
Antidiabetic mechanisms of the hexane extract of an Ayurvedic polyherbal mixture in diabetic rats: A reflection on enzyme activities of antioxidant and carbohydrate metabolism pathways

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Antidiabetic mechanisms of an Ayurvedic polyherbal mixture composed of dried fruit rinds of *Garcinia queasita* Pierre, leaves of *Murraya koenigii* L. Spreng., seeds of *Piper nigrum* L. and cloves of *Allium sativum* L. are scientifically untapped. In the present evaluation, the effect of the hexane extract of the mixture on the enzyme activities of the antioxidant and carbohydrate metabolic pathways was evaluated in streptozotocin-induced (65 mg/kg, ip) diabetic Wistar rats. The rats were randomly assigned to four groups (n=6/each group); healthy, untreated diabetic, diabetic rats treated with the hexane extract and glibenclamide. The hexane extract (25 mg (powder)/kg) and glibenclamide (0.5 mg/kg) were given once a day orally for 30 days. On the 30th day, the liver was excised on sacrificed rats to prepare liver homogenate that was used to determine the antioxidant and carbohydrate metabolism enzyme activities. The results showed that total antioxidant status, catalase and glutathione peroxidase activities were increased by 41% (p=0.04), 264% (p=0.01) and 34% (p=0.10), respectively, in the liver of the hexane extract treated rats with respect to the diabetic control rats. The hexane extract treatment improved the activities of the hexokinase ($0.68 \pm 0.01 \text{ nmol min}^{-1}\text{mL}^{-1}$) and 6-phosphofructokinase enzymes ($0.73 \pm 0.04 \text{ nmol min}^{-1}\text{mL}^{-1}$) in diabetic rats compared to diabetic control rats (0.25 ± 0.01 ; $0.06 \pm 0.01 \text{ nmol min}^{-1}\text{mL}^{-1}$), however, a significant improvement was observed only for the hexokinase activity (p<0.05).

Keywords: Diabetes mellitus, Polyherbal mixture, Hexane extract, Antioxidant potential, Glycolysis

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