

Population Biology and Evolution of Clonal Organisms

EDITED BY

Jeremy B. C. Jackson

Leo W. Buss

Robert E. Cook



Population Biology And Evolution Of Clonal Organisms

Timo Olavi Vuorisalo, P. Mutikainen



Population Biology And Evolution Of Clonal Organisms:

Population Biology and Evolution of Clonal Organisms Jeremy B. C. Jackson, Leo W. Buss, Robert Edward Cook, 1985

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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.

Population Biology of Grasses G. P. Cheplick, 1998-03-28 *Dynamics Ecology and Evolutionary Biology of Clonal Plants* Josef F. Stuefer, Brigitta Erschbamer, Heidrun Huber, Jun-Ichirou Suzuki, 2013-06-29 Spontaneous self cloning or clonality is a widespread phenomenon in the plant kingdom and has a wide array of ecological and evolutionary implications. This volume is the outcome of an international workshop on clonal plant biology aimed at illustrating current progress and recent developments in the scientific study of clonality in plants. The first section of this book includes a collection of original research articles which demonstrate the wide variety of approaches and scientific challenges linked to clonality in plants. The topics covered in this section include ecological and evolutionary implications of sexual versus asexual propagation including life history evolution and sex ratio dynamics, the importance of internal resource transport and remobilization of storage products for the invasiveness and competitiveness of clonal plants, a survey of clonal growth forms in grassland communities and studies on the interactions between clonal plants and animals and fungi. The approaches used range from experimental studies on a broad variety of systems to mathematical modeling of clonal growth and its consequences. The second part features discussion and review papers on a diverse array of subjects ranging from developmental considerations of clonality, principles of selection and evolution in clonal plants, a survey of clonality in algae to potential implications of clonality for plant mating and beyond. This part of the volume aims at presenting novel ideas and

hypotheses and at summarizing existing knowledge in previously under researched areas thereby providing directions for future research initiatives This book captures ongoing cutting edge research in the field of clonal plant ecology and evolution It is directed to anyone from the undergraduate to specialist level who is interested in the biology of the intriguing phenomenon of asexual propagation in plants

Organizational Constraints on the Dynamics of Evolution John Maynard Smith,G. Vida,1990 Selected papers from a symposium in Budapest held June 29 July 3 1987 are arranged in five parts constraints in the origin of life and cellular organization developmental constraints in evolution genetical constraints in evolution life history and evolution and the shaping of the macroevolutionary pattern The 31 contributions are united by a common approach to the rigorous mathematical analysis and description of the processes of natural selection Distributed by St Martin s Press Annotation copyrighted by Book News Inc Portland OR

Plant Reproductive Ecology Jon Lovett Doust,Lesley Lovett Doust,1988 This collection of reviews by leading investigators examines plant reproduction and sexuality within a framework of evolutionary ecology providing an up to date account of the field The contributors discuss conceptual issues showing the importance of sex allocation sexual selection and inclusive fitness and the dimensions of paternity and maternity in plants The evolution maintenance and loss of self incompatibility in plants the nature of sex choice in plants and sex dimorphism are all explored in detail Specific forms of biotic interactions shaping the evolution of plant reproductive strategy are discussed and a taxonomically based review of the reproductive ecology of non angiosperm plant groups such as bryophytes ferns and algae is presented Together these studies focus on the complexities of plant life cycles and the distinctive reproductive biologies of these organisms while showing the similarities between nonflowering plants and the more thoroughly documented flowering species

Fundamentals of Aquatic Ecology R. S. K. Barnes,K. H. Mann,2009-07-21 Fundamentals of Aquatic Ecology is a completely updated and revised edition of the earlier work Fundamentals of Aquatic Ecosystems The new edition has been re titled to reflect the fact that the authors found that from the modification exercise a completely different and new book emerged The new edition concentrates heavily of the fundamental features common to all aquatic systems both marine and freshwater This unique synthesis allows for the discussion of ecological processes comparatively across environments A general introduction is followed by discussion of various types of aquatic ecosystems open waters coastal zones benthos and the aquatic ecosystem as a whole This is followed by an important new chapter on aquatic ecosystems and global ecology Later chapters consider the individuals and communities in aquatic ecosystems A totally re written and rejuvenated edition of an established student text Synthesizes both marine and freshwater ecology Covers both ecosystem ecology and population biology In depth consideration of man s impact on the aquatic environment

