

Introduction To Plant Biotechnology Hs Chawla

Introduction to Plant Biotechnology (3/e) Introduction to Plant Biotechnology Plant Biotechnology Plant Tissue Culture and Molecular Markers Electroporation and Sonoporation in Developmental Biology Introduction To Plant Biotechnology 2e Introduction to Plant Biotechnology (3/e) Genetic Engineering and Biotechnology Modern Applications of Plant Biotechnology in Pharmaceutical Sciences Tree Biotechnology Plant Biotechnology, Volume 1 Journal of Plant Biology Biologics, A History of Agents Made From Living Organisms in the Twentieth Century Plants and People Plant Cell Biotechnology Biotechnologies of Crop Improvement, Volume 2 The Botanica Biotechnology in Sustainable Biodiversity and Food Security Biotechnology, Multiple Omics, and Precision Breeding in Medicinal Plants Integrative Approaches to Biotechnology H S Chawla H. S. Chawla H. S. Chawla Ashwani Kumar Harukazu Nakamura H. S. Chawla H S Chawla Yves Tourte Saurabh Bhatia Kishan Gopal Ramawat Bishun Deo Prasad Alexander von Schwerin Christopher Cumo Rudolf Endress Satbir Singh Gosal B. N. Prasad Jen-Tsung Chen Atul Bhargava Introduction to Plant Biotechnology (3/e) Introduction to Plant Biotechnology Plant Biotechnology Plant Tissue Culture and Molecular Markers Electroporation and Sonoporation in Developmental Biology Introduction To Plant Biotechnology 2e Introduction to Plant Biotechnology (3/e) Genetic Engineering and Biotechnology Modern Applications of Plant Biotechnology in Pharmaceutical Sciences Tree Biotechnology Plant Biotechnology, Volume 1 Journal of Plant Biology Biologics, A History of Agents Made From Living Organisms in the Twentieth Century Plants and People Plant Cell Biotechnology Biotechnologies of Crop Improvement, Volume 2 The Botanica Biotechnology in Sustainable Biodiversity and Food Security Biotechnology, Multiple Omics, and Precision Breeding in Medicinal Plants Integrative Approaches to Biotechnology *H S Chawla H. S. Chawla H. S. Chawla Ashwani Kumar Harukazu Nakamura H. S. Chawla H S Chawla Yves Tourte Saurabh Bhatia Kishan Gopal Ramawat Bishun Deo Prasad Alexander von Schwerin Christopher Cumo Rudolf Endress Satbir Singh Gosal B. N. Prasad Jen-Tsung Chen Atul Bhargava*

this book has been written to meet the needs of students for biotechnology courses at various levels of undergraduate and graduate studies this book covers all the important aspects of plant tissue culture viz nutrition media micropropagation organ culture cell suspension culture haploid culture protoplast isolation and fusion secondary metabolite production somaclonal variation and cryopreservation for good understanding of recombinant dna technology chapters on genetic material organization of dna in the genome and basic techniques involved in recombinant dna technology have been added different aspects on rDNA technology covered gene cloning isolation of plant genes transposons and gene tagging in vitro mutagenesis pcr molecular markers and marker assisted selection gene transfer methods chloroplast and mitochondrion dna transformation genomics and bioinformatics genomics covers functional and structural genomics proteomics metabolomics sequencing status of different organisms and dna chip technology application of biotechnology has been discussed as transgenics in crop improvement and impact of recombinant dna technology mainly in relation to biotech crops

plant biotechnology has created unprecedented opportunities for the manipulation of biological systems of plants to understand biotechnology it is essential to know

the basic aspects of genes and their organization in the genome of plant cells this text on the subject is aimed at students

basics laboratory organization sterilization techniques nutrition medium choice of the explant plant tissue culture seed culture micropropagation meristem culture micropropagation axillary bud proliferation micropropagation adventitious regeneration micropropagation organogenesis micropropagation embryogenesis cell suspension secondary metabolite production in a cell suspension culture anther culture protoplast isolation and fusion biotechnology sds page electrophoresis of proteins isolation of dna from plant tissues isolation and purification of plasmid dna restriction enzyme digestion of dna agarose gel electrophoresis preparation of competent cells transformation of e coil with plasmid dna and ligation of insert dna to a vector agrobacterium mediated gene transfer biolistic method of transformation in plants in vitro amplification of dna by pcr detection of transgenes rapd analysis microsatellite marker analysis southern blotting southern hybridization

