

# Introduction To Population Genetics Halliburton

A Primer of Population Genetics Introduction to Population Genetics Principles of Population Genetics An Introduction to Population Genetics Theory Mathematical Population Genetics 1 Population Genetics Population Genetics and Microevolutionary Theory An Introduction to Population Genetics Understanding Population Genetics Genetics of Populations population genetics and ecology Population Genetics Population Genetics Introduction to Population Genetics Population Genetics: An Introduction to Population Genetics Theory Population Genetics Genetics of Populations Population Genetics and Evolution Theories of Population Variation in Genes and Genomes Daniel L. Hartl Richard Halliburton Daniel L. Hartl J.F. Crow Warren J. Ewens John H. Gillespie Alan R. Templeton Ching Chun Li Torbjørn Sævi Philip W. Hedrick Samuel Karlin Matthew B. Hamilton John H. Gillespie CROW Donald P. Doolittle James F. Crow W.J. Ewens Philip Hedrick Lawrence E. Mettler Freddy B. Christiansen

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the use of molecular methods to study genetic polymorphisms has made a familiarity with population genetics essential for any biologist whose work is at the population level a primer of population genetics third edition provides a concise but comprehensive introduction to population genetics the four chapters of the book address genetic variation the causes of evolution molecular population genetics and the genetic architecture of complex traits chapter end problems reinforce ideas and while there are some equations the emphasis is on explanation rather than derivation

making the theory of population genetics relevant to readers this book explains the related mathematics with a logical organization it presents the quantitative aspects of population genetics and employs examples of human genetics medical evolution human evolution and endangered species for an introduction to and understanding of population genetics

this edition provides a balanced presentation of theory and observation it introduces the principles of genetics and statistics that are relevant to population studies and examines the forces affecting genetic variation from the molecular to the organismic level

this text book originally published in 1970 presents the field of population genetics starting with elementary concepts and leading the reader well into the field it is concerned mainly with population genetics in a strict sense and deals

primarily with natural populations and less fully with the rather similar problems that arise in breeding live stock and cultivated plants the emphasis is on the behavior of genes and population attributes under natural selection where the most important measure is darwinian fitness this text is intended for graduate students and advanced undergraduates in genetics and population biology this book steers a middle course between completely verbal biological arguments and the rigor of the mathematician the first two thirds of the book do not require advanced mathematical background an ordinary knowledge of calculus will suffice the latter parts of the book which deal with population stochastically use more advanced methods

population genetics occupies a central role in a number of important biological and social undertakings it is fundamental to our understanding of evolutionary processes of plant and animal breeding programs and of various diseases of particular importance to mankind this is the first of a planned two volume work discussing the mathematical aspects of population genetics with an emphasis on the evolutionary theory this first volume draws heavily from the author's classic 1979 edition which appeared originally in springer's biomathematics series it has been revised and expanded to include recent topics which follow naturally from the treatment in the earlier edition e.g. the theory of molecular population genetics this book will appeal to graduate students and researchers in mathematical biology and other mathematically trained scientists looking to enter the field of population genetics

this concise introduction offers students and researchers an overview of the discipline that connects genetics and evolution addressing the theories behind population genetics and relevant empirical evidence john gillespie discusses genetic drift natural selection nonrandom mating quantitative genetics and the evolutionary advantage of sex first published to wide acclaim in 1998 this brilliant primer has been updated to include new sections on molecular evolution

genetic drift genetic load the stationary distribution and two locus dynamics this book is indispensable for students working in a laboratory setting or studying free ranging populations

the advances made possible by the development of molecular techniques have in recent years revolutionized quantitative genetics and its relevance for population genetics population genetics and microevolutionary theory takes a modern approach to population genetics incorporating modern molecular biology species level evolutionary biology and a thorough acknowledgment of quantitative genetics as the theoretical basis for population genetics logically organized into three main sections on population structure and history genotype phenotype interactions and selection adaptation extensive use of real examples to illustrate concepts written in a clear and accessible manner and devoid of complex mathematical equations includes the author's introduction to background material as well as a conclusion for a handy overview of the field and its modern applications each chapter ends with a set of review questions and answers offers helpful general references and internet links

an inspiring introduction to a vital scientific field the reader is taken through ten mathematical derivations that lead to important results explaining in a hands on manner the key concepts and methods of theoretical population genetics the derivations are carefully worked out and easy to follow particular attention is given to the underlying assumptions and the mathematics used the results are discussed and broadened out with relevant current implications all topics feature questions with helpful answers the book is intended for the reader who already knows some population genetics but requires a more comprehensive understanding it is particularly suited to those who analyse genetic data and wish to better grasp what their results actually mean it will also be helpful for those who wish to understand how population genetics contributes to the explanation of evolution or as the writers claim if one wants to understand life in all its

improbable and amazing richness one must start by understanding population genetics

