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Chemical composition of the essential oil of *Salvia mirzayanii* isolated by conventional and microwave-assisted hydrodistillation

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Salvia, the largest genus of the family Lamiaceae, includes about 900 species widespread all over the world. Fifty-eight species are found in Iran, 17 of which are endemic. *Salvia mirzayanii* Rech. f. & Esfand., endemic to Iran, grows in the southern parts of the country [1, 2]. Many Salvia species are used as herbal tea and for food flavoring, as well as in cosmetics, perfumery, and the pharmaceutical industries throughout the world [3, 4]. In folk medicine, *S. mirzayanii* is used for the treatment of diarrhea, stomach ache, headache, hyper cholesterolemia, and diabetes. Several studies have also shown the various biological activities of this plant including its antibacterial properties [5].

Microwave-assisted hydrodistillation (MAHD) is an advanced hydrodistillation (HD) technique utilizing a microwave oven in the extraction process [6]. In this study, HD and MAHD methods have been compared for their effectiveness in the isolation of essential oils from the aerial parts of *S. mirzayanii*. The composition of the essential oils was analyzed by GC and GC/MS. The MAHD method was superior in terms of saving energy and extraction time (40 min, compared to 3 h in HD). The constituents of the essential oils were similar and the two oils contained the same dominant components: 1,8-cineole (15.2% HD and 14.2% MAHD), α-muurolol (11.6% and 16 . 4%), β-pinene (13.6% and 7.6%), α-pinene (9.8% and 4.8%), borneol (8.2% and 8.3%), δ-cadinene (8.1% and 10.8%), and γ-cadinene (3.7% and 5.6%). Consequently, as an excellent alternative to HD, MAHD may have no adverse effects on the composition of extracted essential oils. MAHD can be suggested as a modern, fast and green extraction method [7].

References

[1] K.H. Rechinger, *Flora Iranica*. No. 150, Akademische Druck and Verlagsantalt, Graz, Austria, **1982**.
[2] V. Mozaffarian, *A Dictionary of Iranian Plant Names.* Farhang Moaser, Tehran, **1996**.
[3] A. Alizadeh, M. Shaabani, *Adv. Environ. Biol.* **2012**, 6, 221.
[4] G.P.P. Kamatou, W.P.N. Ramogola, A.M. Viljoen, *J. Ethnopharm*. **2008**, 119, 664.
[5] A. Ziaei, Z. Amirghofran, J. Zapp, M. Ramezani, *Iran. J. Immunol.* **2011**, 8, 226.
[6] H.W. Wang, Y.Q. Liu, S.L. Wei, Z.J. Yan, K. Lu, *Molecules* **2010**, 15, 7715.
[7] M.T. Golmakani, K. Rezaei, *Food Chem.* **2008**, 109, 925.