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Editorial

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Bacteriocins and probiotic potential of the lactic acid bacteria (LAB)- to be or not to be?

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Svetoslav Dimirov Todorov
Department of Food and Experimental Nutrition, University of Sao Paulo, Brazil

Correspondence: Svetoslav Dimirov Todorov, Faculty of Pharmaceutical Sciences, Department of Food and Experimental Nutrition, Laboratory of Food Microbiology, University of Sao Paulo, Av. Lineus Prestes 580 Bl 14, 05508-000 Sao Paulo, SP, Brazil, Tel 5511982399561, Email slavi310570@abv.bg

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Editorial

Fermented food products are part of everyday diet of the citizens of various countries all around the globe. They are consumed raw or after thermal treatment and are appreciated for their gastronomical, health promote or medical benefits. Traditional medicine recommend the various fermented food products in the treatment of diseases, however, western medicine use them as an additional source of diet fibers, minerals, vitamins, phenol compounds and bioactive components.

In last decade fermented food products have been subject of intensive research in isolation and identification of lactic acid bacteria (LAB) producer of antimicrobial peptides and study of their probiotic potential. It is well known that many LAB are capable of producing a variety of antimicrobial compounds, which may contribute to their colonization of habitats, including humans and other animals gastrointestinal tract and their competitive advantage over other bacteria. Besides production of lactic acid, which causes a drop in pH enough to inhibit certain species, as its non-dissociated form triggers a lowering of the internal pH in sensitive bacteria that causes a collapse in the electrochemical proton gradient resulting in a bacteriostatic or bactericidal effect, LAB can produce other organic acids, diacetyl, hydrogen peroxide, and bacteriocins. In addition to effect on closely related species, some bacteriocins may present an unusual activity against some Gram-negative bacteria, yeast, *Micobacterium* spp, and even viruses. LAB are one of the best studied probiotics with application for health promoting, prevention and treatment of various diseases.

LAB constitute a phylogenetically heterogeneous group of ubiquitous micro organisms that are naturally present in high nutrient containing organic products such as foods and occupy a wide range of ecological niches ranging from the surface of plants to the gastrointestinal and urogenital tract of humans and other animals. Currently, the LAB group includes a large number of cocci and bacilli, such as species of the genera *Carnobacterium, Enterococcus, Lactobacillus, Lactococcus, Leuconostoc, Oenococcus, Pediococcus, Streptococcus, Tetragenococcus, Vagococcus, Weissella*, etc. From a historical point of view, LAB has been used since ancient times in food fermentation processes and preservation. Due to their lack of pathogenicity, most LAB species have received the GRAS (Generally Recognized as Safe) status by the U.S. Food and Drug Administration. In addition to their important technological properties in food production (production of lactic acid, decrease of lactose, improvement of organoleptic and physical characteristics), various species of LAB have been shown to possess therapeutic properties since they are able to prevent the development of some diseases as shown mostly using animal models and have the capacity to promote beneficial effects in human and animal health. In recent years, the number of functional food products enriched with live probiotic microorganisms, has increased exponentially since it is know that these can confer health benefits on the host.

Besides all beneficial properties studied for various LAB, a special attention need to be pay on the possible presence of virulence factors, production of biogenic amines and antibiotic resistance. This virulence determinants have been well detected and studied in Enterococci and Streptococci, however, in last few years report on presence of virulence factors in otherwise GRAS Lactobacilli have been showing the potential upcoming problems. Horizontal gene transfer of virulence factors between pathogenic and LAB, including probiotics is a highly possible scenario in case of uncontrolled application of probiotics. In addition, some of the antimicrobial peptides expressed by LAB may be a high cytotoxic. Besides all beneficial properties studied for various LAB, a special attention need to be pay on the possible cytotoxicity levels of the expressed bacteriocins in order to drown conclusion for the safe application of the producer or antimicrobial peptides in the bio-preservation.

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Conflict of interest

Author declares that there is no conflict of interest.