

(69)

***In-vitro* Antidiabetic Properties of Methanol Extract and Its Fractions of Sri Lankan Marine Red algae *Gracillaria edulis* (Gmelin) Silva**

Gunathilaka M.D.T.L.¹, Samarakoon K.W.², Ranasinghe P.³, Peiris L.D.C.^{1*}

¹*Department of Zoology, University of Sri Jayewardenepura, Nugegoda, Sri Lanka*

²*National Science and Technology Commission, Dudley Senanayake Mawatha, Colombo, Sri Lanka*

³*Industrial Technology Institute, Halbarawa Gardens, Malabe, Sri Lanka*

**dinithi@sci.sjp.ac.lk*

Abstract

Seaweeds are an important source of bioactive metabolites in drug development and nutraceuticals. Therefore, present study aimed to investigate in-vitro antidiabetic activities of methanol extract and its solvent fractions of Sri Lankan marine red algae, *Gracillaria edulis* (Gmelin) Silva (Family: Gracilariaceae). De-polysaccharide methanolic extract of *G. edulis* was partitioned with hexane, chloroform and ethyl acetate respectively. In-vitro antidiabetic activity was evaluated in crude methanol extract, hexane, chloroform (CH), ethyl acetate (EA) and aqueous (AQ) fractions of *G. edulis*. The α -amylase inhibitory activity was determined using the 3, 5 dinitrosalicylic acid method and anti-glycation activity was performed using glucose-induced protein glycation and formation of protein-bound fluorescent advanced glycation end products (AGEs). The highest alpha amylase inhibitory activity was reported in methanol extract with IC₅₀ value of 170.45±1.17 µg/ml and the % inhibition varied from 54.13% (200 µg/ml) to 16.26% (6.25 µg/ml). The IC₅₀ values of amylase inhibitory activities of hexane, CH, EA and AQ fractions of *G. edulis* were 393.04±4.73 µg/ml, 322.71±4.80 µg/ml, 279.48±5.62 µg/ml and 376.49±12.14 µg/ml respectively. Results showed a significant (p<0.05) difference of IC₅₀ values between methanol extraction, chloroform and ethyl acetate fractions. The highest anti-glycation activity was reported in CH fraction of *G. edulis* with IC₅₀ value of 258.23±3.24 µg/ml compared to methanol extract (IC₅₀:702.33±12.72 µg/ml). The % inhibition of CH fraction varied from 83.88% (800 µg/ml) to 13.84% (25 µg/ml). The IC₅₀ values of anti-glycation activity of hexane, EA and AQ fractions were 637.53±6.21 µg/ml, 586.54±4.37 µg/ml and 723.78±12.81 µg/ml respectively. Results showed a significant difference of IC₅₀ values of hexane, chloroform and ethyl acetate fractions (p<0.05). In conclusion, methanol extraction of *G. edulis* and its fractions showed alpha amylase and anti glycation activity with varying degrees of potentials. Among them methanol extract showed comparatively high alpha amylase inhibition while chloroform fraction showed high capability of preventing the formation of AGE products. Hence, isolation of active compounds from methanol extract and chloroform fraction is warranted.

Keywords: *Gracillaria edulis*, Alpha amylase, Anti-glycation

Acknowledgement: Financial assistances under the research grant ASP/01/RE/SCI/2017/50.