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Hypoglycemic Effects of *Nyctanthes arbor-tristis* L Flower Extract *in vitro*

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Abstract

Boiled flowers of *Nyctanthes arbor-tristis* L (Family: Oleaceae; Sepalika in Sinhala; Night Jasmin in English) has traditionally been used in Sri Lankan Ayurvedic system to manage diabetes. Previously it has been shown that the aqueous flower extract (AFE) could produce hypoglycemic effects in mice. However, the exact mechanisms are not known. Hence the present study aimed to investigate the mechanisms involved using *in vitro* assays. Fresh flowers were shade dried, extracted with distilled water and freeze dried. Preliminary phytochemical screening was conducted using standard methods and confirmed using thin layer chromatography. The total phenolic and flavonoid content was determined at 1.5 mg/ml dose using Gallic acid and Quercetin as respective standards. Hypoglycemic activity was studied *in vitro* α -amylase assay (n=6) with Acarbose as the standard using mice equivalent doses (1.5, 3, 5 mg/ml) and glucose transport across the yeast cells was conducted at 5, 10, 25 and 50 mM glucose concentrations. Phytochemical screening revealed the presence of flavonoids, saponins, unsaturated sterols and triterpenes and cardiac glycosides. AFE resulted in 600 Quercetin equivalents for total flavonoids and 1.6 Gallic acid equivalents for phenols, both of which increased in a linear mode with increasing concentrations. A significant ($p<0.05$) inhibition of α -amylase enzyme was revealed with increasing doses (1.5 mg/ml-60%, 3 mg/ml-52%, 5 mg/ml) giving IC₅₀ value of 3 mg/ml compared to the standard. Both 1.5 mg/ml and 3 mg/ml promoted glucose uptake by yeast cells with increasing glucose concentrations. However, 5 mg/ml exhibited the maximum absorption only at 5 mM of glucose indicating dose independent trend. The present findings confirm that *N. arbor-tristis* exerts its antidiabetic activity via inhibition of α -amylase enzyme and increasing glucose transportation across the cell membranes. Fractionation and isolation of compounds are required for effective utilization as therapeutic agent.

Keywords: *Nyctanthes arbor-tristis*, Aqueous extract, Hypoglycemia, Alpha amylase, Yeast cell uptake