CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24H16-PTH09
Customer Identification : Sea Fennel - Greece - SB5103R
Type : Essential Oil
Source : *Crithmum maritimum*
Customer : Plant Therapy

Checked an approved by:

_____
Alexis St-Gelais, Ph. D., Chimiste 2013-174

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MÉTHODE CERTIFIÉE
⁕ISO 17025:2017
CERTIFIED METHOD

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GAS CHROMATOGRAPHIC ANALYSIS

Method : PC-MAT-014 - Analysis of the composition of an essential oil or other volatile liquide by FAST GC-FID

✳ISO

Results : See analysis summary (next page)

Analyst : Sylvain Mercier, M. Sc., Chimiste 2014-005

Date : 2024-08-26

PHYSICOCHEMICAL DATA

Refractive index : 1.4777 ± 0.0003 (20 ℃)

Method : PC-MAT-016 - Measure of the refractive index of a liquid.

Analyst : Kassandra Baker

Date : 2024-08-19

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.

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ANALYSIS SUMMARY - CONSOLIDATED CONTENTS

New readers of similar reports are encouraged to read table footnotes at least once.

Identification	%	Class
Heptanal	0.01	Aliphatic aldehyde
α-Thujene	0.50	Monoterpene
α-Pinene	3.26	Monoterpene
Camphene	0.08	Monoterpene
β-Pinene	0.29	Monoterpene
Sabinene	15.75	Monoterpene
Myrcene	1.68	Monoterpene
Pseudolimonene	0.07	Monoterpene
α-Phellandrene	0.63	Monoterpene
Δ3-Carene	0.05	Monoterpene
α-Terpinene	1.53	Monoterpene
para-Cymene	2.78	Monoterpene
Limonene	16.90	Monoterpene
1,8-Cineole	[13.24]	Monoterpenic ether
β-Phellandrene	[13.24]	Monoterpene
(*Z*)-β-Ocimene	4.86	Monoterpene
(*E*)-β-Ocimene	0.31	Monoterpene
γ-Terpinene	28.71	Monoterpene
cis-Sabinene hydrate	0.07	Monoterpenic alcohol
para-Cymenene	0.02	Monoterpene
Terpinolene	0.58	Monoterpene
trans-Sabinene hydrate	0.05	Monoterpenic alcohol
Linalool	0.05	Monoterpenic alcohol
Nonanal	0.01	Aliphatic aldehyde
Unknown	0.01	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
cis-para-Menth-2-en-1-ol	0.14	Monoterpenic alcohol
all*o*-Ocimene	0.14	Monoterpene
cis-Limonene oxide	0.01	Monoterpenic ether
cis-para-Mentha-2,8-dien-1-ol	0.01	Monoterpenic alcohol
trans-para-Menth-2-en-1-ol	0.09	Monoterpenic alcohol
Epoxyterpinolene	0.02	Monoterpenic ether
1,4-Dimethyl-4-acetylcyclohexene	0.02	Monoterpenic ketone
Sabinaketone	0.01	Normonoterpenic ketone
Terpinen-4-ol	2.94	Monoterpenic alcohol
Cryptone	0.05	Normonoterpenic ketone
para-Cymen-8-ol	0.02	Monoterpenic alcohol
α-Terpineol	0.15	Monoterpenic alcohol
cis-Piperitol	0.05	Monoterpenic alcohol
trans-Piperitol	0.07	Monoterpenic alcohol

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Compound	%	Class
Unknown	0.02	Unknown
Thymol methyl ether analog I (isothymol methyl ether?)	0.11	Monoterpenic ether
Thymol methyl ether	1.74	Monoterpenic ether
Carvacrol methyl ether	0.02	Monoterpenic ether
Unknown	0.01	Unknown
Unknown	0.02	Unknown
(2*E*)-Decenal	0.02	Aliphatic aldehyde
Geranial	0.14	Monoterpenic aldehyde
Bornyl acetate	0.07	Monoterpenic ester
Thymol	0.02	Monoterpenic alcohol
Unknown	0.01	Unknown
Carvacrol	0.01	Monoterpenic alcohol
Unknown	0.02	Unknown
Unknown	0.04	Unknown
β-Elemene	0.01	Sesquiterpene
β-Caryophyllene	0.09	Sesquiterpene
Aromadendrene	0.02	Sesquiterpene
α-Humulene	0.02	Sesquiterpene
9-epi-β-Caryophyllene	0.02	Sesquiterpene
Germacrene D	0.16	Sesquiterpene
Bicyclogermacrene	0.10	Sesquiterpene
Viridiflorene	0.03	Sesquiterpene
Cuparene	0.02	Sesquiterpene
β-Bisabolene	0.02	Sesquiterpene
δ-Cadinene	0.03	Sesquiterpene
β-Sesquiphellandrene	0.02	Sesquiterpene
Elemicin	0.03	Phenylpropanoid
Spathulenol	0.06	Sesquiterpenic alcohol
Caryophyllene oxide	0.04	Sesquiterpenic ether
Dill apiole	1.30	Phenylpropanoid
Isospathulenol	0.02	Sesquiterpenic alcohol
Unknown	0.01	Unknown
Germacra-4(15),5,10(14)-trien-1α-ol	0.02	Sesquiterpenic alcohol
Phytone	0.02	Terpenic ketone
Consolidated total	**99.48**	

