

(Article)

# Phytochemical profile, GC-MS profiling and *In vitro* evaluation of some biological applications of the extracts of *Origanum syriacum* L. and *Cousinia libanotica* D.C.

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## Supplementary materials

**Table S1.** Identification of the volatile compounds of *Origanum syriacum* and *Cousinia libanotica* extracts by Gas Chromatography-Mass spectrometry“GC-MS” before and after derivatization.

N°	RI	Compounds	<i>Origanum syriacum</i> extracts				<i>Cousinia libanotica</i> extracts			
			CHX	DCM	EtOAc	MeOH	CHX	DCM	EtOAc	MeOH
1	-	heptane, 2,2,4,6,6-pentamethyl-	+							
2	-	isoterpinolene	+							
3	1009	O-cimene	+							
4	1014	eucalyptol	+							
5	1063	4-thujanol	+							
6	1105	trans-sabinene hydrate	+							
7	1114	$\alpha$ -monoacetin		+			+			
8	1164	trans-borneol	+							
9	1194	terpinen-4-ol	+							
10	1218	cuminal					+	+	++	
11	1223	thymoquinone	+	+						
12	1224	duroquinone						+	++	
13	1249	bicyclohexane	+				+			
14	1254	benzene, 2-methoxy-1,3,5-trimethyl-						+		
15	1256	thymol	++	++	+					
16	1259	carvacrol	++	++	+					
17	1408	2,3,3-trimethylpentane							+	

18	1417	<i>trans</i> -caryophyllene	+	+						
19	1434	cuminyln acetate							+	
20	1524	phenol, 2,5-bis(1,1-di-methylethyl)-	+			++				
21	1574	<i>p</i> -cymene-2,5-diol		+	+		+			
22	1585	(+) spathulenol	+							
23	1588	caryophyllene oxide	+++	+						
24	1613	humulene oxide II	+							
25	1646	Cadinol T	+							
26	1670	14-hydroxycaryo-phyllene	+	+						
27	1785	loliolide		+						
28	1883	3,7,11,15-tetramethyl-2-hexadecen-1-ol		++	++					
29	1930	methyl palmitate								+++
30	1937	7,9-di-tert-butyl-1-ox-aspiro(4,5)deca-6,9-diene-2,8-dione	+	+++	+		+	++	+	
31	1978	palmitic acid						++	+++	
32	2005	Ethyl palmitate		+++	+				++	
33	2115	phytol	+	+	+	+++				
34	2144	pregna-4,16-diene-3,20-dione	+							
35	2154	linoleic acid	+	+	+			+++	+++	+
36	2156	stearic acid	+	+++	+				+	
37	2160	oleic acid		+				+	++	
38	2442	phenol, 2,2'-meth-ylenebis[6-(1,1-di-methylethyl)-4-methyl-	++	+++	+++	++		+++	++	+++
39	2527	2-monopalmitin		+		++				
40	2713	heptacosane	+	+			+++	++	+	

41	2725	$\beta$ -monostearin				++				
42	2727	$\alpha$ -monostearin		+						
43	2921	octacosane	++	++						
44	2950	hexatriacontane	+++	+++	+					
45	2963	vitamin E	+	+	+			+	+	
46	3014	tetratetracontane	+++	+++	+					
47	3063	$\gamma$ -sitosterol					+	+	++	
48	3070	$\beta$ -sitosterol	+	+++	++		+	++	++	
49	-	$\beta$ -amyirin					+++	+	+	
50	-	stigmastan-6,22-dien, 3,5-dedihydro-								+
51	-	lupeol	+				+++	+		
52	-	stigmasta-3,5-diene								++
53	-	$\beta$ -amyirin acetate					+		+	
54	-	epilupeol					+	++	+	
55	-	3-epilupeol								+++
56	-	lupeol acetate					+			
57	-	epilupeol acetate					+	+	+	
N°	tR (min)	Compound	CHX	DCM	EtOAc	MeCN	CHX	DCM	EtOAc	MeCN
1'	8.1	propylene glycol						+	+	
2'	8.2	cyclohexanol	+							
3'	9.1	2,3-butane diol		+				+		
4'	9.7	carbamic acid					+			
5'	10.0	hexanoic acid	+				+	++		
6'	10.3	glycolic acid						+		
7'	10.46	oct-1-en-3-ol	++	+				+		
8'	10.48	1-butoxy-2-propanol					+			
9'	11.2	octan-3-ol	+	+						

10'	12.4	levulinic acid					+	+	
11'	13.1	benzyl alcohol					+		
12'	15.2	acetin, bis-1,3-tri-methylether		+					+
13'	19.3	benzoic acid					+	+	
14'	21.7	octanoic acid					+		
15'	24.2	4-isopropylphenol				+			
16'	25.1	glycerol	+	+	+		+	+	+
17'	31.2	diacetin, 2-trimethylether		+				+	
18'	31.8	2-butenedioic acid, (E),					+		+++
19'	32.1	nonanoic acid	+			+	+	+	
20'	32.2	cuminol	+	+		+	++	+	
21'	35.1	decanoic acid					+	+	
22'	35.2	4'-hydroxyacetophenone					++	+++	
23'	36.0	isopropyl catechol		+					
24'	36.1	2-tert-Butyl-4-methylphenol					+		
25'	36.2	malic acid					+++		+++
26'	36.3	propyl gallate				+++	++	++	
27'	36.6	vanillin					+	+	
28'	36.8	2,6-di-tert-butylphenol		+					
29'	36.83	2,4-di-tert-butylphenol					+		
30'	36.9	myrtenoic acid				+	+	+	
31'	37.0	$\beta$ -thujaplicin	+						
32'	37.3	tert-Butylhydroquinone		+					
33'	37.4	allyl carbamate						+	
34'	37.6	4-hydroxy- $\alpha$ -methylene-benzenemethanol					+		
35'	37.9	3,4-dihydroxybenzaldehyde		+					
36'	38.1	4-hydroxybenzoic acid		+			+	+++	+++

