

# Isolation and characterization of protease from lactic acid bacteria isolates from fermented milk products

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## Abstract

Proteolytic lactic acid bacteria (PLAB) are lactic acid bacteria able to produce protease enzyme that hydrolyzes proteins into smaller peptides and amino acids. It is important for growth of bacteria and contributes considerably to flavor compound end-products. In this study, proteolytic activities of PLAB were determined for a PLAB isolated from each of 4 fermented milk products. In total 7 LAB strains were selected comprising 4 isolates, A1, B6, C2, D2, and 3 reference strains, *Lc. lactis* TISTR 1464, *Lb. plantarum* TISTR 854, and *Lb. casei* TISTR 1463). Proteolytic activities were determined for extracellular, intracellular, and cell bound conditions in MRS and skim milk (SKM) broths at 37, 45 and 50°C. For the extracellular enzyme, the highest protease activities were 1.28, 1.15 and 1.0 U/ml, respectively for C2, *Lc. lactis*, and *Lb. plantarum* at 45°C in MRS. The isolates D2, B6, and *Lc. lactis* at 45°C were found to exhibit the highest protease activities in SKM broth of 0.97, 0.96 and 0.91 U/ml, respectively. The highest intracellular protease activities were found in the ranges 0.21-0.27 U/ml, 0.11-0.16 U/ml, and 0.04-0.12 U/ml in SKM broth at 37°C, 40°C, and 50°C, respectively. In contrast the intracellular protease activities in MRS both were lower with ranges of 0.08-0.10, 0.01-0.07 and 0.04-0.12 U/ml at 37, 45 and 50°C, respectively. Finally, the highest cell bound protease activities were in the ranges of 0.82-1.28 and 0.69-0.97 U/ml when cultured in MRS and SKM broths at 37 °C. At 45 °C, the protease activity ranges were 0.33-0.85 and 0.48-0.63 U/ml in MRS and SKM broths, respectively. The lowest protease activities were recorded at 50°C.

**Keywords:** PLAB, Proteolytic activity, fermented milk