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## Bookmark File PDF Plant Molecular Evolution

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**Plant Molecular Evolution** [Springer](#) Plant molecular biology has produced an ever-increasing flood of data about genes and genomes. Evolutionary biology and systematics provides the context for synthesizing this information. This book brings together contributions from evolutionary biologists, systematists, developmental geneticists, biochemists, and others working on diverse aspects of plant biology whose work touches to varying degrees on plant molecular evolution. The book is organized in three parts, the first of which introduces broad topics in evolutionary biology and summarizes advances in plant molecular phylogenetics, with emphasis on model plant systems. The second segment presents a series of case studies of gene family evolution, while the third gives overviews of the evolution of important plant processes such as disease resistance, nodulation, hybridization, transposable elements and genome evolution, and polyploidy. **Plant Molecular Evolution Special Issue Molecular Systematics and Plant Evolution** [CRC Press](#) **Molecular Systematics and Plant Evolution** discusses the diversity and evolution of plants with a molecular approach. It looks at population genetics, phylogeny (history of evolution) and developmental genetics, to provide a framework from which to understand evolutionary patterns and relationships amongst plants. The international panel of contributors are all respected systematists and evolutionary biologists, who have brought together a wide range of topics from the forefront of research while keeping the text accessible to students. It has been written for senior undergraduates, postgraduates and researchers in the fields of botany, systematics, population / conservation genetics, phylogenetics and evolutionary biology. **Developmental Genetics and Plant Evolution** [CRC Press](#) 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 **Developmental Genetics and Plant Evolution** [CRC Press](#) 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 systematists who are more deeply rooted in comparative biology and patterns of plant evolution. The book discusses our increasing understanding of gene function and expression, along with modern phylogenies. It integrates morphological and molecular data to highlight specific key transitions in plant evolution that warrant additional intensive study. Furthermore, it explores increasing knowledge of the physical expression of plant development from disciplines such as anatomy and paleobotany. Rather than focus on the technical aspects of plant genomics, this book provides genuinely integrated explanations of plant evolution. The distinguished panel of contributors has succeeded in capturing a demanding subject in an accessible volume for a wide range of professional botanists and students in developmental biology, applied molecular biology, molecular evolution, morphogenesis, organismal botany, and theoretical systematics. **Integrated Molecular Evolution** [CRC Press](#) Evolutionary biology has increasingly relied upon tools developed in molecular biology that allow for the structure and function of macromolecules to be used as data for exploring the patterns and processes of evolutionary change. **Integrated Molecular Evolution, Second Edition** is a textbook intended to expansively and comprehensive review evolutionary studies now routinely using molecular data. This new edition has been thoroughly updated and expanded, and provides a basic summary of evolutionary biology as well as a review of current phylogenetics and phylogenomics. Reflecting a burgeoning pedagogical landscape, this new edition includes nearly double the number of chapters, including a new section on molecular and bioinformatic methods. Dedicated chapters were added on: Evolution of the genetic code Mendelian genetics and population genetics Natural selection Horizontal gene transfers Animal development and plant development Cancer Extraction of biological molecules Analytical methods Sequencing methods and sequencing analyses Omics Phylogenetics and phylogenetic networks Protein trafficking Human genomics More than 400 illustrations appear in this edition, doubling the number included in the first edition, and over 100 of these diagrams are now in color. The second edition combines and integrates extensive summaries of genetics and evolutionary biology in a manner that is accessible for students at either the graduate or undergraduate level. It also provides both the basic foundations of molecular evolution, such as the structure and function of DNA, RNA and proteins, as well as more advanced chapters reviewing analytical techniques for obtaining sequences, and interpreting and archiving molecular and genomic data. **Molecular Systematics of Plants II DNA Sequencing** [Springer Science & Business Media](#) In the five years since the publication of **Molecular Systematics of Plants**, the field of molecular systematics has advanced at an astonishing pace. This period has been marked by a volume of new empirical data and advances in theoretical and analytical issues related to DNA. Comparative DNA sequencing, facilitated by the amplification of DNA via the polymerase chain reaction (PCR), has become the tool of choice for molecular systematics. As a result, large portions of the **Molecular Systematics of Plants** have become outdated. **Molecular Systematics of Plants II** summarizes these recent achievements in plant molecular systematics. Like its predecessor, this completely revised work illustrates the potential of DNA markers for addressing a wide variety of phylogenetic and evolutionary

