

Genetic Characterization Of Guava Psidium Guajava L

Tree species are indispensable to support human life. Due to their long life cycle and environmental sensitivity, breeding trees to suit day-to-day human needs is a formidable challenge. Whether they are edible or industrial crops, improving yield under optimal, sub-optimal and marginal areas calls for unified efforts from the scientists around the world. While the uniqueness of coconut (kalpavriksha) (Sanskrit meaning tree-of-life) marks its presence in every continent from Far East to South America, tree crops like cocoa, oil palm, rubber, apple, peach, grapes and walnut prove their environmental sensitivity towards tropical, sub-tropical and temperate climates. Desert climate is quintessential for date palm. Thus, from soft drinks to breweries to beverages to oil to tyres, the value addition offers a spectrum of products to human kind, enriched with nutritional, environmental, financial, social and trade related attributes. Taxonomically, tree crops do not confine to a few families, but spread across a section of genera, an attribute so unique that contributes immensely to genetic biodiversity even while cultivated at the commercial scale. Many of these species influence other flora to nurture in their vicinity, thus ensuring their integrity in preserving the genetic biodiversity. While wheat, rice, maize, barley, soybean, cassava and banana make up the major food staples, many fruit tree species contribute greatly to nutritional enrichment in human diet. The edible part of these species is the source of several nutrients that makes additives for the daily diet of humans, for example, vitamins, sugars, aromas and flavour compounds, and raw material for food processing industries. Tree crops face an array of agronomic and horticultural problems in propagation, yield, appearance, quality, diseases and pest control, abiotic stresses and poor shelf-life.

Biological Pigments—Advances in Research and Application: 2012 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Biological Pigments. The editors have built **Biological Pigments—Advances in Research and Application: 2012 Edition** on the vast information databases of ScholarlyNews.™ You can expect the information about Biological Pigments in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of **Biological Pigments—Advances in Research and Application: 2012 Edition** has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Laboratory Protocols in Fungal Biology presents the latest techniques in fungal biology. This book analyzes information derived through real experiments, and focuses on cutting edge techniques in the field. The book comprises 57 chapters contributed from internationally recognised scientists and researchers. Experts in the field have provided up-to-date protocols covering a range of frequently used methods in fungal biology. Almost all important methods available in the area of fungal biology viz. taxonomic keys in fungi; histopathological and microscopy techniques; proteomics methods; genomics methods; industrial applications and related techniques; and bioinformatics tools in fungi are covered and compiled in one book. Chapters include introductions to their respective topics, list of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and notes on troubleshooting. Each chapter is self-contained and written in a style that enables the reader to progress from elementary concepts to advanced research techniques. **Laboratory Protocols in Fungal Biology** is a valuable tool for both beginner research workers and experienced professionals. Coming Soon in the Fungal Biology series:

Goyal, Manoharachary / Future Challenges in Crop Protection Against Fungal Pathogens Martín, García-Estrada, Zeilinger / Biosynthesis and Molecular Genetics of Fungal Secondary Metabolites Zeilinger, Martín, García-Estrada / Biosynthesis and Molecular Genetics of Fungal Secondary Metabolites, Volume 2 van den Berg, Maruthachalam / Genetic Transformation Systems in Fungi Schmoll, Dattenbock / Gene Expression Systems in Fungi Dahms / Advanced Microscopy in Mycology

This book covers the biotechnology of all the major fruit and nut species. Since the very successful first edition of this book in 2004, there has been rapid progress for many fruit and nut species in cell culture, genomics and genetic transformation, especially for citrus and papaya. This book covers both these cutting-edge technologies and regeneration pathways, protoplast culture, in vitro mutagenesis, ploidy manipulation techniques that have been applied to a wider range of species. Three crop species, Diospyros kaki (persimmon), Punica granatum (pomegranate) and Eriobotrya japonica (loquat) are included for the first time. The chapters are organized by plant family to make it easier to make comparisons and exploitation of work with related species. Each chapter discusses the plant family and the related wild species for 38 crop species, and has colour illustrations. It is essential for scientists and post graduate students who are engaged in the improvement of fruit, nut and plantation crops.

