



## Pomegranate *Punica granatum* L. Stem Bark Extract Inhibits Protein Modification by Methylglyoxal in Hyperglycemia Condition

**Shahpour Khangholi<sup>1,\*</sup>, Fadzilah Adibah Abdulmajid<sup>2</sup>**

<sup>1</sup>Department of Horticulture, Shahed University, Tehran, Iran.

<sup>2</sup>Institute of Marine Biotechnology, University Malaysia Terengganu, Malaysia.

E-mail: [khangholi@shahed.ac.ir](mailto:khangholi@shahed.ac.ir)

Methylglyoxal is a precursor of advanced glycation end products (AGEs). Interaction of methylglyoxal with L-alanine produces carbon-centered radicals that in reaction with oxygen produce superoxide radicals. It can be harmful in some other mechanisms especially in diabetic patients. It has been shown that some phytochemicals reduce methylglyoxal-mediated glycation content and subsequently, prevent significantly AGEs level. The assay was conducted to evaluate inhibitory effects of pomegranate stem bark methanolic extract on protein glycation stimulated by methylglyoxal (1). BSA (20 mg/ml) was glycated in presence of methylglyoxal (100 or 150 mM) with/without the different concentrations of extract (85, 170 and 250 µg/ml) or aminoguanidine (1 or 10 mM) as positive control. Sodium azide (NaN<sub>3</sub>) in concentration of 0.2 g/L was added to mixture to assure an aseptic condition. The reaction mixtures were prepared using 0.1 M sodium phosphate buffer, pH 7.0 and then kept at 37 °C in incubator for three weeks. The Effect of extract and controls on formation of intermediate compound (the methylglyoxal-hydro-imidazolone protein adducts) was assessed by competitive ELISA Kit (Catalog number STA-811). The results showed that extract significantly decreased protein carbonyl content from 6.25 nM/mg protein in control to 4.8 nM/mg protein in extract at concentration of 250 µg /ml. In BSA+MGO system increasing of MGO concentration from 100 to 150 mM raised the protein carbonyl content from 4.56 to 6.25 nM/mg protein respectively. However, sample or positive control reduced it. Extract in 250 µg/ml showed significantly similar inhibitory effects compared to AG 1mM. Similarly, it lowered oxidation of thiol group, In BSA-MGO<sub>100Mm</sub>, system aminoguanidine 10 mM with 24.55% thiol loss showed the most inhibition activity against thiol oxidation followed by aminoguanidine 1mM 36.53 and pomegranate stem bark 36.78%. In conclusion the methanolic extract of pomegranate stem bark possesses antiglycation potential comparing to positive control.

**Keywords:** glycation, Maillard's, Reaction, Diabetes, Extract, Pomegranate

### References

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