questions. The volume provides guidance in choosing appropriate techniques, as well as appropriate genes for sequencing, for given levels of systematic inquiry. More than a review of techniques and previous work, *Molecular Systematics of Plants II* provides a stimulus for developing future research in this rapidly evolving field. *Molecular Systematics of Plants II* is not only written for systematists (faculty, graduate students, and researchers), but also for evolutionary biologists, botanists, and paleobotanists interested in reviewing current theory and practice in plant molecular systematics. *Molecular Evolution A Phylogenetic Approach* [John Wiley & Sons](#) The study of evolution at the molecular level has given the subject of evolutionary biology a new significance. Phylogenetic 'trees' of gene sequences are a powerful tool for recovering evolutionary relationships among species, and can be used to answer a broad range of evolutionary and ecological questions. They are also beginning to permeate the medical sciences. In this book, the authors approach the study of molecular evolution with the phylogenetic tree as a central metaphor. This will equip students and professionals with the ability to see both the evolutionary relevance of molecular data, and the significance evolutionary theory has for molecular studies. The book is accessible yet sufficiently detailed and explicit so that the student can learn the mechanics of the procedures discussed. The book is intended for senior undergraduate and graduate students taking courses in molecular evolution/phylogenetic reconstruction. It will also be a useful supplement for students taking wider courses in evolution, as well as a valuable resource for professionals. First student textbook of phylogenetic reconstruction which uses the tree as a central metaphor of evolution. Chapter summaries and annotated suggestions for further reading. Worked examples facilitate understanding of some of the more complex issues. Emphasis on clarity and accessibility. *Integrated Molecular Evolution* [CRC Press](#) Molecular evolution, phylogenetics, genomics, and other related topics are all critical to understanding evolutionary processes. All too frequently, however, they are treated separately in textbooks and courses, such that students fail to connect all of the concepts, principles, and nuances of the evolutionary processes. *Integrated Molecular Evolution* brings these related areas together in one volume, facilitating student comprehension of often difficult concepts. Incorporating the emerging fields of genomics and bioinformatics with traditional fields such as evolution, genetics, and molecular biology, this volume explores a myriad of topics, including Life on Earth and the possible origins of life The evolution of organisms on Earth and the history of the study of evolution Basic structures of DNA, RNA, proteins, and other biological molecules, and the synthesis of each Molecular biology and the evolution, structure, and function of ribosomes DNA replication and the various ways in which chromosomes are separated Ways in which DNA can be changed to produce mutations, infectious causes of mutation, and repair of DNA Definitions, evolution, and the importance of multigene families Phylogenetic analysis and how researchers use the raw sequence data to reconstruct portions of evolutionary processes Details of the genomes of a variety of organisms, from RNA viruses to eukaryotes, presented in order of complexity Each chapter ends with a summary of key points, forming an effective review and enabling students to isolate critical material. The series of topics and the masterful integration of these topics lead students to a full understanding of evolution and the component processes that have led to biological evolution on Earth. *Receptor-like Kinases in Plants From Development to Defense* [Springer Science & Business Media](#) Sequencing projects have revealed the presence of at least several hundred receptor kinases in a typical plant genome. Receptor kinases are therefore the largest family of primary signal transducers in plants, and their abundance suggests an immense signaling network that we have only just begun to uncover. Recent research findings indicate that individual receptor kinases fulfill important roles in growth and development, in the recognition of pathogens and symbionts or, in a few examples, in both growth and defense. This volume will focus on the roles of receptor kinases, their signaling pathways, and the ways in which these