Genetic Engineering of Horticultural Crops provides key insights into commercialized crops, their improved productivity, disease and pest resistance, and enhanced nutritional or medicinal benefits. It includes insights into key technologies, such as marker traits identification and genetic traits transfer for increased productivity, examining the latest transgenic advances in a variety of crops and providing foundational information that can be applied to new areas of study. As modern biotechnology has helped to increase crop productivity by introducing novel gene(s) with high quality disease resistance and increased drought tolerance, this is an ideal resource for researchers and industry professionals. Provides examples of current technologies and methodologies, addressing abiotic and biotic stresses, pest resistance and yield improvement Presents protocols on plant genetic engineering in a variety of wide-use crops Includes biosafety rule regulation of genetically modified crops in the USA and third world countries

The book covers interplay between pest management strategies and safety of pollinators. Detailed information is provided on pests and pollinators of temperate, subtropical and tropical fruit crops. Most of the fruit crops are highly cross pollinated and depend upon insects or benefit from insect pollination for fruit set. Insect pests on the other hand cause major economic damage on fruit crops in tropics, subtropics and temperate. Evidently, pest management in fruit crops on one hand and providing safety to the pollinators on the other is a challenging task in the context of increasing horticultural productivity without upsetting the ecological balance. This book aims to integrate and develop pest control strategies in a way to minimize their impact on beneficial insect species such as natural enemies and pollinators to enhance fruit production and quality. The book covers interplay between pest management strategies and safety of pollinators. Detailed information is provided on pests and pollinators of temperate, subtropical and tropical fruit crops. Pollinators play a crucial role in flowering plant reproduction and in the production of most fruits and vegetables. Most of the fruit crops are highly cross pollinated and depend upon insects or benefit from insect pollination for fruit set. Insect pests on the other hand cause major economic damage on fruit crops in tropics, subtropics and temperate. Evidently, pest management in fruit crops on one hand and providing safety to the pollinators on the other is a challenging task in the context of increasing horticultural productivity without upsetting the ecological balance. This book aims to integrate and develop pest control strategies in a way to minimize their impact on beneficial insect species such as natural enemies and pollinators to enhance fruit production and quality. Most of the fruit crops are highly cross pollinated and depend upon insects or benefit from insect

pollination for fruit set. Insect pests on the other hand cause major economic damage on fruit crops in tropics, subtropics and temperate. Evidently, pest management in fruit crops on one hand and providing safety to the pollinators on the other is a challenging task in the context of increasing horticultural productivity without upsetting the ecological balance. This book aims to integrate and develop pest control strategies in a way to minimize their impact on beneficial insect species such as natural enemies and pollinators to enhance fruit production and quality. The book covers interplay between pest management strategies and safety of pollinators.

This book in the series "Sustainable Development and Biodiversity" contains peer-reviewed chapters from leading academicians and researchers around the world in the field of horticulture, plant taxonomy, plant biotechnology, genetics and related areas of biodiversity science centered on genetic diversity. This book includes original research reviews (national, regional and global) and case studies in genetic diversity in fruits and vegetables, horticulture, and ecology from sub-tropical and tropical regions. It is unique as it covers a wide array of topics covering global interests and will constitute valuable reference material for students, researchers, extension specialists, farmers and certification agencies who are concerned with biodiversity, ecology and sustainable development.

Nutritional Composition of Fruit Cultivars provides readers with the latest information on the health related properties of foods, making the documentation of the nutritive value of historical cultivars especially urgent, especially before they are lost and can't be effectively compared to modern cultivars. Because there is considerable diversity and a substantial body of the compositional studies directed towards commercial varieties, this information is useful for identifying traits and features that may be transposed from one variety to another. In addition, compositional and sensory features may also be used for commercialization and to characterize adulteration. Detailed characterization of cultivars can be used to identify "super-foods". Alternatively, unmasked historical cultivars may be the focus of reinvigorated commercial practices. Each chapter in this book has sections on the botanical aspects, the composition of traditional or ancient cultivars, the composition of modern cultivars, a focus on areas of research, the specialty of the communicating author of each chapter, and summary points. Presents the botanical aspects and composition of both traditional and modern plants, including in-depth insight into current research, and overall summary points for each fruit for consistent comparison and ease of reference Provides important information in the consideration of preservation, transference, or re-introduction of historical/traditional cultivars into current crop science Provides details on compositional and sensory parameters, from aroma and taste to micro- and macronutrients Includes data on nutraceuticals and novel components that have proven to impact on, or be important in, food quality, storage, processing, storage, and marketing

