

18<sup>th</sup> National and 3<sup>rd</sup> International Conference of  
Iranian Biophysical chemistry

هجدهمین همایش ملی و سومین همایش  
بین المللی بیوشیمی فیزیک ایران

25-26 Des, 2024, University of Hormozgan

۵-۶ دی ماه ۱۴۰۳، دانشگاه هرمزگان

Antiglycation Potential of Oregano (*Origanum vulgare*) Leaf Extract: A Natural  
Approach to Combat Diabetes-Related Complications

Avin Asiyabani<sup>1</sup>, Ali Khatibi<sup>1\*</sup>

<sup>1</sup> Department of Biotechnology, Faculty of Biological Sciences, Alzahra University, Tehran, Iran.

\*Correspondence: Ali Khatibi ([Khatibi@alzahra.ac.ir](mailto:Khatibi@alzahra.ac.ir))

**Abstract**

Diabetes mellitus is a chronic disorder of glucose metabolism with serious clinical consequences. The multi-system complications of diabetes include microvascular and macrovascular endpoints. Persistent hyperglycemic state in type 2 diabetes mellitus leads to the initiation and progression of non-enzymatic glycation reaction with proteins, lipids, and nucleic acids, leading to the formation of advanced glycation end-products (AGEs). These compounds are associated with various chronic conditions, including cardiovascular and neurological diseases, as well as aging. The inhibition of glycation has become a significant focus in biomedical research, with natural compounds from medicinal plants showing great potential as therapeutic agents. Oregano (*Origanum vulgare*), a well-known medicinal plant with anti-inflammatory, antimicrobial, and antioxidant properties. This study aimed to evaluate the inhibitory effects of oregano leaf extract on the production of fluorescent end-products in glycated human serum albumin (HSA). HSA was incubated with a high glucose concentration in the presence or absence of oregano leaf extract for 35 days. The obtained results from spectroscopic techniques indicated that oregano extract significantly reduced the formation of AGEs. Furthermore, circular dichroism (CD) analysis demonstrated that the extract modulates the structural alterations of glycated HSA. These findings highlight the critical role of plant-based interventions in mitigating complications associated with diabetes and glycation.

**Keywords:** Advanced glycation end-products (AGEs), Diabetes, Glycation, Herbal plants, Human serum albumin (HSA), Oregano.