important signaling proteins are regulated. *Plant Molecular Systematics Macromolecular Approaches* [Wiley-Interscience](#) Describes how the primary chemicals (protein, DNA) found in plants are used in determining plant taxonomic and evolutionary relationships--a growing area reflecting the application of molecular biologic techniques in macromolecular systematic research. Topics include seed protein electrophoresis, electrophoretic studies of Rubisco, enzyme electrophoresis, amino acid sequencing, and systematic serology. Emphasizes evaluation of the systematic potential of the various kinds of data made available by new technology. Includes case studies and discussion of trends and directions in molecular systematics. *Molecular Systematics of Plants* [Springer Science & Business Media](#) The application of molecular techniques is rapidly transforming the study of plant systematics. The precision they offer enables researchers to classify plants that have not been subject to rigorous classification before and thus allows them to obtain a clearer picture of evolutionary relationships. *Plant Molecular Systematics* is arranged both conceptually and phylogenetically to accommodate the interests not only of general systematists, but also those of people interested in a particular plant family. The first part discusses molecular sequencing; the second reviews restriction site analysis and the sequencing of mitochondrial DNA. A third section details the analysis of ribosomal DNA and chloroplast DNA. The following section introduces model studies involving well-studied families such as the Onagraceae, Compositae and Leguminosae. The book concludes with a section addressing theoretical topics such as data analysis and the question of morphological vs. molecular data. *Plant Evolution An Introduction to the History of Life* [University of Chicago Press](#) Although plants comprise more than 90% of all visible life, and land plants and algae collectively make up the most morphologically, physiologically, and ecologically diverse group of organisms on earth, books on evolution instead tend to focus on animals. This organismal bias has led to an incomplete and often erroneous understanding of evolutionary theory. Because plants grow and reproduce differently than animals, they have evolved differently, and generally accepted evolutionary views—as, for example, the standard models of speciation—often fail to hold when applied to them. Tapping such wide-ranging topics as genetics, gene regulatory networks, phenotype mapping, and multicellularity, as well as paleobotany, Karl J. Niklas's *Plant Evolution* offers fresh insight into these differences. Following up on his landmark book *The Evolutionary Biology of Plants*—in which he drew on cutting-edge computer simulations that used plants as models to illuminate key evolutionary theories—Niklas incorporates data from more than a decade of new research in the flourishing field of

molecular biology, conveying not only why the study of evolution is so important, but also why the study of plants is essential to our understanding of evolutionary processes. Niklas shows us that investigating the intricacies of plant development, the diversification of early vascular land plants, and larger patterns in plant evolution is not just a botanical pursuit: it is vital to our comprehension of the history of all life on this green planet. **Molecular phylogenetics in plant evolution** [The Impact of Plant Molecular Genetics Springer Science & Business Media](#) The impact of molecular genetics on plant breeding and, consequently, agri culture, is potentially enonnous. Understanding and directing this potential im pact is crucial because of the urgent issues that we face concerning sustainable agriculture for a growing world population as well as conservation of the world's rapidly dwindling plant genetic resources. This book is largely devoted to the applications of genetic markers that have been developed by the application of molecular genetics to practical problems. These are known as DNA markers. They have gained a certain notoriety in foren sics, but can be used in a variety of practical situations. We are going through a period of accelerated breakthroughs in molecular ge netics. Therefore, the authors of each chapter were encouraged to speculate about both current bottlenecks and the future of their subfields of research. We can cer tainly apply molecular genetic tools and approaches to help resolve crucial ge netic resource problems that face humanity. However, little has been discussed with respect to when or how we should use such tools, nor to who specifically should use them; therefore, social and economic analyses are important in the planning stages of projects that are aimed at practical results. **Molecular Evolution A Statistical Approach** [Oxford University Press](#) "Studies of evolution at the molecular level have experienced phenomenal growth in the last few decades, due to rapid accumulation of genetic sequence data, improved computer hardware and software, and the development of sophisticated analytical methods. The flood of genomic data has generated an acute need for powerful statistical methods and efficient computational algorithms to enable their effective analysis and interpretation. This advanced textbook is aimed at graduate level students and professional researchers (both empiricists and theoreticians) in the fields of bioinformatics and computational biology, statistical genomics, evolutionary biology, molecular systematics, and population genetics. It will also be of relevance and use to a wider audience of applied statisticians, mathematicians, and computer scientists working in computational biology."