



Microbial Enzyme Production

**Alexandru Mihai Grumezescu, Alina
Maria Holban**



Microbial Enzyme Production:

Microbial Enzyme Technology in Food Applications Ramesh C. Ray, Cristina M. Rosell, 2017-03-27 The aim of food processing is to produce food that is palatable and tastes good extend its shelf life increase the variety and maintain the nutritional and healthcare quality of food To achieve favorable processing conditions and for the safety of the food to be consumed use of food grade microbial enzymes or microbes being the natural biocatalysts is imperative This book discusses the uses of enzymes in conventional and non conventional food and beverage processing as well as in dairy processing brewing bakery and wine making Apart from conventional uses the development of bioprocessing tools and techniques have significantly expanded the potential for extensive application of enzymes such as in production of bioactive peptides oligosaccharides and lipids flavor and colorants Some of these developments include extended use of the biocatalysts as immobilized encapsulated enzymes microbes both natural and genetically modified as sources for bulk enzymes solid state fermentation technology for enzyme production Extremophiles and marine microorganisms are another source of food grade enzymes The book throws light on potential applications of microbial enzymes to expand the base of food processing industries

Microbial Production of Food Ingredients, Enzymes and Nutraceuticals Brian McNeil, David Archer, Ioannis Giavasis, Linda Harvey, 2013-03-21 Bacteria yeast fungi and microalgae can act as producers or catalysts for the production of food ingredients enzymes and nutraceuticals With the current trend towards the use of natural ingredients in foods there is renewed interest in microbial flavours and colours food bioprocessing using enzymes and food biopreservation using bacteriocins Microbial production of substances such as organic acids and hydrocolloids also remains an important and fast changing area of research Microbial production of food ingredients enzymes and nutraceuticals provides a comprehensive overview of microbial production of food ingredients enzymes and nutraceuticals Part one reviews developments in the metabolic engineering of industrial microorganisms and advances in fermentation technology in the production of fungi yeasts enzymes and nutraceuticals Part two discusses the production and application in food processing of substances such as carotenoids flavonoids and terpenoids enzymes probiotics and prebiotics bacteriocins microbial polysaccharides polyols and polyunsaturated fatty acids Microbial production of food ingredients enzymes and nutraceuticals is an invaluable guide for professionals in the fermentation industry as well as researchers and practitioners in the areas of biotechnology microbiology chemical engineering and food processing Provides a comprehensive overview of microbial flavours and colours food bioprocessing using enzymes and food biopreservation using bacteriocins Begins with a review of key areas of systems biology and metabolic engineering including methods and developments for filamentous fungi Analyses the use of microorganisms for the production of natural molecules for use in foods including microbial production of food flavours and carotenoids

Microbial Enzymes Dinesh Yadav, Pankaj Chowdhary, Gautam Anand, Rajarshi Kumar Gaur, 2025-01-13 Comprehensive discussion of production and purification strategies for microbial enzymes important to various industries

from food and beverages to pharmaceuticals *Microbial Enzymes* provides expert insight into diverse aspects of microbial enzymes highlighting strategies for their production purification and manipulation elucidating eco friendly industrial applications and discussing several production processes such as the production of cellulose and non synthetic indigo dye This book emphasizes recent technological interventions in microbial enzyme technology like metagenomics system biology molecular biology genomics directed evolution and bioinformatics The important microbial enzymes highlighted in this book include xylanases ureases methane monooxygenase polyhydroxyalkanoates pectinases peroxidases L rhamnosidase alkane hydroxylases laccases proteases gallic acid decarboxylase chitinases beta glucosidase lipases inulinases tannase mycozyme ACC deaminase ligninolytic enzymes and many more Novel treatment methods involving strains of microorganisms with desirable properties applicable in the process of bioremediation through mitigating climate concern increasing green production technology improving agriculture productivity and providing a means of earning a livelihood are discussed Readers will also gain state of the art background knowledge on existing technologies and their current challenges and future prospects Contributed to by leading experts in the field and edited by four highly qualified academics *Microbial Enzymes* explores important topics including Strategies for the discovery and enhancement of enzyme function and potentials of system biology to better understand the kinetics of industrially important enzymes Production and therapeutic applications of monoclonal antibodies in cancer and other diseases and characterization of tannase as a virulence factor Opportunities to produce enzymes through food waste and byproducts and recent developments in computational tools Use of Omics tools in the discovery of fungal enzymes and secondary metabolites *Microbial Enzymes* is a thorough and highly practical reference on the subject for students scientists biotechnologists microbiologists and policymakers working in environmental microbiology biotechnology and environmental sciences

