

BACTERIOCINS OF LACTIC ACID BACTERIA

Edited by
L. De Vuyst and E. J. Vandamme



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Bacteriocins Of Lactic Acid Bacteria Microbiology Genetics And Applications

Wilhelm H. Holzapfel, Brian J.B. Wood



Bacteriocins Of Lactic Acid Bacteria Microbiology Genetics And Applications:

Bacteriocins of Lactic Acid Bacteria Luc De Vuyst, Erick J. Vandamme, 2012-12-06 As antibacterial compounds bacteriocins have always lived in the shadow of those medically important efficient and often broad spectrum low molecular mass antimicrobials well known even to laypeople as antibiotics This is despite the fact that bacteriocins were discovered as early as 1928 a year before the penicillin saga started Bacteriocins are antimicrobial proteins or oligopeptides displaying a much narrower activity spectrum than antibiotics they are mainly active against bacterial strains taxonomically closely related to the producer strain which is usually immune to its own bacteriocin They form a heterogeneous group with regard to the taxonomy of the producing bacterial strains mode of action inhibitory spectrum and protein structure and composition Best known are the colicins and microcins produced by Enterobacteriaceae Many other Gram negative as well as Gram positive bacteria have now been found to produce bacteriocins In the last decade renewed interest has focused on the bacteriocins from lactic acid bacteria which are industrially and agriculturally very important Some of these compounds are even active against food spoilage bacteria and endospore formers and also against certain clinically important food borne pathogens Recently bacteriocins from lactic acid bacteria have been studied intensively from every possible scientific angle microbiology biochemistry molecular biology and food technology Intelligent screening is going on to find novel compounds with unexpected properties just as has happened and is still happening with the antibiotics Knowledge especially about bacteriocins from lactic acid bacteria is accumulating very rapidly

Bacteriocins of Lactic Acid Bacteria Luc De Vuyst, Erick J. Vandamme, 1994-01-15 As antibacterial compounds bacteriocins have always lived in the shadow of those medically important efficient and often broad spectrum low molecular mass antimicrobials well known even to laypeople as antibiotics This is despite the fact that bacteriocins were discovered as early as 1928 a year before the penicillin saga started Bacteriocins are antimicrobial proteins or oligopeptides displaying a much narrower activity spectrum than antibiotics they are mainly active against bacterial strains taxonomically closely related to the producer strain which is usually immune to its own bacteriocin They form a heterogeneous group with regard to the taxonomy of the producing bacterial strains mode of action inhibitory spectrum and protein structure and composition Best known are the colicins and microcins produced by Enterobacteriaceae Many other Gram negative as well as Gram positive bacteria have now been found to produce bacteriocins In the last decade renewed interest has focused on the bacteriocins from lactic acid bacteria which are industrially and agriculturally very important Some of these compounds are even active against food spoilage bacteria and endospore formers and also against certain clinically important food borne pathogens Recently bacteriocins from lactic acid bacteria have been studied intensively from every possible scientific angle microbiology biochemistry molecular biology and food technology Intelligent screening is going on to find novel compounds with unexpected properties just as has happened and is still happening with the antibiotics Knowledge especially about bacteriocins from lactic acid bacteria is accumulating

