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***In vitro* anti-diabetic activity of aqueous and methanol extracts of *Plumbago indica* L. root bark**

D.M.I.H. Dissanayake, L.D.C. Peiris*

Department of Zoology, University of Sri Jayewardenepura, Gangodawila, Nugegoda

Plant products rich in polyphenols have been reported to mimic insulin during the utilization of glucose and act as good inhibitors of key enzymes like alpha amylase associated with diabetes (type 2) and lipid peroxidation in tissues. Various pharmacological studies have indicated the potential use of genus *Plumbago* that contain polyphenols (e.g., Kaempferol) in treating diabetes. Therefore, this study evaluated the *in vitro* anti-diabetic activity of *Plumbago indica* root bark extract (Family: Plumbaginaceae; Common name: Rath nithul/nitol). Root bark (RB) was dried under a shady area and the powder obtained was extracted with distilled water and 90% methanol (100 mL each). The obtained freeze dried and evaporated products [yield; aqueous: 15.50 % (w/w), methanol: 28.80 % (w/w)] were subjected to phytochemical screening according to standard methods. Total phenol and tannin contents were determined in both RB extracts at 2 mg/ml concentration. To determine *in vitro* anti-diabetic activity, wheat alpha amylase inhibition and glucose uptake by yeast cells were performed at varying concentrations of the extracts (31.25, 62.5, 125, 250, 500 µg/ml) and acarbose (positive control) respectively. Methanolic RB extract was rich with numerous phytochemicals including tannins, phenols, anthraquinones, unsaturated sterols and triterpenes followed by aqueous RB extract with saponins, tannins, phenols and anthraquinones. Of the two extracts, the methanol extract contained the highest phenol (0.78 mg GAE/g of dry mass) and tannin (0.80 mg CE/g of dry mass) content. Moreover, methanol extract has given a significant ($p < 0.05$) alpha amylase inhibitory percentage and glucose uptake percentage with IC_{50} values of 85.01 ± 0.12 µg/ml and 271.70 ± 0.06 µg/ml respectively. Respective IC_{50} values for aqueous RB extract were 206.30 ± 0.12 µg/ml and 299.70 ± 0.04 µg/ml. Further, acarbose showed an IC_{50} value of 47.2 ± 2.3 µg/ml. The present study provides some evidence to suggest that the methanol RB extract possesses higher anti-diabetic properties than aqueous RB extract. Hence, it emphasizes the importance of isolating and examining individual bioactive compounds present in *P. indica* root bark for future research in treating diabetes.

Keywords: Total tannin and phenol content, alpha amylase, glucose uptake by yeast cells.

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Email: indeewarie92@gmail.com