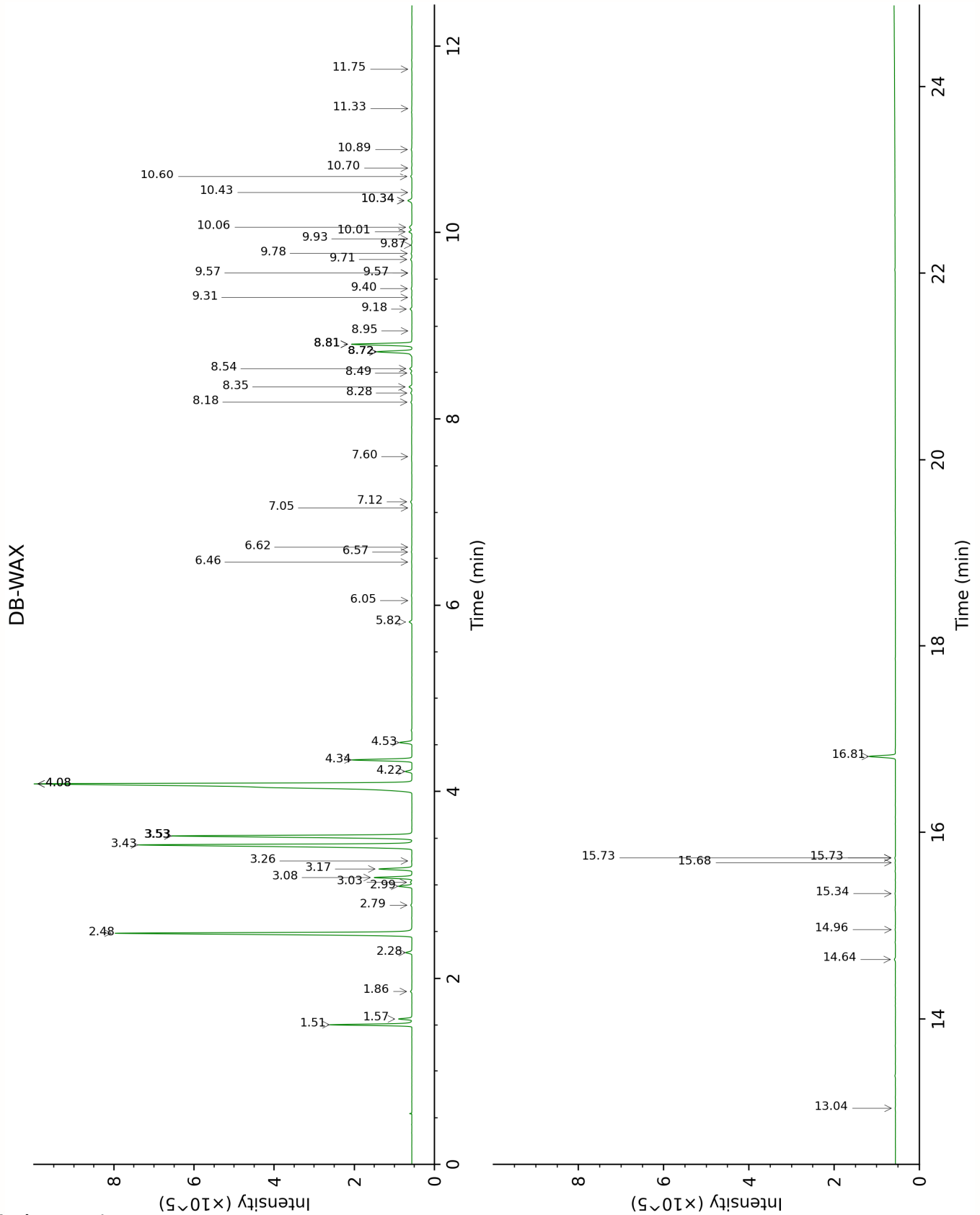tr: The compound has been detected below 0.005% of the total signal

