SHORT REPORT

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Composition of the Essential Oil of *Marrubium anisodon* C. Koch of Turkish Origin

Neş'e Kırımer[1], Mine Kürkçüoğlu[1], Gençay Akgül[2], K. Hüsnü Can Başer[*1,3] and Ahmed Abdelfattah Mahmoud[3,4]

[1]*Anadolu University, Faculty of Pharmacy, Department of Pharmacognosy, 26470 Eskişehir, Türkiye*

[2]*Nevşehir Hacı Bektaş Veli University, Faculty of Science and Letters, Department of Biology, 50300 Nevşehir, Türkiye*

[3]*King Saud University, College of Science, Department of Botany and Microbiology, Riyadh 11451, Saudi Arabia*

[4] *Department of Plant Protection, Faculty of Agriculture, Saba Basha, Alexandria University, Alexandria, Egypt*

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Abstract: Hydrodistilled essential oil from aerial parts of *Marrubium anisodon* (Lamiaceae) was analyzed by GC-FID and GC/MS. Thirty-nine components were characterized representing 87.9 % of the oil. (*Z*)-β-Farnesene (20.2 %), nonacosane (18.5%) and β-caryophyllene (13.3 %) were the main constituents.

Keywords: *Marrubium anisodon*; essential oil; GC/MS analysis.

1. Plant Source

The family Labiatae (Lamiaceae) consists of herbs and shrubs, usually glandular and aromatic. The family is composed of many culinary or flowering herbs, native to Turkey and the Mediterranean area. While the family is represented by 45 genera. The genus *Marrubium* comprises 22 taxa, 13 of which are endemic in Turkey (1). *Marrubium anisodon* C. Koch was collected from Karaman, Konya-Karaman road, at an altitude of ca. 750 m., on 19 June 2001. A voucher specimen has been deposited at the Akgül's collection (GA 2455).

2. Previous Studies

In the only previous study, the essential oil of *M. anisodon* of Iranian origin was reported to contain germacrene D (44%), β-pinene (15%) and β-caryophyllene (10%) as major components (2). To the best of our knowledge, this is the first paper on the essential oil composition of *Marrubium anisodon* of Turkish origin.

* Corresponding authors: E-mail: khcbaser@gmail.com

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3. Present Study

Air-dried aerial parts of *M. anisodon* were subjected to hydrodistillation for 3h using a Clevenger-type apparatus to produce essential oil. Due to the poor yield of oil, it was recovered by trapping in *n*-hexane.

The oil was analyzed by gas chromatography and gas chromatography/mass spectrometry systems. Analysis conditions were as reported before (3). Results are shown in Table 1.

Table 1. Volatile compounds of *Marrubium anisodon*

RRI	Compound	%
1076	camphene	t
1118	β-pinene	t
1174	myrcene	t
1203	limonene	0.1
1213	1,8-cineole	0.7
1280	*p*-cymene	t
1328	1-tridecene	0.3
1393	3-octanol	0.5
1452	1-octen-3-ol	0.4
1454	dimethyltetradecane	0.7
1497	α-copaene	0.2
1506	decanal	0.2
1535	β-bourbonene	0.2
1589	β-ylangene	0.5
1594	*trans*-β-bergamotene	0.3
1600	β-elemene	0.1
1612	**β-caryophyllene**	**13.3**
1668	**(*Z*)-β-farnesene**	**20.2**
1687	α-humulene	2.8
1700	heptadecane	0.1
1726	germacrene D	1.0
1741	β-bisabolene	0.3
1773	δ-cadinene	0.2
1783	β-sesquiphellandrene	0.7
1838	(*E*)-β-damascenone	0.3
1868	(*E*)-geranyl acetone	1.8
1958	(*E*)-β-ionone	0.3
2008	caryophyllene oxide	1.5
2041	pentadecanal	0.2
2050	(*E*)-nerolidol	0.5
2071	humulene epoxide II	0.4
2100	heneicosane	1.2
2131	hexahydrofarnesyl acetone	6.2
2300	tricosane	4.4
2348	farnesyl acetone	1.7
2500	pentacosane	2.0
2622	phytol	1.7
2700	heptacosane	4.4
2900	nonacosane	**18.5**

RRI: Relative retention indices calculated against *n*-alkanes
% calculated from FID data t: Trace (< 0.1 %)

Lawrence argued that Labiatae genera with tricolpate pollen grains were oil-poor and those oil-poor genera generally contain sesquiterpenes such as β-caryophyllene and germacrene D as main constituents in the oils (4).The genus *Marrubium* is also known to have tricolpate pollen grains (1).In the only previous study, the essential oil of *M. anisodon* of Iranian origin was reported to contain germacrene D (44%), β-pinene (15%) and β-caryophyllene (10%) as major components. In the present study, thirty-nine components were characterized representing 87.9 % of the oil. Unlike the previous

study of *M. anisodon* oil of Iranian origin (2), (*Z*)-β-farnesene (20.2 %), nonacosane (18.5%) and β-caryophyllene (13.3 %) were found as main constituents (Table 1). As shown in Table 1, (*Z*)-β-farnesene was previously reported as main volatile constituents in *M. bourgaei* subsp. *caricum* (14%) (5) and *M. peregrinum* (12-16%) (6).

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