Plant Diversity and Ecology in the Chihuahuan Desert Maria C. Mandujano,Irene Pisanty,Luis E. Eguiarte,2020-07-18 Environmental and specific diversity in the Chihuahuan desert in general and in the Cuatro Ci negas Basin in particular has long been recognized as outstanding This book provides a global

ecological overview together with in depth studies of specific processes The Chihuahuan desert is the warmest in North America and has a complex geologic climatic and biogeographical history which affects today's distribution of vegetation and plants and generates complex phylogeographic patterns The high number of endemic species reflects this complex set of traits The modern distribution of environments including aquatic and subaquatic systems riparian environments gypsum dunes and gypsum rich soils low levels of phosphorous and organic matter and high salinity combined with an extreme climate call for a range of adaptations Plants are distributed in a patchy pattern based on punctual variations and many of them respond to different resources and conditions with considerable morphological plasticity In terms of physiological morphological and ecological variability cacti were identified as the most important group in specific environments like bajadas characterized by high diversity values while gypsophytes and gypsovagues of different phylogenies including species with restricted distribution and endemics

Biological Approaches and Evolutionary Trends in Plants Shoichi Kawano, 2012-12-02 Biological Approaches and Evolutionary Trends in Plants is a collection of papers presented at the Fourth International Symposium of Plant Biosystematics held on July 10-14 1989 in Kyoto Japan Contributors some are world's leading plant biologists discuss the findings in evolutionary biology and issues in plant biosystematics in light of the evidence and ideas brought forward at various levels of biological organization from molecule to cell individual population species and community levels This volume is organized into four sections encompassing 22 chapters and begins with an overview of discoveries concerning parapatric differentiation of weed populations including adaptive evolution in herbicide resistant biotypes and complex evolutionary patterns in weed crop complexes of various groups The next section explores molecular approaches in plant biosystematics focusing on amino acid sequencing of proteins restriction site variations of cpDNA mtDNA rDNA etc and chromosome banding patterns revealed by differential staining The discussion shifts to a wave of research in plant population biology and evolutionary ecology since the 1970s and its impact on biology and biosystematics The book considers various aspects of reproductive biology and evolutionary changes in significant reproductive parameters and attempts to demographically quantify these parameters The final chapter is devoted to the use of functional phylogenetic systematics for predictive ecology This book will be of interest to plant biologists and scientists and researchers in fields such as biochemistry botany microbiology ecology and evolutionary biology

Life History Evolution in Plants Timo Olavi Vuorisalo, P. Mutikainen, 2001-11-30 The lack of discussion of the life histories of modular organisms is the weakness of this book that I most regret Modular organisms are different S C Stearns The Evolution of Life Histories 1992 Life history theory endeavours to increase our understanding of the processes whereby the broad features of the life cycles of organisms such as the timing and magnitude of reproduction have evolved Although reproductive traits have dominated as study objects due to their immediate importance for evolutionary success much work has also been conducted on patterns of development growth and senescence as well as on the shifts in resource allocation related to these processes The basic axiom of life

history theory is that patterns of life histories such as reproductive traits are subject to evolutionary explanation This idea can be traced back at least as far as Darwin s Origin of Species 1859 In his discussion of plant domestication Darwin wrote I cannot doubt that the continued selection of slight variations either in the leaves the flowers or the fruit will produce races differing from each other chiefly in these characters Darwin was impressed by the success of plant breeders in moulding the growth and reproductive parameters of cultivated plants and believed that natural selection could have a similar impact in natural populations