very rapidly **Handbook of Fermented Functional Foods, Second Edition** Edward R.(Ted) Farnworth,2008-05-28 For centuries people around the world have used fermentation to preserve and enhance the flavor of a wide variety of foods Today complex interactions of microbiota in the digestive tract are found to influence proper digestion metabolism and disease resistance With greater emphasis on natural products and the role of food in health and wellbeing food manufacturers are once again turning to fermentation not just for extending shelf life but to create functional food products that take an active part in maintaining overall health Featuring five new chapters and updating all data to reflect the latest research findings Handbook of Fermented Functional Foods Second Edition examines the health benefits of fermented foods as well as the processes and production techniques involved in manufacturing fermented food products Maintaining the highest quality information and the easily accessible format of its predecessor this edition includes new chapters on olives tempeh and the traditional fermented foods of China Thailand and India It looks at the history of fermented foods and reveals the specific benefits of fermented milk Kefir yogurt and cheese Contributions cover fermented soy products including Natto and Miso as well as the fermentation of other vegetables such as Korean Kimchi and Doenjang and German sauerkraut The book also explains the bioactivity and bioavailability of microorganisms and investigates the more recent practice of producing probiotic cultures to add to fermented foods for increased health benefit Presenting new findings and interpretations that point even more clearly to the important role fermented foods play in our diet and overall health this second edition demonstrates the current knowledge of fermented food production and reflects the growing credibility of probiotics in health maintenance *Bacteriocins of Lactic Acid Bacteria* Dallas G. Hoover,Larry R. Steenson,2014-06-28 Bacteriocins of Lactic Acid Bacteria is based on the 1990 Annual Meeting of the Institute of Food Technologists held in Dallas Texas It describes a number of well characterized bacteriocins and where possible discusses practical applications for those that have been defined thus far from the lactic acid bacteria The book begins with an introductory overview of naturally occurring antibacterial compounds This is followed by discussions of methods of detecting bacteriocins and biochemical procedures for extraction and purification genetics and cellular regulation of bacteriocins bacteriocins based on the genera of lactic acid bacteria Lactococcus Lactobacillus Pediococcus and Leuconostoc and related bacteria such as Carnobacterium and Propionibacterium and the regulatory and political aspects for commercial use of these substances The final chapter sets out the prognosis for the future of this dynamic area The information contained in this book should benefit those with interest in the potential for industrial use of bacteriocins as preservative ingredients Anyone interested in lactic acid bacteria or the biosynthesis regulation and mechanisms of inhibition of these proteinaceous compounds will also appreciate the material presented These include food scientists microbiologists food processors and product physiologists food toxicologists and food and personal product regulators **Lactic Acid Bacteria: Genetics, Metabolism and Applications** G. Venema,Jos H. J. Huis in 't Veld,J.H.J. Huis in 't Veld,J. Hugenholtz,1996-09-30 The September 1996 proceedings summarize

current research in the area of lactic acid bacteria in respect to fundamental biology application and the potential possibilities for use in promoting human and animal health and nutrition The 14 papers discuss topics in genetics metabolism and applications including the biosynthesis of bacteriocins in lactic acid bacteria the proteolytic systems of lactic acid bacteria *Lactococcus lactis* and stress the barriers to application of genetically modified lactic acid bacteria the acceleration of cheese ripening and lactic acid bacteria as vaccine delivery vehicles Includes illustrations Annotation copyrighted by Book News Inc Portland OR

Lactic Acid Bacteria Marcela Albuquerque Cavalcanti de Albuquerque, Alejandra de Moreno de LeBlanc, Jean Guy LeBlanc, Raquel Bedani, 2020-02-19 Lactic acid bacteria LAB are a diverse group of bacteria that comprise low GC content Gram positive cocci or rods that produces lactic acid as the major end product of the fermentation process *Bifidobacterium* genera may also be considered as a part of the LAB group for possessing some similar phenotypical characteristics despite the higher GC content The key feature of LAB metabolism is efficient carbohydrate fermentation This contributes to the production of several microbial metabolites that result in the improvement of flavor and texture of fermented foods in addition to its positive impact on the human health when LAB is administered as a probiotic The book deals with advances made in the functionalities of LAB such as their effect on vitamin D receptor expression impact on neurodegenerative pathologies production of B vitamins for food bio enrichment production of bacteriocins to improve gut microbiota dysbiosis production of metabolites from polyphenols and their effects on human health effect on reducing the immunoreaction of food allergens as biological system using time temperature to improve food safety and the use of probiotics in animal feed The book also reviews the use of LAB and probiotic technologies to develop new functional foods and functional pharmaceuticals