World population is increasing at an alarming rate and this has resulted in increasing tremendously the demand for tree products such as wood for construction materials, fuel and paper, fruits, oils and medicines etc. This has put immense pressure on the world's supplies of trees and raw material to industry and will continue to do so as long as human population continues to grow. Also, the quality of human diet, especially nutritional components, is adversely affected due to limited genetic improvement of most of fruit trees. Thus there is an immediate need to increase productivity of trees. Improvement has been made through conventional breeding methods, however, conventional breeding is very slow due to long life cycle of trees. A basic strategy in tree improvement is to capture genetic gain through clonal propagation. Clonal propagation via organogenesis is being used for the production of selected elite individual trees. However, the methods are labour intensive, costly, and produce low volumes. Genetic gain can now be captured through somatic embryogenesis. Formation of embryos from somatic cells by a process resembling zygotic embryogenesis is one of the most important features of plants. In 1958, Reinert in Germany and Steward in USA independently reported somatic embryogenesis in carrot cultures. Since then, tremendous progress in somatic

embryogenesis of woody and non-woody plants has taken place. It offers a potentially large-scale propagation system for superior clones. This book provides a comprehensive review of the antioxidant value of widely consumed fruits. Each chapter covers the botanical description, nutritional & health properties of these popular fruits. Fruits are one of the most important indicators of dietary quality and offer protective effects against several chronic diseases such as cardiovascular diseases, obesity, and various types of cancer. In order to effectively promote fruit consumption, it is necessary to know and understand the components of fruits. In addition to underscoring the importance of fruit consumption's effects on human diet, the book addresses the characterization of the chemical compounds that are responsible for the antioxidant properties of various fruits. Given its scope, the book will be of interest to graduate and post-graduate students, research scholars, academics, pomologists and agricultural scientists alike. Those working in various fruit processing industries and other horticultural departments will also find the comprehensive information relevant to their work.

Plant genomics and biotechnology have recently made enormous strides, and hold the potential to benefit agriculture, the environment and various other dimensions of the human endeavor. It is no exaggeration to claim that the twenty-first century belongs to biotechnology. Knowledge generation in this field is growing at a frenetic pace, and keeping abreast of the latest advances and calls on us to double our efforts. Volume II of this two-part series addresses cutting-edge aspects of plant genomics and biotechnology. It includes 37 chapters contributed by over 70 researchers, each of which is an expert in his/her own field of research. Biotechnology has helped to solve many conundrums of plant life that had long remained a mystery to mankind. This volume opens with an exhaustive chapter on the role played by thale cress, *Arabidopsis thaliana*, which is believed to be the *Drosophila* of the plant kingdom and an invaluable model plant for understanding basic concepts in plant biology. This is followed by chapters on bioremediation, biofuels and biofertilizers through microalgal manipulation, making it a commercializable prospect; discerning finer details of biotic stress with plant-fungal interactions; and the dynamics of abiotic and biotic stresses, which also figure elsewhere in the book. Breeding crop plants for desirable traits has long been an endeavor of biotechnologists. The significance of molecular markers, marker assisted selection and techniques are covered in a dedicated chapter, as are comprehensive reviews on plant molecular biology, DNA fingerprinting techniques, genomic structure and functional genomics. A chapter dedicated to organellar genomes provides extensive information on this important aspect. Elsewhere in the book, the newly emerging area of epigenetics is presented as seen through the lens of biotechnology, showcasing the pivotal role of DNA methylation in effecting permanent and transient changes to the genome. Exclusive chapters deal with bioinformatics and systems biology. Handy tools for practical applications such as somatic embryogenesis and micropropagation are included to provide frontline information to entrepreneurs, as is a chapter on somaclonal variation. Overcoming barriers to sexual incompatibility has also long been a focus of biotechnology, and is addressed in chapters on wide hybridization and hybrid embryo rescue. Another area of accomplishing triploids through endosperm culture is included as a non-conventional breeding strategy. Secondary metabolite production through tissue cultures, which is of importance to industrial scientists, is also covered. Worldwide exchange of plant genetic material is currently an essential topic, as is conserving natural resources in situ. Chapters on in vitro conservation of extant, threatened and other valuable germplasms, gene banking and related issues are included, along with an extensive account of the biotechnology of spices – the low-volume, high-value crops. Metabolic engineering is another emerging field that provides commercial opportunities. As is well known, there is widespread concern over genetically modified crops among the public. GM crops are covered, as are genetic engineering strategies for combating biotic and abiotic stresses where no other solutions are in sight. RNAi- and micro RNA- based strategies for crop improvement have proved to offer novel alternatives to the existing non-conventional techniques,

