

4.3 = COMPOSITION OF THE ESSENTIAL OILS IN *CALENDULA SUFFRUTICOSA* (ASTERACEAE) FROM SICILY

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The genus *Calendula* L. (*Calenduleae* Cass., *Asteraceae*) includes several species having medicinal properties. Pharmacological studies reveal, for instance, that *C. officinalis* L. exhibits antibacterial, antiviral, antiinflammatory, antitumor and antioxidant properties; *C. arvensis* L. has antibacterial, antiinflammatory, antimutagenic and haemolytic activities; *C. suffruticosa* Vahl has antimicrobial activity, especially against pathogenic microorganisms as *Pseudomonas syringae* Van Hall, *Pseudomonas fluorescens* (Flügge) Migula, *Xanthomonas campestris* (Pammel) Dowson and *Agrobacterium tumefaciens* Smith & Townsend. Nevertheless, despite a long tradition of use of the above species, and others, the genus has not been explored properly (1).

In this contribution, the chemical composition of the essential oils in flowers, leaves and seeds of *Calendula suffruticosa*, from Castelmola on the Peloritani Mountains (E Sicily), is described.

C. suffruticosa is a perennial and highly variable species growing in the Mediterranean basin: in it, a lot of subspecies and some varieties are distinguished (2). In the Mediterranean area, according to Greuter (3) nine subspecies occur on the whole, two of which also occur in the Italian Peninsula and in Sicily. Namely, these are *C. suffruticosa* subsp. *suffruticosa* and *C. suffruticosa* subsp. *fulgida* (Raf.) Guadagno. In its intraspecific variability, the species has a distribution ranging from the south-western Mediterranean basin – North Africa (Tunisia, Algeria and Morocco), southern coasts of Portugal and Spain, Italy (s.l.) and Malta – to the south east - Greece and western Turkey. In Italy besides in Tuscany and Marche, it is common in Basilicata, Calabria and Sicily, from the coast up to 500 m altitude. In Sicily, both the subsp. *suffruticosa* and *fulgida* occur. The results here reported on a chemical study of a population is referred to subsp. *fulgida*, but only temporarily, since there are some distinctive characters that suggest a taxonomic position independent on both the two subspecific taxa so far recognized for the Sicilian flora (4).

The essential oils were obtained by hydro-distillation and were analysed by GC and GC-MS.

On the whole, the essential oils are characterized by the presence of oxygenated sesquiterpenes, particularly β -eudesmol, and fatty acids, with hexadecanoic acid as the compound representative of this fraction and present in a very high concentration in the seeds. Along with this, essential oils from flowers and leaves also contain the diterpene neophytadiene while the flowers are the only parts of the plant in which sesquiterpene hydrocarbons are found.

Owing to the chemical composition of other subspecies of *C. suffruticosa* is not still detected, the data obtained for the Castelmola population are a basic comparison term and a support to delimit the whole intraspecific taxa of the concerned species and besides to a more deeply taxonomic evaluation of the analyzed Sicilian population.

1) D. Arora, A. Rani, A. Sharma (2013) *Pharmacognosy Review*, 7(14),179-187

2) S.Pignatti (1982) *Flora d'Italia* 3, 137-140

3) W. Greuter (2008) *Med-Checklist*, 2, 56-57

4) G. Giardina, F.M. Raimondo, V. Spadaro (2007) *Boccone*, 20, 381-382