37'	38.2	5-(7a-isopropenyl-4,5-dimethyl-octahydroinden-4-yl)-3-methyl-pent-2-en-1-ol	+	+				+
38'	38.3	4-(acetyloxy)-3-methoxybenzoic acid						+
39'	38.4	dodecanoic acid			+	+		
40'	38.9	L-(+)-lactic acid	+					
41'	39.1	syringaldehyde				+		
42'	39.2	homovanillyl alcohol				+		
43'	39.3	9-hydroxynonanoic acid				+		
44'	39.7	L-(-)-arabitol						+++
45'	39.9	vanillic acid		+		++	+	
46'	40.2	azealic acid			+	++		
47'	40.7	myristic acid	+++	+	+++	+++	+++	
48'	41.1	3-phenyllactic acid					+	
49'	41.2	quininic acid			+			
50'	41.3	glyoxylic acid monohydrate					+	
51'	41.4	syringic acid			+	+	+	
52'	41.47	D-(-)-fructopyranose						+
53'	41.6	$\beta$ -D-(+)-talopyranose						+
54'	41.7	4-coumaric acid			+			
55'	41.78	pentadecanoic acid	+	+	+	++	++	+
56'	42.0	mannitol						+++
57'	42.2	myo-inositol						+++
58'	42.4	talose						+++
59'	42.5	palmitelaidic acid	+	+	+	+	+	
60'	43.3	tuberonic acid		+	+			
61'	43.6	heptadecanoic acid				+		

62'	43.68	methyl $\alpha$ -D-glucofuranoside									+
63'	43.7	caffeic acid			+						
64'	43.8	methyl galactoside (1S,2R,3S,4S,5R)-									+
65'	44.3	$\alpha$ -linolenic acid	+	+	+		+	+			
66'	45.3	moracin M		+							
67'	45.9	D-(+)-galacturonic acid									+
68'	46.0	thymol-B-D-glucopyranoside									+
69'	46.13	andrographolide		+							
70'	46.16	retinol		+							
71'	46.18	arachidic acid		+			++	++	+		
72'	46.3	prostaglandin E2	+								
73'	46.37	tryptophenolide		+							
74'	46.93	heneicosanoic acid					+	+			
75'	47.13	2-palmitoylglycerol			+		+		++		
76'	47.17	1,3-dipalmitin							+		
77'	47.3	1-monopalmitin	+	+	+++		++	++	++	+	
78'	47.5	$\beta$ -arabinopyranose									+
79'	47.6	aucubin									+
80'	47.67	behenic acid	+++	+			+	+++	+		
81'	47.8	(10E,15Z)-9,12,13-trihydroxyoctadeca-10,15-dienoic acid		+	+			+			
82'	47.9	D-(+)-turanose									+
83'	48.1	sucrose									+++
84'	48.2	maltose (isomer 2)									++
85'	48.29	lactulose									+
86'	48.3	tricosanoic acid						+			
87'	48.4	tetracosanol					+	+	+		

88'	48.5	2-monostearin			+				
89'	48.58	1-monooleoylglycerol					+		+
90'	48.6	1-monolinolein						++	
91'	48.63	1,5-anhydroglucitol							+
92'	48.69	D-arabinose							++
93'	48.7	glycerol monostearate	++	+++	+++		++	++	++
94'	48.79	monostearin							+++
95'	48.92	lactose							+++
96'	48.93	15-tetracosenoic acid, (Z)-						+	
97'	49.0	(±)-naringenin		+	+++				
98'	49.1	lignoceric acid	+				+	++	+
99'	49.76	pentacosanoic acid						+	
100'	49.8	1-hexacosanol	++				+		
101'	50.4	hexacosanoic acid					+	++	
102'	50.6	nonacosan-10-ol	+						
103'	50.7	5,7,4'-trihydroxy-8-c- prenyldihydro-flavonol			+				
104'	50.8	genistein							+
105'	50.9	5-hydroxy-7-methoxy-2- methylisoflavone			+++				
106'	51.1	1-octacosanol					+		
107'	51.3	chlorogenic acid							+
108'	51.36	cholesterol					+		
109'	51.8	octacosanoic acid					+	++	
110'	52.2	campesterol	+	+			+	+	
111'	52.4	homoeriodictyol chal- cone		+					
112'	52.5	stigmasterol	+++	+			+	+	
113'	52.7	1-triacontanol					+	+	
114'	53.6	α – amyrin					+++	+	



115'	54.8	erythrodiol	+		
116'	55.2	uvaol	+	+	
117'	55.4	betulinic alcohol	+		
118'	55.7	oleanolic acid	+++	++	+
119'	55.9	betulinic acid	+++	+	
120'	56.0	lup-20(29)-en-3-ol, acetate, (3 $\beta$ )-			
				+	+
121'	56.3	ursolic acid	+	+	+
122'	59.9	pomolic acid		+	

Note: +++: high amount; ++: moderate amount; + : low amount; RI is the retention index determined in regards to a series of n-alkanes (C7–C35) on the apolar DB-5 MS. The RI values are identified as following:  $RI = 100 \times n + 100 \times ((\text{Apex } Rt_{(\text{lower alkane})} - Rt_{(\text{lower alkane})}) / (Rt_{(\text{follower alkane})} - Rt_{(\text{lower alkane})}))$  where n is the number of carbon of lower alkane. The tR is the retention time in minute. Cyclohexane = CHX, Dichloromethane = DCM, Ethyl acetate = EtOAc, acetonitrile = MeCN