Lactic Acid Bacteria Wilhelm H. Holzapfel, Brian J.B. Wood, 2014-04-29 Lactic Acid Bacteria Biodiversity and Taxonomy Lactic Acid Bacteria Biodiversity and Taxonomy Edited by Wilhelm H Holzapfel and Brian J B Wood The lactic acid bacteria LAB are a group of related microorganisms that are enormously important in the food and beverage industries Generally regarded as safe for human consumption and in the case of probiotics positively beneficial to human health the LAB have been used for centuries and continue to be used worldwide on an industrial scale in food fermentation processes including yoghurt cheeses fermented meats and vegetables where they ferment carbohydrates in the foods producing lactic acid and creating an environment unsuitable for the survival of food spoilage organisms and pathogens The shelf life of the product is thereby extended but of course these foods are also enjoyed around the world for their organoleptic qualities They are also important to the brewing and winemaking industries where they are often undesirable intruders but can in specific cases have desirable benefits The LAB are also used in producing silage and other agricultural animal feeds Clinically they can improve the digestive health of young animals and also have human medical applications This book provides a much needed and comprehensive account of the current knowledge of the LAB covering the taxonomy and relevant biochemistry physiology and molecular biology of these scientifically and commercially important

microorganisms It is directed to bringing together the current understanding concerning the organisms remarkable diversity within a seemingly rather constrained compass The genera now identified as proper members of the LAB are treated in dedicated chapters and the species properly recognized as members of each genus are listed with detailed descriptions of their principal characteristics Each genus and species is described using a standardized format and the relative importance of each species in food agricultural and medical applications is assessed In addition certain other bacterial groups such as Bifidobacterium often associated with the LAB are given in depth coverage The book will also contribute to a better understanding and appreciation of the role of LA B in the various ecosystems and ecological niches that they occupy In summary this volume gathers together information designed to enable the organisms fullest industrial nutritional and medical applications Lactic Acid Bacteria Biodiversity and Taxonomy is an essential reference for research scientists biochemists and microbiologists working in the food and fermentation industries and in research institutions Advanced students of food science and technology will also find it an indispensable guide to the subject Also available from Wiley Blackwell The Chemistry of Food Jan Velisek ISBN 978 1 118 38384 1 Progress in Food Preservation Edited by Rajeev Bhat Abd Karim Alias and Gopinadham Paliyath ISBN 978 0 470 65585 6

Lactic Acid Bacteria: Genetics, Metabolism and Applications W.N. Konings, O.P. Kuipers, J.H.J. Huis in 't Veld, 2013-03-09 In ancient times foods fermented with lactic acid bacteria already constituted an important part of the human diet From then on lactic acid bacteria have played an essential role in the preservation of food raw materials and have contributed to the nutritional organoleptic and health properties of human food products and animal feed The important function that lactic acid bacteria still have in the production of foods all over the world has resulted in a growing scientific interest in these micro organisms by academic research groups as well as by industry During the last 15 years this research has been stimulated by major internationally coordinated funding efforts that have resulted in a variety of important scientific breakthroughs and have led to new applications Written by international experts in the field this issue of Antonie van Leeuwenhoek documents these developments with respect to genetics metabolism and the application of lactic acid bacteria for industrial and potential medical applications In this book the first complete genome of a lactic acid bacterium is presented The book will serve as a reference source and also as an indispensable source of information for further development and exploration of the field

