

Effect of Mamao Pomace Extract on Insulin Resistance in Type 2

Diabetic Rats

Sootthikarn Mungkhunthod¹, Panot Tangsucharit¹, Laddawan Senggunprai¹, Jintana Sripui²,
Upa Kukongviriyapan³, Patchareewan Pannangpetch^{1*}

¹Department of Pharmacology, Faculty of Medicine, ²Department of Food Technology, Faculty of Technology,

³Department of Physiology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

*Corresponding author, E-mail: patc_pan@kku.ac.th

Background and Objective: High fat diet (HFD) can cause insulin resistance which plays a major pathogenic role in the development of type 2 diabetes mellitus. Interestingly, an *in vitro* antihyperglycemic activity of Mamao (*Antidesma thwaitesianum* Mull. Arg) has been reported including anti-alpha-amylase and anti-alpha-glucosidase. Thus, this study aimed to investigate the effect of Mamao pomace ethanolic extract (MPE) on insulin resistance, blood glucose, lipid profiles and serum adipokines in HFD/Streptozotocin (STZ)-induced type 2 diabetic rats.

Methods: Male Sprague-Dawley rats were fed HFD (60% lard oil) throughout the experiment. Normal control rats were fed normal chow. At week 4 of HFD feeding, STZ 30 mg/kg was injected intraperitoneally. Two weeks after STZ injection, treatments were applied for further six weeks as followed: Group I: distilled water (diabetic control); Group II-IV: MPE 250, 500 and 1000 mg/kg respectively; Group V: pioglitazone 10 mg/kg. Then, fasting blood glucose (FBG), oral glucose

tolerance test (OGTT), serum insulin, serum adiponectin and lipid profiles were examined. Homeostasis Model Assessment-Insulin Resistance (HOMA-IR), an indicator of insulin resistance was calculated.

Results: MPE (500 and 1000 mg/kg) significantly decreased the FBG and improved OGTT as compared to DM-control group ($p < 0.05$). HOMA-IR score of DM rats receiving MPE was significantly decreased whereas serum adiponectin was significantly increased as compared to DM control. Moreover, MPE significantly lowered serum total cholesterol, triglyceride₁ and raised high-density lipoprotein cholesterol (HDL).

Conclusion: The results indicate that MPE improves insulin resistance, hyperglycemia and lipid profiles in type 2 diabetic rats, possibly via its adiponectin secretion-enhancing effect.

Key words: *Antidesma thwaitesianum*; Mamao pomace, insulin resistance; type 2 diabetes mellitus.

