Assessment of adhesion properties of probiotic lactic acid bacteria isolated from an indigenous fermented fruit

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Abstract

Probiotics are continuously gaining attention in the food industry for the development of functional foods due to their ability to confer several health benefits to the hosts. The study aims to assess the adhesion properties of lactic acid bacteria (LAB) isolated from an indigenous fermented fruit in east Malaysia (*Bambangan, Mangifera pajang*). The selected probiotic candidates were investigated on their proteinaceous components in adhesion using human intestinal CaCo-2 cells. The tested LAB demonstrated different adhesion ability to human colon epithelium cells ranged from 0.8% to 5.51%, with *L. plantarum* 0612 marked the highest adhesion. However, the adherence capacity reduced dramatically to 77% upon treatment with LiCl, indicating the involvement of proteinaceous components in the adhesion mechanism to the epithelial cells. Nevertheless, the bacterial surface proteins do not differ remarkably between those highly adhesive strains. The surface proteins extracted from *L. plantarum* 0612 were rated 1518 nm in diameter with 0.023 polydispersity index. Besides, a competitive adhesion assay with the extracted protein confirmed the adhesion of surface layer proteins. In conclusion, *L. plantarum* 0612 is the most suitable candidate as probiotic and surface layer proteins are involved in the adhesion to the intestinal epithelial cells.

Keywords: *Lactobacillus, Mangifera pajang,* Caco-2 cells, SDS-PAGE, Surface layer proteins