and detailed information on these aspects is also included. The book's last five chapters are devoted to presenting the various aspects of environmental, marine, desert and rural biotechnology. The state-of-the-art coverage on a wide range of plant genomics and biotechnology topics will be of great interest to post-graduate students and researchers, including the employees of seed and biotechnology companies, and to instructors in the fields of plant genetics, breeding and biotechnology.

RNAi technology is used for large-scale screens that systematically shut down each gene in the cell, which can help identify the components necessary for a particular cellular process or an event such as cell division. Exploitation of the pathway is also a promising tool in biotechnology and medicine. Introducing new technology in the study of RNA

This Reference Work provides a comprehensive overview of bioactive compounds found in underutilized fruits and nuts around the world and it elucidates their pharmacological, biological and health effects. In this book, readers will learn about the potential applications of bioactive molecules presented in several underutilized fruits and nuts rich in carbohydrates, lipids, fats, proteins, polyphenols, carotenoids, vitamins, organic acids, and volatile compounds. Readers will also discover more about the nutraceutical importance of these underutilized crops, and will also find specific case studies of the therapeutic potential of underutilized fruits and nuts. Written by highly renowned scientists of the field, this reference work appeals to a wide readership, from students and researchers to healthcare and industry professionals interested in plant biotechnology, biology, pharmacology and food engineering.

It is over 20 years since the publication of A.c. Hulme's two volume text on The Biochemistry of Fruits and their Products. Whilst the bulk of the information contained in that text is still relevant it is true to say that our understanding of the biochemical and genetic mechanisms within the tropical fruits, the papaya, *Carica papaya* L. (family Caricaceae Dumort.), is presented as the main representative being cultivated in tropical and sub-tropical areas mostly in developing countries. Papayas nutritional value, beneficial to health, as well as various industrial applications of their products, led to be economically important for both developing and developed countries. Within this broad field of knowledge, this book aims to contribute to better understanding of the topic. The organization of the chapters and sections is also straightforward; Chapter One presents what papaya is (*Carica papaya* L.), its taxonomy, distribution, origin and morphology. Closing the first part, Chapters Three and Four show the nutritional and medical values, discussing vitamins, minerals and dietary fibers, the industrial applications of using papaya and various parts of the plant, as a source of proteolytic enzymes and some active compounds reported to antimicrobial, anticancer, amongst other properties, illustrating the fatty acid composition, triacylglycerol profile and papaya seed oil of Malaysian papaya fruits. In the second part of the book, the readers should find the relevant aspects of papaya microbiology related to fresh fruits quality and safety and the beneficial effects of microorganisms isolated from papaya, such as some Lactic Acid Bacteria strains that have been proposed to be potentially probiotics, as shown in Chapters Five and Six. Finally the book addresses the importance of Integrated Management of the Papaya Ringspot Virus, which is transmitted by several aphid species and could commit 100% of the crop as described in Chapter Seven and the biotechnological strategies for control of papaya virus diseases as shown in Chapter Eight.

Merging topical data from recently published review and research articles, as well as the knowledge and insight of industry experts, Omics Applications in Crop Science delves into plant science, and various technologies that use omics in agriculture. This book concentrates on crop breeding and environmental applications, and examines the application

