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# Evaluation of the chemical composition and antimicrobial activity of different fennel (*Foeniculum vulgare* Mill.) ecotypes essential oils from Iran

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**Background and Aims:** The present study has evaluated the chemical composition and antimicrobial activity of the essential oils of five Iranian ecotypes of fennel.
**Methods:** The Essential oils of five Iranian ecotypes of fennel have obtained from dried seeds using hydro distillation method.Variations in the essential oil compositions were determined using Gas chromatography coupled to mass spectrometry (GC-MS). Antimicrobial activities were tested against the strains Staphylococcus aureus, Bacillus cereus, Pseudomonas aeruginosa, Escherichia coli, Candida albicans using disc paper and broth microdilution methods.
**Results:** Our results show that all essential oils have a broad spectrum of antimicrobial activity against all the tested bacterial strains. The essential oils have more sensitivity to gram-positive than gram-negative bacteria, however, some difference in antimicrobial activities of essential oils was observed for several microorganisms, which was attributed to the variation in percentage of the components. The most important identified compounds in all samples of fennel volatile oils were trans-anethole, estragole, fenchone, limonene, alpha-pinene and gamma-terpinene.
**Conclusions:** This plant showed desire antibacterial effects and therefore is a good candidate for future investigation of development of new bactericidal and bacteriostatic agent investigation was developed to purify the essential component and estimate their effects.

**Keywords:** MIC; *Foeniculum vulgare*; MBC; Chemical composition