genetics and evolution

population genetics and ecology is a collection of papers presented at a 1975 conference workshop held in israel and is devoted to topics in population genetics and ecology contributors discuss topics related to population genetics and ecology including the determinants of genetic variation in natural populations experimental design and analysis of field and laboratory data and theory and applications of mathematical models in population genetics the book describes a number of field and laboratory studies that focus on a variety of spatial and temporal character and enzyme frequency patterns in natural populations along with possible associations between these patterns and ecological parameters this volume is organized into three sections encompassing 31 chapters and begins by summarizing the results of field and laboratory research that investigated gene frequency patterns in space and time of animal and plant populations this book then explains the origin of new taxa animal and plant domestication variation in heritability related to parental age and problems in the genetics of certain haplo diploid populations the next section offers a combination of data analyses and interpretations of related models with some papers devoted to the origin of race formation and the interaction between sexual selection and natural selection among the theoretical studies presented are facets of selection migration interaction stochastic selection effects properties of density and frequency dependent selection concepts and measures of genetic distance and speciation aspects of altruism and kin selection this book will be of interest to naturalists experimentalists theoreticians statisticians and mathematicians

now updated for its second edition population genetics is the classic accessible introduction to the concepts of

population genetics combining traditional conceptual approaches with classical hypotheses and debates the book equips students to understand a wide array of empirical studies that are based on the first principles of population genetics featuring a highly accessible introduction to coalescent theory as well as covering the major conceptual advances in population genetics of the last two decades the second edition now also includes end of chapter problem sets and revised coverage of recombination in the coalescent model metapopulation extinction and recolonization and the fixation index

#### publisher description

i have for a number of years taught a course in population genetics for students interested in plant and animal breeding the objective of the course has been to lay a foundation in population genetics for the concepts of quantitative genetics which are introduced in the last third of the course i have not been able to find an appropriate text for this purpose for a quarter of a century falconer s introduction to quantitative genetics has been the standard and excellent text in that subject for my purposes however this text is not sufficiently detailed in the population genetics basis for quantitative theory a number of good texts in population genetics are available of which li s first course in population genetics is didactically the best but these texts are directed toward the genetics of natural populations rather than domestic populations breeding under human control they also tend to treat quantitative genetics gingerly if at all i have therefore developed the present text from my teaching notes the chapters of this book are labeled lectures each is intended to correspond approximately to the amount of material which can be covered in a 50 minute lecture divisions are of course dictated by the natural divisions of the subject matter and the lectures are therefore not of uniform length nevertheless in so far as possible an attempt has been made to make the average length a lecture s worth

population genetics is the mathematical investigation of the changes in the genetic structure of populations brought about by selection mutation inbreeding migration and other phenomena together with those random changes deriving from chance events these changes are the basic components of evolutionary progress and an understanding of their effect is therefore necessary for an informed discussion of the reasons for and nature of evolution it would however be wrong to pretend that a mathematical theory depending as it must on a large number of simplifying assumptions should be accepted unreservedly and that its conclusions should be accepted uncritically no one would pretend that in the event of disagreement between observation and mathematical prediction the discrepancy is due to anything other than the inadequacy of the mathematical treatment the biological world is of course far too complex for the study of population genetics to be simply a branch of applied mathematics so that while we are concerned here with the mathematical theory i have tried to indicate which of our results should continue to apply in a context wider than that in which they are formally derived the difficulties involved in the joint discussions of mathematical and genetical problems are obvious enough i have tried to aim this book rather more at the mathematician than at the geneticist and for this reason a brief glossary of common genetical terms is included

preface chapter 1 general background and the diversity of genetic variation chapter 2 measures of genetic variation chapter 3 selection chapter 4 genetic drift and effective population size chapter 5 mutation chapter 6 neutral theory and coalescence chapter 7 gene flow and population structure chapter 8 inbreeding and related topics chapter 9 molecular population genetics and evolution bibliography answers to numerical problems index

self contained and reader friendly this volume provides a balanced blend of evolutionary theory population genetics and systematics with an emphasis on the experimental approach

this textbook provides an authoritative introduction to both classical and coalescent approaches to population genetics written for graduate students and advanced undergraduates by one of the world's leading authorities in the field the book focuses on the theoretical background of population genetics while emphasizing the close interplay between theory and empiricism traditional topics such as genetic and phenotypic variation mutation migration and linkage are covered and advanced by contemporary coalescent theory which describes the genealogy of genes in a population ultimately connecting them to a single common ancestor effects of selection particularly genomic effects are discussed with reference to molecular genetic variation the book is designed for students of population genetics bioinformatics evolutionary biology molecular evolution and theoretical biology as well as biologists molecular biologists breeders biomathematicians and biostatisticians contains up to date treatment of key areas in classical and modern theoretical population genetics provides in depth coverage of coalescent theory discusses genomic effects of selection gives examples from empirical population genetics incorporates figures diagrams and boxed features throughout includes end of chapter exercises speaks to a wide range of students in biology bioinformatics and biostatistics

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