

UNIVERSITI TEKNOLOGI MARA

**SURFACE-ASSOCIATED PROTEINS
OF *Bifidobacterium pseudocatenulatum*
WILD TYPE KAKii THAT ADHERE
TO CACO-2 CELL LINES**

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ABSTRACT

Probiotics need to be adhesive towards human gastrointestinal tract (GIT) in order to provide host's health benefits. Surface-associated proteins were one of the important elements which played a role in bacterial-mucosal adhesion activity. Thus, the objective of this study was to determine the surface associated proteins expressed by *Bifidobacterium* sp. which involved in adhesion activity. In this study, cell surface hydrophobicity, adhesion score of *Bifidobacterium* strains on Caco-2 cell and identification of surface-associated proteins produced by selected *Bifidobacterium* strain were carried out. Based on the result obtained, *B. pseudocatenulatum* KAKii had gave most promising cell hydrophobicity activity with a significant higher attachment score ($p < 0.05$) among all strains used. *B. pseudocatenulatum* KAKii was able to adhere to Caco-2 cell lines with 1.6 % of adherence percentage, with no significant differences ($p > 0.05$) compared to another commercial probiotics. This strain was favored to attach to intestinal cell line at pH 6 and after 120 minutes of exposure. Subsequently, cell's surface-associated protein of *B. pseudocatenulatum* KAKii was extracted by using six different buffers; 1 % SDS, 1 x HEPES, 8 M urea, 0.01 M NaOH, 5 M LiCl and mixture of 1 % SDS and 8 M urea. Results showed that mixture of 8 M urea and 1 % SDS in the ratio 1:1 is a better protein extractor. Extracted proteins were further separated via 2-Dimensional PAGE (2-D PAGE) and identified via MALDI-TOF/TOF tandem mass spectrometry. Several peptide sequences obtained from *B. pseudocatenulatum* KAKii lead to probable peptide of proteins involved in bacterial attachment. In addition, extracted proteins were also bounds specifically to mucin and leads to several peptides fragment identified via mass spectrometry.

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