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Biotechnological Potential of Bacteriocinogenic Lactic Acid Bacteria is Objective, but Safety is the Priority

Introduction

Studies on isolation of bacteriocinogenic microorganisms have become routine for the research teams and we are building extensive data base for several new antimicrobial producing cultures. The role of bacteriocins was acknowledged as one of the beneficial sides of the probiotics. Bacteriocins produced by different microorganisms, including LAB, are considered to be important potential alternatives in the development of new approaches for the improvement of food safety and in the combating of microbial infections. Knowledge of LAB bacteriocins began with the discovery of nisin and is still one of the best studied bacteriocins, recognized as a safe and potent antimicrobial suitable for application in food biopreservation processes.

Methods

The number of research projects that are focused upon the isolation and characterization of bacteriocins have continued to escalate and according to www.scopus.com, more than 14.474 research papers have been published concerning different aspects of the production, characterization, and application of bacteriocins. According to the same database more than 81.427 papers have been focused on different aspects of probiotics (accessed on January 2024). The concept of multiple beneficial properties for the safe bacterial culture is a scientific fact, but still not as deeply investigated. Are this can be the next scientific challenge? Characterization of the new beneficial safe cultures, including bacteriocinogenic with aim to be applied as viable microbes in *in situ* biopreservation process include some well-established steps: correct identification, safety evaluation (of producer and antimicrobial agent), characterization of the bacteriocin and suggested application.

Results

Research and screening for new strains with more than one beneficial property were accelerated with aim to implement in the food fermentation processes microbial starter that can be considered as multifunctional and if possible, to be with probiotic or bioprotective properties in addition to their starter cultures performance. Safety has always been and will be driving priority in selection of new functional microbial cultures. However, in addition, combination between production of antimicrobial proteins (bacteriocins) and antioxidants can be considered as interesting application scenario in the selection of new starter cultures. Beneficial properties that such as cultures can bring to the fermented food products will be resulting in reduction of chemical additives and cover exigences of the consumers for more natural and freer of the artificial preservatives food commodities. Appropriate selection of safe microbial cultures with appropriate antimicrobial and antioxidant properties is the first step of the large research projects, where technological properties and *in situ* suggested beneficial properties need to be validated in further research.

Discussion

The role of bacteriocins from LAB has been proven regarding their contribution to biopreservation processes. Bacteriocins can be clearly associated with controlling spoilage and pathogens, extending shelf life, and replacing chemical preservatives. With new knowledge of bacteriocinogenic LAB a more scientific questions will need to be addressed and answers provided. Currently, a solidly built scientific structure stands behind the application of bacteriocins in food and other areas, but this structure needs to be maintained and built upon in order to provide consumers with safe, nutritional, and beneficial food in the future.

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