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Anti-Diabetic and Histopathological Effects of Aqueous Leaf Extract of Sterculia Tragacanth on Pancreas of Alloxan-Induced Diabetic Sprague Dawley Rats

Authors : Anietie M. Archibong, Mfoniso I. Udonkang, Aniekan-Augusta O. Eyo, Dianabasi K. Udo

Abstract : Diabetes mellitus is a chronic disease marked by hyperglycaemia which often leads to several complications despite treatment with orthodox medicines. Medicinal plants have been shown to have anti-diabetic properties. The study aimed to investigate the effect of aqueous crude leaf extract of Sterculia tragacantha on the pancreas of Alloxan-induced diabetic Sprague dawley rats. Sixty-two male rats (150-180g weight) were used. The mean lethal dose (LD50) was determined with 32 rats using Lorke's method. Thirty rats comprising six groups of five animals each: Group I (negative control), Group II (Alloxan-induced-diabetic-non-treated), Group III (diabetic-5mg/kg/day Glabenclamide-treated), Group IV (diabetic low dose 44.72 mg/kg), Group V (diabetic given medium dose 89.44 mg/kg), and Group VI (diabetic given high dose 134.16 mg/kg) of extract were given for 14 days orally. The fasting blood sugar levels were measured at baseline, 24/72 hours, and 7/14 days. Formalin-fixed-paraffin wax-embedded pancreases were stained with haematoxylin and eosin, Masson trichrome, and anti-insulin antibody. The LD50 was 447.21 mg/kg. The body weights (p=0.511) and pancreas weights (p=0.103) were not affected by the extract. The extract decreased the fasting blood glucose levels on day 7 (p=0.015) and day 14 (p=0.001). The pancreas in Group I and IV were normal. Groups II, III, and V had hypertrophied islets, while VI had atrophied islets with fibrosis. Group III had scanty beta cells. Aqueous leaf extract of Sterculia tragacantha had moderate toxicity, anti-diabetic properties, and minimal pathological effect on the pancreas. The low dose of the extract is safer for administration.

Keywords : Alloxan, Diabetes mellitus, pancreatic beta cells, Sterculia tragacantha
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