Fruit Oils: Chemistry and Functionality presents a comprehensive overview of recent advances in the chemistry and functionality of lipid bioactive phytochemicals found in fruit oils. The chapters in this text examine the composition, physicochemical characteristics and

organoleptic attributes of each of the major fruit oils. The nutritional quality, oxidative stability, and potential food and non-food applications of these oils are also extensively covered. The potential health benefits of the bioactive lipids found in these fruit oils are also a focus of this text. For each oil presented, the levels of omega-9, omega-6 and omega-3 fatty acids are specified, indicating the level of health-promoting traits exhibited in each. The oils and fats extracted from fruits generally differ from one another both in terms of their major and minor bioactive constituents. The methods used to extract oils and fats as well as the processing techniques such as refining, bleaching and deodorization affect their major and minor constituents. In addition, different post-processing treatments of fruit oils and fats may alter or degrade important bioactive constituents. Treatments such as heating, frying, cooking and storage and major constituents such as sterols and tocopherols are extensively covered in this text. Although there have been reference works published on the composition and biological properties of lipids from oilseeds, there is currently no book focused on the composition and functionality of fruit oils. *Fruit Oils: Chemistry and Functionality* aims to fill this gap for researchers, presenting a detailed overview of the chemical makeup and functionality of all the important fruit oils.

The conservation of crop genetic resources is one of the important elements in efforts to sustainably increase agricultural production in low-income countries, and to guarantee long-term food security, especially for the low-income population groups in these countries. Horticultural crops, as high-value crops, have an important role to play in revitalizing rural economies and can add significantly to national economies. Moreover, horticulture provides more than twice the number of jobs compared to traditional cereal crop production, and the shifting of conventional agriculture towards high-value horticulture has increased employment opportunities in developing countries. To exploit this potential, researchers need a vast array of horticultural genetic resources and information on new traits. Horticultural crops, which are only a part of PGRFA (Plant Genetic Resources for Food and Agriculture), are characterized by a wide and varied range of species. In fact, there are five major horticultural crop groups: fruit and nut crops, vegetables, food legumes, roots and tubers, and lastly the ornamental and medicinal group. In this context, the present book provides a comprehensive overview of the current state of conservation and utilization of horticultural genetic resources, addressing contemporary approaches to conservation in connection with different technologies, including biotechnological approaches as practised in India and in some cases, globally. It includes a brief chapter on the unique nature of horticultural genetic resources, providing a rationale for viewing them as being distinct from field crop genetic resources. Subsequent chapters share insights on protocols for the conservation of selected horticultural crops *ex situ*, and focus on the increased need to complement these efforts with *in situ* conservation approaches. Geospatial tools are also briefly described, emphasizing their utility with regard to mapping and managing resources. The book also explores the wild gene pool in horticulture crops; discusses legal aspects related to horticultural genetic resources and biotechnological aspects; and describes the key aspects of sustainable management and replenishment. Given its scope, the book offers a valuable resource for all horticulturists, graduate students, researchers, policymakers, conservationists, and NGOs engaged in horticulture in particular and biodiversity in general.

In recent decades, significant advances in new methodologies like DNA sequencing and high-throughput sequencing have been used to identify microorganisms and monitor their interactions with different environments. Microbial genomics techniques are opening new approaches to microbiology by revealing how microorganisms affect human beings and the environment. This book covers four major areas: 1) Environmental microbial genomics, 2) Microbial genomics in human health, 3) Microbial genomics in crop improvement and plant health protection, and 4) Genome analysis of microbial pathogens. Within these areas, the topics addressed include: microbial genome diversity, evolution, and microbial genome sequencing; bioinformatics and microarray-based genomic technologies; functional genomics of

bioremediation of soil and water from organic and inorganic pollutants and carbon management; functional genomics of microbial pathogens and relevant microorganisms; functional genomics of model microorganisms; and applied functional genomics. Given its scope, the book offers a comprehensive source of information on the latest applications of microorganisms and microbial genomics to enhance the sustainability of agriculture and the environment.

"Global papaya production has grown significantly over the last few years, mainly as a result of increased production in India. This is the first comprehensive book authored by an international team of experts at the forefront of research and covers botany, biotechnology, production, postharvest physiology and processing"--

This book reviews how the release of the citrus genome facilitates the investigation of ancestral species, the study of their complex biological features, and the genetic basis of agronomic traits of paramount importance for their sustainable cultivation. The first chapters discuss citrus origin and distribution, and the economic importance and varietal composition of the cultivated species, providing an overview of citrus and related genera genetic resources. The book then describes the role of traditional breeding techniques (for scion and rootstocks) as well as the potential of genomic breeding and innovative protocols for biotechnological approaches. The second part provides essential information on the genus Citrus, the attributes of pure citrus species, genetic admixtures, hybrids and citrus relatives, and on the horticultural classification of cultivated species, varieties and rootstocks. The third part then focuses on the different molecular mechanisms, covering various aspects of citrus biology, including the role of beneficial compounds of citrus fruits. In addition, it examines the molecular responses of citrus to abiotic stresses and to field and post-harvest diseases. Providing insights gained in recent years, it is a valuable guide for those who are interested in gene discovery, comparative genomics, molecular breeding and new breeding techniques. It is particularly useful for scientists, breeders and students at universities and public sector institutes involved in research for the citrus industry.