--back cover. **Molecular Evolution and Horizontal Gene Transfer in Plant Parasitic Nematodes** Most evolutionary analyses of plant-parasitic nematodes have been based on a small number character sets and have provided little insight into the evolution of parasitism within the species analyzed. I have designed a strategy to recover the most robust phylogeny for five Meloidogyne species (*M. arenaria*, *M. chitwoodi*, *M. hapla*, *M. incognita*, and *M. javanica*), three closely related taxa (*Heterodera glycines*, *Globodera pallida* and *G. rostochiensis*) and the more distant taxon, *C. elegans*. The multiple-gene approach is based on sampling more than 80,000 tylenchid sequences present in public databases. I identified 47 genes which could unambiguously be assigned as orthologues, and performed an alignment, so that all 47 genes could be concatenated to create one multi-gene alignment. Bayesian analysis places *M. incognita* and *M. javanica* as sister taxa, with *M. arenaria* basal to these. Placement of *M. hapla* and *M. chitwoodi* are congruent with previous studies, as are relationships with the other taxa examined. A method for a high-throughput genome screen for horizontally acquired genes is further presented, illustrated using expressed sequence tag (EST) data from *M. incognita*, *M. javanica* and *M. arenaria*. Applying a phylogenetic filter to a series of homology searches revealed previously postulated horizontally transferred genes and six new candidates. Computational and experimental methods verified the horizontal gene transfer candidates as bona fide nematode genes. Phylogenetic analysis implicated rhizobial ancestors as donors of horizontally acquired genes in Meloidogyne. Analysis of these horizontally transferred gene candidates suggests a link between horizontally transferred genes in Meloidogyne and parasitism. **Plant Molecular Evolution** [Springer Science & Business Media](#) Plant molecular biology has produced an ever-increasing flood of data about genes and genomes. Evolutionary biology and systematics provides the context for synthesizing this information. This book brings together contributions from evolutionary biologists, systematists, developmental geneticists, biochemists, and others working on diverse aspects of plant biology whose work touches to varying degrees on plant molecular evolution. The book is organized in three parts, the first of which introduces broad topics in evolutionary biology and summarizes advances in plant molecular phylogenetics, with emphasis on model plant systems. The second segment presents a series of case studies of gene family evolution, while the third gives overviews of the evolution of important plant processes such as disease resistance, nodulation, hybridization, transposable elements and genome evolution, and polyploidy. **Plant Variation and Evolution Molecular Markers, Natural History and Evolution** [Springer Science & Business Media](#) 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. **Special Issue: Molecular Evolution and Phylogenetic Utility of Non-coding DNA** **Molecular Systematics of Plants** [Springer Science & Business Media](#) The application of molecular techniques is rapidly transforming the study of plant systematics. The precision they offer

enables researchers to classify plants that have not been subject to rigorous classification before and thus allows them to obtain a clearer picture of evolutionary relationships. **Plant Molecular Systematics** is arranged both conceptually and phylogenetically to accommodate the interests not only of general systematists, but also those of people interested in a particular plant family. The first part discusses molecular sequencing; the second reviews restriction site analysis and the sequencing of mitochondrial DNA. A third section details the analysis of ribosomal DNA and chloroplast DNA. The following section introduces model studies involving well-studied families such as the Onagraceae, Compositae and Leguminosae. The book concludes with a section addressing theoretical topics such as data analysis and the question of morphological vs. molecular data. **Plant Development and Evolution** [Academic Press](#) **Plant Development and Evolution**, the latest release in the Current Topics in Developmental Biology series, highlights new advances in the field, with this new volume presenting interesting chapters on the Evolution of the plant body plan, Lateral root development and its role in evolutionary adaptation, the Development of the vascular system, the Development of the shoot apical meristem and phyllotaxis, the Evolution of leaf diversity, the Evolution of regulatory networks in land plants, The role of programmed cell death in plant development, the Development and evolution of inflorescence architecture, the Molecular regulation of flower development, the Pre-meiotic another development, and much more. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Current Topics in Developmental Biology series Updated release includes the latest information on **Plant Development and Evolution On the Economy of Plant Form and Function Proceedings of the Sixth Maria Moors Cabot Symposium** [Cambridge University Press](#) This book summarizes the major recent advances in the economic analysis of plant behavior. **Molecular Ecology and Evolution: Approaches and Applications** [Birkhäuser](#) The past 25 years have witnessed a revolution in the way ecologists and evolutionary biologists approach their disciplines. Modern molecular techniques are now reshaping the spectrum of questions that can be addressed while studying the mechanisms and consequences of the ecology and evolution of living organisms. "Molecular Ecology and Evolution: Approaches and Applications" describes, from a molecular perspective, several methodological and technical approaches used in the fields of ecology, evolution, population biology, molecular systematics, conservation genetics, and development. Modern techniques are introduced, and older, more classic ones refined. The advantages, limitations, and potentials of each are discussed in detail, and thereby illustrate the widening range of cross-field research and applications which this modern technology is stimulating. This book will serve as an important textbook for graduate and advanced undergraduate students, and as a key reference work for researchers **Plant Biosystematics** [Elsevier](#) **Plant Biosystematics** is a compendium of papers from a symposium titled "Plant Biosystematics: Forty Years Later" held in Montreal in July 1983. This collection reviews the current field of biosystematics, particularly the evolution of natural biota, and how plant biosystematics can contribute to the welfare of humans. One paper reviews biosystematics, compares new approaches, and discusses the latest trend in comparative, molecular evolution of genes. One author discusses the cytology and biosystematics concerning the discontinuities and genetic independence occurring in the evolutionary process. Another author discusses chromosome pairing in species and hybrids that includes models of chromosome pairing in diploids. The text also describes chromosome banding and biosystematics, as well as the problems of chromosome banding that should be addressed to in future research. With estimates of the number of species being threatened with extinction numbering around 20,000 one paper address the issue of conservation and biosystematics. The author suggests that more biological information should be published to avoid duplication of effort, and possibly drive scientists to have their views more widely felt. Agriculturists, botanists, conservationists, environmentalists, and researchers in the field of botany, conservation, and plant genealogy will find this book valuable. **Molecular Evolution of a Homotetrameric Enzyme of Plant Origin from the Solanum Tuberosum L. Adp-glucose Pyrophosphorylase Small Subunit Characterization of the Receptor-like Kinase TMK1 and Molecular Evolution of the Receptor-like Kinase Gene Family in Arabidopsis Thaliana An Introduction to Molecular Evolution and Phylogenetics** [Oxford University Press](#) DNA can be extracted and sequenced from a diverse range of biological samples, providing a vast amount of information about evolution and ecology. The analysis of DNA sequences contributes to evolutionary biology at all levels, from dating the origin of the biological kingdoms to untangling family relationships. **An Introduction to Molecular Evolution and Phylogenetics** presents the fundamental concepts and intellectual tools you need to understand how the genome records information about evolutionary past and processes, how that information can be "read", and what kinds of questions we can use that information to answer. Starting with evolutionary principles, and illustrated throughout with biological examples, it is the perfect starting point on the journey to an understanding of the way molecular data is used in modern biology. **Online Resource Centre** **The Online Resource Centre features:** For registered adopters of the book:- Class plans for one-hour hands-on sessions associated with each chapter- Figures from the textbook to view and download **Introduction to Evolutionary Genomics** [Springer Science & Business Media](#) This book is the first of its kind to explain the fundamentals of evolutionary genomics. The comprehensive coverage includes concise descriptions of a variety of genome organizations, a thorough discussion of the methods used, and a detailed review of genome sequence processing procedures. The opening chapters also provide the necessary basics for readers unfamiliar with evolutionary studies. Features: introduces the basics of