

ESSENTIAL OIL COMPOSITION OF *Tanacetum bachtiaricum* FROM IRAN

K. Javidnia,^{1,2*} R. Miri,^{1,2} M. Soltani,¹
and A. R. Khosravi³

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Tanacetum L. is a large genus of the Asteraceae family, tribe Anthemideae, and is represented by about 70 species in temperate regions, especially temperate regions of the Old World [1]. *Tanacetum vulgare* L. (Tansy) and *T. parthenium* (L.) Schultz-Bip (Feverfew) are two remarkable medicinal plants of this genus; tansy extracts have been used in perfumery, and although it is used as an antispasmodic and vermifuge, its toxicity outweighs its benefits [2]. Feverfew is used for the treatment and prevention of migraine headache, and this activity is mainly attributed to parthenolide, a major sesquiterpene lactone in the oil of feverfew [2, 3].

In Iran, *Tanacetum* comprises 29 species, of which 15 of them are endemic [4, 5]. *T. bachtiaricum* Mozaff. is a suffruticose and strongly aromatic plant which is recently described as a new endemic species for the flora of Iran [5]. It is confined to the high-altitude, rocky slopes of central mountainous regions of Iran.

TABLE 1. Composition of the Essential Oil of *Tanacetum bachtiaricum*

Compound	RI	%	Compound	RI	%
α -Thujene	929	0.3	Myrtenol	1195	0.4
α -Pinene	936	25.0	Verbenone	1208	0.4
Camphene	951	0.6	Lavandulyl acetate	1288	0.4
Sabinene	973	0.4	Eugenol	1357	0.4
β -Pinene	978	2.1	Lavandulyl isobutanoate	1420	0.4
Dehydro-1,8-cineole	989	0.4	Lavandulyl isovalerate	1508	6.5
α -Terpinene	1015	0.4	Spathulenol	1577	0.7
<i>p</i> -Cymene	1025	0.9	Caryophyllene oxide	1581	1.6
1,8-Cineole	1030	33.9	Eicosane	2000	1.9
γ -Terpinene	1058	0.6	Oxygenated aliphatic hydrocarbons		-
Linalool	1099	2.9	Aliphatic hydrocarbons		1.9
α -Campholenal	1126	1.3	Monoterpene hydrocarbons		30.3
<i>trans</i> -Pinocarveol	1137	0.9	Oxygenated monoterpenes		58.2
(<i>E</i>)-Tagetone	1142	0.4	Sesquiterpene hydrocarbons		-
<i>trans</i> -Verbenol	1145	0.6	Oxygenated sesquiterpenes		2.3
Borneol	1168	6.0	Phenylpropanoid derivatives		0.4
Terpinen-4-ol	1175	1.2	Number of identified compounds		27
α -Terpineol	1190	2.5	Total		93.1

RI: retention indices relative to C₈-C₂₈ *n*-alkanes on HP₅.

The components are listed in order of elution from the HP-5 column.

1) Medicinal & Natural Product Chemistry Research Centre, Shiraz University of Medical Sciences, Shiraz, Iran, e-mail: javidniak@sums.ac.ir; 2) Department of Medicinal Chemistry, Faculty of Pharmacy, Shiraz University of Medical Sciences, Shiraz, Iran; 3) Department of Biology, Faculty of Sciences, Shiraz University, Shiraz, Iran. Published in *Khimiya Prirodnikh Soedinenii*, No. 6, pp. 646-647, November-December, 2008. Original article submitted May 14, 2007.

In Table 1, data on the constituents of the essential oil of *T. bachtiaricum* are given. Monoterpenoids constituted 88.5% of the total essential oil where the oxygenated monoterpene portion was 58.2% against 30.3% of monoterpene hydrocarbons. α -Pinene, the second major compound of our essential oil, was also a major compound in the *T. parthenium* oil [6]. 1,8-Cineole, which was the first major constituent in our essential oil, was a main compound of many *Tanacetum* essential oils, such as *T. fruticosum* Ledeb. [7], *T. khorassanicum* (Krasch.) Parsa [8], *T. lingulatum* (Boiss.) Bornm. [9], *T. paradoxum* Bornm. [10], and *T. polycephalum* Schultz-Bip. [11–14]. Borneol was the fourth compound of our essential oil (6.0%) and was also a major constituent in several *T. polycephalum* essential oils [11–13], and its derivative, bornyl acetate, was a major structure in the essential oil of *T. parthenium* [6] and *T. Balsamita* L. [15]. Lavandulol derivatives comprised 7.3% of our essential oil, and structures with this backbone represent a major portion of *T. fruticosum* [7] and *T. paradoxum* [10] oils. Camphor, which was a major constituent in the essential oil of many *Tanacetum* species like *T. parthenium* [6], *T. fruticosum* [7], *T. khorassanicum* [8], *T. lingulatum* [9], *T. paradoxum* [10], *T. polycephalum* [11–14] and *T. Balsamita* L. [15], was not detected in our oil. Camphene, which is also the main constituent of *T. parthenium* [6] and *T. polycephalum* [12, 13] essential oils, is present in small amounts in our essential oil (0.6%).

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