

# Potential of Melinjo Seed Extract Against Insulin Levels and PDX1 Expression of Male Diabetes Mellitus Model Rats

ROSNI

Faculty of Medicine, University of Prima Indonesia  
Jalan Belanga No. 1 simp. Ayahanda, Medan, North Sumatera, Indonesia

## Abstract

*Diabetes mellitus (DM) caused by an increase in blood glucose levels due to decreased insulin secretion. One way to deal with DM is pharmacological therapy, which has side effects if given for a long period of time. The purpose of this study was to examine Melinjo Seed Extract (MSE) activity in increasing insulin levels, lowering blood glucose levels, increasing the density of Langerhans islet, and increasing the expression of PDX-1 in DM rats model. This research is a laboratory experimental analytic study using a Completely Randomized Design (CRD). The yield of MSE was 9.71% and contains phenolic compounds, steroids, terpenoids, tannins, flavonoids, and alkaloids. In vivo study on Sprague Dawley (*Rattus norvegicus* L) as DM rats model induced by streptozotocin (STZ), rats were divided into 6 groups with different treatments. K1 as a negative control was given distilled water, K2 was given STZ 60 mg/kg BW, K3 was positive control given metformin 85.02 mg/kg BW, K4 was given MSE at a dose of 200 mg/kg BW, K5 was given MSE at a dose of 400 mg/kg BW and K6 was given MSE dose 600 mg/kg BW. The data obtained from the examination of serum blood sugar levels on the 3rd day after STZ induction, and 10th and 21st after treatment. Insulin levels on the 21st day after treatment. After that, the density of Langerhans islands and PDX1 expression were measured. Analysis of the data was done using One Way ANOVA with Tukey's HSD Post Hoc Test and non-parametric statistical test Kruskal Wallis and Mann-Whitney U with  $\alpha=0.05$ . The level of significance is determined by  $p \leq 0.05$ . The results showed that EBM with a dose of 600 mg/kg BW can reduce serum glucose levels to 372.22 to 273.70 mg/dL and increase insulin levels from 68.81 to 253.11  $\mu$  IU/mL, the density of Langerhans islet cells increased from 54.36 to 64.15 and PDX-1 expression in Langerhans island cells increased from 73.49 to 114.80. The conclusion of this study is that the effective EBM dose for DM therapy is 600 mg/kg BW.*

*Keyword: MSE, diabetes mellitus, insulin, blood sugar, Langerhans island, PDX-1*