Valorization of Agri-Food Wastes and By-Products: Recent Trends, Innovations and Sustainability Challenges addresses the waste and by-product valorization of fruits and vegetables, beverages, nuts and seeds, dairy and seafood. The book focuses its coverage on bioactive recovery, health benefits, biofuel production and environment issues, as well as recent technological developments surrounding state of the art of food waste management and innovation. The book also presents tools for value chain analysis and explores future sustainability challenges. In addition, the book offers theoretical and experimental information used to investigate different aspects of the valorization of agri-food wastes and by-products. Valorization of Agri-Food Wastes and By-Products: Recent Trends, Innovations and Sustainability Challenges will be a great resource for food researchers, including those working in food loss or waste, agricultural processing, and engineering, food scientists, technologists, agricultural engineers, and students and professionals working on sustainable food production and effective management of food loss, wastes and by-products. Covers recent trends, innovations, and sustainability challenges related to food wastes and by-products valorization Explores various recovery processes, the functionality of targeted bioactive compounds, and green processing technologies Presents emerging technologies for the valorization of agri-food wastes and by-products Highlights potential industrial applications of food wastes and by-products to support circular economy concepts

This book sheds new light on the chickpea genome sequencing and resequencing of chickpea germplasm lines and provides insights into classical genetics, cytogenetics, and trait mapping. It also offers an overview of the latest advances in genome sequencing and analysis. The growing human population, rapid climate changes and limited amounts of arable land are creating substantial challenges in connection with the availability and affordability of nutritious food for smallholder farmers in developing countries. In this context, climate smart crops are

essential to alleviating the hunger of the millions of poor and undernourished people living in developing countries. In addition to cereals, grain legumes are an integral part of the human diet and provide sustainable income for smallholder farmers in the arid and semi-arid regions of the world. Among grain legumes, the chickpea (*Cicer arietinum*) is the second most important in terms of production and productivity. Besides being a rich source of proteins, it can fix atmospheric nitrogen through symbiosis with rhizobia and increase the input of combined nitrogen. Several abiotic stresses like drought, heat, salinity, together with biotic stresses like *Fusarium* wilt, *Ascochyta* blight, and *Botrytis* grey mould have led to production losses, as the chickpeas is typically grown in the harsh climates of our planet's semi-arid regions. Functional advanced biopolymers have received far less attention than renewable biomass (cellulose, rubber, etc.) used for energy production. Among the most advanced biopolymers known is chitosan. The term chitosan refers to a family of polysaccharides obtained by partial de-N-acetylation from chitin, one of the most abundant renewable resources in the biosphere. Chitosan has been firmly established as having unique material properties as well as biological activities. Either in its native form or as a chemical derivative, chitosan is amenable to being processed—typically under mild conditions—into soft materials such as hydrogels, colloidal nanoparticles, or nanofibers. Given its multiple biological properties, including biodegradability, antimicrobial effects, gene transfectability, and metal adsorption—to name but a few—chitosan is regarded as a widely versatile building block in various sectors (e.g., agriculture, food, cosmetics, pharmacy) and for various applications (medical devices, metal adsorption, catalysis, etc.). This Special Issue presents an updated account addressing some of the major applications, including also chemical and enzymatic modifications of oligos and polymers. A better understanding of the properties that underpin the use of chitin and chitosan in different fields is key for boosting their more extensive industrial utilization, as well as to aid regulatory agencies in establishing specifications, guidelines, and standards for the different types of products and applications.

