

Probiotic Potentials of different *Lactobacillus* Isolates from the Ethnic Fermented Foods of Garo Hills, Meghalaya, India

Birendra K.Mishra^{1*}, Subrota Hati² and Sujit Das¹

¹RDAP Dep., North-Eastern Hill University, Tura Campus, Tura-794002, Meghalaya, India

²Dairy Microbiology Dept., Anand Agricultural University, Anand-388110, Gujarat, India

*Corresponding author: birendramishra14@gmail.com

Abstract

Background and Objective: Probiotics are the health promoting viable microorganisms that exhibit a beneficial effect on the health of human being by improving the intestinal microflora. The probiotics are generally consumed as a part of the fermented foods. Traditional fermented foods of Garo Hills, Meghalaya, India contain lots of friendly bacteria. This study aimed to evaluate the probiotic properties of *Lactobacillus* cultures isolated from the traditional fermented foods of the Garo Hills of Meghalaya.

Methods: The *Lactobacillus* isolated were analysed for their tolerance to low pH, bile salts, antimicrobial potential, auto-aggregation ability, microbial adhesion to hydrocarbons, antioxidative potential, antibiotic susceptibility, proteolytic activity and cholesterol assimilation.

Results: Out of eight *Lactobacillus* isolates, *Lactobacillus rhamnosus* (K4) and *Lactobacillus helveticus* (K14) was found to tolerate pH 2 and pH 3 for 1.5 and 3 hours. *Lactobacillus fermentum* (K16) could survive efficiently at 0.5% bile salts after 1.5 and 3 h and it was also able to reduce cholesterol efficiently (60.64%) as compared to the other isolates. *Lactobacillus rhamnosus* (K4) strain displayed highest antioxidant activity (49.13, 62.8973, 97 and 82.17% at 0, 2, 6 and 24 hours respectively) and also exhibited the highest cell surface hydrophobicity (69.95%). *Lactobacillus helveticus* (K14) also exhibited the highest aggregation (81.32%) and proteolytic activity (0.67 O.D.) justifying their capability to self-aggregate easily which is a prerequisite for colonization and protection of gastrointestinal tract. Antibiotic susceptibility pattern of selected isolates were also observed and antimicrobial activity was demonstrated against *E. coli*, *S. aureus*, *S. typhi*, *P. aeruginosa* and *Bacillus subtilis*. Further, the evolutionary relatedness between the *Lactobacillus* isolates was signified by a DNA alignment program, MAFFT v6.864.

Conclusion: The present study confirmed the potentials of the *Lactobacillus* cultures as probiotics for exploitation in the development of novel functional fermented foods for the betterment of human health in North-Eastern region of India and the other parts as well. Further, clinical investigations are required to validate the health claims against these *Lactobacillus* cultures.

Keywords: Probiotics, antioxidative, *Lactobacillus helveticus*, Meghalaya
