UNIVERSITI TEKNOLOGI MARA

DETERMINATION OF ANTIDIABETIC EFFECT OF *EUGENIA POLYANTHA* USING STREPTOZOTOCIN-INDUCED DIABETIC RATS

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ABSTRACT

The antidiabetic effect of an aqueous extract of *Eugenia polyantha* (Myrthaceae) was investigated in normal and streptozotocin-induced diabetic male adult albino Sprague-Dawley rats. In the present study, rats were pretreated with an aqueous extract of *Eugenia polyantha* (0.5 and 0.05 g/kg body weight oral administration daily) for 14 days and then subjected to diabetic induction with a single intraperitoneal dose of STZ (55 mg/kg body weight). After 7 days, rats were sacrificed for blood and organ collection. Blood samples were used for determination of fasting blood glucose, aspartate aminotransferase (AST) and alanine aminotransferase (ALT). Throughout the experiment, the rat weights, water and food intake and relative weight of organs were determined. The STZ-induced diabetic rats given 0.5 and 0.05 g/kg body weight of EP showed no significant improvement in controlling body weights, food and water consumption and hyperglycemia compared to diabetic control rats. Both doses (0.5 and 0.05 g/kg body weight of EP) caused death in normal rats. Diabetic control rats showed significant lost in body weight, increased water consumption and hyperglycemia compared to normal rats. No effect of STZ and EP showed on organs (lungs, livers, hearts and kidneys), ALT and AST levels. These results suggest that the aqueous extract of *Eugenia polyantha* (Myrthaceae) had less antidiabetic effect if consumed before diabetes induction in rats. Hypothesis of *Eugenia polyantha* reducing blood glucose levels by a dose-dependent manner in STZ-induced diabetic rats has not been proven. This study also showed that 55 mg/kg body weight of STZ increases blood glucose of rats.

Keywords: antidiabetic; Sprague-Dawley rat *Eugenia polyantha;* streptozotocin-induced diabetic rats; death; weight reduction.

CHAPTER 1

INTRODUCTION

In Malaysia, there is about 8.2% of Malaysians got diabetes. This number is increasing when compared to 1986 statistics, which showed 6.2% of Malaysians were diabetic. According to a research that has done by Diabetes Care, the figure is high because the epidemiology of diabetes around the world is only 2.8%. By 2030, it is postulated that there will be 366 millions of people are diabetic (Kosmo Tuesday 9, November, 2006).

Diabetes is a Greek word meaning "going through" and *mellitus* from the Latin word for "honey" or "sweet" (Porth, 2003). Diabetes is a chronic disease that can be caused by many factors such as heredity, aging, pregnancy, unhealthy diet, obesity, urbanization, sedentary lifestyles, stress, immunosuppression and diversification of illness (Miyazaki *et* al., 2005).

Impaired beta cell synthesis or release of insulin will cause disorder of carbohydrate, fat and protein metabolism (Porth, 2003) and decreased usage of glucose by the tissues and overactivity of hepatic glycogenolysis and gluconoeogenesis (Shirwaikar *et* al., 2003).

Diabetes mellitus is classified into type 1 and type 2 diabetes. Type 1 diabetes is insulin dependent while type 2 is non-insulin dependent (Oh *et* al., 2003). There are 15-20% of