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Exploration of antibacterial and biopreservation potential of lactic acid bacteria isolated from traditional fermented foods of India

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Lactic acid bacteria (LAB) are generally regarded as safe bacteria and have significant role in human daily life. These bacteria produce certain antimicrobial agents like organic acids, diacetyl, hydrogen peroxide which helps to extend the shelf life of various food products. The aim of this study was to screen the antibacterial activity of LAB isolated from traditional fermented foods of India (especially rural regions) against the most common food borne (indicator) pathogens. The antagonistic potential of these isolates against *Escherichia coli*, *Staphylococcus aureus*, *Salmonella species* and *Bacillus cereus* were tested using agar well diffusion method. Out of 30 lactic acid bacteria isolates five isolates (i.e., LAB1, LAB2, LAB3, LAB4 and LAB5) were effective against all selected indicator pathogens. Amongst the five isolates, LAB3 exhibited the highest antibacterial activity in terms of zone of inhibition ($>18 \pm 1.5$ mm) and least activity was shown by isolate LAB2 ($>10 \pm 1.8$ mm). The degree of antimicrobial potential among the isolates was in the order of LAB3>LAB1>LAB4>LAB5>LAB2. Overall, the isolated LAB exhibited significant inhibitory effects against wide range of food borne pathogens. Although, the spectrum of inhibition was varied for the isolates examined but the above finding explore their potential application as a natural biopreservatives (i.e., bacteriocins) due to inhibiting the growth of pathogenic and food spoiling bacteria, maintaining the nutritive quality, flavor enhancer and extending the shelf life in wide range of food products (such studies are under progress in laboratory). Moreover, the characterization of antibacterial agents helps in the improvement of food product safety.

Biography

Tejpal Dhewa is currently working as Assistant Professor in the Department of Nutrition Biology, Central University of Haryana. Earlier, he taught in the Department of Microbiology, Bhaskarcharya College of Applied Sciences, New Delhi and Dolphin (PG) Institute of Biomedical and Natural Sciences, Dehradun. He has received his Master degree in Microbiology from University of Rajasthan and earned his Doctoral degree in Microbiology from Bundelkhand University, India. He is involved in teaching PG students with special focus on food microbiology, medical microbiology and industrial microbiology. He has guided several MSc students in DIBNS. He has executed research projects supported by Mascoma Corporation (USA) and University of Delhi (DU), India. Currently he is a Principal Investigator (PI) of DU Innovation Project on development of a real time biosensor to detect microorganisms in food and agricultural products. He has developed two antimicrobial formulations against methicillin and vancomycin resistant *Staphylococcus aureus* and filed two national patents. He also developed freeze dried synbiotic formulation for extension of shelf life of probiotic products. He has published more than 25 papers, 10 presentations in national and international Seminars and conferences, 1 book, 3 monographs, 3 popular articles and several book chapters to his credit.

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