Biotechnology: Prospects and Applications R.K. Salar, S.K. Gahlawat, P. Siwach, J.S. Duhan, 2014-02-06 Biotechnology Prospects and Applications covers the review of recent developments in biotechnology and international authorship presents global issues that help in our understanding of the role of biotechnology in solving important scientific and societal problems for the benefit of mankind and environment A balanced coverage of basic molecular biology and practical applications relevant examples colored illustrations and contemporary applications of biotechnology provide students and researchers with the tools and basic knowledge of biotechnology In our effort to introduce students and researchers to cutting edge techniques and applications

of biotechnology we dedicated specific chapters to such emerging areas of biotechnology as Emerging Dynamics of Brassinosteroids Research Third generation green energy Bioremediation Metal Organic Frameworks New smart materials for biological application Bioherbicides Biosensors Fetal Mesenchymal Stem Cells and Animal forensics Biotechnology Prospects and Applications will be highly useful for students teachers and researchers in all disciplines of life sciences agricultural sciences medicine and biotechnology in universities research stations and biotechnology companies The book features broader aspects of the role of biotechnology in human endeavor It also presents an overview of prospects and applications while emphasizing modern cutting edge and emerging areas of biotechnology Further it provides the readers with a comprehensive knowledge of topics in food and agricultural biotechnology microbial biotechnology environmental biotechnology and animal biotechnology The chapters have been written with special reference to the latest developments in above broader areas of biotechnology that impact the biotechnology industry A list of references at the end of each chapter is provided for the readers to learn more about a particular topic Typically these references include basic research research papers review articles and articles from the popular literature

Handbook of Natural Antimicrobials for Food Safety and Quality M Taylor, 2014-11-04 Natural additives are increasingly favoured over synthetic ones as methods of ensuring food safety and long shelf life The antimicrobial properties of both plant based antimicrobials such as essential oils and proteins such as bacteriocins are used in for example edible preservative films in food packaging and in combination with synthetic preservatives for maximum efficacy New developments in delivery technology such as nanoencapsulation also increase the potential of natural antimicrobials for widespread use in industry Part one introduces the different types of natural antimicrobials for food applications Part two covers methods of application and part three looks at determining the effectiveness of natural antimicrobials in food Part four focuses on enhancing quality and safety and includes chapters on specific food products Reviews different types of antimicrobials used in food safety and quality Covers how antimicrobials are created to be used in different foods Examines how the antimicrobials are used in foods to enhance the safety and quality

Biotechnological Applications of Microbes: Volume II Ajit Varma, Gopi K. Podila, 2013-12-30 Understanding Microbes is vital to understand the past and the future of mankind and our planet These are the oldest form of life on the earth Microbes provide us with oxygen to breathe and food to eat Without microbes life is impossible on the earth Microbes cause as well as prevent diseases hence are highly relevant to medicine and other related health sciences too Research and biotechnological applications of Microbes is a fascinating field of science and increasingly being seen as a mainstream tenet of biology The present book focuses on diverse areas of microbial research and provides a wealth of information on the microbial world biochemistry of the molecules their functions syntheses and regulation activity microbial genetics immunology biotechnology control of microbial growth interactions between humans insects and microorganisms and public health microbial ecology terrestrial microbiology microbiology of waste treatment and so on

Beneficial Microbes in

Fermented and Functional Foods Ravishankar Rai V, Jamuna A. Bai, 2014-12-17 This book focuses exclusively on the beneficial effects of microbes in food The section on traditional and modern fermented foods covers the role of microbes and their diversity in fermented foods interaction between the different microflora present in fermented food products development of starter cultures to improve the nutritional and sensory quality of fermented foods and factors and processes affecting the safety of various fermented foods The second section focuses on microbes in and as functional foods probiotics prebiotics and synbiotics

