



## Phytochemicals and antimicrobial activities of aerial parts and roots of *Trigonella tehranica* L. essential oils

F. Kiashi<sup>1</sup>, F. Momeni-nasab<sup>1</sup>, M. Akhbari<sup>2</sup>, A. Hadjiakhoondi<sup>1</sup>, M. Aghaahmadi<sup>3</sup>, S. Tavakoli<sup>1</sup>, Z. Tofighi<sup>1\*</sup>

<sup>1</sup>Department of Pharmacognosy, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran.

<sup>2</sup>Essential Oils Research Institute, University of Kashan, Kashan, Iran.

<sup>3</sup>Department of Biology, Faculty of Science, University of Isfahan, Isfahan, Iran.

**Background and objectives:** *Trigonella tehranica* (Leguminosae) is an indigenous plant in northern regions of Iran. There were many reports about antimicrobial activity of other species of this genus; therefore, the aim of present study was investigation of chemical compounds and antimicrobial activities of *T. tehranica* essential oils for the first time. **Methods:** The essential oils of aerial parts and roots of *T. tehranica* from Taleqan, Alborz Province, Iran were obtained by hydro-distillation and analyzed by GC-MS. Antimicrobial activities of essential oils were tested against some Gram-positive bacteria (*Bacillus subtilis*, *Staphylococcus epidermidis* and *Staphylococcus aureus*), Gram-negative bacteria (*Salmonella paratyphi-A*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella pneumonia*, *Shigella dysenteriae* and *Proteus vulgaris*) and fungi (*Aspergillus brasiliensis*, *Aspergillus niger* and *Candida albicans*) via disc diffusion method and minimal inhibitory concentrations (MICs) were reported. **Results:** The abundant compounds of aerial parts essential oil were *n*-hexadecanoic acid (20.84%), camphane (11.45%) and neo-menthol (5.05%). The major volatiles of roots essential oil were hexanal (14.83%), butane, 2-methyl (13.39%) and 1-pentene (12.80%). The roots essential oil showed the most antimicrobial activity on *Bacillus subtilis* (inhibition zone (IZ) equal to 21 mm) and the aerial parts essential oil demonstrated the most effects on *Bacillus subtilis* (IZ as 16 mm) and *Candida albicans* (IZ as 20 mm). **Conclusion:** Although essential oils of *T. tehranica* were effective on many examined microorganisms, their antifungal activity was higher significantly.

**Keywords:** antibacterial, antifungal, fruits, roots, *Trigonella tehranica*, volatile oil