Probiotic Lactic Acid Bacteria Isolated from Indigenous Fermented Camel Milk (Chal)

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Abstract

Background and Aim : Probiotic bacteria are living microorganisms commonly present in fermented products. These bacteria are regarded as beneficial due to their metabolic functions, which contribute to health improvement and enhance resistance against various diseases. Additionally, they play a crucial role in preserving the health of the digestive system by ensuring a balanced intestinal microbial flora. Among these microorganisms, lactic acid bacteria (LAB) are recognized as promising probiotics, typically found in milk and dairy products, and are prevalent in natural environments with numerous applications in the food industry. This study represents the first evaluation of the probiotic characteristics of LAB species isolated from a traditional fermented camel milk known as Chal.

Methods : Bacterial isolates from Chal were isolated using MRS (DeMan Rogosa and Sharpe) medium and incubations at 37°C for 48h at anaerobic conditions. All isolates were initially identified as belonging to LAB based on their morphological and biochemical reactions, including Gram reaction, Catalase reaction, spore forming ability and motility. The isolates were further characterized for their probiotic potentials including their antibacterial activity determined against Escherichia coli, Staphylococcus aureus and Salmonella by Agar well diffusion assay. Moreover, the isolates were evaluated for their acidic, bile and NaCl tolerance, Lactose fermentation and antibiotic sensitivity pattern.

Results : Out of 165 bacterial isolates examined under anaerobic conditions, 17 were identified and purified as lactic acid bacteria (LAB). All 17 isolates were Gram positive, either bacilli or coccobacilli, catalase negative, non-motile, and non-spore forming. Based on the findings related to their tolerance to acid and bile, as well as their antibiotic sensitivity profiles, five isolates—10A, 13B, 19S, 19B, and 21B demonstrated notable probiotic potential and were chosen for further indepth studies.

Conclusion : To date, there have been no studies focused on the isolation and identification of probiotic lactic acid bacteria (LAB) from camel fermented milk (Chal) within the country. This research represents the inaugural report of probiotic LAB species derived from natural resources, potentially serving as a valuable source for obtaining indigenous genetically distinct strains. Future investigations aims to identify these isolates at species level using molecular methods and explore their potential roles in combating diabetes and obesity.

Keywords : chal. probiotic LAB, obesity, intestinal microbial flora

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