

ANTIAPOPTOSIS EFFECT OF CHAYOTE ETHANOL EXTRACT (*Sechium edule (Jacq.) Swartz*) ON RATS WITH TYPE 2 DIABETES MELLITUS

Jekson Martiar Siahaan^{1,2)}, Tengku Muhammad Fauzi^{3,4)},
Hadyanto Lim^{5,6)}

¹⁾Department of Physiology, Faculty of Medicine, Universitas Methodist Indonesia, Medan

²⁾Department of Molecular Biology, Master's Program of Biomedical Sciences,
Faculty of Medicine, Universitas Methodist Indonesia, Medan

³⁾Department of Biochemistry, Faculty of Medicine,
Universitas Methodist Indonesia, Medan

⁴⁾Biomedical Laboratory of Master's Program in Biomedical Sciences,
Faculty of Medicine, Universitas Methodist Indonesia, Medan

⁵⁾Department of Pharmacology, Faculty of Medicine,
Methodist University of Indonesia, Medan

⁶⁾Department of Molecular Biology, Master's Program of Biomedical Sciences,
Faculty of Medicine, Universitas Methodist Indonesia, Medan

ABSTRACT

Background: Dysfunction and loss of pancreatic-cell mass in type 2 diabetes mellitus are caused by increased cytokines and free fatty acids (FFA) with persistent hyperglycemia. Prolonged exposure to these mediators induces excessive production of reactive oxygen species (ROS) and activation of caspases that inhibit insulin secretion and promote pancreatic cell apoptosis. The flavonoids found in chayote (*Sechium edule (Jacq.) Swartz*) are able to reduce sugar levels by inhibiting the absorption of glucose in the intestines and improving the diameter of the pancreas of rats. This study aimed to determine the effect of ethanol extract of chayote (*Sechium edule (Jacq.) Swartz*) on caspase 3, bcl-2, and bcl-xl.

Subjects and Method: This was a randomized controlled trial. Thirty male white rats waster strain (*Rattus novergicus sp.*) DMT2 were induced by High Fatty Diet (HFD) - Streptozotocin (STZ) - Nicotinamide (NA). These rats were randomized into 6 groups. The treatment consisted of three doses of extract: 50 mg/kgBW, p.o; 100 mg/kgBB, p.o; and 150 mg/kgBW, p.o. The dependent variable was caspase 3, bcl-2, and bcl-xl. The independent variable was ethanol extract. Data were analyzed by One Way ANOVA.

Results: The lowest caspase 3 activity was in the 150 mg/KgBW dose group (Mean= 2.16; SE= 0.02; p= 0.415). The lowest bcl-xl activity was found in the 150 mg/KgBW dose group (Mean= 5.22; SE 0.56; p<0.001). The highest bcl-2 activity was found in the 150 mg/KgBW dose group (Mean= 9.22; SE= 2.01; p= 0.015).

Conclusion: Ethanol extract of Chayote (*Sechium edule (Jacq.) Swartz*) with a dose of 150 mg/kgBW is able to reduce caspase 3 and bcl-xl as marker of apoptosis and increase the activity of bcl-2 as marker of antiapoptosis.

Keywords: chayote, *sechium edule (jacq.) swartz*, caspase 3, bcl-2, bcl-xl, rats.

Correspondence:

Jekson Martiar Siahaan. Department of Physiology, Faculty of Medicine, Universitas Methodist Indonesia. Jl. Hang Tuah Number.8, Madras Hulu, Medan Polonia, 20151 North Sumatera. Email: jekson.siahaan.sked@gmail.com. Mobile: +6289666444206.