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Effect of pH values and inoculation amounts for α-glucosidase inhibitory activity in mulberry leaves fermentation

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Mulberry (*Morus alba* L.) has long been used as a traditional medicine and foods in Korea, China, and Japan. Mulberry leaves contain 1–deoxynojirimycin (DNJ) have been recognized as a potentially important source to prevent or treat hyperglycemia. Alpha–glucosidase inhibitor including DNJ is usually used to prevent or medical care of type II diabetes. These inhibitors combine with intestine α–glucosidase and blocking the absorption of postprandial blood glucose. Researchers have reported that the human and rat small intestinal maltase and sucrose were strongly inhibited by mulberry leaf extract. These results were confirmed that the inhibition of maltase and sucrose was mainly due to the presence of DNJ. However, DNJ content of natural mulberry leaf are as low as 0.1%. Thus, more effective method of extraction and culture for the DNJ high–production is needed. In this study, we investigated the affection of α–glucosidase inhibitory activity according to different pH values (3–9) and inoculation amounts (0.1–0.5%) when *Bacillus subtilis* was cultured with mulberry leaf powder. The results of mulberry leaf fermentation according to pH values and inoculation amounts were shown that α–glucosidase inhibitory activity increased in culture conditions for pH 7 to 9, inoculation amount 0.4%, and incubation until 2 to 4 days. In particular, α–glucosidase inhibitory activity was highest for 91.4% in culture conditions for pH 7, inoculation amount 0.4%, and 2 day of incubation. Therefore, it was conducted to determine factors that influence the activity of α-glucosidase inhibitor produced by *Bacillus subtilis* under various fermentation conditions and these results provide a basic data for optimal culture condition increasing α–glucosidase inhibitory activity from mulberry leaves through fermentation. Also, it was analyzed to produce cost-effective and productive α-glucosidase inhibitors.

Biography

Yong-Soon Kim works at National Institute of Agricultural Sciences (NAS) of Rural Development Administration (RDA) in South Korea. He completed his Doctor of Agriculture at Kagoshima University of Japan. His thesis was entitled as "Genetic analysis of the insecticidal crystal protein gene in Bacillus thuringiensis strain AF101". Now, he attends Department of Agricultural Biology in NAS and focuses on development of high-technology food & drug materials from mulberry fruits.

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