

Characterization of Bacteriocin from Indigenous Probiotic *Lactobacillus* with Emphasis on Broad Antibacterial Spectrum

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Background: Bacteriocins from lactic acid bacteria (LAB) have been excellent biotherapeutic agents to be used against pathogenic bacteria. However, the antibacterial activities of bacteriocins from indigenous LAB have not been validated scientifically from our part of the globe. The current study determines the antibacterial properties and characterizes bacteriocin isolated from local *Lactobacillus* strains.

Methods: Five commercial curd samples were processed microbiologically, using MRS media, in order to isolate LAB. The LAB was identified following conventional and molecular methods, and the probiotic features were validated. Antagonistic properties of the isolated LAB were determined against the indicator pathogenic bacteria. Bacteriocin isolated from such probiotic strains were characterized through enzyme treatment, SDS-PAGE analysis and antibacterial property.

Result: The LAB isolates were identified as *Lactobacillus* Spp. and the isolates showed probiotic features, with tolerance to variable temperature (15°C and 42°C) and acid (pH 2-4), bile salt (0.125%, 0.25% and 0.50 %) and NaCl (2%, 4% and 6.5%). The LAB were γ -hemolytic and did not cause gelatin hydrolysis and mostly were sensitive to the antibiotics tested. Antagonistic activity test reveals a zone diameter of inhibition (ZDI) of 16-46 mm and 7-26 mm in agar-overlay and agar-well techniques, respectively, against the gram positive and gram negative indicator bacterial pathogens. The isolated bacteriocins from probiotic LAB were of 11-14 kDa. The bacteriocin showed antibacterial activity displaying ZDIs 15-30 mm and minimum inhibitory concentration (MICs) 7.12 – 483.12 μ g/ml.

Conclusion: The lactobacilli were excellent probiotics, and the bacteriocin from the LAB had a broad spectrum of antibacterial activity. Thus, the indigenous *Lactobacillus* strains from local niches and the bacteriocin isolated from them might be used as biotherapeutic agents against bacterial infection.

Keywords: Lactic acid bacteria; probiotics; bacteriocin; antibacterial activity; biotherapeutic agent

Biography:

Debashis Halder is involved in Ph.D Research since last three years, under the supervision of Prof. Shyamapada Mandal, Laboratory of Microbiology and Experimental Medicine, Department of Zoology, University of GourBanga, India. He has worked on three projects and published five research articles in four reputed international journals. He is passionate to pursue a career in Medical Microbiology and truly attracted by Molecular Immunology and Phytomedicine. He wishes to continue as a scientist with a dynamic team of sincere researchers along with continuous research in his fields and extend his valuable service towards the scientific community with extensive research work.