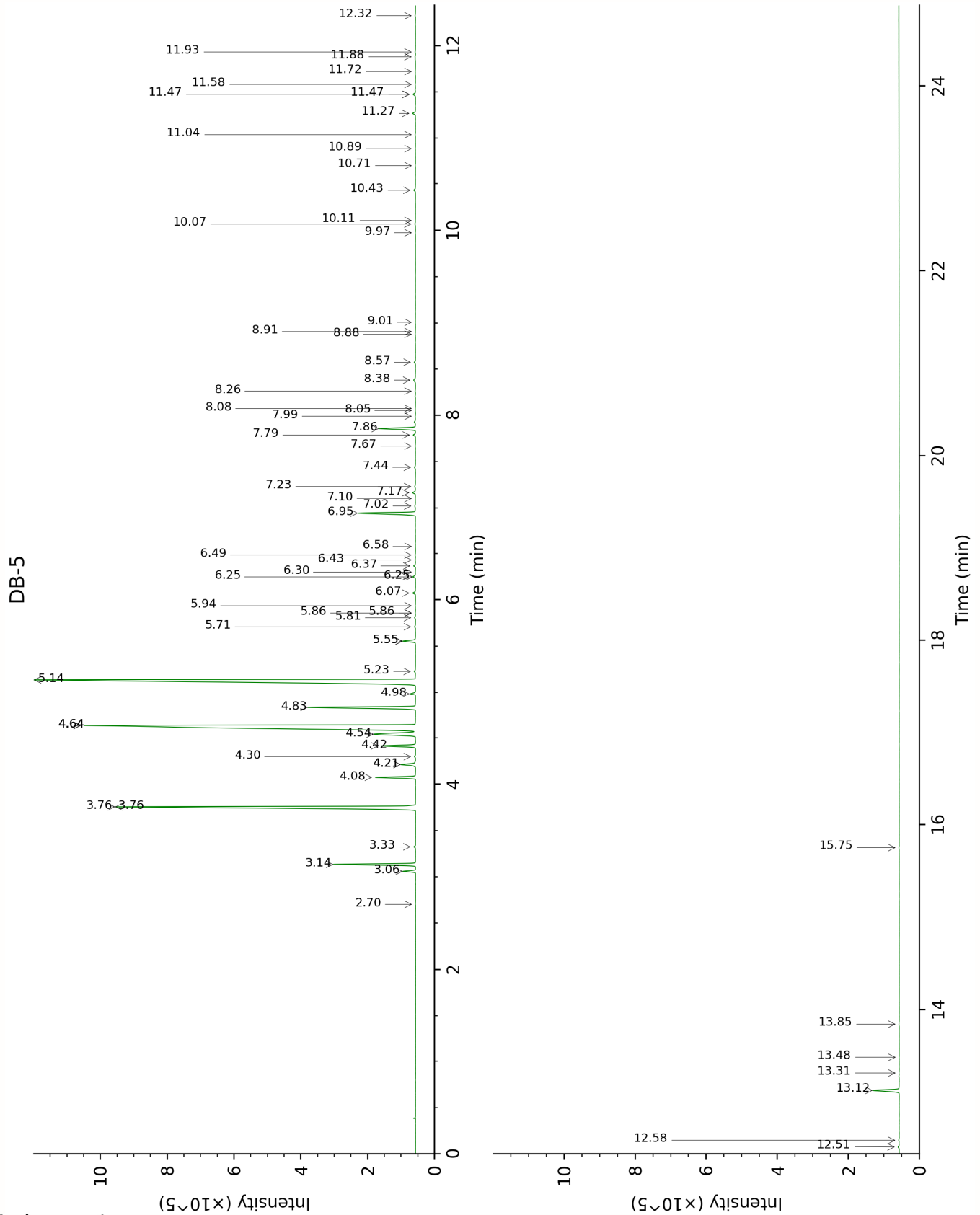Note: no correction factor was applied

About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm is set to prioritize data from the most standard DB-5 column, and smallest values so as to avoid overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report to access the full untreated data and perform their own calculations if needed.

Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

Bracketed value ([xx]): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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This page was intentionally left blank. The following pages present the complete data of the analysis.

