

**CONTRIBUTION TO THE KNOWLEDGE OF THE COMPOSITION
OF THE ESSENTIAL OILS FROM FIVE *CALAMINTHA* SPECIES
CULTIVATED IN ROMANIA**

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Abstract: The *Calamintha* species, fam. *Lamiaceae*, originally from West and South Europe, were cultivated at SCDL Bacău. The essential oils were extracted by hydrodistillation; the separation and identifying of their components were made using a gas-chromatograph equipped with massspectrometrical detector. The obtained data emphasized a great variation of the composition of the essential oils. So, the essential oil from *C. officinalis* contained mainly pulegone and p-menthone; the one extracted from *C. grandiflora* contained germacrene D and β -cariophyllene; the essential oil from *C. mentifolia* contained rose furane; *C. sylvatica* provided an essential oil containing pulegone and isomenthone and the main components of the oil obtained from *C. nepeta* were estragol and menthone.

Key words: *Calamintha*, composition of the essential oils

Introduction

The plants from *Calamintha sp.* are used in order to aromatize the food because of their special flavour [Phyllips and Foy, 1990] and also for medicinal purpose due to their expectorant and febrifuge effect [Brown, 1995; Chevallier, 1996].

The researches performed by De Pooter and Scamp (1986) indicates that the essential oil extracted from the *Calamintha nepenta* contained mainly pulegone and isomenthone, while the main components in the oil obtained from *C. sylvatica* were neomenthol and linalil acetate.

Some of the *Calamintha* species were cultivated at SCDL Bacău, therefore the researches concerning the composition of the essential oils were allowed.

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Material and methods

The researches were performed on five species of *Calamintha*, that were cultivated at SCDL Bacău: *C. nepeta* (L.) Savi, *C. grandiflora* (L.) Moench, *C. menthyfolia* and *C. sylvatica* Bromf., which after Ciocârlan (2000) is similarly with *C. officinalis*.

The volatile compounds were extracted by hydrodistillation with a Singer-Nickerson apparatus. The separation and identifying of the components were made using a gas chromatograph Agilent equipped with massspectrometrical detector. There was used a capillary column DB 5 (length of 25 m, internal diameter of 0,25 mm) and helium as carrying-gas; the initial temperature was 60 °C and the thermic gradient was 4 °C/min till the final temperature of 280 °C. The NIST spectra bank was used for the identifying the volatile compounds, which were verified with the Kovats indices.

Results and discussion

The performed researches allowed the identifying and the quantitative determination of 22-30 components in the essential oil extracted from the *Calamintha* species.

The results, showed in the table I, indicated differences depending on species between the compositions of the essential oils extracted from the analysed plants.

