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Abstract

Isolation and purification of sesquiterpene coumarins from *Ferula assa-foetida* and their *in vitro* interaction study with DNA

S. Javaheri[1], A. Hosseini[1*], N. Ghiasvand[2], F. Jafari[2], F. Ahmadi[2], Y. Shokoohinia[2]

[1]*Student Research Committee, School of Pharmacy, Kermanshah University of Medical Sciences, Kermanshah, Iran.*

[2] *Pharmaceutical Sciences Research Center, School of Pharmacy, Kermanshah University of Medical Sciences, Kermanshah, Iran.*

Background and objectives: Interaction of compounds with ct-DNA can affect the replication, protein synthesis and cell division. Different species of the genus *Ferula* (Apiaceae) have shown various biomedical applications for many centuries. Biological features of this genus such as cytotoxicity, antibacterial, antiviral, P-glycoprotein (P-gp) inhibitory and antiinflammatory activity have been attributed to sesquiterpene coumarins. Consequently, binding studies of sesquiterpen coumarin with ct-DNA are useful for the understanding of the reaction mechanism and providing guidance for the application and design of new and more efficient drugs targeted to DNA. Interaction of galbanic acid (GA) with ct-DNA, was evaluated by cyclic voltammetry (CV), diggerential pulse voltammetry (DPV), enhancement fluorescence, UV-VIS and FT-IR spectroscopy. **Methods:** The oleo gum-resin of *Ferula assa-foetida* was collected and dried in spring. Hexane extract of gum was prepared and defatted. Several coumarins were purified using normal open and preparative column and high performance liquid chromatographic methods and the structures were elucidated. GA is one of constituents isolated and binding interaction with ct-DNA was studied by CV, DPV, fluorescence, UV-Vis, FT-IR and spectroscopy. **Results:** GA bears two cathodic peaks. The cathodic peaks I and II may correspond to the reduction of the alkene groups (-C_3=C_4- and –C_6=C_{11}-) at the electrode surface, respectively with average binding site size of 1.7. **Conclusion:** Binding of GA with ct-DNA caused significance chances in electrochemical and spectral characteristics of GA confirming the interaction mode of GA with ct-DNA in partial intercalation via DNA groove mode.

Keywords: DNA binding, galbanic acid, sesquiterpene coumarin

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[*]*Corresponding author: amin.hosseini@kums.ac.ir,* Tel: +98833-4266780, Ext .315