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Original paper

Hypoglycemic effects of *Caesalpinia bonduc* (L). Roxb leaf extract in streptozotocin-induced diabetic rats

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Abstract Introduction:

Diabetes mellitus remains a critical global health challenge, necessitating effective therapeutic interventions. Aim: This study evaluated the hypoglycemic and pancreatic protective effects of *Caesalpinia bonduc* leaf extract in streptozotocin-induced diabetic rats. Material and methods: Twenty-five diabetic rats were randomly assigned to treatment groups receiving 150, 200, and 400 mg/kg leaf extract, glibenclamide (positive control), and placebo for two weeks. Blood glucose levels were measured at baseline, after STZ induction, and at 0, 2, 4, 6, and 24 hours after treatment. Histological assessments of pancreatic tissue were performed, and phytochemical screening identified flavonoids, tannins, and saponins. Results: The extract significantly reduced blood glucose levels, with the 150, 200, and 400 mg/kg doses lowering glucose from baseline averages of 237.40 ±7.81 mg/dl, 324.00 ±42.26 mg/dl, and 336.00 ±23.34 mg/dl to 103.00 ±4.60 mg/dl, 199.40 ±67.73 mg/dl, and 116.20 ±8.65 mg/dl, respectively, at 6 hours after treatment. Histopathological improvements included reduced necrosis, inflammation, and improved pancreatic morphology. Conclusions: These findings underscore the extract's dual mechanisms of action – antioxidant protection and insulin secretion enhancement – likely driven by flavonoids. The robust hypoglycemic response and pancreatic tissue protection provided by *C. bonduc* leaf extracts highlight their potential as valuable adjuncts in diabetes therapy. Further clinical evaluations and mechanistic studies are necessary to substantiate their clinical applicability. Key words: *Caesalpinia bonduc*, diabetes mellitus, hypoglycemic activity, pancreatic protection, flavonoids, streptozotocin, herbal antidiabetic.