

Antidiabetic effects of *P. macrocarpa* ethanolic fruit extract in streptozotocin-induced diabetic rats

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Abstract

Background: The fruits of *P. macrocarpa* have long been used as a traditional Malay medicinal herb for hundreds of years. Intraperitoneal (i.p.) injection of streptozotocin (STZ) (65 mg/kg) was used to induce diabetes in rats confirmed by an oral glucose tolerance test (OGTT). The ethanol extract of *P. macrocarpa* (EPPM) fruits at 100 and 200 mg/kg were given orally for 35 days, glibenclamide. In total, 0.5 mg/kg served as a positive control.

Results: The present toxicity study suggests that the EPPM fruits are non-toxic. In an OGTT, the EPPM at 50, 100, and 200 mg/kg and glibenclamide (0.5 mg/kg) reduced the blood glucose level (hyperglycemia due to glucose load 2 g/kg p.o.) significantly after 2 h of oral administration, when compared to the diabetic control. Repeated oral administration of EPPM daily for up to 35 days exhibited significant antidiabetic activity in STZ-induced diabetic rats compared to the diabetic control. At the end of 35 days of treatment, the 200 mg/kg (EPPM) dose was found to be more effective than the 100 and 50 mg/kg (EPPM) doses and blood glucose levels decreased from 392.66 +/- 3.20 to 174.33 +/- 4.32 mg/dl (p< 0.01). In contrast, on day 35, the blood glucose levels of the normal control, drug control, and diabetic control were 132.16 +/- 5.79, 134.33 +/- 7.18 (p< 0.01), and 514.83 +/- 7.96 respectively. From histology analysis, the pancreases of the diabetic control were granulated and dilated islet cells, whereas in the drug control they appeared granulated, without dilation and important hyper plasticity of islets. The treatment groups (EPPM 100 and 200 mg/kg) also showed granulated pancreatic islets and prominent hyper plasticity islets. Light micrographs in various regions of rat kidney tissue from the treatment groups showed absence of matrix expansion and glomerular basement membrane thickening, suggesting it became normal histoarchitecture of the renal. Biochemical aspects in treating animals' all serum analytic parameters were almost similar to the drug control group with the exception of the 50 mg/kg treatment group.

Conclusion: In this way, it may also serve as a good alternative in the present armamentarium of antidiabetic drugs.

Keywords

Author Keywords: *P. macrocarpa*; Toxicity; Histology; Kidney; Pancreas
KeyWords Plus: SCHEFF. BOERL.; PHALERIA; CYTOTOXICITY; MANGIFERIN; SAFETY; BARK

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