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Hypoglycemic and hypolipidemic activities of aqueous extract of flowers from *Nyctanthus arbor-tristis* L. in male mice

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Abstract

Background: Boiled aqueous extract of flowers (AEF) from *Nyctanthes arbor-tristis* L. are used in Sri Lankan traditional Ayurvedic Medicine to manage diabetes mellitus. AEF has widely been used as a folk medicine for the treatment of various ailments due to its therapeutic activity. However, little is known concerning therapeutic activity of the extract as well as its underline mechanisms and safety. Diabetes is known to increase low-density cholesterol and decrease high-density cholesterol thus triggering coronary diseases. Hence, the primary objective of the present study is to investigate the hypoglycemic and hypolipidemic activities of the AEF.

Methods: AEF was prepared and male mice ($n = 9$ group) were gavaged either with 250, 500 and 750 mg/kg of AEF or distilled water (DW). Subsequently, fasting and random blood glucose concentrations were determined. To investigate mechanisms of actions of AEF, animals were orally administered with 500 mg/kg or the vehicle (DW) and glucose tolerance was performed before and after glucose challenge. For further studies, *in vitro* alpha-amylase assay and glucose absorption from the gastrointestinal tract were performed using 500 mg/kg of the extract. Additionally, glycogen content in the liver and skeletal muscles, a complete lipid profile assay, and toxicological and biochemical parameters were conducted after a chronic study.

Results: Five hundred mg/kg and 750 mg/kg of AEF significantly ($p < 0.01$) reduced fasting blood glucose levels respectively by 49 and 39 % at 4 h post-treatment, while 500 mg/kg of AEF also decreased the random blood glucose level significantly ($p < 0.01$) by 32 % at 4 h post-treatment. AEF significantly inhibited glucose absorption by 85 % from the intestine and increased diaphragm uptake of glucose by 64 %. The extract also exhibited inhibition (16.66 %) of alpha-amylase enzyme activity. It also decreased the level of total cholesterol (by 44.8 %), triglyceride (by 53 %) and increased (by 57 %) the high-density lipoprotein cholesterol. Treatment with AEF did not induce any overt signs of toxicity or hepatotoxicity.

Conclusion: Results the present study indicated that AEF possess hypoglycemic and hypolipidemic properties. Therefore, AEF could be used as an alternative medicine in management of diabetes mellitus.

Keywords: Hypoglycemic, Hypolipidemic, Diabetes mellitus, *Nyctanthes arbor-tristis*, Aqueous extract of flower

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