Natural Food Antimicrobial Systems A.S. Naidu, 2000-06-21 Consumer concerns play a critical role in dictating the direction of research and development in food protection The rising demand for minimally processed foods growing concerns about the use of synthetic preservatives and suspected links between the overuse of antibiotics and multi drug resistance in microbes has made food safety a global priority Natural Food Antimicrobial Systems focuses on advances in the technology of food safety Numerous antimicrobial agents exist in animals and plants where they evolved as defense mechanisms For example the antimicrobial components of milk have been unraveled in recent years The book covers how these components such as lactoferrin can be used as multifunctional food additives such as antioxidants and immuno modulating agents The six sections cover lacto antimicrobials ovo antimicrobials phyto antimicrobials bacto antimicrobials acid antimicrobials and milieu antimicrobials Each chapter provides background and historical information molecular properties antimicrobial activity biological advantage applications safety tolerance and efficacy and biotechnology To satisfy the rapidly changing consumption patterns of the global market the food processing industry continuously searches for new technologies in food science Designed as a reference for academia and corporate R D Natural Food Antimicrobial Systems fills this need offering in depth information on emerging biotechnology efficacy and applications of natural food antimicrobial systems

Handbook of Food and Beverage Fermentation Technology Y. H. Hui, Lisbeth Meunier-Goddik, Jytte Josephsen, Wai-Kit Nip, Peggy S. Stanfield, 2004-03-19 Over the past decade new applications of genetic engineering in the fermentation of food products have received a great deal of coverage in scientific literature While many books focus solely on recent developments this reference book highlights these developments and provides detailed background and manufacturing information Co Edited by Fidel Toldra Recipient of the 2010 Distinguished Research Award from the American Meat Science Association Presenting a comprehensive overview Handbook of Food and Beverage Fermentation Technology examines a wide range of starter cultures and manufacturing procedures for popular alcoholic beverages and bakery dairy meat cereal soy and vegetable food products An international panel of experts from government industry and academia provide an in depth review of fermentation history microorganisms quality assurance practices and manufacturing guidelines The text focuses on the quality of the final food product flavor formation and new advances in starter cultures for dairy fermentations using recent examples that depict the main species used their characteristics and their impact on the development of other fermented foods With approximately 2 300 references for further exploration this is a valuable resource

for food scientists technologists microbiologists toxicologists and processors New Products and New Areas of Bioprocess Engineering, 2003-06-30 Today ergot alkaloids have found widespread clinical use and more than 50 formulations contain natural or semisynthetic ergot alkaloids They are used in the treatment of uterine atonia postpartum bleeding migraine orthostatic circulatory disturbances senile cerebral insufficiency hypertension hyp prolactinemia acromegaly and Parkinsonism Recently new therapeutic applications have emerged e g against schizophrenia and for therapeutic usage based on newly discovered antibacterial and cytostatic effects immunomodulatory and hypolipemic activity The broad physiological effects of ergot alkaloids are based mostly on their interactions with neurotransmitter receptors on the cells The presence of hidden structures resembling some important neurohumoral mediators e g noradrenaline serotonin dopamine in the molecules of ergot alkaloids could explain their interactions with these receptors 1 Ergot alkaloids are produced by the filamentous fungi of the genus *Claviceps* e g *Claviceps purpurea* Ergot Mutterkorn On the industrial scale these alkaloids were produced mostly by parasitic cultivation field production of the ergot till the end of the 1970s Today this uneconomic method has been replaced by submerged fermentation Even after a century of research on ergot alkaloids the search still continues for new more potent and more selective ergot alkaloid derivatives *Food Biotechnology: Principles and Practices* Vinod K.

Joshi, R.S. Singh, 2012-03-10 This book covers the course of Food Biotechnology adopted by various universities The book is primarily meant for undergraduate and postgraduate classes as a Reference cum Textbook It would be very useful both from teaching and research point of view All the chapters in the book are contributed by the experts in their respective fields of research These are intended to equip the readers with the basics and applied research in food biotechnology To make concepts more clear the contents have been divided into following sections The aim is to develop an authentic account of biotechnology in the food industry and stimulate research in food biotechnology Unlike the past the present food industry is profitably deriving benefits from bioengineering These applied aspects are covered so that the students could take relevant assignments in the food industry It also highlights future needs of research on the various aspects of food biotechnology The book includes topics like biosensors biocolours biopreservatives probiotics genetically modified foods and microbial flavours The book addresses various disciplines of food microbiology food biotechnology food engineering and postharvest technology