Microbial Enzymes and Biotechnology W.M. Fogarty, C.T. Kelly, 2011-09-26 Biotechnology is now one of the major growth areas in science and engineering and within this broad discipline enzyme technology is one of the areas earmarked for special and significant developments This publication is the second edition of *Microbial Enzymes and Biotechnology* which was originally published in 1983 In this edition the editors have attempted to bring together accounts by the relevant experts of the current status of the major areas of enzyme technology and specifically those areas of actual and or potential commercial importance Although the use of microbial enzymes may not have expanded at quite the rate expected a decade ago there is nevertheless intense activity and considerable interest in the whole area of enzyme technology Microbial enzymes have been used in industry for many centuries although it is only comparatively recently that detailed knowledge relating to their nature properties and function has become more evident Developments in the 1960s gave a major thrust to the use of microbial enzymes in industry The commercial success of alkaline proteases and amyloglucosidases formed a bed rock for subsequent research and development in the area

Agro-Industrial Wastes as Feedstock for Enzyme Production Gurpreet S. Dhillon, Surinder

Kaur,2016-08-25 *Agro industrial Wastes as Feedstock for Enzyme Production Apply and Exploit the Emerging and Valuable Use Options of Waste Biomass* explores the current state of the art bioprocesses in enzyme production using agro industrial wastes with respect to their generation current methods of disposal the problems faced in terms of waste and regulation and potential value added protocols for these wastes It surveys areas ripe for further inquiry as well as future trends in the field Under each section the individual chapters present up to date and in depth information on bioprospecting of agro industrial wastes to obtain enzymes of economic importance This book covers research gaps including valorization of fruit and vegetable by product a key contribution toward sustainability that makes the utmost use of agricultural produce while employing low energy and cost efficient bioprocesses Written by experts in the field of enzyme technology the book provides valuable information for academic researchers graduate students and industry scientists working in industrial food microbiology biotechnology bioprocess technology post harvest technology agriculture waste management and the food industry Addresses key opportunities and challenges in the emerging field of enzyme technology with an emphasis on energy and bio based industrial applications Explores the current state of the art bioprocesses in enzyme production using fruit and vegetable wastes with respect to their generation current methods of disposal and problems faced in terms of waste and regulation Presents in depth information on bioprospecting of fruit and vegetable to obtain enzymes of economic importance Delves into environmental concerns and economic considerations related to fruit and vegetable processing by products

Microbial Enzymes: Roles and Applications in Industries Naveen Kumar Arora,Jitendra Mishra,Vaibhav Mishra,2020-04-28 *Microbial Enzymes Roles and applications in industry* offers an essential update on the field of microbial biotechnology and presents the latest information on a range of microbial enzymes such as fructosyltransferase laccases amylases lipase and cholesterol oxidase as well as their potential applications in various industries Production and optimisation technologies for several industrially relevant microbial enzymes are also addressed In recent years genetic engineering has opened up new possibilities for redesigning microbial enzymes that are useful in multiple industries an aspect that the book explores In addition it demonstrates how some of the emerging issues in the fields of agriculture environment and human health can be resolved with the aid of green technologies based on microbial enzymes The topics covered here will not only provide a better understanding of the commercial applications of microbial enzymes but also outline futuristic approaches to use microbial enzymes as driver of industrial sustainability Lastly the book is intended to provide readers with an overview of recent applications of microbial enzymes in various industrial sectors and to pique researchers interest in the development of novel microbial enzyme technologies to meet the changing needs of industry

Microbial Production of Food Ingredients and Additives Alexandru Mihai Grumezescu,Alina Maria Holban,2017-08-04 *Microbial Production of Food Ingredients and Additives Volume Five* the latest release in the Handbook of Food Bioengineering series is a solid resource on how microorganisms can increase food production and quality

Microorganisms are used to create and enhance food used as food additives to improve food taste and in improving function and fortification to benefit overall health The book presents the applications of microbial products in food bioengineering and methods to obtain valuable ingredients such as sugars acids secondary metabolites enzymes and vitamins Recent and future applications of these microbial derived food components are discussed along with future applications Provides various research examples on how microbial production can improve food by lactic acid bacteria Presents information on how microorganisms may be utilized to produce high quantity and quality therapeutic food ingredients used for human and animal food Includes numerous applications to provide a broad perspective on the benefits of microbial production and how they are an alternative to chemical production and purification of ingredients **Microbial Extremozymes** Mohammed

