

In-vitro anti-diabetic activity of polyphenole-rich extract from marine brown algae *Choonospora minima* (Hering 1841)

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Marine brown algae are known for their health benefits, especially against diabetes due to its biologically active compounds. However, marine algae in Sri Lanka are underutilized. The present study investigated in-vitro anti-diabetic activity of polyphenolic-extract of Sri Lankan marine brown algae *Choonospora minima* (Family, Scytosiphonaceae). In-vitro anti-diabetic activity was evaluated in de-polysaccharide polyphenolicextract of *C. minima* using inhibitory activity on α -amylase, α -glucosidase, glucose induced protein glycation and glucose diffusion through dialysis membrane. The IC₅₀ values of α -amylase inhibitory activity of polyphenolic-extract was found to be 18.25 ± 0.13 $\mu\text{g/ml}$ compared to the standard acarbose (87.43 ± 0.59 $\mu\text{g/ml}$), while the percentage inhibition varied from 88.73% (133.33 $\mu\text{g/ml}$) to 17.74% (6.66 $\mu\text{g/ml}$). Similarly, the extract was effective against the activity of α -glucosidase with IC₅₀ value of 3.83 ± 0.05 $\mu\text{g/ml}$ compared to the standard acarbose (0.38 ± 0.06 $\mu\text{g/ml}$) and anti-glucosidaseactivity of methanol extract was found to be 100.05 ± 1.38 mg acarbose equivalent/ g of extract. The anti-glycation activity of methanol extract was reported as 43.11 ± 0.76 mg Rutin equivalent/g of extract with IC₅₀ value of 267.92 ± 4.74 $\mu\text{g/ml}$ compared to the standard Rutin (11.55 ± 0.82 $\mu\text{g/ml}$). The polyphenolic-extract of *C. minima* (25.96 ± 0.62 $\mu\text{g/ml}$) showed a significant inhibition of glucose diffusion across a dialysis membrane at 180 min compared to standard acarbose (22.79 ± 0.47 $\mu\text{g/ml}$) and control (57.65 ± 1.67 $\mu\text{g/ml}$). The results suggest that *C. minima* has potential to combat hyperglycemic condition through multiple mechanisms and can be utilized to develop drug leads against diabetes. The research grant (ASP/01/RE/SCI/2017/50) by University of Sri Jayewardenepura is acknowledged.

Keywords: *Choonospora minima*, α -amylase, α -glucosidase, anti-glycation, glucose diffusion