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CSIR
भारत का नवाधार इंजन
The Innovation Engine of India

Indian Journal of Experimental Biology
Vol. 63, March 2025, pp. 252-263
DOI: 10.56042/ijeb.v63i03.10733

Journal of Natural Science and Pure Research
NISPR
सीएनएसआर-मिस्पार

Bioprospecting of probiotic lactic acid bacteria from jalebi batter and evaluation of their antidiabetic and antioxidant potential

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Received 27 April 2024; revised 31 October 2024

Diabetes has become the most commonly prevalent metabolic disorder worldwide. Though the medications are available for effective management of hyperglycemia due to diabetes but most of them have adverse side effects. Therefore, there is immense emphasis on the exploration of safer alternatives for managing diabetes. One such safe alternative may be the application of probiotics for the effectual control/management of diabetes. In the current study, sixteen lactic acid bacteria (LAB) were isolated from jalebi batter, a rarely explored ecological niche, for potential probiotics. These isolates were evaluated for their fundamental probiotic characteristics, with seven isolates demonstrating robust survival rates ranging from 87.6% to 96.8% in simulated gastrointestinal conditions. Additionally, these selected LAB isolates displayed noteworthy functional attributes viz. hydrophobicity, autoaggregation, and coaggregation capabilities. Furthermore, the LAB isolates were investigated for antibiotic susceptibility, antibacterial activity and antioxidant potential. Moreover, LAB isolates from the jalebi batter were examined for their inhibition potential against α -glucosidase and α -amylase enzymes via both intact cells (IC) and cell-free supernatants (CFS). Notably, LAB isolate J-7 exhibited the highest inhibition of α -glucosidase (CFS: 72.27%; IC: 11.90%) and α -amylase (CFS: 15.21%; IC: 13.04%), and also possessed other functionally desired probiotic attributes. The LAB isolate J-7 was identified based on 16S rDNA sequencing as *Limosilactobacillus fermentum*, and designated as *L. fermentum* PP556213 strain J-7.

Keywords: *Limosilactobacillus fermentum*, α -amylase, α -glucosidase, Autoaggregation, Hydrophobicity