phylogenetics and describes a wide variety of laboratory methods and interpretative tools in the field The second and major portion of the book provides a cornucopia of biological applications for molecular markers organized along a scale from micro evolutionary topics such as forensics parentage kinship population structure and intra specific phylogeny to macro evolutionary themes including species relationships and the deeper phylogenetic structure in the tree of life Unlike most prior books in molecular evolution the focus is on organismal natural history and evolution with the macromolecules being the means rather than the ends of scientific inquiry Written as an intellectual stimulus for the advanced undergraduate graduate student or the practicing biologist desiring a wellspring of research ideas at the interface of molecular and organismal biology this book presents material in a manner that is both technically straightforward yet rich with concepts and with empirical examples from the world of nature *South American Primates* Paul A. Garber,Alejandro Estrada,Julio Cesar Bicca-Marques,Eckhard W.

Heymann,Karen B. Strier,2008-11-13 This will be the first time a volume will be compiled focusing on South American monkeys as models to address and test critical issues in the study of nonhuman primates In addition the volume will serve an important compliment to the book on Mesoamerican primates recently published in the series under the DIPR book series The book will be of interest to a broad range of scientists in various disciplines ranging from primatology to animal behavior animal ecology conservation biology veterinary science animal husbandry anthropology and natural resource management Moreover although the volume will highlight South American primates chapters will not simply review particular taxa or topics Rather the focus of each chapter is to examine the nature and range of primate responses to changes in their ecological and social environments and to use data on South American monkeys to address critical theoretical questions in the study of primate behavior ecology and conservation Thus we anticipate that the volume will be widely read by a broad range of students and researchers interested in prosimians New World monkeys Old World monkeys apes humans as well as animal behavior and tropical biology **Ecology and Evolution of the Acari** J. Bruin,Leo P.S. van der Geest,M.W. Sabelis,2013-03-09 Acarology is on the move For a long time the development of Acarology as a field of biological science has been dominated by systematists and applied scientists In the last 15 years however Acari have been increasingly recognized as highly suitable for the testing of theories in ecological and evolutionary sciences The growing interest from evolutionary and molecular biologists and from population and community ecologists in mites and ticks has a strong impetus on the field of Acarology and has already led to significant progress This book contains many chapters that illustrate the recent progress in mainly evolutionary and ecological aspects of Acarology *Genetics Manual: Current Theory, Concepts, Terms* George P Redei,1998-03-31 The 1 150 pages contain more information than any other comparable book It is not a glossary or dictionary or review because all concepts are explained not just defined or mentioned Covers the latest developments usually missed in textbooks and monographs The broad range of modern genetics of cell and molecular biology biometry etc are included without glossing over the classical foundations The hundreds of simple and clear illustrations are vey useful for classroom purposes because they can be drawn on the blackboard or projected on a screen without taking much time to make the crucial points The cross references among the entries tie the contents into an extremely useful comprehensive textbook The concise style leads the reader to the point without verbiage The etymology of the terms is explained The text is not intimidating and it is very easy to read because all the terms are explained within the book Most of the biometrical procedures are presented by worked out examples in a plain form rarely or not found at all in other books It effectively reaches out to non geneticists without compromising high scientific standards Usually the most essential features of a concept are presented at the beginning of the entry and the reader can go as far as she he feels needed about the logic The WEB and e mail addresses of databases and other sources of detailed information are very helpful A well selected list of about 1000 references published mainly in the last couple of years completes the volume The moderate price makes it a best

buy and an excellent choice to own for students teachers scientists physicians lawyers and all educated persons who cannot afford an entire library yet wish to be well informed *Evolutionary Genetics* Charles W. Fox,Jason B. Wolf,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 evolutionaryy genetics but also current and in depth enough to be of value to established researchers in evolution biology **Plant Biotechnology in Ornamental Horticulture** Yi Li,Yan Pei,2007-02-28 Find out how biotechnology can produce more nutritious fruits and vegetables more colorful flowers and grass that needs less waterand mowing Plant Biotechnology in Ornamental Horticulture presents an in depth overview of the key scientific and technical advances issues and challenges in one of the fastest growing segments of **Genetics, Paleontology, and Macroevolution** Jeffrey S. Levinton,2001-08-06 An expanded and updated second edition comprehensively looks at macroevolution integrating evolutionary processes at all levels to explain animal diversity Proceedings of the International Symposium on Sea Turtle Conservation Genetics, 12-14 September 1995, Miami, Florida Brian W. Bowen,W. N. Witzell,1996 *Encyclopedia of Evolutionary Biology* ,2016-04-14 Encyclopedia of Evolutionary Biology Four Volume Set 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 **The Ecology of Marine Fishes** Dr. Larry G. Allen,Dr. Michael H. Horn,2006-02-15 Marine fishes have been intensively studied and some of the fundamental ideas in the science of marine ecology have emerged from the body of knowledge derived from this diverse group of organisms This unique authoritative and accessible reference compiled by 35 luminary ecologists evolutionary

biologists and ichthyologists provides a synthesis and interpretation of the large often daunting body of information on the ecology of marine fishes The focus is on the fauna of the eastern Pacific especially the fishes of the California coast a group among the most diverse and best studied of all marine ecosystems A generously illustrated and comprehensive source of information this volume will also be an important launching pad for future research and will shed new light on the study of marine fish ecology worldwide The contributors touch on many fields in biology including physiology development genetics behavior ecology and evolution The book includes sections on the history of research both published and unpublished data sections on collecting techniques and references to important earlier studies **Developmental Genetics and Plant Evolution** Quentin C.B. Cronk,Richard M. Bateman,Julie A. Hawkins,2004-01-29 A benchmark text Developmental Genetics and Plant Evolution integrates the recent revolution in the molecular developmental genetics of plants with mainstream evolutionary thought It reflects the increasing cooperation between strongly genomics influenced researchers with their strong grasp of technology and evolutionary morphogenetists and sys Plant Variation and Evolution David Briggs,S. Max Walters,2016-06-30 The long awaited fourth edition of a classic text now fully revised and updated for the molecular era