plant tissue culture techniques help in understanding basic life processes which is essential to improving crop productivity furthermore recently molecular biology has assumed great importance with respect to plant biotechnology this book combines all three aspects into one with a focus on practical applications of various techniques it discusses micropropagation studies on several crop plants the molecular basis of understanding various life processes including the molecular basis of somatic embryogenesis and other physiological and biochemical processes having significant biotechnological applications it also covers in vitro studies of certain important plants like aloe vera simmondsia chinensis anacyclus pyrethrum and crataeva nurvala arachis hypogaea I phoenix dactylifera dendrocalamus asper asparagus adscendens roxb natural products of plant origin with their therapeutic potential and biotechnological production as well as genome analysis of crop plants with future applications in biotechnology

in ovo electroporation is an epoch making achievement in the study of developmental biology with this method experiments can be carried out in gain and loss of function in desired tissue at any desired stage in chick embryos introduction of a tetracycline regulated gene expression system and a transposon system has further extended the potential of the method making it possible to obtain long term expression and to turn on and off a gene of interest it is now applied to mice aquatic animals and even to plants for the study of developmental biology and for other purposes in this book the application of electroporation in many embryonic tissues and organs is introduced with some chapters that deal with gene transfer in adults sonoporation another useful tool using ultrasonic waves instead of electric currents for gene transfer to mesenchymal tissues is also introduced

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introductory text for students of genetics is general and the students of agronomy as the book gives numerous agronomic applications

modern applications of plant biotechnology in pharmaceutical sciences explores advanced techniques in plant biotechnology their applications to pharmaceutical sciences and how these methods can lead to more effective safe and affordable drugs the book covers modern approaches in a practical step by step manner and includes illustrations examples and case studies to enhance understanding key topics include plant made pharmaceuticals classical and non classical techniques for secondary metabolite production in plant cell culture and their relevance to pharmaceutical science edible vaccines novel delivery systems for plant based products international industry regulatory guidelines and more readers will find the book to be a comprehensive and valuable resource for the study of modern plant biotechnology approaches and their pharmaceutical applications builds upon the basic concepts of cell and plant tissue culture and recombinant dna technology to better illustrate the modern and potential applications of plant biotechnology to the pharmaceutical sciences provides detailed yet practical coverage of complex techniques such as micropropagation gene transfer and biosynthesis examines critical issues of international importance and offers real life examples and potential solutions

forest trees cover 30 of the earth s land surface providing renewable fuel wood timber shelter fruits leaves bark roots and are source of medicinal products in addition to benefits such as carbon sequestration water shed protection and habitat for 1 3 of terrestrial species however the genetic analysis and breeding of trees has lagged

this book first of this new two volume set provides an informative tour of the basics of biotechnology to recent advances in biotechnology knowledge of new and fresh approaches is a prerequisite to solving plant biological problems and to this end the editors have brought together a group of contributors who address the most recent techniques and their applications in plant biotechnology the chapters discuss some recent techniques such as tilling targeting induced local lesions in genomes advances in molecular techniques to study diversity protein purification and methods and analysis in protein protein interaction detection the volume also covers molecular markers and qtl mapping including four chapters that deal with different molecular markers development of mapping populations and association mapping for dissecting the genetic basis of complex traits in plants in sufficient detail the knowledge of biotechnology techniques and their applications will be valuable for researchers and scientists as well as for the many students engaged in plant biotechnology studies

the use of biologics drugs made from living organisms has raised specific scientific industrial medical and legal issues the essays contained in this collection each deal with a case study of a biologic substance or group of biologics and its use during the twentieth century

an exploration of the relationship between plants and people from early agriculture to modern day applications of biotechnology in crop production plants and people origin and development of human plant science relationships covers the development of agricultural sciences from roman times through the development of

agricultural experiment station

in the past there were many attempts to change natural foodstuffs into high value products cheese bread wine and beer were produced traditionally using microorganisms as biological tools later people influenced the natural process of evolution by artificial selection in the 19th century observations regarding the dependence of growth and reproduction on the nutrient supply led to the establishment of agricultural chemistry simultaneously efforts were directed at defining the correlation between special forms of morphological differentiation and related biochemical processes new experimental systems were developed after the discovery of phytohormones and their possible use as regulators of growth and differentiation in these systems intact plants or only parts of them are cultivated under axenic conditions these methods called in vitro techniques were introduced to modern plant breeding in the field of basic research plant cell cultures were increasingly developed and the correlations between biochemical processes and visible cell variations were explored further it should be possible to manipulate the basic laws of regulation and the respective biochemical processes should be regarded as being independent of morphological processes of plant development