GuavaBotany, Production and UsesCABI

Trees that are indispensably supportive to human life pose a formidable challenge to breed them to suit to human needs. From soft drinks to breweries to beverages to oil to tires, the value added products from trees give a spectrum of products to human kind. While attempts to tap these resources through conventional breeding are underway, the quick and elegant way of manipulating the genetic systems at the genome level is an essential chapter of modern science. Books featuring genomics of tree crops are few, and genomics is such a science that changes rapidly. *Genomics of Tree Crops* is an earnest attempt towards compiling genomics of tree crops. Plant genomics has made monumental strides in the last decade providing insights into intra-genomic phenomena such as heterosis, epistasis, pleiotropy and other interactions between loci and alleles within the genome. In contrast, the investigation of the roles and functions of single genes is a primary focus of molecular biology and is a common topic of modern genetic research. A genome is the sum total of all of an individual organism's genes. Thus, genomics is the study of all the genes of a cell, or tissue, at the DNA (genotype), mRNA (transcriptome), or protein (proteome) levels. The complete sequencing of the three billion base pair human genome with 25,000 genes identified and the invention of DNA microarrays ushered in a new era in the science of genomics leading to explosive advancements in oncology diagnostics. This impetus into the genomics era lead the way toward advances in plant genomics which started with *Arabidopsis thaliana* and went through an array of crops such as rice, maize, papaya, various cereals and legumes, with pigeon pea added to the list towards the end of 2011. Trees, on the other hand, are the least attended taxa with regard to genomic research. Some of the areas that attained attention of the scientists are: DNA sequencing, bioinformatics, genomics of flowering, gene flow, spatial structure, local adaptation and assisted migration in trees, transformation of fruit trees, genomics of tropical and temperate fruit trees, genomics of *Hevea* rubber, genomics of papaya and genomics of

palms. Genomics of Tree Crops compiles this information with chapters authored by experts on these crops.

Koa (*Acacia koa*) is a tree species endemic to Hawaii that is of immense ecological and economic importance. This species has been mined from local forests for its wood for more than 100 years, and extensive areas of koa-dominated forests have been converted to grazing lands. Today, in recognition of the great importance and value of koa and the forests in which it is found, there is substantial interest in restoration and management of koa forests. This report brings together knowledge on the biogeography, physiology, ecology, and silviculture of koa in an effort to assist landowners and resource stewards in making sound decisions about restoring and managing koa forests.

Sugarcane is the most important plant source for sugar and alcohol production and is cultivated in more than 80 countries in tropical and subtropical areas. However, environmental factors negatively influence its yield and jeopardize the prospect to meet the increasing demand for sugar, other sugarcane derived by products and bioethanol. The development of stress tolerant plants is fundamental for the maintenance and increase of crop yields. *Biotechnology to Enhance Sugarcane Productivity and Stress Tolerance* provides a comprehensive account of both theoretical and practical aspects of sugarcane production. It contains extensive coverage of genome mapping and molecular breeding in sugarcane and presents the status of the elucidation and improvement of plant genomes of economic interest. Through 14 chapters written by eminent scientists with global influence, this book examines various methods for sugarcane improvement through biotechnology. The book focuses on genetic and physical mapping, positioning, cloning, and monitoring of desirable genes using biotechnological approaches for high sugarcane productivity and the development of stress tolerance. Additional information includes the bioengineering of sugarcane, procedures to boost productivity, genetics and assessments for resistance to drought and salinity, genetics for high yields, and various topics of research on sugarcane genetics. It serves as a detailed reference source for cane growers, sugar and sugarcane technologists, students, and professors.

This book investigates the introduction of invasive species and their behavior in oceanic islands. How can we define invasive species? What is their history? How did they come to dominate and transform ecosystems? These are relevant questions when trying to understand the behavior of invasive species—primarily in fragile ecosystems such as islands—and to understand the biological, ecological, social and economic impacts of invasions. We chose the Galapagos Islands, a place well-known to be unique in the study of evolution, as a laboratory to analyze the interactions between invasive and endemic species, to understand the makeup of the ecosystems emerging after invasions have occurred, to describe the relationships of invasives with the people that live in these islands, and to try to develop comprehensive analyses on this topic from multi-scalar and multi-disciplinary points of view. For a long time, the discussion has been about how proper management of the species could achieve two main goals: the eradication of the species to recover affected ecosystems and the conservation of endemic species. The discussion has taken on other nuances, including the suggestion that an invasive species, when it is already adapted to an ecosystem, forms an integral part of it, and thus eradication would in itself go against conservation. On the other hand, some invasive species are not only part of the biological compound of the island ecosystems, but they also form part of the social and cultural history of the inhabited

islands. Some of these identified by the local inhabitants are species of real or potential economic value.

