

Studies on Antihyperglycemia and Antihypercholesterolemia in Rats (*Rattus norvegicus*) using Intestinal-origin Probiotics Strains

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Abstract

The objective of this study was to evaluate the ability of intestinal-origin probiotics strains in alleviating hyperglycemia and hypercholesterolemia in rats (*Rattus norvegicus*) *in vivo*. Five strains of Lactic Acid Bacteria consists of *Lactobacillus casei* strain AP and AH, and *Pediococcus acidilactici* strains AA, BE and BK were previously isolated and identified from faeces of infants who consumed breast milk as the only source of diet. *In vitro* evaluation those five strains showed their potential as probiotic based on their capability to grow on media pH 2.0, with 1.5% concentration of bile salts, the ability to attach on gastric mucin *in vitro*, and their ability to inhibit the growth of pathogen. Evaluation on the ability to use prebiotic inulin as carbon source showed that *Lactobacillus casei* (strain AP and AG) and *Pediococcus acidilactici* strain BE had the ability to degrade inulin as a prebiotic. Evaluation of probiotics on their capability to synthesize conjugated linoleic acid from free linoleic acid showed that only *Lactobacillus casei* strain AP was able to convert more than 60% of free linoleic acid to conjugated linoleic acid in the media. Further *in vivo* studies using rats (*Rattus norvegicus*) showed that *Lactobacillus casei* strain AP had the ability to alleviate hyperglycemia and hypercholesterolemia. The ability of *Lactobacillus casei* strain AP in reducing hyperglycemia was comparable with that of metformin (anti-hyperglycemia drug) provided orally at level 45 mg/kg of body weight.

Biography

Dr. Widodo is an *Associate Professor* at the Faculty of Animal Science and the Graduate School of Biotechnology Universitas Gadjah Mada (UGM). He obtained his Bachelor degree in Microbiology at the Faculty of Agriculture UGM, completed a Master degree by Research (MSc) in Biotechnology at the University of New South Wales (UNSW), Australia, and completed his PhD from University of Melbourne, Australia. Upon completion his PhD, he did a postdoctoral training at the Japan International Research Centre for Agricultural Sciences (JIRCAS) in Tsukuba. As a lecturer, his main duty is teaching the subject of Microbiology and Biotechnology, and supervises students in doing laboratory and other experimental works for their thesis. His main research interest includes Food Microbiology and Biotechnology, and Dairy Biotechnology. In addition, Widodo is the Managing Editor of the Indonesian Journal of Biotechnology (<http://ijbiotech.ugm.ac.id/index.php/biotech>), a nationally accredited journal, and internationally indexed in a number database.