



Volatile Oil Composition of Anzer Thyme

Anzer Kekiğinin Uçucu Yağ Bileşenleri

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Abstract

Özet

The Black Sea region belongs to one of the richest regions of Turkey regarding biological diversity. Totally 2239 species are distributed in the East Black Sea region. 514 species are endemic and the endemism ratio is ca. 23 %. Rize displays more than half of the plants distributed at the East Black Sea region. It can be stated that almost 70 % of these plants are of medicinal and aromatic value. One of them is Anzer Thyme. Totally 24 volatile oil components were detected corresponding to 99.88 % of total volatile oil. The biggest chemical group was oxygenated monoterpenes (77.83 %). Specially thymol, carvacrol and linalool were detected in high amounts (respectively 20.45 %, 14.83 % and 13.89 %).

Karadeniz bölgesi biyolojik çeşitlilik açısından Türkiye'nin en zengin bölgelerinden biridir. Doğu Karadeniz Bölgesi'nde toplam 2239 tür bulunmakta olup, bunların 514'ü endemiktir ve endemizm oranı yaklaşık %23' tür. Doğu Karadeniz bölgesinde yayılış gösteren bitkilerin yarısından fazlası Rize ilinde bulunmakta olup, bitkilerin yaklaşık %70'i tıbbi ve aromatik değere sahiptir. Bunlardan biri de Anzer Kekiğidir. Toplam uçucu yağın %99.88'ine tekabül eden toplam 24 uçucu yağ bileşeni tespit edilebilmiştir. En büyük kimyasal grup oksijenli monoterpenlerdir (%77.83). Özellikle thymol, carvacrol ve linalool yüksek miktarlarda (sırasıyla %20.45, %14.83 ve %13.89) tespit edilmiştir.

Keywords: Anzer thyme, Volatile oil, Medicinal plant

Anahtar kelimeler: Anzer kekiği, Uçucu yağ, tıbbi bitki

1. INTRODUCTION

Medicinal and aromatic plants have use in in traditional and modern medicine. They are helpful in the prevention, improvement and maintenance of diseases. These plants have use in nutrition as nutritional supplements, herbal tea, spices and condiments. Besides their use

inbody care products, perfumery and cosmetics, these plants are useful in the pesticide and brightening industry. Different parts of these plants (root, rhizome, tuber, stem or woody structure, bark, leaf, flower, fruit, seed and herb) are used as drug leaves. The use of medicinal plants as medicine for therapeutic purposes dates back to ancient times. In particular, Ibn Sina's work called El-Kanun Fi-t Tıbb, which he wrote in 930-1037, contains a lot of information about the use of many plants as medicine, which organs and which diseases they have therapeutic properties. The mentions that thyme has dissolving and disintegrating properties, breaking even frozen blood, preventing shivering from cold when drunk in winter, destroying warts, expectorant, relieving rib pain, improving eyesight and appetite, its use as digestion facilitator, dewormer and diuretic can be seen in the literature (Kahya, 2017).

The genus *Thymus* represents one of the most important genera of the Lamiaceae family, containing over 100 species (Tohidi et al., 2017). This medicinal plant has perennial behaviour and is distributed naturally in different regions of the world. The origin of this plant was assumed as the Mediterranean regions (Pirbalouti et al., 2013). In Turkey this genus is represented by 38 species and altogether 64 taxa, 24 of them are endemic (Manou et al., 1998).

The Black Sea region is one of the richest regions of Turkey concerning biodiversity. 2239 plant species are present in the East Black Sea region. The number of endemic species are 514 and the endemism ratio is ca. 23 %. Over 50 % of the plants present at the East Black Sea region can be seen also in the Rize province. The percent of plants with potential medicinal and aromatic value are about 70 % (Yurteri et al., 2017).

Thymus praecox Opiz subsp. *caucasicus* (Wild. ex Ronniger) Jalas var. *caucasicus* was collected from the Anzer Plateau in Rize and investigated regarding its volatile oil composition.

2. MATERIALS and METHODS

The Anzer Plateau, where the plant material was collected, is located in Rize. Rize is located in Northeastern Anatolia, East of the Eastern Black Sea coastline. It is surrounded by Of and Trabzon from the west, İspir of Erzurum from the south, Yusufeli and Arhavi of Artvin from the east, and the Black Sea from the north, and its area is 3922 km² excluding the lakes. The plant material *Thymus praecox* Opiz subsp. *caucasicus* (Wild. ex Ronniger) Jalas var. *caucasicus* was collected from the Anzer plateau and its active ingredients were investigated.

