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INTERACTION BETWEEN METHANOLIC EXTRACT OF *Hibiscus rosa-sinensis* LEAVES AND GLIBENCLAMIDE IN STREPTOZOTOCIN INDUCED DIABETIC RATS

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ABSTRACT

The interaction between drug-herb interaction may cause synergistic or antagonist effect in the treatment of disease. The present study was conducted to determine the interaction between glibenclamide, a sulfonylureas group of antidiabetic drugs and *Hibiscus rosa-sinensis* leaves methanol extract, an herbal that has hypoglycemic effect. The effect in lowering of blood glucose levels and the changes in histological study of pancreas tissues were evaluated in the streptozotocin induced diabetic rats. Glibenclamide was administered orally at the dose of 0.5 mg/kg and *Hibiscus rosa-sinensis* leaves methanol extract was given at the dose of 125 mg/kg orally. Both glibenclamide and *Hibiscus rosa-sinensis* leaves methanol extract showed the hypoglycemic effect. The combination of glibenclamide together with *Hibiscus rosa-sinensis* leaves methanol extract were indicated greater reduction in the blood glucose levels and increase in the number of pancreatic beta cells instead of using treatment alone. It is concluded that *Hibiscus rosa-sinensis* leaves methanol extract shows synergistic effect when used together with glibenclamide in reducing blood glucose levels and increasing the number of pancreatic beta cells.

Keywords: Glibenclamide, *Hibiscus rosa-sinensis*, hypoglycemic, synergistic effect, pancreatic beta cells.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Diabetes mellitus is a common disease in the world that affects the quality of life and health of the patients that may lead to the other diseases and sometimes cause death. Diabetes mellitus can be differentiated based on their types. There are three types of diabetes mellitus which are Type 1 diabetes, Type 2 diabetes and gestational diabetes. Type 1 diabetes occurs when the pancreatic beta cells are destroyed by the human's immune systems that cause little or no insulin production by the pancreas. It is also known as insulin-dependent diabetes mellitus (IDDM). Non-insulin-dependent diabetes mellitus (NIDDM) or Type 2 diabetes occurs when the body could not use the insulin it produces effectively. For gestational diabetes, it is similar with Type 2 diabetes but occurs in the pregnancy women. Among the patients of diabetes, 90 percent of them are Type 2 diabetes (Tilburg *et al.*, 2001). People who were suffered of diabetes mellitus which affect essential biochemical activities came from all stages of age and this disease also known as global metabolic epidemic disease (Singh *et al.*, 2011).

In 2010, the prevalence estimation of the diabetes increased up to 285 million, that represented 6.4% of the world's adult population and by the year of 2030 it was predicted that the number of patient will increase to 438 million (Naidu *et al.*, 2012). Some of the factors that cause the increases in the number of the

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