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Original article

Phytotherapeutic efficacy of the medicinal plant *Terminalia catappa* L.

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ABSTRACT

Diabetes is a chronic, lifelong condition due to inadequate production of insulin or the cells does not properly respond it. Recently, the significance and effectiveness of herbal drugs associated with diabetes has emerged. The aim of the present study was to determine the anti-diabetic effects of *Terminalia catappa* L. leaves on streptozotocin (STZ)-treated rats. Two different concentrations of ethanolic leaf extract (300 and 500 mg/kg) of *T. catappa* were used to treat diabetic rats, and biochemical parameters were analyzed in blood samples. The results of herbal treatments were compared with the standard drug, glibenclamide. The ethanol extract (500 mg/kg) had significant anti-diabetic activity by altering blood glucose, glycosylated hemoglobin, liver glycogen, glucose 6-phosphatase, fructose 1,6-bisphosphatase, glucokinase, aspartate transaminase, alanine transaminase, alkaline phosphatase, urea, uric acid and creatinine levels while increasing insulin levels. Thus, the present study suggests that the supplementation of the diabetic patients with *T. catappa* leaves can lead to recovery from diabetic effects.

1. Introduction

Diabetes mellitus is a metabolic ailment resulting from a failure of insulin production, insulin action, or both. Insulin insufficiency in turn leads to long-lasting hyperglycemia with impairments of carbohydrate, fat and protein metabolism. As the disease progresses, it causes damage to the vascular tissues, leading to severe diabetic complications such as neuropathy, nephropathy, retinopathy, cardiovascular complications and ulceration (Arkkila et al., 2001). Thus, diabetes leads to a wide range of ailments.

In patients suffering from type 2 diabetes mellitus, the management of hyperglycemia starts with modifications to the diet and physical activity (Nathan et al., 2009). Glycemic maintenance in diabetic patients is not possible through diet and physical exercise alone, but requires the intake of oral hypoglycemic agents to prevent diabetic effects. Various blood glucose lowering drugs such as sulfonylureas, biguanides and intestinal α-glucosidase inhibitors are available in the marketplace, but these drugs have some side effects and are also expensive. Glibenclamide is commonly used by diabetic patients and reduces blood glucose levels in animal models of diabetes (Holmes et al., 1984). Drugs from medicinal plants are prescribed universally because of their efficiency, lower side effects and relatively low cost (Venkatesh et al., 2003). *Terminalia catappa* L. is growing in warmer parts of Asia and is called the Indian almond, Malabar almond and tropical almond. It is a medium size tree, and the leaves are clustered towards the ends of the branches. Various extracts of the leaves of this plant have been reported to have anti-cancer, anti-HIV reverse transcriptase, hepatoprotective, anti-inflammatory, anti-hepatitis and aphrodisiac effects (Lin et al., 1997). Although the fruits of *T. catappa* and the

Abbreviations: ALP, Alkaline phosphatase; ALT, Alanine aminotransferase; AST, Aspartate aminotransferase; STZ, Streptozotocin.

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