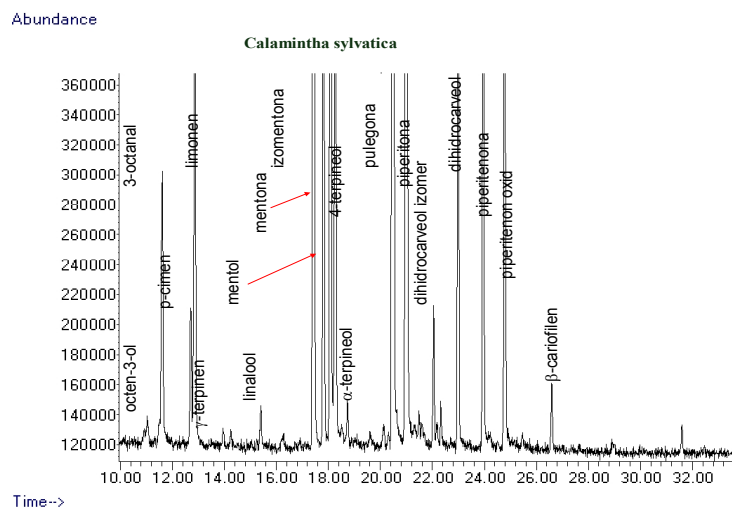


Figure 1- The chromatogram of the essential oil extracted from *Calamintha*

Nr.	Components	<i>C. officinalis</i>	<i>C. grandiflora</i>	<i>C. menthyfolia</i>	<i>C. sylvatica</i>	<i>C. nepeta</i>
1	Diceton alcool	0,73	-	-	-	-
2	α -Pinene	0,40	-	-	-	-
3	Octen-3-ol	0,31	-	1,37	0,16	0,28
4	β -Pinene	-	-	-	-	0,16
5	3-Octanol	-	-	-	1,76	-
6	1,3,8-p-Menthatriene	-	-	0,81	0,78	-
7	Limonene	1,44	-	-	2,73	1,72
8	Ocymene	-	-	0,29	0,14	-
9	Acetofenone	-	-	2,81	-	-
10	Rose furane	-	-	86,59	-	-
11	Isomenthone	-	-	-	19,50	3,45
12	Menthone	5,67	-	-	3,16	20,19
13	Menthol	-	-	-	6,72	-
14	p-Menthone	28,29	-	-	-	-
15	Terpinene-4-ol	-	-	-	3,81	-
16	Isopulegone	1,35	-	-	-	0,45
17	Neoisomenthol	2,73	-	-	-	-
18	Estragol	-	-	-	-	54,95
19	Pulegone	48,75	-	-	33,64	12,87
20	Piperitone	3,00	-	-	13,61	0,46
21	cis-Pulegone oxid	0,34	-	-	-	-
22	γ -Elemene	-	0,58	-	-	-
23	Menthil acetate	0,57	-	-	-	-
24	Isopulegol acetate	-	-	-	3,46	-
25	Acid cyclopropan octanone	-	-	0,46	-	-
26	Chrysanthenone	0,34	-	-	3,24	-
27	4-Methyl isopulegone	-	-	-	3,84	-
28	β -Elemene	-	0,28	-	-	-
29	β -Cariophyllene	-	19,68	2,87	0,34	0,10
30	β -Cubebene	-	3,14	-	-	-
31	Amorphene	-	1,17	-	-	-
32	α -Cariopyllene	-	-	0,45	-	-
33	γ -Muurolene	-	2,17	-	-	-
34	Germacrene D	-	57,92	-	-	-
35	Cedrene	-	-	0,24	-	-
36	Alloaromadendrene	-	2,37	-	-	-
37	β -Cadinene	-	0,52	-	-	-
38	α -Muurolene	-	1,63	-	-	-
39	Spathulenple	-	-	0,23	-	-
40	Lupeole	-	-	0,28	-	-
41	Cariophyllene oxid	-	1,51	-	-	-
42	T-Muurolole	-	0,41	-	-	-

Table I - The chemical composition of the essential oil extracted from five *Calamintha* species

The greatest number of volatile compounds (33) was determined in the essential oil extracted from *C. sylvatica*. Among these, pulegone registered the higher amount (33,64 %), followed by isomenthone (19,50 %). Also, a great concentration of piperitone (13,61 %) and menthol (6,72 %) was determined in the essential oil from *C. sylvatica*, according to the chromatogramme showed in the figure 1

So, the most special composition was registered at the essential oil extracted from the *C. grandiflora*: the analysis performed indicated no easily volatile compounds in this oil; the most abundant components determined in this essential oil was germacrene D (57,92 %) and β -cariophyllene (19,68 %).

Also the essential oil obtained from the *C. menthifolia* showed a special composition. Thus, the analysis emphasized high amount of a single compound: rose furan, which represent the greatest part of the essential oil composition (86,59 %).

A high amount of easily volatile compounds was remarked in the essential oil extracted from *C. nepeta*, which contains estragol as a major compounds (54,95 %), followed by mentone (20,19 %) and pulegone (12,87 %).

Also in the essential oil obtained from *C. officinalis* was determined a great content in compounds with high volatility, but in this case pulegone represents the most important components (48,75 %), followed by p-menthone (28,29 %).

Conclusions

1. The studied *Calamintha* species showed a specific composition of the essential oil, the major part of it being represented by a single compound (*C. menthifolia*), by two compounds (*C. grandiflora* and *C. officinalis*) or by three compounds (*C. sylvatica* and *C. nepeta*).
2. The most remarkable differences was registered in the case of the essential oil extracted from *C. menthifolia*, which contains an easily volatile compounds, rose furan, as a major component and also in the case of the essential oil from *C. grandiflora*, which contains in majority two compounds with small volatility: germacrene D and β -cariophyllene.

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