2.1.1. Sample Preparation and Volatile Oil Analysis

Sample preparation and volatile oil analysis using GC-MS was done as described by Yurteri et al. (2021).

3. RESULTS and DISCUSSION

The volatile oil composition of collected Anzer Thyme can be seen in Table 1. Totally 21 volatile oil components were detected corresponding to 99.88 % of total volatile oil. The biggest chemical group was oxygenated monoterpenes (77.83 %). Specially thymol, carvacrol and linalool were detected in high amounts (respectively 20.45 %, 14.86 % and 13.89 %). Also monoterpene hydrocarbons (5.17), sesquiterpene hydrocarbons (4.59 %) and oxygenated sesquiterpenes (1.77 %) were detected as chemical groups. Isovaleric acid (1.26 %), α -terpinyl acetate (5.18), myristic alcohol (2.35 %), isoeugenyl phenylacetate (0.41) and pentadecanolide (1.32) were constituents of investigated volatile oil.

Sekeroglu et al. (2007) detected thymol (47.45%), γ -terpinene (8.73%), p-cymene (8.30%), terpinyl acetate (4.88%) and carvacrol (4.66%) as major components in the same species. Yurteri et al. (2017) investigated the same species and detected 39-42.12 % thymol, 20.76-53.57 % carvacrol and 11.65-31.37 % α -terpinyl acetate in Anzer thyme populations collected from different altitudes.

The reason for the difference in terms of volatile components among given literature can be explained by ecological conditions of the region grown on volatile components, the harvest times of the plant, the maturation stage, the different plant parts, species diversity and genetic diversity (Hazzit & Baaliouamer, 2009; Lukas et al., 2015; Toncer et al., 2010; Tümen et al., 1995).

Table 1. Volatile Oil Composition of (*Thymus praecox* Opiz subsp. *caucasicus* (Wild. Ex Ronniger) Jalas var. *caucasicus* collected from Anzer/Rize

Chemical Classes	RI	Chemical Formula	%
Monoterpene hydrocarbons			
p-Cymene	1025	C ₁₀ H ₁₄	0.75
γ-Terpinene	1067	C ₁₀ H ₁₆	4.42
Total			5.17
Oxygenated monoterpenes			
Linalool	1099	C ₁₀ H ₁₈ O	13.89
trans-Sabinene hydrate	1101	C ₁₀ H ₁₈ O	0.67
Eucalyptol	1032	C ₁₀ H ₁₈ O	0.32
Menthone	1158	C ₁₀ H ₁₈ O	4.76
Isoborneol	1165	C ₁₀ H ₁₈ O	6.74
α-Terpineol	1187	C ₁₀ H ₁₈ O	1.41
Pulegone	1241	C ₁₀ H ₁₆ O	1.27
Carvone	1246	C ₁₀ H ₁₄ O	9.11
(Z)-Jasmone	1248	C ₁₁ H ₁₆ O	4.35
Thymol	1304	C ₁₀ H ₁₄ O	20.45
Carvacrol	1313	C ₁₀ H ₁₄ O	14.86
Total			77.83
Sesquiterpene hydrocarbons			
α-Himachalene	1449	C ₁₅ H ₂₄	4.02
α-Humulene	1454	C ₁₅ H ₂₄	0.57
Total			4.59
Oxygenated sesquiterpenes			
Caryophyllene oxide	1587	C ₁₅ H ₂₄ O	1.77
Total			1.77
Others			
Isovaleric acid	820	C ₅ H ₁₀ O ₂	1.26
α-Terpinyl acetate	1349	C ₁₂ H ₂₀ O ₂	5.18
Myristic alcohol	1380	C ₁₄ H ₃₀ O	2.35
Isoeugenyl phenylacetate	1680	C ₁₈ H ₁₈ O ₃	0.41
Pentadecanolide	1827	C ₁₅ H ₂₈ O ₂	1.32
Total			10.52
Totally			99.88

4. CONCLUSION

Lamiaceae species are very popular in folk medicine to treat various health problems such as throat infections, stomach disorders, ulcer, spasm, cold, hemorrhages and skin problems. The family is also famous for the presence of essential oils. Their constituents have been found to

be anti-inflammatory, hemostatic, cicatrizing, stomachic, sedative, spasmolytic, diuretic, expectorant, cardiac, hypotensive.

Medicinal and aromatic plants form a numerically large group of economically important plants which provide basic raw materials for medicines, perfumes, flavours and cosmetics. These plants and their products not only serve as valuable source of income for small landholders farmers and entrepreneurs but also earn valuable foreign exchange by way of export facilities. Anzer Thyme was investigated regarding its valuable volatile oil composition during this study.

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