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Anti-diabetic effect of a novel N-trisaccharide isolated from *Cucumis prophetarum* in streptozotocin-nicotinamide induced type 2 Diabetic rats

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queous crude extract of Cucumis prophetarum (L.) fruits was fractionated into water soluble (F1), chloroform (F2), basic A(F3) and neutral (F4) fractions by acid-base extraction of which F1 was isolated by precipitation in one step. The crude extract (CE) and its fractions were subjected to antidiabetic (a-amylase and a-glucosidase) evaluation. F1 showed potent antidiabetic activity compared to CE, F2, F3 and F4. Structure of the active compound (F1) was elucidated using NMR, 2D NMR, LC-MS/MS & IR data. Further, different doses of active compound, N-Trisaccharide (25 and 50 mg/kg.b.w) were administered once daily for 28 days to STZ-NA induced diabetic rats. Plasma insulin and glycogen levels were measured. The activities of hexokinase, glucose-6-phosphatase, fructose-1, 6-bisphosphatase, glucose-6-phosphate dehydrogenase, glycogen synthase and glycogen phosphorylase were measured. Furthermore, histological studies on pancreas were also carried out. N-Trisaccharide at doses of 25 and 50 mg/kg.b.w on day 14 showed 47.7 and 69.3% antihyperglycemic activity, respectively. Treatment at the same dose for 28 days provided complete protection against STZ-NA challenge (65 & 230 mg/kg b.w., respectively), intraperitoneally. N-Trisaccharide significantly (P≤0.05) increased the plasma insulin and liver glycogen levels in diabetic rats. The altered enzyme activities of carbohydrate metabolism in the liver and kidney of the diabetic rats were significantly (P≤0.05) improved. Additionally, N-trisaccharide increased glycogen synthase and decreased glycogen phosphorylase activity in diabetic rats. Histological studies confirmed an increase in insulin level is due to regeneration of pancreatic β -cells. The results of the study suggested that N-trisaccharide possesses propitious effect in STZ-NA induced type 2 diabetes, indicating its usefulness in diabetes management.

Biography

Kavishankar G. B is currently pursuing doctoral studies at University of Mysore and has successfully completed a course work on protein purification in Umea University, Umea, Sweden.