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# Composition of the Essential Oil of *Nepeta racemosa* Lam.

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**ABSTRACT:** Water-distilled essential oils of *Nepeta racemosa* collected from two different localities in Turkey were analyzed by capillary GC and GC/MS. The major constituents of the oils were found to be 4 $\alpha$ ,7 $\alpha$ ,7 $\beta$ -nepetalactone (31.51-91.46%) and 1,8-cineole (2.04-10.44%).

**KEYWORD INDEX:** *Nepeta racemosa*, Labiatae, essential oil composition, nepetalactone.

**PLANT NAME:** *Nepeta racemosa* Lam. (syn. *N. mussinii* Spreng.).

**SOURCE:** Plant materials were collected from two different locations in Turkey, Erzurum (1987) and Kars (1990). Voucher specimens are kept at the Herbariums of Erzurum Atatürk University and Anadolu University Faculty of Pharmacy (ESSE 8994).

**PLANT PART:** Air-dried aerial parts (flowering) were water distilled to produce oils in 0.11-0.70% yield.

**PREVIOUS WORK:** Sixteen compounds have been previously identified in an oil of *N. racemosa* (1). The major components were found to be 4 $\alpha$ ,7 $\alpha$ ,7 $\beta$ -nepetalactone (40.4%) and 4 $\alpha$  $\beta$ ,7 $\alpha$ ,7 $\beta$ -nepetalactone (30.6%).

**PRESENT WORK:** GC and GC/MS analyses of the oils were carried out according to a procedure that has been previously described (2). Thirteen and seventy-eight components representing 95.33% and 77.05% of the oils from Erzurum and Kars materials were characterized respectively. The yield and composition of the oils can be seen in Table I.

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**Table I. Comparative percentage composition of two oils of *Nepeta racemosa* of different Turkish origins**

Compound	Erzurum (yield 0.7%)	Kars (yield 0.11%)
cyclohexane**	0.04	-
octane	-	t
acetone	0.02	0.02
2-butanone	0.01	-
nonane	-	0.06
ethanol	-	0.01
decane	-	0.02
$\alpha$ -pinene	0.15	0.63
camphene	-	0.03
hexanal	-	0.04
undecane	-	0.04
$\beta$ -pinene	0.61	2.32
isoamyl acetate	t	0.17
sabinene	-	0.01
myrcene	-	0.22
$\alpha$ -phellandrene	-	t
pseudolimonene**	-	0.25
$\alpha$ -terpinene	-	0.12
limonene	-	0.80
1,8-cineole	2.04	10.44
(E)-2-hexenal	0.04	0.07
amyl furan	-	0.03
(Z)- $\beta$ -ocimene	-	0.30
$\gamma$ -terpinene	0.01	0.40
5-methyl-3-heptanone	t	0.47
bicyclo[4.2.0]octa-1,3,5-triene**	-	0.19
p-cymene	0.20	1.41
methyl cyclohexyl ketone**	-	0.10
3-methyl cycloheptanone**	-	0.17
6-methyl-5-hepten-2-one	-	0.05
(Z)-3-hexenol	-	0.02
6-methyl-3-heptanol	-	0.12
dichloro benzene**	-	0.14
1-octen-3-ol	-	0.38
trans-sabinene hydrate	-	0.20
trans-linalool oxide (furanoid)	-	0.04
$\alpha$ -copaene	-	0.10
decanal	-	0.08
camphor	-	0.02
$\beta$ -bourbonene	-	0.45
$\beta$ -cubebene	-	0.02
cis-sabinene hydrate	-	0.03
linalool	-	0.19
$\beta$ -caryophyllene	-	2.19
terpinen-4-ol	-	0.42
myrtenal	-	0.29
pulegone	-	0.44

Table I. (cont.)

Compound	Erzurum (yield 0.7%)	Kars (yield 0.11%)
acetophenone	-	0.20
trans-pinocarveol	-	0.28
$\alpha$ -humulene	-	0.15
piperitone oxide I*	-	0.27
$\gamma$ -muurolene	-	0.02
$\alpha$ -terpineol	-	0.49
$\alpha$ -terpinyl acetate	-	2.82
germacrene D	-	0.92
$\beta$ -bisabolene	-	0.08
$\alpha$ -muurolene	-	0.19
naphthalene	-	0.42
$\delta$ -cadinene	-	0.72
geranyl acetate	-	1.34
methyl salicylate	-	0.05
cuminaldehyde	-	0.31
myrtenol	-	0.17
calamenene	-	0.78
methyl hydrocinnamate	-	0.65
geraniol	-	0.62
(Z)-geranyl acetone	-	0.10
$\beta$ -ionone	-	0.12
4 $\alpha$ $\beta$ ,7 $\alpha$ ,7 $\alpha$ $\beta$ -nepetalactone	0.75	1.29
patchoulane*	-	2.40
4 $\alpha$ $\alpha$ ,7 $\alpha$ ,7 $\alpha$ $\beta$ -nepetalactone	91.46	31.51
cumin alcohol	-	0.24
spathulenol	-	1.53
hexahydrofarnesyl acetone	-	0.25
nonanoic acid	-	0.31
T-cadinol	-	0.53
thymol	-	2.79
carvacrol	-	1.54
acetoeugenol**	-	0.39
lauric acid**	-	0.07

\* correct isomer not characterized  
\*\* tentative identification from GC/MS library  
t = trace

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