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Effect of 50% hydroethanolic leaf extracts of *Ruellia tuberosa* L. and *Dipteracanthus patulus* (Jacq.) on AST, ALT, ACP and ALP levels in serum, liver and kidney of alloxan induced diabetic rats

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ABSTRACT

This study was undertaken to evaluate the relationship and effects of diabetes on liver function. The hepatic effects of diabetes were evaluated *in vivo* using alloxan -induced diabetic rats as an experimental model. The degree of hepatic dysfunction was measured by using biochemical parameters like transaminases (ALT and AST), alkaline phosphatase (ALP) and acid phosphatase (ACP) in serum, liver, kidney. The aim of the study was to investigate the enzyme alterations in alloxan -induced diabetic rats. Diabetes was induced by a single dose of alloxan monohydrate given intraperitoneally in sterile normal saline at a dose of 120 mg/kg body weight. Six albino rats were divided into seven groups, normal control (Group I), diabetic control (Group II), drug treated (Group III) and plant extract treated (IV, V, VI, and VII) which were sacrificed 30 days post treatment, respectively. Increased levels of aspartate aminotransaminase (AST), alanine aminotransaminase (ALT), ALP (alkaline phosphatase) and ACP (acid phosphatase) were observed in the liver. Treatments with 50% hydroethanolic leaf extracts of *Ruellia tuberosa* L. and *Dipteracanthus patulus* (Jacq.) significantly reduced the enzyme levels. Our findings suggest that *Ruellia tuberosa* L. and *Dipteracanthus patulus* (Jacq.) have the ability to moderately repair the kidney and liver damage. The effect of the plant extracts was found to be lower than the standard drug (glibenclamide 600 µg/kg body weight) used.

Key words : *Ruellia tuberosa* L. *Dipteracanthus patulus* (Jacq.), Transaminases, Phosphatases

INTRODUCTION

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with the long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart and blood vessels (ADA, 2007). Globally, the estimated incidence of DM and projection for year 2010, as given by International Diabetes Federation (IDF) is 239 million (Karastergiou and Kaski, 2008). A number of medicinal plants, traditionally used for over 1000 years named rasayana are present in herbal preparations of Indian traditional health care systems (Scartezzini and Sproni, 2000), many of these herbal medicines are used as a single agents or in different oral formulations have been recommended for diabetes mellitus due to the fact that they are less toxic than oral hypoglycemic agents such as sulfonylureas, metformin etc. (Ponnachan *et al.*, 1993;

Chattopadhyay, 1993).

It has been documented that several medicinal plants show their hypoglycemic effects associated with a significant alteration in the activity of the liver kinase enzymes (Bopanna *et al.*, 1997; Kumari *et al.*, 1995). In addition, Bopanna *et al.* (1997) and Eskander *et al.* (1995) demonstrated that the administration of several herb extracts could restore the changes in the activities of serum enzymes, like Alkaline Phosphatase (ALP), Acid Phosphatase (ACP) and transaminases: Aspartate Aminotransferase (AST) and Alanine Aminotransferase (ALT).

In folk medicine, *Ruellia tuberosa* L. has been used as anti-diabetic, antipyretic, analgesic, anti hypertensive, thirst- quenching, and antidotal (Chiu and Chang, 1995) and *Dipteracanthus patulus* (Jacq.) leaves are used for treating itches, insect bites, venereal diseases, sores, tumours and rheumatic complaints (Murugesu Mudaliar, 1988). Both the plants belong to *Acanthaceae* family.

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