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Essential Oil, *Crithmum maritimum*
Internal code: 24H16-PTH09

Sea Fennel - Greece - SB5103R

Report prepared for:
Plant Therapy

DB-WAX

Upper chromatogram (Time axis 0–12 min):

11.75, 11.33, 10.89, 10.70, 10.60, 10.43, 10.34, 10.06, 10.01, 9.93, 9.87, 9.78, 9.71, 9.57, 9.57, 9.40, 9.31, 9.18, 8.95, 8.81, 8.72, 8.54, 8.49, 8.35, 8.28, 8.18, 7.60, 7.12, 7.05, 6.62, 6.57, 6.46, 6.05, 5.82, 4.53, 4.34, 4.22, 4.08, 3.53, 3.43, 3.26, 3.17, 3.08, 3.03, 2.99, 2.79, 2.48, 2.28, 1.86, 1.57, 1.51

Time (min)

Intensity (×10^5)

Lower chromatogram (Time axis 12–24 min):

16.81, 15.73, 15.68, 15.73, 15.34, 14.96, 14.64, 13.04

Time (min)

Intensity (×10^5)

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DB-5

Time (min)

Intensity (×10^5)

Time (min)

Intensity (×10^5)

FULL ANALYSIS DATA

Heptanal	Column DB-WAX			Column DB-5		
	3.26	1147.3	0.02	2.70	901.5	0.01
α-Thujene	1.57	999.3	0.51	3.06	925.4	0.50
α-Pinene	1.51	992.6	3.24	3.14	930.3	3.26
Camphene	1.86	1027.3	0.07	3.33	942.9	0.08
β-Pinene	2.28	1066.9	0.29	3.76*	971.4	[16.07]
Sabinene	2.48	1086.7	15.75	3.76*	971.4	[16.07]
Myrcene	3.08	1133.8	1.69	4.08	992.4	1.68
Pseudolimonene	3.03	1129.8	0.07	4.21*	1001.5	[0.73]
α-Phellandrene	2.99	1126.7	0.63	4.21*	1001.5	[0.73]
Δ3-Carene	2.78	1111.2	0.06	4.30	1007.0	0.05
α-Terpinene	3.17	1140.8	1.53	4.42	1014.2	1.53
para-Cymene	4.34	1227.6	2.79	4.54	1022.1	2.78
Limonene	3.43	1160.5	16.90	4.64*	1028.0	[30.25]
1,8-Cineole	3.53*	1167.8	[13.24]	4.64*	1028.0	[30.25]
β-Phellandrene	3.53*	1167.8	[13.24]	4.64*	1028.0	[30.25]
(*Z*)-β-Ocimene	4.08*	1209.3	[33.46]	4.83	1040.2	4.86
(*E*)-β-Ocimene	4.22	1218.8	0.30	4.98	1049.7	0.31
γ-Terpinene	4.08*	1209.3	[33.46]	5.14	1059.2	28.71
cis-Sabinene hydrate	7.12	1426.8	0.07	5.23	1065.0	0.07
para-Cymenene	6.57	1386.9	0.02	5.55*	1085.4	[0.61]
Terpinolene	4.52	1240.9	0.58	5.55*	1085.4	[0.61]
trans-Sabinene hydrate	8.18	1505.9	0.06	5.71	1095.2	0.05
Linalool	8.28	1513.4	0.06	5.81	1101.3	0.05
Nonanal	6.05	1349.9	0.01	5.86*	1104.5	[0.02]
Unknown ORMA I [m/z 119, 109 (94), 43 (61), 95 (56), 91 (48), 77 (32), 152 (32), 137 (31), 134 (24)]	8.72*	1547.3	[1.83]	5.86*	1104.5	[0.02]
Unknown BOSE I [m/z 109, 81 (54), 91 (32), 79 (22)...]	6.46	1379.3	0.02	5.94	1109.5	0.01
cis-para-Menth-2-en-1-ol	8.35	1518.4	0.15	6.07	1118.2	0.14
all*o*-Ocimene	5.82	1333.6	0.14	6.25*	1129.4	[0.14]
cis-Limonene oxide	6.62	1390.6	0.01	6.25*	1129.4	[0.14]
cis-para-Mentha-2,8-dien-1-ol	9.71	1625.1	0.09	6.30	1132.7	0.01
trans-para-Menth-2-en-1-ol	9.18	1582.9	0.10	6.37	1136.9	0.09

