

## **Abstract**

Differentiation among populations of the Iranian *Teucrium polium* was analyzed on the basis of morphological and phytochemical variability, to evaluate the level and distribution of diversity among four distant populations from arid, semi-arid and sub-humid regions of Fars province. Morphological analysis included characters related to the plant, leaf and stem morpholog. Analyses of variances and clustering have been done to establish the variability and significance of morphological differentiation. The morphological analysis of plants from the populations confirmed that the specie belongs to malacophyllous xeromorphic species and are distinguished by stable conservative xeromorphic characteristics. Morphological variation was correlated with ecological conditions at the site of origin and there is a small difference between the plants belonging to arid and semi-arid populations vs. the sub-humid ones. Chemical analysis was performed using combination of capillary GC, GC-MS after fractionation on column chromatography. The chemical composition of oil differed qualitatively and quantitatively between the populations.  $\beta$ -Caryophyllene was the major oils compound in sub-humid and semi-arid populations, while the main compound of arid populations were farnesene-cis-b and linalool. In addition, oil samples from semi-arid and sub-humid populations contained  $\beta$ -bisabolene (1.6-2.2%), myrcene (0.9-1.1%), bornyl acetate (0.7-0.8%) and 3-octanol (0.6-0.8%), which were not detected in oil samples from arid populations. All oils sample, however were dominated by hydrocarbon compounds. The relatively low morpho-chemical diversity in the populations indicates that the maintenance of their evolutionary potential is at risk if population sizes are not maintained and if there is no protection of the habitats.

**Keywords:** *Teucrium polium*, Morphology, Essential oil, Medicinal plant.



University of Zabol  
Graduate School  
Faculty of Agriculture  
Department of Agronomy

**Thesis Submitted in Partial Fulfillment of the Requirement for the  
degree of Master of Science (M. Sc) in Horticulture(Medicinal  
plants)**

**Evaluation of phytochemical and  
morphological inter- and intera  
ecotypes of *Tucrium polium* in  
Rangeland of Fars Province**

**Supervisors**

Dr. M. R. Asgharipour

**Advisor**

Dr. Ba. Fakheri

**By**

Hossein Gorgini Shabankareh

July 2014