

Abstract

The objective of this study was to examine the effects of morphological changes and comparison of yield and essential oil components *Ziziphora tenuior* at some habitats in Khorasan Razavi and Khorasan Shomali provinces. Plant sampled from four distinct region in Bajgiran, Shirvanm Quchan and Farooj in randomized complete block design. Evaluated morphological traits included plant height, stem diameter, distance between nodes, leaf length and width, wet and dry performance, density, ash and essential oil content. Flowering stems at reproductive stages were collected, dried and extracted. Collected essential oils were analyzed using GC/MS. All habitats according de Martonne was arid and semi-arid. Plants were contributed in 1204 to 2118 m in longitude. Suitable EC was ranged between 0.565 to 1.02 dS m⁻¹ and pH ranged between 7.98 to 8.4. The greatest distribution of this plant was observed in non-saline soils. Results indicated that habitats conditions had significant impact on morphological traits and essential oil percentage. In addition to, essential oil analysis revealed that the most important components of essential oil in Abjahan was: Pulegone (25.5), Iso- Menthone (15.2), Todeh: Pulegone (34.2), Ali abad: Pulegone (20.2), Iso- Menthone (18.3) and Bashmahale: Pulegone (30.4), Iso- Menthone (10.8). Ecological conditions and habitats condition were affected morphological traits, essential oil yield and essential oil components. It seems that rainfall, altitude and geological direction was among the most important factors which influenced morphological traits and phytochemical properties. The greatest morphological traits and essential oil yield was observed at Abjahan. With regard to polgon antimicrobial activity the best habitates for *Ziziphora tenuior* collecting was Toodeh. For better usage of *Ziziphora tenuior* essential oil it could be advised the identification of population which have greater conditions.

Keywords: Medicinal plants, *Ziziphora tenuior*, Essential oils, Geographical distribution



University of Zabol
Graduata School
Faculty of Agriculture
Department of Horticulture

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**Phytochemical and morphological diversity inter-and
intera-habitates of *Ziziphora clinopodioides* Lam in
Razavi Khorasan and Shomali Khorasan**

Supervisor:

Dr. M. Damarde
Dr. M. Asghari por

Advisor:

Dr. M. KHirkhah
M.Sc. M. rahimi

By:

Abuzar akbari abjahan

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