Introduction To Population Genetics Halliburton

A Primer of Population GeneticsIntroduction to Population GeneticsPrinciples of Population GeneticsAn Introduction to Population Genetics TheoryPopulation Genetics and Microevolutionary TheoryMathematical Population Genetics 1Population Genetics:Genetics of PopulationsUnderstanding Population GeneticsGenetics of Populationspopulation genetics and ecologyPopulation GeneticsPopulation GeneticsAn Introduction to Population Genetics TheoryIntroduction to Population GeneticsPopulation Genetics and EvolutionPopulation GeneticsAn Introduction to Population GeneticsMathematical Population Genetics 1Human Population Genetics Daniel L. Hartl Richard Halliburton Daniel L. Hartl J.F. Crow Alan R. Templeton Warren J. Ewens Donald P. Doolittle Philip Hedrick Torbjörn Säll Philip W. Hedrick Samuel Karlin John H. Gillespie Matthew B. Hamilton James F. Crow CROW Lawrence E. Mettler W.J. Ewens Ching Chun Li Warren J. Ewens John H. Relethford

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

in response to many requests the third edition of a primer of population genetics has been dramatically shortened and streamlined for greater accessibility designed primarily for undergraduates it will also serve for graduate students and professionals in biology and other sciences who desire a concise but comprehensive overview of the field with a primary focus on the integration of experimental results with theory the abundance of experimental data generated by the use of molecular methods to study genetic polymorphisms sparked a transformation in the field of population genetics present in virtually all organisms molecular polymorphisms allow populations to be studied without regard to species or habitat and without the need for controlled crosses mutant genes or for any prior genetic studies thus a familiarity with population genetics has become essential for any biologist whose work is at the population level these fields include evolution ecology systematics plant breeding animal breeding conservation and wildlife management human genetics and anthropology population genetics seeks to understand the causes of genetic differences within and among species and molecular biology provides a rich repertoire of techniques for identifying these differences

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 breading live stock and cul t i vat ed plans 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 graduatestudents 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

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

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

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

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

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

publisher description

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

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

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 assump tions 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

this is the first of a planned two volume work discussing the mathematical aspects of population genetics with an emphasis on evolutionary theory this volume draws heavily from the author s 1979 classic but it has been revised and expanded to include recent topics which follow naturally from the treatment in the earlier edition such as the theory of molecular population genetics

introductory guide to human population genetics and microevolutionary theory providing an introduction to mathematical population genetics human population genetics gives basic background on the mechanisms of human microevolution this text combines mathematics biology and anthropology and is best suited for advanced undergraduate and graduate study thorough and accessible human population genetics presents concepts and methods of population genetics specific to human population study utilizing uncomplicated mathematics like high school algebra and basic concepts of probability to explain theories central to the field by describing changes in the frequency of genetic variants from one generation to the next this book hones in on the mathematical basis of evolutionary theory human population genetics includes helpful formulae for learning ease graphs and analogies that make basic points and relate the evolutionary process to mathematical ideas glossary terms marked in boldface within the book the first time they appear in text

citations that act as reference points for further research exemplary case studies topics such as hardy weinberg equilibrium inbreeding mutation genetic drift natural selection and gene flow human population genetics solidifies knowledge learned in introductory biological anthropology or biology courses and makes it applicable to genetic study note errata for the first edition can be found at the author s website employees oneonta edu relethjh hpg errata pdf

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