

Characterization of Potentially Industrial, Important Lactic Acid Bacteria (LAB) Isolated From Goat Milk

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Goat milk is proven as nutritious, easily digestible, alternative milk for human consumption, containing diverse lactic acid bacteria (LAB) with various functionalities. The aim of this study was to isolate and characterize industrially beneficial lactic acid bacteria present in goat milk for future food applications. In this study 100 bacterial isolates were obtained (by culturing on MRS agar) from 20 fresh goat milk samples which were directly collected from goat farms in Colombo area. Among the 100 isolates, 44 isolates were gram positive and 29 isolates were confirmed as LAB by presumptive identification tests (gram positive, catalase negative, non-motile and non-endospore formers). Hemolytic test was performed to ensure safety for human consumption and 40% non-hemolytic organisms were selected for further investigations (2 rods and 6 cocci). Identification to species level was done based on morphological, physiological and biochemical characteristics following the Bergeys manual. The pool of isolates were identified as *Lactobacillus pentosus*, *Lactobacillus plantarum*, *Streptococcus thermophilus*, *Streptococcus bovis*, *Lactococcus lactis* and *Enterococcus faecium*. All the isolated LAB species were able to coagulate the skimmed milk within 24 hours by lactic acid production (pH 4.8 to 5.9). All isolates survived under high (45 °C) and low (15 °C) temperatures exhibiting the abilities to survive under industrial fermentation and refrigeration conditions. Isolates were tolerant to different NaCl concentrations (2%, 4%, 6.5%) and pH levels (1.5, 3, 9) as well. *Lactobacillus pentosus* (33 mg L⁻¹) and *Streptococcus thermophilus* (14 mg L⁻¹) were the best lactic acid producers indicated by quantified lactic acid concentration from High Performance Liquid Chromatography. Therefore, the LAB isolated from goats milk could be considered as potentially beneficial organisms for future food fermentations.

Keywords: *Lactobacillus*, *Lactococcus*, High performance Liquid Chromatography, Lactic acid