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Bacteriocinogenic lactic acid bacteria may be the answer in control of food-borne and why not in humans diseases?

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The exploration of naturally occurring antimicrobials in food preservation receives increasing attention due to consumer awareness of natural food products and a growing concern about microbial resistance toward conventional preservatives. Several studies address to the bacteriocins produced by Lactic acid bacteria (LAB) isolated from dairy, meat and fish products and highlights the potential of these antimicrobial agents in food bio-preservation. In last decade several studies focussed on the screening of LAB from the tropical fruits as a source of the potentially beneficial LAB. Some of this LAB are shown to be bacteriocins producers with a broad spectrum of activity and some exhibit a potential probiotics properties. However, in last few years there has been increase in number of the reports on application of LAB and their antimicrobial proteins in the area of control of human diseases.

Bacteriocins are ribosomally synthesized peptides with antimicrobial activity, produced by LAB. Their mode of action may include pore formation, degradation of cellular DNA, disruption through specific cleavage of 16S rDNA, and inhibition of peptidoglycan synthesis.

In this overview number of LAB bacteriocins and its activity against several other bacterias have been reviewed, namely, *Lactobacillus plantarum* ST16Pa isolated from papaya and its bacteriocin ST16Pa; *Pediococcus pentosaceus* ST44AM isolated from marula and its bacteriocin ST44AM; *Enterococcus casseliflavus* ST182Gu isolated from fresh guava fruits and its bacteriocin ST182Gu; *Lactobacillus plantarum* ST8KF and its bacteriocin ST8KF, isolated from *Kefir; Enterococcus mundtii* ST4V, isolated from soy beans and its mundticin ST4V; *Streptococcus macedonicus* ST91KM isolated from Bulgarian yoghurt and its bacteriocin ST91KM.

Lactobacillus plantarum ST16Pa was used for control of food born pathogen *Listeria monocytogenes* and in addition presents interesting properties as a potential probiotic for human application. *Pediococcus pentosaceus* ST44AM was active against broad spectrum of pathogens. However, this bacteriocin shares a high similarity to pediocin PA-1 and exhibited a synergetic effect with vancomycin against *Listeria monocytogenes* when it has been applied in sub MIC doses. *Enterococcus casseliflavus* ST182Gu produces a broad spectrum bacteriocin with is active against large number of *Listeria* spp. strains with a potential application in bio-preservation. Lactobacillus plantarum ST8KF was re-incorporated in kefir grains and successfully used in control of enterococcal contaminations in kefir. The bacteriocin ST8KF was showing potential application in control of Mycobacterium tuberculosis. Inhibitory effect of bacteriocin produced by Streptococcus macedonicus against selected pathogens related with mastitis was showed in situ by DGGE analysis of the total DNA extracted from the mixed population containing this bacteriocin producer and mastitis pathogens. *Enterococcus mundtii* ST4V exhibit a broad spectrum of activity, including activity against gram-negative bacteria and viruses. *Enterococcus mundtii* ST4V was showing a good inhibitory effect against Candida albicans and even showing synergetic interaction when it was applied with some contraceptive medicaments. *Enterococcus mundtii* ST4V was applied as a starter culture in production of Boza. No significant differences in rheological properties were observed, suggesting that the presence of *Enterococcus mundtii* ST4V had no effect on the sensorial quality of the final product. The preservative properties of bacteriocin ST4V were evaluated by contaminating *Boza* with *Lactobacillus sakei* LMG13558. Changes in microbial populations were monitored by using classical microbiological methods, PCR with species-specific primers and DGGE. However, some bacteriocins produced by boza related LAB was shown to have an inhibitory effect on Mycobacterium tuberculosis.

Biography

Svetoslav Dimitrov Todorov has completed his Ph.D. at Sofia University, Sofia, Bulgaria and postdoctoral studies from Stellenbosch University, Matieland, South Africa. At the moment, he is visiting professor at Sao Paulo University, Faculty of Pharmaceutical Sciences, Sao Paulo, Brazil. He has published more than 90 papers in reputed journals and serving as a member of the editorial board. He is reviewer for more than 30 international journals.

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