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Article in *Journal of Essential Oil Research* · December 2011
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Composition of the Essential Oil of *Thymus pseudopulegioides* Klokov et Des.-Shost from Turkey

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Abstract

Water-distilled essential oils from aerial parts of *Thymus pseudopulegioides* collected from three different localities in Turkey were analyzed by GC/MS. One hundred and four compounds were identified representing 97.5-99.5% of the total components detected in thymol/carvacrol (50.14/10.67%), thymol/linalool (23.14/20.24%) and linalool/ α -terpinyl acetate/geraniol (21.55/16.70/11.17%) rich oils.

Key Word Index

Thymus pseudopulegioides, Labiatae, essential oil composition, thymol, linalool, carvacrol, α -terpinyl acetate, geraniol, p-cymene.

Plant Name

Thymus pseudopulegioides Klokov et Des.-Shost. (1).

Source

Plant materials were collected from the following localities in north western Turkey. Voucher specimens are kept at the Herbarium of the Faculty of Pharmacy, Anadolu University in Eskisehir, Turkey (ESSE).

A = Trabzon: Çaykara, Soganli dag on July 28, 1994 (ESSE 10959)

B = Bayburt: Çaykara, Mohakambo yaylasi on July 25, 1994 (ESSE 10955)

C = Trabzon: Köprübasi, Vizara yaylasi on July 20, 1994 (ESSE 10791)

Plant Part

Dried aerial parts were water distilled for 3 h using a Clevenger-type apparatus to yield oils in the following yields: 1.06%, 1.03% and 0.65%, for A, B and C, respectively.

Previous Work

None.

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Received: January 1997
Accepted: February 1997

Table I. Percentage composition of three oils of *Thymus pseudopulegioides*

Compound	A	B	C	Compound	A	B	C
α -pinene	1.7	0.7	1.1	neral	-	-	0.1
α -thujene	0.6	0.5	0.4	γ -muurolene	0.3	0.2	-
camphene	0.1	-	-	α -terpineol	0.3	-	1.4
hexanal	<0.1	-	-	α -terpinyl acetate	2.0	-	16.7
β -pinene	0.1	-	-	borneol	0.6	0.2	-
sabinene	<0.1	-	0.1	germacrene D	1.7	-	3.7
δ -3-carene	<0.1	-	-	valencene	0.2	-	-
3-heptanone	<0.1	-	-	β -bisabolene	1.3	0.7	1.1
myrcene	1.1	1.0	0.1	piperitone	0.2	-	-
α -terpinene	1.3	1.1	0.3	trans-piperitone oxide	0.1	-	-
limonene	0.6	-	0.4	bicyclogermacrene	0.8	-	1.3
1,8-cineole	0.1	-	-	(E,E)- α -farnesene	0.1	-	-
β -phellandrene	0.2	-	-	geranyl acetate	1.4	-	7.9
(E)-2-hexenal	<0.1	-	-	δ -cadinene	0.6	0.4	-
(Z)- β -ocimene	<0.1	-	-	γ -cadinene	0.3	-	-
γ -terpinene	9.3	9.7	0.8	(E)- β -bisabolene	-	0.9	0.7
(E)- β -ocimene	<0.1	-	-	cadina-1,4-diene	0.1	-	-
5-methyl-3-heptanone	0.7	0.5	0.2	myrtenol	<0.1	-	-
p-cymene	8.6	10.7	9.0	nerol	0.1	-	0.6
terpinolene	0.1	-	-	guaia-3,7-diene	0.1	-	-
3-octyl acetate	<0.1	-	-	β -damascenone	<0.1	-	-
3-nonanone	<0.1	-	-	trans-carveol	<0.1	-	-
1-octenyl acetate	0.1	-	0.3	geraniol	1.4	-	11.2
(Z)-3-hexenol	<0.1	-	-	p-cymen-8-ol	0.1	-	-
3-octanol	0.3	0.2	0.2	thymyl acetate	<0.1	-	-
nonanal	<0.1	-	-	benzyl acetone	0.1	-	-
α ,p-dimethylstyrene	0.1	-	-	epi-cubebol	0.1	-	-
1-octen-3-ol	1.3	1.5	0.6	2-phenylethyl alcohol	<0.1	-	-
α -cubebene	<0.1	-	-	α -calacorene-I	<0.1	-	-
trans-sabinene hydrate	0.2	-	<0.01	piperitenone	0.2	-	-
trans-linalool oxide (furanoid)	0.1	-	-	cubebol	<0.1	-	-
α -ylangene	<0.1	-	-	β -ionone	<0.1	-	-
α -copaene	0.2	-	-	piperitenone oxide	0.1	-	-
decanal	<0.1	-	-	α -calacorene-II	0.1	-	-
α -bourbonene	<0.1	-	-	isocaryophyllene oxide	<0.1	-	-
β -bourbonene	0.7	0.2	0.8	caryophyllene oxide	0.3	0.2	0.2
benzaldehyde	<0.1	-	-	pentadecanal	<0.1	-	-
linalool	20.2	-	21.6	1,6-germacradien-5-ol	<0.1	-	-
linalyl acetate	0.3	-	-	cubenol	<0.1	-	-
bornyl acetate	<0.1	-	0.1	1-epi-cubenol	<0.1	-	-
trans- β -bergamotene	<0.1	-	-	globulol	<0.1	-	-
methyl thymol	2.0	1.8	1.1	viridiflorol	<0.1	-	-
terpinen-4-ol	0.3	0.3	0.1	cumin alcohol	<0.1	-	-
β -caryophyllene	2.6	-	1.4	hexahydrofamesylacetone	0.1	-	-
methyl carvacrol	2.4	7.3	2.0	spathulenol	0.5	0.3	0.7
aromadendrene	0.4	-	-	eugenol	<0.1	-	-
γ -gurjunene	<0.1	-	-	T-cadinol	<0.1	-	-
trans-dihydrocarvone	<0.1	-	-	thymol	23.1	50.1	8.6
phenylacetaldehyde	<0.1	-	-	carvacrol	4.5	10.7	4.8
alloaromadendrene	0.1	-	-	α -cadinol	0.1	-	-
trans-pinocarveol	<0.1	-	-	hexadecanol	<0.1	-	-
(E)- β -farnesene	0.1	-	-	pentacosane	<0.1	-	-
α -humulene	0.2	-	-	phytol	<0.1	-	-

Present Work

The oils were analyzed by GC/MS using a Hewlett-Packard GC/MSD system. Innowax FSC column (60 m x 0.25 mm) was used with helium as the carrier gas. GC oven temperature was kept at 60°C for 10 min and programmed to 220°C at a rate of 4°C/min, and then kept constant at 220°C for 10 min and programmed to 240°C at a rate of 1°C/min. Split flow was adjusted at 50 mL/min. The injector and detector temperatures were at 250°C. MS were taken at 70 eV. Mass range was from m/z 35 to 425. Library search was carried out using Wiley GC/MS Library and TBAM Library of Essential Oil Constituents. Relative percentage amounts were calculated from TIC by the computer. The compounds identified in the oil can be seen in Table I.

Reference

1. P. H. Davis, *Flora of Turkey and the East Aegean Islands*. Vol. 7, p 381, University Press, Edinburgh (1982).