molecular biology, DNA replication, mutation, phylogeny, neutral evolution, and natural selection; presents a brief evolutionary history of life from the primordial seas to the emergence of humans; describes the genomes of prokaryotes, eukaryotes, vertebrates, and humans; reviews methods for genome sequencing, phenotype data collection, homology searches and analysis, and phylogenetic tree and network building; discusses databases of genome sequences and related information, evolutionary distances, and population genomics; provides supplementary material at an associated website. **A Broader View for Plant EvoDevo: Novel Approaches for Diverse Model Systems** [Frontiers Media SA](#) This collection attempts to integrate work pertaining to a fundamental question in plant evolution: **What are the molecular underpinnings for the origin of different plant forms? Among the many facets this question**

touches are the transition to land, the emergence of vascular plants, the origin of the seed and the origin and diversification of floral form. We aim to bring to the forefront the most salient and original plant systems and approaches within an inclusive phylogenetic context that encompasses representatives of the major lineages of land plants. Telling the Evolutionary Time Molecular Clocks and the Fossil Record [CRC Press](#) Determining the precise timing for the evolutionary origin of groups of organisms has become increasingly important as scientists from diverse disciplines attempt to examine rates of anatomical or molecular evolution and correlate intrinsic biological events to extrinsic environmental events. Molecular clock analyses indicate that many major groups RNA Helicases [Academic Press](#) This volume of Methods in Enzymology aims to provide a reference for the diverse, powerful tools used to analyze RNA helicases. The contributions in this volume cover the broad scope of methods in the research on these enzymes. Several chapters describe quantitative biophysical and biochemical approaches to study molecular mechanisms and conformational changes of RNA helicases. Further chapters cover structural analysis, examination of co-factor effects on several representative examples, and the analysis of cellular functions of select enzymes. Two chapters outline approaches to the analysis of inhibitors that target RNA helicases. This volume of Methods in Enzymology aims to provide a reference for the diverse, powerful tools used to analyze RNA helicases The contributions in this volume cover the broad scope of methods in the research on these enzymes Plant Genome Diversity Volume 1 Plant Genomes, their Residents, and their Evolutionary Dynamics [Springer Science & Business Media](#) In this timely new 2-volume treatise, experts from around the world have banded together to produce a first-of-its-kind synopsis of the exciting and fast moving field of plant evolutionary genomics. In Volume I of Plant Genome Diversity, an update is provided on what we have learned from plant genome sequencing projects. This is followed by more focused chapters on the various genomic "residents" of plant genomes, including transposable elements, centromeres, small RNAs, and the evolutionary dynamics of genes and non-coding sequences. Attention is drawn to advances in our understanding of plant mitochondrial and plastid genomes, as well as the significance of duplication in genic evolution and the non-independent evolution among sequences in plant genomes. Finally, Volume I provides an introduction to the vibrant new frontier of plant epigenomics, describing the current state of our knowledge and the evolutionary implications of the epigenomic landscape. Molecular and Genome Evolution This title describes the driving forces behind the evolutionary process at the molecular and genome levels, the effects of the various molecular mechanisms on the structure of genes, proteins, and genomes. Climate Change, Ecology and Systematics [Cambridge University Press](#) Climate change has shaped life in the past and will continue to do so in the future. Understanding the interactions between climate and biodiversity is a complex challenge to science. With contributions from 60 key researchers, this book examines the ongoing impact of climate change on the ecology and diversity of life on earth. It discusses the latest research within the fields of ecology and systematics, highlighting the increasing integration of their approaches and methods. Topics covered include the influence of climate change on evolutionary and ecological processes such as adaptation, migration, speciation and extinction, and the role of these processes in determining the diversity and biogeographic distribution of species and their populations. This book ultimately illustrates the necessity for global conservation actions to mitigate the effects of climate change in a world that is already undergoing a biodiversity crisis of unprecedented scale. Plant Viruses: Evolution and Management [Springer](#) This book focuses on the evolution of plant viruses, their molecular classification, epidemics and management, covering topics relating to evolutionary mechanisms, viral