during the past 15 years cellular and molecular approaches have emerged as valuable adjuncts to supplement and complement conventional breeding methods for a wide variety of crop plants biotechnology increasingly plays a role in the creation conservation characterization and utilization of genetic variability for germplasm enhancement for instance anther microspore culture somaclonal variation embryo culture and somatic hybridization are being exploited for obtaining incremental improvement in the existing cultivars in addition genes that confer insect and disease resistance abiotic stress tolerance herbicide tolerance and quality traits have been isolated and re introduced into otherwise sensitive or susceptible species by a variety of transgenic techniques together these transformative methodologies grant access to a greater repertoire of genetic diversity as the genes may come from viruses bacteria fungi insects animals human beings unrelated plants or even be artificially derived remarkable achievements have been made in the production characterization field evaluation and commercialization of transgenic crop varieties worldwide likewise significant advances have been made towards increasing crop yields improving nutritional quality enabling crops to be raised under adverse conditions and developing resistance to pests and diseases for sustaining global food and nutritional security the overarching purpose of this 3 volume work is to summarize the history of crop improvement from a technological perspective but to do so with a forward outlook on further advancement and adaptability to a changing world our carefully chosen case studies of important plant crops intend to serve a diverse spectrum of audience looking for the right tools to tackle complicated local and global issues

this volume contains papers which indicate how biodiversity can be used in a sustainable and equitable manner various uses of biotechnology including bioremediation and genetic engineering are dealt with by various authors

biotechnology multiple omics and precision breeding in medicinal plants explores the various methods for advancing medicinal plant research it covers a wide range of approaches including integrated and advanced plant biotechnology mutagenesis nanotechnology genome wide association studies multiple omics tools and high throughput technologies the book highlights the significant impact of combining pan genomics with metabolomics in medicinal plant research particularly in understanding how genetic diversity influences the profiles of secondary metabolites and the therapeutic potential of these plants features explores ways to improve

the production of secondary metabolites and bioactive compounds in key medicinal plants features information on bioinformatics artificial intelligence models molecular markers and genome editing techniques such as crispr assisted precision breeding promotes specific prebiotic formulas to ward off adverse effects of antibiotics covers information on epigenetic regulation in boosting secondary metabolite production and the use of speed breeding combined with high throughput technologies proposing a multitude of technologies and methodologies in plant biotechnology with focus on enhancing the production of secondary metabolites and bioactive compounds from medicinal plants this book is an ideal resource for researchers and academia in plant sciences breeding agriculture and horticulture industries

biotechnology is one of the fastest emerging fields that has attracted attention of conventional biologists biochemists microbiologists medical and agricultural scientists the coming decades are likely to witness a boom in biotechnology which is expected to surpass information technology as the new engine of the global economy biotechnology is experiencing a revolution that will affect every facet of our lives from crop improvement to commerce drugs and sustainable development new approaches and a plethora of information available at a frantic pace demands its dissemination to the scientific community the current book has been written with the specific objective of providing information on the recent developments in biotechnology to the readers the proposed book presents a multidisciplinary approach to the latest information and developments in biotechnology in an easy to read succinct format the book has been divided into 6 sections and 15 chapters giving an in depth analysis of the latest research and developments in the biotechnological realm the topics have been presented in a lucid easy to read methodical way with illustrations and suitable case studies to provide additional help and clarity the authors have tried to present state of the art and integrative information in a manner that familiarizes the reader with the important concepts and tools of recent biotechnological studies apart from biotechnological personnel the book would also be useful for readers of diverse disciplines such as bioinformatics agriculture environmental science pharmaceutical sciences biochemistry and general biology features a systematic overview of the recent state of the art technologies novel contents with maximum coherence extensive use of examples and case studies to illustrate how each technique has been used in practice incorporation of the latest information on these topics from recent research papers this book serves as a reference book and presents information in an accessible way for students researchers and scientific investigators in biotechnology it may also be used as a textbook for postgraduate level courses in biological sciences

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