

4.2 = PRELIMINARY STUDY OF VARIABILITY OF ESSENTIAL OILS OBTAINED FROM SARDINIAN POPULATIONS OF *Teucrium capitatum* L. ssp. *capitatum*

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Essential oils are complex mixtures of organic compounds produced by approximately 17,500 aromatic species of plants belonging to different families, especially Myrtaceae, Lauraceae, Lamiaceae and Asteraceae. The synthesis and accumulation of EOs are associated with the presence of complex secretory structures such as glandular trichomes and resin ducts (1). A major difficulty in the studies on EOs is the chemical polymorphism, attributable to environmental (2,3) or genetic factors (4,5).

As part of a larger investigation on the *Teucrium* genus, the aim of the present study was to define the qualitative and quantitative intraspecific variability of the essential oils obtained from *T. capitatum* L. *capitatum* collected from different wild populations growing in the North-Western coast of Sardinia island (Italy).

T. capitatum ssp. *capitatum* is a suffruticose chamaephyte belonging to Lamiaceae family, characteristic of arid areas of scrubland and pastures, consolidated dunes, from 0 to 900 m above sea level. Flowering aerial parts have been collected from three different locations (Porto Palmas-TccPP; Capo Mannu-TccCM and Porticciolo-TccP), air-dried, and the EOs were obtained in agreement with (6) European Pharmacopoeia. Their chemical composition was analyzed by GC/FID and GC/MS. Chemical data analyses were performed by PCA and CA using IBM SPSS STATISTIC 20 software.

All essential oils were characterized by a very high percentage of hydrocarbon monoterpenes (80.4, 87.6, 62.8%, respectively) and oxygenated monoterpenes (13.5, 6.6, 11.4%), and by a lower percentage of sesquiterpenes (4.9, 5.6, 20.5%). The main compounds in the different populations are represented of α -Pinene (34.0, 29.8, 20.4%), Limonene (15.6, 30.4, 20.6%), β -Pinene (12.2, 10.0, 7.6%) and (E)-Nerolidol (0, 0, 16.7%). This oxygenated sesquiterpene, that shows a wide range of pharmacological and biological activities (7,8), was only found in the oil obtained from TccP. There are few available data on the chemical composition of essential oil of this species (9,10), and the presence of (E)-Nerolidol is confirmed by Antunes et al., 2004 (11).

The analysis carried out with CA was performed with single linkage in order to identify statistically differences between the taxa under study. On the basis of their chemical composition the analyzed populations were grouped in two clusters, one constituted of TccPP and TccCM and a second represented only by TccP. These differences could be attributable to edaphic factors that are similar in TccPP and TccCM, whereas they are different in TccP.

This is a first step for a future broad-spectrum research on Sardinian populations of *T. capitatum capitatum* with the aim to identify chemical differences and to elucidate the genetic and ecological factors that produce them.

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