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Alpha-amylase inhibitory activity of partially purified glycoproteins from *Gymnema sylvestre*

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Introduction: Diabetes mellitus is a leading non-communicable disease worldwide, and its management remains a major healthcare challenge. *Gymnema sylvestre* (Sirukurinjan) is a well-known antidiabetic plant in traditional medicine. In recent years, glycoproteins have attained considerable attention as potent antidiabetic agents, but no studies have been reported on the antidiabetic activity of glycoproteins from *G. sylvestre*.

Objective: To evaluate the α -amylase inhibitory activity of partially purified glycoproteins extracted from *G. sylvestre*.

Methodology: Partially purified glycoproteins were extracted from *G. sylvestre* leaves using ammonium sulfate precipitation followed by dialysis. Total sugar content was measured, and structural characterisation was performed using FT-IR analysis. The α -amylase inhibitory activity of glycoprotein was evaluated using the DNSA assay with acarbose as a standard. Statistically, IC₅₀ of standard and glycoproteins were analysed using one-way ANOVA followed by Tukey's test, with significance set at $p < 0.05$.

Results: The *G. sylvestre* extraction yielded 0.97% partially purified glycoproteins with a sugar content of 158.67 $\mu\text{g/mL}$. FTIR analysis confirmed the presence of characteristic O–H stretching and prominent amide bands. In α -amylase inhibition assays, acarbose exhibited the strongest effect (IC₅₀: $42.10 \pm 2.97 \mu\text{g/mL}$), while *G. sylvestre* partially purified glycoproteins demonstrated moderate activity (IC₅₀: $388.45 \pm 0.81 \mu\text{g/mL}$), with a significant difference between them. ($p < 0.05$).

Conclusion: This study highlights that partially purified glycoproteins from *G. sylvestre* possess measurable α -amylase inhibitory activity, supporting their potential role in diabetes management. Further structural characterisation, following the completion of purification of glycoproteins and in vivo validation, is needed.

Keywords: α -Amylase inhibition, Diabetes mellitus, Glycoprotein, *Gymnema sylvestre*