

The Antibacterial Effects of the Volatile Oil of *Heracleum persicum* on Some Gram-Positive and Gram-Negative Bacteria

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Background & Objectives: Due to increased bacterial resistance to common antibiotics, tendency towards using herbal essential oils like *Heracleum persicum* is increasing. In this study, antibacterial effects of hydrodistilled volatile oil from aerial parts of *Heracleum persicum* were evaluated on several strains of Gram-positive and Gram-negative bacteria.

Methods: This descriptive study was performed in department of microbiology. The hydrodistilled volatile oil from aerial parts of *Heracleum persicum* was analyzed by gas chromatography and mass spectrometry (GC-MS) technique. The antimicrobial activity of the aerial parts essential oil of *Heracleum persicum* was screened by disc diffusion and microdilution Methods was used for determination of MIC. The bacterial strains were *Staphylococcus aureus* ATCC25923, *Escherichia coli* ATCC25922, *P. aeruginosa* ATCC27853 and clinical isolates of *S. typhimurium*, *E. aerogenes*, *S. epidermidis*, *Acinetobacter baumannii*. Filter paper discs were impregnated with 100 μ l of volatile oil of *Heracleum persicum* to give a final concentration of 1mg/disc for disc diffusion. The inoculum size of strains was 1.5 \times 10⁸ cfu/ml. Inhibition zones were measured after 24hr incubation at 37 $^{\circ}$ C. The serial dilutions of the oil from 2 to 512 μ g/ml were prepared in 96 wells microtitre plates using Muller Hinton broth for microdilution. 100 μ l of bacterial suspension in 1.5 \times 10⁵ cfu/ml concentration was added to each well. Incubation period was 18hr at 35 $^{\circ}$ C.

Results: Twenty compounds of the hydrodistilled volatile oil from aerial parts of *Heracleum persicum* were identified, representing 92.15 % of the total oil. (E)-anethole(23.0%), hexyl butanoate (19.7%) were the main components. the MIC varied from 26.67 to 512 μ g/ml for all Gram-positive and Gram-negative bacteria. The highest MIC was observed against *S. aureus* (26.67 μ g/ml). The lowest MIC value 512 μ g/ml was recorded against *E. aerogenes*.

Conclusion: Result shows that the hydrodistilled volatile oil of *Heracleum persicum* could inhibit the growth of Gram-positive and Gram-negative bacteria. However, the inhibitory effect of *Heracleum persicum* on Gram-positive cocci is more than Gram-negative rods.

Keywords: *Heracleum persicum*; Antibacterial Effect; Volatile Oil