Causes of Evolution Robert M. Ross, Warren D. Allmon, 1990-12-18 By studying evolution across geological time paleontologists gain a perspective that sometimes complements and sometimes conflicts with views based solely on studies of extant species The contributors to Causes of Evolution consider whether factors exerting major influences on evolution are biotic or abiotic intrinsic or extrinsic Causes of Evolution presents a broad sampling of paleontological research programs encompassing vertebrates invertebrates and vascular plants empirical work and theoretical models organisms ranging in age from Cambrian to Recent and temporal scales from ecological time to hundreds of millions of years The diverse array of research styles and opinions presented will acquaint scientists in related fields with the strengths and weaknesses of paleontology as an approach to evolutionary studies and will give evolutionary biologists of every stripe new bases for evaluating the scope and bias of their own work

The Structure and Confirmation of Evolutionary Theory Elisabeth A. Lloyd, 2021-01-12 Traditionally a scientific theory is viewed as based on universal laws of nature that serve as axioms for logical deduction In analyzing the logical structure of evolutionary biology Elisabeth Lloyd argues that the semantic account is more appropriate and powerful This book will be of interest to biologists and philosophers alike

Clonality in the Anthropocene: Adaptation, Evolution, and Functioning of Clonal Plants from Individuals to Ecosystems Yong-Jian Wang, Jianping Tao, Asad Shabbir, Wei Xue, Fei-Hai Yu, Fang-Li Luo, 2024-09-02 The Anthropocene with the ongoing global changes in climate land use acidity and content of toxins represents the greatest recent challenges for plants Clonal plants mainly reproduce vegetatively asexually and offspring remain attached to the parent at least until establishment Despite limited gene recombination and genetic diversity clonal plants are widely distributed and play significant roles in various ecosystems worldwide Clonal traits such as resource sharing and signaling between connected ramets selective positioning of ramets reallocation of stored energy nutrients between connected ramets initiation of meristem banks in response to clonal integration and trade offs between clonal and sexual reproduction might help clonal plants adapt to different environmental conditions The expression fitness effects and evolution of clonal traits can be influenced by environmental changes which can be efficiently inherited and affects offspring performance i e clonal parental effect These adaptations may contribute to the survival competition invasiveness and spread of clonal species in response to global climate change in the Anthropocene from individuals to ecosystems Understanding the capacity of clonal species to survive and adjust to changing environments is requisite but limited Specifically the unique traits of clonal plants have been

underestimated and their contribution to population community and ecosystem dynamics is unclear The roles of clonality in ecosystem functioning e g carbon storage carbon nitrogen and phosphorus cycling water and soil conservation and water purification need to be further explored The contribution of clonal growth in plant invasiveness and community invisibility also needs to be addressed Hence there is an urgent need for more in depth studies investigating the adaptation and evolution mechanisms functioning and approaches of plant clonality to global change and invasiveness at different levels

Size-Structured Populations Bo Ebenman, Lennart Persson, 2012-12-06 At last both ecology and evolution are covered in this study on the dynamics of size structured populations How does natural selection shape growth patterns and life cycles of individuals and hence the size structure of populations This book will stimulate biologists to look into some important and interesting biological problems from a new angle of approach concerning life history evolution intraspecific competition and niche theory structure and dynamics of ecological communities

The Natural History of Inbreeding and Outbreeding Nancy Wilmsen Thornhill, 1993-08-15 Inbreeding the mating of close kin and outbreeding the mating of distant relatives or unrelated organisms have long been important subjects to evolutionary biologists Inbreeding reduces genetic diversity in a population increasing the likelihood that genetic defects will become widespread and deprive a population of the diversity it may need to cope with its environment Most plants and animals have evolved behavioral and morphological mechanisms to avoid inbreeding However today many endangered species exist only in small very isolated populations where inbreeding is unavoidable so it has become a concern for conservationists In this volume twenty six experts in evolution behavior and genetics examine the causes and consequences of inbreeding The authors ask whether inbreeding is as problematic as biologists have thought under what ecological conditions inbreeding occurs and whether organisms that inbreed have mechanisms to dampen the anticipated problems of reduced genetic variation The studies including theoretical and empirical work on wild and captive populations demonstrate that many plants and animals inbreed to a greater extent than biologists have thought with variable effects on individual fitness Graduate students and researchers in evolutionary biology animal behavior ecology and conservation biology will welcome this wide ranging collection