Kuddus,2021-08-20 **Microbial Extremozymes Novel Sources and Industrial Applications** is a unique resource of practical research information on the latest novel sources and technologies regarding extremozymes in bioremediation waste management valorization of industrial by products biotransformation of natural polymers nutrition food safety and diagnosis of disease The book s broad knowledge and varying applications are useful to the food industry dairy industry fruit and vegetable processing and baking and beverages industries as well as the pharmaceutical and biomedical industries This is a concise all encompassing resource for a range of scientists needing knowledge of extremozymes to enhance and research Furthermore it provides an updated knowledge of microbial enzymes isolated from extreme environments temperatures etc and their biotechnological applications It will be useful to researchers scientists and students in enzyme research In addition users from the dairy and baking industries will benefit from the presented content Explores recent scientific research on extremophiles and extremozymes technologies that help innovate novel ideas Provides innovative technologies for enzyme production from extremophilic microbes Includes cutting edge research for applications in various industries where extreme temperature conditions exist Presents novel microorganisms and their enzymes from extreme environments Thermophilic Psychrophilic Acidophilic Alkaliphilic Anaerobic Halophilic Barophilic Metallotolerant Radioresistant etc *Food*

Microbiology Osman Erkmen,T. Faruk Bozoglu,2016-04-13 This book covers application of food microbiology principles into food preservation and processing Main aspects of the food preservation techniques alternative food preservation techniques role of microorganisms in food processing and their positive and negative features are covered Features subjects on mechanism of antimicrobial action of heat thermal process mechanisms for microbial control by low temperature mechanism of food preservation control of microorganisms and mycotoxin formation by reducing water activity food preservation by additives and biocontrol food preservation by modified atmosphere alternative food processing techniques and traditional fermented products processing The book is designed for students in food engineering health science food science agricultural engineering food technology nutrition and dietetic biological sciences and biotechnology fields It will also be valuable to researchers teachers and practising food microbiologists as well as anyone interested in different branches of food

Enzymes in Food Biotechnology Mohammed Kuddus,2018-08-23 Enzymes in Food Biotechnology Production

Applications and Future Prospects presents a comprehensive review of enzyme research and the potential impact of enzymes on the food sector This valuable reference brings together novel sources and technologies regarding enzymes in food production food processing food preservation food engineering and food biotechnology that are useful for researchers professionals and students Discussions include the process of immobilization thermal and operational stability increased product specificity and specific activity enzyme engineering implementation of high throughput techniques screening to relatively unexplored environments and the development of more efficient enzymes Explores recent scientific research to innovate novel global ideas for new foods and enzyme engineering Provides fundamental and advanced information on enzyme research for use in food biotechnology including microbial plant and animal enzymes Includes recent cutting edge research on the pharmaceutical uses of enzymes in the food industry

Enzymes in Synthetic Biology ,2018-08-30 Volume 608 of the series Methods in Enzymology covers key aspects of enzyme discovery engineering tools and platforms and examples of applications in the enzymology of synthetic biology Detailed methods for laboratory use of enzymes in synthetic biology applications Informative case history examples illustrating how enzyme and metabolic engineering are used to generate new products Emphasises latest developments in laboratory automation for the engineering of biology Covers many aspects of the design build test learn cycle used in synthetic biology

Bioprospecting of Plant Biodiversity for Industrial Molecules Santosh Kumar Upadhyay,Sudhir Pratap Singh,2021-06-22 BIOPROSPECTING OF PLANT BIODIVERSITY FOR INDUSTRIAL MOLECULES A comprehensive collection of recent translational research on bioresource utilization and ecological sustainability Bioprospecting of Plant Biodiversity for Industrial Molecules provides an up to date overview of the ongoing search for biodiverse organic compounds for use in pharmaceuticals bioceuticals agriculture and other commercial applications Bringing together work from a panel of international contributors this comprehensive monograph covers natural compounds of plants endophyte enzymes and their applications in industry plant bioprospecting in cosmetics marine bioprospecting of seaweeds and more Providing global perspectives on bioprospecting of plant biodiversity the authors present research on enzymes mineral micro nutrients biopesticides algal biomass and other bioactive molecules In depth chapters assess the health impacts and ecological sustainability of the various biomolecules and identify existing and possible applications ranging from ecological restoration to production of essential oils and cosmetics Other topics include bio energy crops as alternative fuel resources the role of plants in phytoremediation of industrial waste and the industrial applications of endophyte enzymes This comprehensive resource Includes a through introduction to plant biodiversity and bioprospecting Will further the knowledge of application of different plants and improve research investigation techniques Summarizes novel approaches for researchers in food science microbiology biochemistry and biotechnology Bioprospecting of Plant Biodiversity for Industrial Molecules is an indispensable compendium of biological research for scientists researchers

