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Anti-diabetic & Antioxidant Potential of Momordica Charantia Extract in Streptozotocin-induced Diabetic Rats

L.Sai Bhuvaneswari, M.Pharmacy, Department of Pharmacology, Sri Venkateswara College of Pharmacy

Co-author: N.Rajeswari

Objective & Aim: This study aims to investigate the anti-diabetic and antioxidant potential of Momordica charantia (bitter melon) extract in streptozotocin (STZ)-induced diabetic Wistar rats by evaluating its efficacy in reducing blood glucose levels and enhancing antioxidant defense mechanisms, thereby assessing its therapeutic potential in managing diabetes mellitus and oxidative stress-related complications.

Method: Adult male Wistar rats were randomly divided into four groups: normal control, diabetic control, diabetic + *Momordica charantia* extract, and diabetic + standard drug (metformin). Diabetes was induced using a single intraperitoneal injection of streptozotocin (55 mg/kg). After confirmation of hyperglycemia, the treatment groups received orally administered ethanolic extract of *Momordica charantia* (250 mg/kg body weight) or metformin (100 mg/kg) daily for 28 days.

Fasting blood glucose levels were measured weekly. At the end of the treatment period, animals were sacrificed for biochemical analyses. Antioxidant parameters including malondialdehyde (MDA), superoxide dismutase (SOD), catalase (CAT), and reduced glutathione (GSH) were assessed in pancreatic and liver tissues. Histopathological studies of the pancreas were also performed to observe morphological changes.

Results: *Momordica charantia* extract significantly reduced blood glucose levels and improved antioxidant enzyme activities in diabetic rats compared to the untreated diabetic control. Histopathological analysis revealed partial regeneration of pancreatic β-cells in extract-treated rats.

Conclusion: The findings suggest that *Momordica charantia* possesses significant anti-diabetic and antioxidant activities, supporting its traditional use in diabetes management and its potential role in mitigating oxidative stress-associated complications.

Keywords: *Momordica charantia*, anti-diabetic activity, antioxidant, streptozotocin, diabetes mellitus, Wistar rats, oxidative stress, β-cell regeneration, medicinal plants, herbal therapy

Biography:**Ms. L.Sai Bhuvaneswari** is pursuing her M.Pharmacy in the Department of Pharmacology at *Sri Venkateswara College of Pharmacy*. Her research focuses on pharmacological evaluation of herbal medicines, particularly their role in managing metabolic disorders. Her study on the *Anti-diabetic and Antioxidant Potential of Momordica charantia Extract in Streptozotocin-Induced Diabetic Rats.* reflects her interest in exploring natural therapies for diabetes and oxidative stress-related conditions.

Biography2: Ms. N. Rajeswari, M.Pharm (Pharmacology), is an Assistant Professor at Sri Venkateswara College of Pharmacy with over 6 years of academic and research experience. Her interests include experimental pharmacology, toxicology and herbal drug research, with a focus on integrating traditional medicine with modern therapeutics.

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