Fourth European Conference on Artificial Life Phil Husbands, Inman Harvey, 1997 Topics include self organization the origins of life natural selection evolutionary computation neural networks communication artificial worlds software agents philosophical issues in artificial life ethical problems and learning and development Researchers in artificial life attempt to use the physical representation of lifelike phenomena to understand the organizational principles underlying the dynamics of living systems The goal of the 1997 European Conference on Artificial Life is to provoke new understandings of the relationships between the natural and the artificial Topics include self organization the origins of life natural selection evolutionary computation neural networks communication artificial worlds software agents philosophical issues in artificial life ethical problems and learning and development

Comparative Ecology of Microorganisms and Macroorganisms John H. Andrews, 2017-06-27 This second

edition textbook offers an expanded conceptual synthesis of microbial ecology with plant and animal ecology Drawing on examples from the biology of microorganisms and macroorganisms this textbook provides a much needed interdisciplinary approach to ecology The focus is the individual organism and comparisons are made along six axes genetic variation nutritional mode size growth life cycle and influence of the environment When it was published in 1991 the first edition of *Comparative Ecology of Microorganisms and Macroorganisms* was unique in its attempt to clearly compare fundamental ecology across the gamut of size The explosion of molecular biology and the application of its techniques to microbiology and organismal biology have particularly demonstrated the need for interdisciplinary understanding This updated and expanded edition remains unique It treats the same topics at greater depth and includes an exhaustive compilation of both the most recent relevant literature in microbial ecology and plant animal ecology as well as the early research papers that shaped the concepts and theories discussed Among the completely updated topics in the book are phylogenetic systematics search algorithms and optimal foraging theory comparative metabolism the origins of life and evolution of multicellularity and the evolution of life cycles From *Reviews of the First Edition* John Andrews has succeeded admirably in building a bridge that is accessible to all ecologists Ecology I recommend this book to all ecologists It is a thoughtful attempt to integrate ideas from and develop common themes for two fields of ecology that should not have become fragmented American Scientist Such a synthesis is long past due and it is shameful that ecologists both big and little have been so parochial The Quarterly Review of Biology

Evolutionary Ecology across Three Trophic Levels Warren G. Abrahamson, Arthur E. Weis, 2020-03-31 In a work that will interest researchers in ecology genetics botany entomology and parasitology Warren Abrahamson and Arthur Weis present the results of more than twenty five years of studying plant insect interactions Their study centers on the ecology and evolution of interactions among a host plant the parasitic insect that attacks it and the suite of insects and birds that are the natural enemies of the parasite Because this system provides a model that can be subjected to experimental manipulations it has allowed the authors to address specific theories and concepts that have guided biological research for more than two decades and to engage general problems in evolutionary biology The specific subjects of research are the host plant goldenrod *Solidago* the parasitic insect *Eurosta solidaginis* Diptera Tephritidae that induces a gall on the plant stem and a number of natural enemies of the gallfly By presenting their detailed empirical studies of the *Solidago Eurosta* natural enemy system the authors demonstrate the complexities of specialized enemy victim interactions and thereby the complex interactive relationships among species more broadly By utilizing a diverse array of field laboratory behavioral genetic chemical and statistical techniques Abrahamson and Weis present the most thorough study to date of a single system of interacting species Their interest in the evolutionary ecology of plant insect interactions leads them to insights on the evolution of species interactions in general This major work will interest anyone involved in studying the ways in which interdependent species interact

Genetics and Conservation of Rare Plants Donald A. Falk, 1991 Nearly 700 species of

plants may become extinct by the year 2000 Faced with this overwhelming prospect plant conservationists must take advantage of every technique available This unique work summarizes our current knowledge of the genetics and population biology of rare plants and integrates it with practical conservation recommendations It features discussions on the distribution and significance of genetic variation management and evaluation of rare plant germplasm and conservation strategies for genetic diversity Case studies focusing on specific problems offer important insights for today s challenges in rare plant conservation

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