Guava (*Psidium guajava* L.) is an exquisite, nutritionally and economically valuable crop of tropical and subtropical regions of the world. It outshines other tropical fruits in productivity, hardiness, adaptability, nutritional value, and ensures higher economic returns to growers. Guava is commercially grown in over 70 countries, and is gaining in popularity as a 'super fruit' due to its nutritional and health benefits. With contributions from international experts, this is a valuable resource for researchers and students in horticulture, and guava-industry support personnel.

Citrus greening, a disease that reduces yield, compromises the flavor, color, and size of citrus fruit and eventually kills the citrus tree, is now present in all 34 Floridian citrus-producing counties. Caused by an insect-spread bacterial infection, the disease reduced citrus production in 2008 by several percent and continues to spread, threatening the existence of Florida's \$9.3 billion citrus industry. A successful citrus greening response will focus on earlier detection of diseased trees, so that these sources of new infections can be removed more quickly, and on new methods to control the insects that carry the bacteria. In the longer term, technologies such as genomics could be used to develop new citrus strains that are resistant to both the bacteria and the insect.

Principles of Tropical Horticulture leads the reader through a background of environmental influences and plant physiology to an understanding of production and post-harvest systems, environmental adaptation techniques and marketing strategies. Focusing on the principles behind production practices and their scientific basis, rather than detailed biological traits of each crop, this text outlines successes and failures in practices to date and sets out how the quantity and quality of horticultural produce can improve in the future. Case studies are frequently used and chapters cover the production of vegetables, fruit and ornamental crops, including temperate zone crops adapted to grow in the tropics.

With over 50,000 distinct species in sub-Saharan Africa alone, the African continent is endowed with an enormous wealth of plant resources. While more than 25 percent of known species have been used for several centuries in traditional African medicine for the prevention and treatment of diseases, Africa remains a minor player in the global natural products market largely due to lack of practical information. This updated and expanded second edition of the *Handbook of African Medicinal Plants* provides a comprehensive review of more than 2,000 species of plants employed in indigenous African medicine, with full-color photographs and references from over 1,100 publications. The first part of the book contains a catalog of the plants used as ingredients for the preparation of traditional remedies, including their medicinal uses and the parts of the plant used. This is followed by a pharmacognostical profile of 170 of the major herbs, with a brief description of the diagnostic features of the leaves, flowers, and fruits and monographs with botanical names,

common names, synonyms, African names, habitat and distribution, ethnomedicinal uses, chemical constituents, and reported pharmacological activity. The second part of the book provides an introduction to African traditional medicine, outlining African cosmology and beliefs as they relate to healing and the use of herbs, health foods, and medicinal plants. This book presents scientific documentation of the correlation between the observed folk use and demonstrable biological activity, as well as the characterized constituents of the plants.

Present world is witnessing drastic changes harshly impacting its bio-resources (plants, animals and organisms) that are considered as natural gift for our livelihood. Global warming, climate change, abiotic and biotic stresses are strangling and challenging the survivability of these resources. It is therefore crucial to manage these resources for making planet Earth more suitable to live. Moreover, there is an utter need to know how climate dynamic and biotic or abiotic factors are influencing on bio-resources and also to frame its sustainable management strategies. This book is the output of the research deliberations at 3rd International Conference on Bio-resource and Stress Management, India; and expert views on contemporary research and management issues in relation to bio-resources and its management. This timely needed uniquely written reference book consists of 29 well-crafted chapters on sustainable land, water and crop management, organic agriculture, climate change and crop productivity, stress management, bio-resource conservation, bio-fortification for nutritional security, agro-techniques, agro-forestry and forest resource management and waste management etc. which certainly will be of great use by the scientists, academicians, researchers, scholars, students, extension workers, corporate and NGO's working in these aspects.

Provides a systematic review of the latest techniques of biotechnology as applied to perennial fruit crops. The book emphasizes genetic manipulation rather than tissue culture or micropropagation. Individual fruit crops are covered as well as methodologies applicable to a range of fruits.

[Copyright: 8c98f7f7507d534c71a2b50f5313bfab](https://doi.org/10.1007/978-81-322-2534-4)