

IDENTIFICATION AND SCREENING OF POTENT LACTIC ACID BACTERIA HAVING ANTIMICROBIAL ACTIVITY AGAINST MULTIDRUG RESISTANT FOOD BORNE ZOONOTIC PATHOGENS

Mahfuzul Islam*

Executive Summary

Milk is harboring both pathogenic and beneficial bacteria. This study aimed to identify and screen potent lactic acid bacteria having antimicrobial activity against multidrug resistant food borne zoonotic pathogens. The 100 milk samples of cow were aseptically collected from 10 randomly selected dairy farms of Dhaka City of Bangladesh. The collected milk samples were then processed and cultured on to selective media. The isolated microorganisms were identified based on staining, motility, cultural and biochemical properties according to standard laboratory methods. PCR confirmation of *Staphylococcus* species were performed by targeting the primers of 16S rRNA. The isolated bacteria were also subjected to characterize their antibiotic sensitivity. Antimicrobial potency (AMP) of the isolated Lactic Acid Bacteria (LAB) were screened by agar well diffusion test. Among 100 milk samples, 56% milk samples were reported as positive for *Staphylococcus* species, followed by *Escherichia coli* (23%), *Klebsiella spp.* (19%), and *Salmonella spp.* (9%) ($p < 0.001$). On the other hand, 143 pathogenic bacteria were isolated and identified from the milk samples inspected of which 49.65% were *Staphylococcus* species, 25.17% were *Escherichia coli*, 18.88% were *Klebsiella spp.*, and 6.29% were *Salmonella spp.* In terms of LAB, 184 isolates were identified from 100 milk samples. Multidrug resistant (MDR) property was observed in around 90% of the isolates ($p < 0.001$). Among them, 100% of the *Escherichia coli* and *Klebsiella spp.* showed MDR properties followed by *Staphylococcus spp.* (81.69%), and *Salmonella spp.* (77.78%). Most of the isolates showed their resistance against ampicillin, amoxicillin, and tetracycline. It was revealed that 11 LAB showed AMP against *Salmonella spp.* Overall, the production of appropriate probiotics and postbiotics from LAB containing AMP can help to lower the MDR milk-borne pathogenic bacterial infection.

*Associate Professor, Dept. of Micro Biology and Parasitology, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh