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Antibacterial activity of methanol extract of Mazouj and Ghalghaf galls extracts of Oak against *Pseudomonas aeruginosa*

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Background & Aim: Most of the infections caused by *Pseudomonas aeruginosa* resistant strains are originated from hospitals and its prevalence is increasing worldwide. Therefore, many efforts have been made to find new effective plant compounds as a substitute for antibiotics. The aim of this study is to evaluate the active constituents, antibacterial and anti-biofilm activity of aqueous and methanol extracts of Mazuj and Ghalghaf galls against *Pseudomonas aeruginosa*.

Method: This study was performed by standard strains of bacteria. The methanol extract of Mazuj and Ghalghaf galls were prepared by Soxhlet apparatus. Antibacterial activity of extracts was evaluated by the diffusion method. Moreover, Minimum Inhibitory Concentration (MIC) was assessed by micro dilution method. In order to evaluate anti-quorum sensing activity of methanol and aqueous extracts of Mazuj and Ghalghaf galls, effects of the extract on anti-biofilm activity, production of elastase, proteases and pyocyanin were examined. Active compounds Mazuj and Ghalghaf galls were identified by gas chromatography-mass.

Results: The methanol and aqueous extracts of Mazuj and Ghalghaf galls exhibited strong inhibitory effects against *Pseudomonas aeruginosa*. The MIC values of extracts were similar and ranged from 6.25 mg/ml to 25 mg/ml. The extracts of Mazuj and Ghalghaf galls strongly inhibited the formation of *Pseudomonas aeruginosa* biofilms, production of elastase, proteases and pyocyanin at concentrations higher than 6.25 mg/ml. The highest compound isolated from the extract of Mazuj galls 9-Octadecenoic acid and the extract of Ghalghaf galls 9-12 octadecenoic acid and oleic acid.

Conclusion: According to the results of this study, these extracts demonstrate favorable antibacterial activity against tested bacteria. The methanol extract proved to have more antibacterial activity than the aqueous extract. However, a profound understanding of the field identification of antimicrobial agents in diseases treatment as the alternative to antibiotics requires more experimental research.

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