

## Abstract

This research was studied the proteins differentiation produced from free cell and biofilm of lactic acid bacteria or LAB strains to analyze the different protein profiles produced and their functions involved in biofilm formation and antimicrobial activity. LAB are now commonly used in animal feed production as probiotic to improve ruminant digestive system and prevent diseases. LAB can simply form biofilm attaching to the target surfaces. Various proteins produced from free cell and biofilm are different according to their mechanisms in the cell which they have changed due to environment conditions. Total 11 strains of LAB were tested for their ability to form biofilm on glass (hydrophilic) and plastic (hydrophobic) surfaces by crystal violet staining assay. According to the result, LAB that was grew on plastic surface was stable than the glass surface after 5 days of incubation. Only 3 strains which were *Pediococcus 16 AVPd02*, *Lactobacillus SD1* and *Lactobacillus CU20* were selected to evaluate in flow cell system. *Pediococcus 16AVPd02* and *Lactobacillus SD1* could produce highest amount of biofilm within 24 hours. Their intracellular and extracellular proteins were compared on the protein profiles. Extracellular proteins of both strains were showed significantly different in biofilm and free cell than the intracellular proteins. The proteins involved in glycolysis/gluconeogenesis pathway were upregulated in biofilm supernatant of both strains included type I glyceraldehyde-3-phosphate dehydrogenase, class II fructose-1,6-bisphosphate aldolase and phosphoglycerate kinase which possibly involved in biofilm formation mechanisms. Glycoside hydrolase which had the ability of degrading exopolymeric substance (EPS) were found downregulated in biofilm. Several proteins found in both supernatant and cell lysate have the potential to be an antimicrobial compounds which were 50S ribosomal protein L1 and GntR family transcriptional regulator.

**Keyword:** Lactic acid bacteria (LAB), free cell, biofilm, antimicrobial activity, exopolymeric substance (EPS).