A Century of Parasitology John Janovy, Jr.,Gerald W. Esch,2016-03-21 Reviews key areas in ecological medical and molecular parasitology Features essays from some of the world s leading parasitologists Each topic is set in context by featuring a key paper from the Journal of Paraistology over the past 100 years *Eel Biology* K. Aida,K. Tsukamoto,K. Yamauchi,2012-12-06 As a food resource in both Eastern and Western countries the eel is an important fish Over the years remarkable progress has been achieved in understanding the mysterious life cycle of eels that has fascinated scientists since the age of Aristotle The spawning area of the Japanese eel was discovered and the migratory route of its larvae was elucidated With the development of techniques for artificial induction of gonadal maturation it became possible to obtain hatched larvae Larval rearing to the leptocephalus stage one of the most difficult tasks involved in eel culture finally was achieved By presenting these important breakthroughs Eel Biology will be of great help in the development of effective management strategies for maintaining stable eel populations With contributions by leading experts this book is a valuable source for researchers as well as industry technicians in the fields of aquatic biology aquaculture and fisheries **Flukes and Snails Revisited** D. Rollinson,L. H. Chappell,2001 Summarises the current state of various studies investigating snail parasite relationships **Genes in the Environment** Rosie S. Hails,John E. Beringer,H. Charles J. Godfray,2001-08 Genes in the Environment presents the recent research in the exciting and rapidly developing field of molecular genetic and modelling techniques These techniques central to ecology provide valuable new tools for addressing complex ecological questions and considerable insights into our understanding of the dynamics of populations and communities A diver se range of topics is covered including community dynamics in soils and water gene flow and spatial dynamics and the evolution of the pathogenic and symbiotic relationships Organisms studied range from bacteria viruses and fungi to insects plants and fish

Reticulate Evolution Nathalie Gontier,2015-07-09 Written for non experts this volume introduces the mechanisms that underlie reticulate evolution Chapters are either accompanied with glossaries that explain new terminology or timelines that position pioneering scholars and their major discoveries in their historical contexts The contributing authors outline the history and original context of discovery of symbiosis symbiogenesis lateral gene transfer hybridization or divergence with gene flow and infectious heredity By applying key insights from the areas of molecular phylo genetics microbiology virology ecology systematics immunology epidemiology and computational science they demonstrate how reticulate evolution impacts successful survival fitness and speciation Reticulate evolution brings forth a challenge to the standard Neo Darwinian framework which defines life as the outcome of bifurcation and ramification patterns brought forth by the vertical mechanism of natural selection Reticulate evolution puts forward a pattern in the tree of life that is characterized by horizontal mergings and lineage crossings induced by symbiosis symbiogenesis lateral gene transfer hybridization or divergence with gene flow and infective heredity making the tree of life look more like a web of life On an epistemological level the various means by which hereditary material can be transferred horizontally challenges our classic notions of units and levels of evolution fitness modes of transmission linearity communities and biological individuality The case studies presented examine topics including the origin of the eukaryotic cell and its organelles through symbiogenesis the origin of algae through primary and secondary symbiosis and dinoflagellates through tertiary symbiosis the superorganism and holobiont as units of evolution how endosymbiosis induces speciation in multicellular life forms transferrable and non transferrable plasmids and how they symbiotically interact with their host the means by which pro and eukaryotic organisms transfer genes laterally bacterial transformation transduction and conjugation as well as transposons and other mobile genetic elements hybridization and divergence with gene flow in sexually reproducing individuals current human microbiome and viriome studies that impact our knowledge concerning the evolution of organismal health and acquired immunity and how symbiosis and symbiogenesis can be modelled in computational evolution **Nature at Work - the Ongoing Saga of Evolution** V. P. Sharma,2011-12-27 Charles Robert Darwin was born on 12th February 1809 in Shrewsbury England Darwin shares his birthday with U S President Abraham Lincoln Both were crusaders against slavery Darwin disliked slavery and Lincoln abolished it Darwin was a born naturalist and showed keen interest in nature from the very beginning A breakthrough came when he was selected as a naturalist on the H M S Beagle ship His ve year voyage on the Beagle started in 1931 and was completed in 1936 This was followed by publication of his research ndings that challenged creationist views of the church Darwin conducted a study of fossils and geological records and concluded rightly that all life forms emerged over millions of years of evolution through the force of natural selection In 1959 Darwin published his work on evolution in a book titled On the Origin of Species by Means of Natural Selection or the Preservation of Favored Races The book was received as a scienti c bomb shell and has since changed the human understanding of life forever Today Darwin s ideas on

evolution provide foundation to modern biology Darwin died of a heart attack on the 19th April 1882 and was buried in Westminster Abbey near the grave of Sir Isaac Newton The scienti c community is celebrating Darwin s bicentenary worldwide in honor of his ingenuity scienti c thought conviction and courage

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