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# Bioactives of Hypericum Perforatum to Control Diabetes: In Vitro and In Vivo Biological Evaluation in Diabetic Rats †

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**Background:** Improving diabetes mellitus treatment is a significant contemporary medical and societal issue. Plant-based botanicals may lower blood sugar, enhance insulin absorption, and block important enzymes that contribute to the onset and course of diabetes. The preventive role of *Hypericin perforatum* and its constituent hypericin was studied using diabetic rats and in vitro cultures.

**Methods:** The in vitro glucose absorption by yeast cells, alpha-amylase, and glucosidase activity were used to examine the mechanism of action of *Hypericum perforatum* (HP) extract. The extract's safety and in vivo efficacy were studied using a Streptozotocin (STZ)-induced diabetic rat model. Hematology, blood biochemistry, and plasma insulin were also assessed.

**Results:** The extract significantly (p0.03) enhanced the uptake of glucose through the plasma membrane of yeast along with α-amylase (p0.05) and α-glucosidase (o.o4) inhibition activity in vitro. Meanwhile, the extract could significantly reduce renal (uric acid and creatinine), hepatic (SGOT, SGPT, and ALP), and lipid (triglycerides and cholesterol) profiles in the serum of diabetic rats. The extract was safe up to a 1000 mg/kg dosage in preclinical acute dose toxicity studies. In diabetic rats, the extract reduced pancreatic histological alterations. This study found that the extract reduced STZ-induced diabetes and oxidative stress to liver and pancreatic tissue, as well as increasing plasma insulin levels in the treated rats.

**Conclusions:** Our findings indicate that *Hypericum perforatum* extract demonstrated protective activity by effectively halting the sequential progression of oxidative stress, renal and hepatic function test, lipid profile test, and STZ-induced histopathological alterations in the liver and pancreas.

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