

Traditionally made Serbian cheese as a source of potential probiotics

***Enterococcus* spp. strains**

Mirjana Ž. Grujović*, Katarina G. Mladenović, Ljiljana R. Čomić

¹University of Kragujevac, Faculty of Science, Department of Biology and Ecology, Radoja
Domanovića 12, 34000 Kragujevac, Republic of Serbia

Short title: **Potential probiotics application of enterococci**

*Correspondence: Mirjana Ž. Grujović
University of Kragujevac
Faculty of Science
Department of Biology and Ecology
Radoja Domanovića 12
34000 Kragujevac
Republic of Serbia
phone +381-34-336 223
FAX +381-34-335 040
e-mail: mirjana.grujovic@pmf.kg.ac.rs

Summary

The purpose of this research paper was the evaluation of the probiotic potential of six strains of *Enterococcus* spp. isolated from traditionally made cheese. The isolates presented the part of unexplored microflora of cheese. The tolerance of enterococci strains to different gastrointestinal conditions (low pH, presence of pepsin, pancreatin and bile salts) was investigated. Using the microdilution method, sensitivity to clinically relevant antimicrobial agents (tetracycline, ampicillin, gentamicin, vancomycin and polymyxin B) was evaluated. The ability of autochthonous *Enterococcus* spp. to adhere to solvents, as well as the ability of auto-aggregation and co-aggregation between them and *Escherichia coli* clinical isolate, was investigated. The results indicated that isolates were tolerant to the simulated gastrointestinal condition in high percent. Isolates showed sensitivity to all tested antibiotics, especially to ampicillin, MIC values obtained from 0.19-2.5 µg/mL. Isolates showed ability of growth in medium with phenol and showed no ability to synthesize histamine and tyramine. The highest percentage of adhesion was detected with chloroform, and the lowest with xylene. The isolates showed moderate auto-aggregation ability. A different degree of co-aggregation with *E. coli* was observed. *Enterococcus* spp. showed strain specific co-aggregation.

In conclusion, tested enterococci showed a high tolerance to gastrointestinal conditions (mainly to the presence of bile extracts and gastric pH values). The adhesion ability is an important characteristic, because bacteria, with process this ability, can be used as the mechanical barrier for adhesion of other bacteria, like enterobacteria, to epithelium. The ability to auto- and co-aggregation are important factors for determination of probiotics potential of isolates and their potential medical application. Further studies need to include the investigation of adherence and colonization of intestinal epithelium cells, the possible *in vivo* studies and more detailed investigation of safety aspect.