

Probiotic properties and safety assessment of *Enterococcus durans* DMGUD5 and its suitability as a dairy starter culture to manufacture fermented dairy product

Deepak Meghwal¹, Kamallesh Kumar Meena^{1*},
Lokesh Gupta², Manvik Joshi³ & Sunil Meena⁴

¹Department of Dairy and Food Microbiology, ²College of Dairy and Food Technology, ³Department of Dairy and Food Chemistry, Maharana Pratap University of Agriculture and Technology, Udaipur 313001, India

⁴Department of Dairy Science and Food Technology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi 221005, India

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This study aimed to isolate and characterize exopolysaccharide (EPS)-producing lactic acid bacteria (LAB) from goat milk and evaluate their probiotic potential and suitability as starter cultures for fermented dairy products. Of the 60 LAB isolates, 19 demonstrated EPS production ability, of which six strains exhibited the highest EPS production. These isolates were identified by 16S rDNA sequencing and assessed for their probiotic properties, including acid and bile tolerance, survivability in simulated gastric and pancreatic juices, auto-aggregation, cell surface hydrophobicity, lysozyme and phenol tolerance, antibacterial and antifungal activities, antioxidative capacity, and safety tests. *Enterococcus durans* DMGUD5 exhibited the most promising probiotic characteristics and was used to prepare fermented curd. The curd was analyzed for its proximate composition and shelf life, considering its sensory attributes, pH, probiotic viability, and microbial safety. DMGUD5 demonstrated high EPS production, superior acid and bile tolerance, strong survival under simulated gastrointestinal conditions, and significant antibacterial, antifungal, and antioxidative activities. The curd prepared using DMGUD5 had acceptable sensory properties and maintained probiotic viability above $6 \log_{10}$ CFU/g for eight days under refrigerated storage ($4 \pm 1^\circ\text{C}$). *E. durans* DMGUD5, exhibits promising probiotic properties and can be used as a starter culture for the production of functional fermented dairy products.

Keywords: Exopolysaccharide, Lactic acid bacteria, Probiotic viability, Antibiotic sensitivity, Curd, Goat milk