graduate and postgraduate students and academics in the areas of microbiology food biotechnology industrial microbiology plant biotechnology and microbial biotechnology **Applications of Microbial Genes in Enzyme Technology** Vijai Kumar Gupta, Maria G. Tuohy, Gauri Dutt Sharma, 2013 The developments in molecular genetics and cell biology in the last four decades have reshaped enzyme production This book provides comprehensive material on applications of important microbes and their gene functions in enzyme technology for audiences across many disciplines **Microbial Diversity, Interventions and Scope** Shiwani Guleria Sharma, Neeta Raj Sharma, Mohit Sharma, 2020-06-25 This book focuses on the application of microbes in all fields of biology There is an urgent need to understand and explore new microbes their biological activities genetic makeup and further opportunities for utilizing them The book is divided into sections highlighting the application of microbes in agriculture nanotechnology genetic engineering bioremediation industry medicine and forensic sciences and describing potential future advances in these fields It also explores the potential role of microbes in space and how they might support life on a different planet **Industrial Enzyme Applications** Andreas Vogel, Oliver May, 2019-07-10 This reference is a must read It explains how an effective and economically viable enzymatic process in industry is developed and presents numerous successful examples which underline the efficiency of biocatalysis **Industrial Applications of Microbial Enzymes** Pankaj Bhatt, 2024-08-26 Microbial enzymes are important because they can be used for a wide variety of industrial purposes There is dispersed and scanty information available with respect to microbial enzymes and their industrial applications In this edited book leading scientists have covered the various aspects of microbial enzymes and their industrial applications Using microbial enzymes can help expedite various manufacturing processes and contribute to sustainable development which is a priority worldwide Research gaps in the entrainment of microbial enzymes with their direct application in product development are a major focus of this volume Key Features Covers microbial enzymes with comprehensive and in depth information Benefits students by describing recent advancements into microbial enzymology Provides updates regarding microbial enzymes for researchers and industrial scientists Includes findings on the microbial actions for better life **Bioprospecting of Microorganism-Based Industrial Molecules** Sudhir Pratap Singh, Santosh Kumar Upadhyay, 2021-12-13 Discover a comprehensive and current overview of microbial bioprospecting written by leading voices in the field In Bioprospecting of Microorganism Based Industrial Molecules distinguished researchers and authors Sudhir P Singh and Santosh Kumar Upadhyay deliver global perspectives of bioprospecting of biodiversity The book covers diverse aspects of bioprospecting of microorganisms demonstrating biomass value of nutraceutical pharmaceutical biomedical and bioenergetic importance The authors present an amalgamation of translational research on bioresource utilization and ecological sustainability that will further the reader's knowledge of the applications of different microbial diversity and reveal new avenues of research investigation Readers will also benefit from A thorough introduction to microbial biodiversity and bioprospecting An exploration of anti ageing and skin lightening microbial products and microbial

production of anti cancerous biomolecules A treatment of UV protective compounds from algal biodiversity and polysaccharides from marine microalgal sources Discussions of microbial sources of insect toxic proteins and the role of microbes in bio surfactants production Perfect for academics scientists researchers graduate and post graduate students working and studying in the areas of microbiology food biotechnology industrial microbiology plant biotechnology and microbial biotechnology Bioprospecting of Microorganism Based Industrial Molecules is an indispensable guide for anyone looking for a comprehensive overview of the subject Microbial Enzymes and Biotransformations Jose Luis Barredo,2010-11-19 Leading experts in enzyme manipulation describe in detail their cutting edge techniques for the screening evolution production immobilization and application of enzymes These readily reproducible methods can be used to improve enzyme function by directed evolution to covalently immobilize enzymes to microencapsulate enzymes and cells and to manufacture enzymes for human health nutrition and environmental protection Overview chapters on microorganisms as a source of metabolic and enzymatic diversity and on the fast moving field of enzyme biosensors are presented Microbial Enzymes and Biotransformations offers laboratory and industrial scientists a wealth of proven enzymatic protocols that show clearly how to go from laboratory results to successful industrial applications *Enzymes in Food Technology* Mohammed Kuddus,2018-11-19 The integration of enzymes in food processing is well known and dedicated research is continually being pursued to address the global food crisis This book provides a broad up to date overview of the enzymes used in food technology It discusses microbial plant and animal enzymes in the context of their applications in the food sector process of immobilization thermal and operational stability increased product specificity and specific activity enzyme engineering implementation of high throughput techniques screening of relatively unexplored environments and development of more efficient enzymes Offering a comprehensive reference resource on the most progressive field of food technology this book is of interest to professionals scientists and academics in the food and biotech industries

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Microbial Enzyme Production Introduction

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