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Safety properties of bacteriocinogenic putative probiotic lactic acid bacteria in environment representing healthy and hyperthermia body conditions

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The use of benefits produced by bacteria in human nutrition has long-standing records; today, we call these beneficial effects probiotics. An additional feature of strains is the ability to produce bacteriocins, which can be used to control other bacteria. Furthermore, safety profile is an essential mile stone in the selection of strains to be evaluated as probiotics.

Focus of current study was to evaluate safety profile of *Enterococcus faecium* ST02JL, *Pediococcus pentosaceus* ST408, *Pediococcus pentosaceus* ST401 and *Lactiplantibacillus plantarum* ST414 from the collection of ProBacLab, Laboratory of Microbiology, Faculty of Pharmaceutical Sciences, University of Sao Paulo, Brazil taking in consideration that evaluated cultures can be exposed on normal (37^{o}C) and hyperthermia (39^{o}C) conditions. In the current study we have evaluated bacteriocin production where equal levels of activity were recorded at 37^{o}C and 39^{o}C for *P. pentosaceus* ST408, *P. pentosaceus* ST401 and *Lpb. plantarum* ST414. However, for *E. faecium* ST02JL was recorded inhibition for 7 out of 8 tested *Listeria* strains, while at 37^{o}C only 6 test organism were inhibited. All tested strains were characterized as gelatinase negative and γ-hemolytic when cultured at 37^{o}C and 39^{o}C. Some differences were observed when antibiotic resistance for studied strains was evaluated. Moreover, when exposed to presence of the conditions simulating gastrointestinal conditions, cultured at 37^{o}C and 39^{o}C, respectively, differences in the survival were observed. For *E. faecium* ST02JL when exposed to stomach conditions viable cells were reduced from 8.08×10^{8} CFU/ml para 1.76×10^{6} CFU/ml (cultured at 37^{o}C) and to 4.62×10^{5} CFU/ml. Further after lower GIT conditions bacterial titer was 1.42×10^{6} CFU/ml (at 37^{o}C) and 1.23×10^{6} CFU/ml (at 39^{o}C). Similar results were observed for *P. pentosaceus* ST408, *P. pentosaceus* ST401 and *Lpb. plantarum* ST414, showing role of the incubation temperature on survival rates when studied strains were exposed to the GIT conditions. These results indicates that even the temperature cannot play key role in the safety profile of the putative probiotics, some variations can be observed, and this needs to be considered as factor in selection of appropriate strains for human and animals' use. Moreover, healthy and hyperthermia conditions can be a strong factor that may influence survival and further beneficial performance of the probiotic cultures. Microbial behavior of the probiotic strains in different host conditions can be related to the clinical conditions and influence by the body temperature.

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