Microbiological Safety and Quality of Food Barbara M. Lund, Tony C. Baird-Parker, Grahame W. Gould, 2000 This authoritative two volume reference provides valuable necessary information on the principles underlying the production of microbiologically safe and stable foods The work begins with an overview and then addresses four major areas Principles and application of food preservation techniques covers the specific techniques that defeat growth of harmful microorganisms how those techniques work how they are used and how their effectiveness is measured Microbial ecology of different types of food provides a food by food accounting of food composition naturally occurring microflora effects of processing how spoiling can occur and preservation Foodborne pathogens profiles the most important and the most dangerous microorganisms that can

be found in foods including bacteria viruses parasites mycotoxins and mad cow disease The section also looks at the economic aspects and long term consequences of foodborne disease Assurance of the microbiological safety and quality of foods scrutinizes all aspects of quality assurance including HACCP hygienic factory design methods of detecting organisms risk assessment legislation and the design and accreditation of food microbiology laboratories Tables photographs illustrations chapter by chapter references and a thorough index complete each volume This reference is of value to all academic research industrial and laboratory libraries supporting food programs and all institutions involved in food safety microbiology and food microbiology quality assurance and assessment food legislation and generally food science and technology

Handbook of Food Science, Technology, and Engineering Yiu H. Hui, 2006 [Handbook of Food Science, Technology, and Engineering - 4 Volume Set](#) Y. H. Hui, Frank Sherkat, 2005-12-19 Advances in food science technology and engineering are occurring at such a rapid rate that obtaining current detailed information is challenging at best While almost everyone engaged in these disciplines has accumulated a vast variety of data over time an organized comprehensive resource containing this data would be invaluable to have The

Functional Foods and Biotechnology Kalidas Shetty, Dipayan Sarkar, 2020-04-13 The second book of the Food Biotechnology series Functional Foods and Biotechnology Biotransformation and Analysis of Functional Foods and Ingredients highlights two important and interrelated themes biotransformation innovations and novel bio based analytical tools for understanding and advancing functional foods and food ingredients for health focused food and nutritional security solutions The first section of this book provides novel examples of innovative biotransformation strategies based on ecological biochemical and metabolic rationale to target the improvement of human health relevant benefits of functional foods and food ingredients The second section of the book focuses on novel host response based analytical tools and screening strategies to investigate and validate the human health and food safety relevant benefits of functional foods and food ingredients Food biotechnology experts from around the world have contributed to this book to advance knowledge on bio based innovations to improve wider health focused applications of functional food and food ingredients especially targeting non communicable chronic disease NCD and food safety relevant solution strategies Key Features Provides system science based food biotechnology innovations to design and advance functional foods and food ingredients for solutions to emerging global food and nutritional insecurity coupled public health challenges Discusses biotransformation innovations to improve human health relevant nutritional qualities of functional foods and food ingredients Includes novel host response based food analytical models to optimize and improve wider health focused application of functional foods and food ingredients The overarching theme of this second book is to advance the knowledge on metabolically driven food system innovations that can be targeted to enhance human health and food safety relevant nutritional qualities and antimicrobial properties of functional food and food ingredients The examples of biotransformation innovations and food analytical models provide critical insights on current advances in food biotechnology

to target design and improve functional food and food ingredients with specific human health benefits Such improved understanding will help to design more ecologically and metabolically relevant functional food and food ingredients across diverse global communities The thematic structure of this second book is built from the related initial book which is also available in the Food Biotechnology Series Functional Foods and Biotechnology Sources of Functional Food and Ingredients edited by Kalidas Shetty and Dipayan Sarkar ISBN 9780367435226 For a complete list of books in this series please visit our website at <https://www.crcpress.com> Food Biotechnology Series book series CRCFOOBIO TECH

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