

## **Antihyperglycemic and anti-inflammatory effects of fermented food paste on high-fat diet and streptozotocin-challenged mice**

### **ABSTRACT**

**Background:** Fermented food has been widely consumed as health food to ameliorate or prevent several chronic diseases including diabetes. Xeniji™, a fermented food paste (FFP), has been previously reported with various bioactivities, which may be caused by the presence of several metabolites including polyphenolic acids, flavonoids, and vitamins. In this study, the anti-hyperglycemic and anti-inflammatory effects of FFP were assessed.

**Methods:** In this study, type 2 diabetes model mice were induced by streptozotocin and high-fat diet (HFD) and used to evaluate the antihyperglycemic and anti-inflammatory effects of FFP. Mice were fed with HFD and challenged with 30 mg/kg body weight (BW) of streptozotocin for 1 month followed by 6 weeks of supplementation with 0.1 and 1.0 g/kg BW of FFP. Metformin was used as positive control treatment.

**Results:** Xeniji™-supplemented hyperglycemic mice were recorded with lower glucose level after 6 weeks of duration. This effect was contributed by the improvement of insulin sensitivity in the hyperglycemic mice indicated by the oral glucose tolerance test, insulin tolerance test, and end point insulin level. In addition, gene expression study has shown that the antihyperglycemic effect of FFP is related to the improvement of lipid and glucose metabolism in the mice. Furthermore, both 0.1 and 1 g/kg BW of FFP was able to reduce hyperglycemia-related inflammation indicated by the reduction of proinflammatory cytokines, NF-κB and iNOS gene expression and nitric oxide level.

**Conclusion:** FFP potentially demonstrated *in vivo* antihyperglycemic and anti-inflammatory effects on HFD and streptozotocin-induced diabetic mice.

**Keyword:** Fermented foods; Diabetic; Inflammation; High-fat diet; Lipid metabolism; glucose