ecology and emergence, appropriate analysis methods, and the role of evolution in taxonomy. The currently emerging virus species are increasingly becoming a threat to our way of life, both economically and physically. Plant viruses are particularly significant as they affect our food supply and are capable of rapidly spreading to new plant species. In basic research, plant viruses have become useful models to analyze the molecular biology of plant gene regulation and cell-cell communication. The small size of DNA genome of viruses possesses minimal coding capacity and replicates in the host cell nucleus with the help of host plant cellular machinery. Thus, studying virus cellular processes provides a good basis for explaining DNA replication, transcription, mRNA processing, protein expression and gene silencing in plants. A better understanding of these cellular processes will help us design antiviral strategies for plants. The book provides in-depth information on plant virus gene interactions with hosts, localization and expression and the latest advances in our understanding of plant virus evolution, their responses and crop improvement. Combining characterization of plant viruses and disease management and presenting them together makes it easy to compare all aspects of resistance, tolerance and management strategies. As such, it is a useful resource for molecular biologists and plant virologists alike. Variation and Evolution in Plants and Microorganisms Toward a New Synthesis 50 Years after Stebbins [National Academies Press](#) "The present book is intended as a progress report on [the] synthetic approach to evolution as it applies to the plant kingdom." With this simple statement, G. Ledyard Stebbins formulated the objectives of Variation and Evolution in Plants, published in 1950, setting forth for plants what became known as the "synthetic theory of evolution" or "the modern synthesis." The pervading conceit of the book was the molding of Darwin's evolution by natural selection within the framework of rapidly advancing genetic knowledge. At the time, Variation and Evolution in Plants significantly extended the scope of the science of plants. Plants, with their unique genetic, physiological, and evolutionary features, had all but been left completely out of the synthesis until that point. Fifty years later, the National Academy of Sciences convened a colloquium to update the advances made by Stebbins. This collection of 17 papers marks the 50th anniversary of the publication of Stebbins' classic. Organized into five sections, the book covers: early evolution and the origin of cells, virus and bacterial models, protocist models, population variation, and trends and patterns in plant evolution. Molecular Markers in Plants [John Wiley & Sons](#) Molecular Markers in Plants surveys an array of technologies used in the molecular analysis of plants. The role molecular markers play in plant improvement has grown significantly as DNA sequencing and high-throughput technologies have matured. This timely review of technologies and techniques will provide readers with a useful resource on the latest molecular technologies. Molecular Markers in Plants not only reviews past achievements,

but also catalogs recent advances and looks forward towards the future application of molecular technologies in plant improvement. Opening chapters look at the development of molecular technologies. Subsequent chapters look at a wide range of applications for the use of these advances in fields as diverse as plant breeding, production, biosecurity, and conservation. The final chapters look forward toward future developments in the field. Looking broadly at the field of molecular technologies, *Molecular Markers in Plants* will be an essential addition to the library of every researcher, institution, and company working in the field of plant improvement. *Plant Systematics* [Academic Press](#) *Plant Systematics, Third Edition*, has made substantial contributions to plant systematics courses at the upper-undergraduate and first year graduate level, with the first edition winning The New York Botanical Garden's Henry Allan Gleason Award for outstanding recent publication in plant taxonomy, plant ecology or plant geography. This third edition continues to provide the basis for teaching an introduction to the morphology, evolution and classification of land plants. A foundation of the approach, methods, research goals, evidence and terminology of plant systematics are presented, along with the most recent knowledge of evolutionary relationships of plants and practical information vital to the field. In this new edition, the author includes greatly expanded treatments on families of flowering plants, as well as tropical trees (all with full-color plates), and an updated explanation of maximum likelihood and Bayesian inference algorithms. Chapters on morphology and plant nomenclature have also been enhanced with new material. Covers research developments in plant molecular biology Features clear, detailed cladograms, drawings and photos Includes major revisions to chapters on phylogenetic systematics and plant morphology