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Epoxyterpinolene	7.05	1422.0	0.01	6.43	1141.0	0.02
1,4-Dimethyl-4-acetylcyclohexene	7.60	1462.4	0.02	6.48	1144.4	0.02
Sabinaketone	8.95	1565.0	0.02	6.58	1150.3	0.01
Terpinen-4-ol	8.81*	1554.1	[2.95]	6.94	1173.7	2.94
Cryptone	9.40	1600.1	0.04	7.02	1178.6	0.05
para-Cymen-8-ol	11.75	1793.9	0.02	7.10	1183.8	0.02
α-Terpineol	10.01	1648.7	0.15	7.16	1187.8	0.15
cis-Piperitol	9.78	1630.2	0.04	7.23	1192.0	0.05
trans-Piperitol	10.60	1696.5	0.07	7.44	1205.4	0.07
Unknown CRMA I [m/z 43, 119 (32), 97 (32), 41 (29), 71 (28), 58 (25)...]				7.67	1220.7	0.02
Thymol methyl ether analog I (isothymol methyl ether?)	8.54	1533.5	0.11	7.79	1228.7	0.11
Thymol methyl ether	8.72*	1547.3	[1.83]	7.86	1233.4	1.74
Carvacrol methyl ether	8.81*	1554.1	[2.95]	7.99	1242.2	0.02
Unknown CRMA II [m/z 43, 81 (62), 109 (51), 71 (40), 55 (26), 41 (25)...]				8.05	1246.4	0.01
Unknown MISC CV [m/z 43, 109 (63), 71 (50), 81 (31), 55 (29), 85 (26)...]	9.93	1642.8	0.02	8.08	1247.9	0.02
(2*E*)-Decenal	9.31	1592.5	0.03	8.26	1260.3	0.02
Geranial	10.34*	1675.5	[0.26]	8.38	1268.3	0.14
Bornyl acetate	8.49	1529.8	0.06	8.57	1281.2	0.07
Thymol	15.34	2126.6	0.02	8.88	1301.8	0.02
Unknown CRMA III [m/z 81, 137 (39), 43 (36), 95 (27), 69 (23), 79 (18)...]				8.91	1303.8	0.01
Carvacrol	15.68	2159.5	0.02	9.01	1310.9	0.01
Unknown ZIOF XII [m/z 139, 69 (63), 83 (53), 43 (49), 41 (39)...]				9.98	1378.6	0.02
Unknown CRMA VII [m/z 159, 43 (68),				10.07	1385.3	0.04

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Compound	R.T.	R.I.	%	R.T.	R.I.	%
91 (57), 119 (52), 105 (51), 107 (42)...]						
β-Elemene	8.72*	1547.3	[1.83]	10.11	1387.9	0.01
β-Caryophyllene	8.72*	1547.3	[1.83]	10.43	1411.3	0.09
Aromadendrene	8.81*	1554.1	[2.95]	10.70	1431.6	0.02
α-Humulene	9.57*	1613.4	[0.02]	10.89	1445.2	0.02
9-epi-β-Caryophyllene	9.57*	1613.4	[0.02]	11.04	1456.5	0.02
Germacrene D	10.06	1652.6	0.19	11.27	1473.5	0.16
Bicyclogermacrene	10.34*	1675.5	[0.26]	11.48*	1488.8	[0.13]
Viridiflorene	9.86	1637.3	0.03	11.48*	1488.8	[0.13]
Cuparene	11.33	1758.3	0.03	11.58	1496.8	0.02
β-Bisabolene	10.43	1682.5	0.02	11.72	1507.4	0.02
δ-Cadinene	10.70	1704.7	0.04	11.88	1519.9	0.03
β-Sesquiphellandrene	10.89	1721.4	0.05	11.93	1523.9	0.02
Elemicin	15.73*	2164.6	[0.03]	12.32	1554.6	0.03
Spathulenol	14.64	2057.6	0.06	12.51	1569.2	0.06
Caryophyllene oxide	13.04	1907.8	0.02	12.58	1574.8	0.04
Dill apiole	16.81	2276.0	1.28	13.12	1618.0	1.30
Isospathulenol	15.73*	2164.6	[0.03]	13.31	1633.4	0.02
Unknown SCTE IX [m/z 159, 91 (58), 105 (54), 93 (51), 81 (50), 177 (44)...]				13.48	1647.4	0.01
Germacra-4(15),5,10(14)-trien-1α-ol				13.85	1677.6	0.02
Phytone	14.96	2088.2	0.02	15.75	1843.4	0.02
Total reported		99.35%			99.63%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, only the first one is taken into account in the consolidated total

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied
R.T.: Retention time (minutes)
R.I.: Retention index

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