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PROTECTIVE ROLE OF *FISCUS BENGALENSIS* LEAF EXTRACT AGAINST STREPTOZOTOCIN INDUCED BIOCHEMICAL ALTERATIONS AND BODY WEIGHTS IN MUSCLE TISSUE OF ALBINO RATS

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ABSTRACT

Diabetes mellitus is a chronic disease characterized by high blood glucose levels due to an absolute or relative deficiency of circulating insulin levels. *Fiscus bengalensis* leaf has several biological properties, including anti-diabetic and antioxidant activity. The present study was designed to investigate the anti-diabetic effect of *Fiscus bengalensis* leaf extract against streptozotocin (STZ) induced alterations in blood glucose, body weights and oxidative enzymes in muscle tissues of albino rats. Adult male albino Wistar rats, weighing 180 ± 20 g was made diabetic by injecting STZ (40mg/kg body weight) intraperitoneally. Diabetic rats were supplemented with ethanolic extract of *Fiscus bengalensis* leaf extract (250 mg/kg body weight) for a period of three weeks. After this period, rats were decapitated and blood was collected. Fresh muscle tissue was also isolated for the assay of oxidative enzymes such as lactate dehydrogenase (LDH), succinate dehydrogenase (SDH), malate dehydrogenase (MDH) and glucose-6-Phosphate dehydrogenase (G-6-PDH) status in control and experimental rats. Blood glucose and LDH activity levels were significantly elevated in diabetic rats with decreased body weight, SDH, MDH and G-6-PDH activity levels when compared with control. The above mentioned parameters were significantly restored to near normal by oral administration of *Fiscus bengalensis* leaf extract once daily for three weeks as compared to untreated rats. The results obtained indicated that ethanolic extract has more potent protective action against hyperglycemic condition.

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INTRODUCTION

Diabetes mellitus (DM) is a chronic and life long metabolic disorder characterized by hyperglycemia due to disturbance in the group of metabolism of carbohydrates, fat and protein (Koukhdan and Khaksar, 2015). This disease mainly related to insulin deficiency and can involve many organs (Georg and Ludvik, 2000; Nyholm *et al.*, 2000; Palanisamy *et al.*, 2011). In diabetes, the deficiency of insulin leads into a complex series of reactions, which are clinically manifested as hyperglycemia and is characterized by a loss of glucose homeostasis (Shyam *et al.*, 2013). Persistent hyperglycemia in diabetes causes increased production of oxygen free radicals from autoxidation of glucose (Hunt *et al.*, 1990) and glycosylation of protein (Wolff and Dean, 1987) which lead to oxidative stress which is associated with several health complications including antipathies, cardiovascular disorders, blindness, renal failure, neuropathies and cancers (American Diabetes Association,

2006; Mansour *et al.*, 2002; Ashraf and Zare, 2015; Sheweita *et al.*, 2016).

Diabetes mellitus is one of the major global public health problem. The number of people suffering from diabetes is increasing worldwide at an alarming rate. It is a long considered disease of minor significance to world health which is now taking its place as one of the major threats to human health in the 21st century. The past two decades have seen as explosive diabetes worldwide. Pronounced changes in the human environment, in human behavior, lifestyle and accompanied globalization have resulted in escalating rates of both obesity and diabetes. Currently there are over 150 million diabetics worldwide and this number is likely to increase due to increase in sedentary lifestyle, consumption of energy rich diet and obesity (Yajnik, 2001). Recently, a survey estimated that there will be more than 439 million people suffering from diabetes in nearly all countries by the year 2030 (Shaw *et al.*, 2010). The countries with the largest number of diabetic people

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