

## ESSENTIAL OIL COMPOSITION OF *Tanacetum alyssifolium*, AN ENDEMIC SPECIES FROM TURKEY

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In Turkey, the genus *Tanacetum* (Asteraceae) is represented by 44 species and altogether 59 taxa [1]. Within the genus, *Tanacetum alyssifolium* is an endemic species found in Turkey and also grows only in the Ilıc district, Erzincan [1].

The *Tanacetum* species, being rich in essential oils, have been the subject of interest of phytochemists. In the past, many studies have reported on the essential oil compositions of various *Tanacetum* species. In the previous studies [2-12], camphor, 1,8-cineole,  $\alpha$ -thujone, carvone, thymol, *trans*-sabinyl acetate, borneol, caryophyllone oxide, (*E*)-myroxide, sabinene, bornylacetate, and isopulegone were determined as the major constituents of the essential oils of *Tanacetum* species. The findings show that the genus *Tanacetum* had a considerable variation in essential oil composition.

The present work was undertaken to study the chemical composition of the essential oil of *T. alyssifolium* growing wild in Turkey.

In the present study, the analysis of the essential oil from aerial parts has resulted in the characterization of 14 components, representing 99.8% of the total oil. The relative concentrations of the components identified are summarized in Table 1 according to its elution order on the BPX5 MS column. The major constituents were borneol (35.2%),  $\alpha$ -thujone (24.6%), camphor (12.4%),  $\beta$ -eudesmol (6.1%), 1,8-cineole (4.8%), and thymol (4.1%). As can be seen from Table 1, the essential oil is composed mainly of monoterpene hydrocarbons (87.9%), followed by oxygenated monoterpenes (4.1%) and oxygenated sesquiterpenes (7.8%).

TABLE 1. Chemical Composition of the Essential Oil of *Tanacetum alyssifolium* (Bomm.) Grierson

Component	RI	Content, %	Component	RI	Content, %
1,8-Cineole	1026	4.8	Citronellyl formate*	1222	0.9
( <i>Z</i> )-Sabinene hydrate*	1068	1.1	Thymol	1230	4.1
( <i>E</i> )-Sabinene hydrate*	1097	0.9	Spathulenol*	1351	0.6
$\alpha$ -Thujone	1102	24.6	$\beta$ -Eudesmol*	1388	6.1
$\beta$ -Thujone	1112	3.3	Monoterpene hydrocarbons		-
( <i>E</i> )-Pinocarveol	1130	1.1	Oxygenated monoterpenes		87.9
Camphor	1137	12.4	Aromatic monoterpenes		4.1
( <i>Z</i> )-Chrysanthenol*	1147	1.9	Sesquiterpene hydrocarbons		-
Borneol	1156	35.2	Oxygenated sesquiterpenes		7.8
Myrtenal	1171	1.7	Total		99.8

RI: retention index. Compounds listed in order of elution from a BPX5 MS column. Identification: GC-MS, RI, CoI (co-injection). \*Identification: GC-MS, RI.

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Compared to other *Tanacetum* species [2-9, 11], in this study we found considerable qualitative and quantitative differences in the essential oil composition of *Tanacetum* sample collected from Ilic. This may be due to genotypic variation and climatic and environmental factors [7]. The essential oil composition shows a great variability in the *Tanacetum* genus [13-15], and this chemical diversity, which is mainly genetically determined, can represent a valuable contribution for the chemotaxonomic identification of the plants.

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