

Date : 2025-02-27

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25B13-PTH04

Customer Identification : Thyme (Thymol / Red) - Greece - T40114R

Type : Essential Oil

Source : *Thymus vulgaris* ct. *Thymol*

Customer : Plant Therapy

Checked and approved by:

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

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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 : 2025-02-26

PHYSICOCHEMICAL DATA

Refractive index : 1.5006 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2025-02-14

CONCLUSION

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

ANALYSIS SUMMARY - CONSOLIDATED CONTENTS

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

Identification	%	Class
Isobutyral	0.01	Aliphatic aldehyde
Isovaleral	0.01	Aliphatic aldehyde
2-Methylbutyral	0.01	Aliphatic aldehyde
Methyl 2-methylbutyrate	0.06	Aliphatic ester
(3Z)-Hexenol	0.15	Aliphatic alcohol
Tricyclene	0.11	Monoterpene
α -Thujene	0.56	Monoterpene
α -Pinene	0.90	Monoterpene
β -Fenchene	0.02	Monoterpene
Unknown	0.03	Monoterpene
Camphene	1.77	Monoterpene
α -Fenchene	0.03	Monoterpene
β -Pinene	0.22	Monoterpene
Sabinene	0.10	Monoterpene
Unknown	0.04	Monoterpene
Octen-3-ol	0.86	Aliphatic alcohol
Octan-3-one	0.06	Aliphatic ketone
Myrcene	1.83	Monoterpene
Octan-3-ol	0.02	Aliphatic alcohol
α -Phellandrene	0.27	Monoterpene
Δ^3 -Carene	0.14	Monoterpene
α -Terpinene	1.27	Monoterpene
<i>meta</i> -Cymene	0.09	Monoterpene
<i>para</i> -Cymene	16.75	Monoterpene
1,8-Cineole	1.09	Monoterpenic ether
Limonene	0.49	Monoterpene
β -Phellandrene	0.06	Monoterpene
(Z)- β -Ocimene	0.01	Monoterpene
(E)- β -Ocimene	0.02	Monoterpene
γ -Terpinene	6.30	Monoterpene
2-Methylbutyl butyrate	tr	Aliphatic ester
<i>cis</i> -Sabinene hydrate	0.08	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (fur.)	0.02	Monoterpenic alcohol
<i>trans</i> -Linalool oxide (fur.)	0.04	Monoterpenic alcohol
Terpinolene	0.12	Monoterpene
<i>para</i> -Cymenene	0.02	Monoterpene
<i>trans</i> -Sabinene hydrate	0.05	Monoterpenic alcohol
Nonanal	tr	Aliphatic aldehyde
Linalool	5.16	Monoterpenic alcohol
Hotrienol	0.03	Monoterpenic alcohol

endo-Fenchol	0.01	Monoterpenic alcohol
Unknown	0.02	Unknown
<i>trans</i> -Pinocarveol	0.03	Monoterpenic alcohol
Camphor	1.32	Monoterpenic ketone
<i>trans-para</i> -Menth-2-en-1-ol	tr	Monoterpenic alcohol
Camphene hydrate	0.01	Monoterpenic alcohol
<i>trans</i> -Chrysanthemal	0.01	Monoterpenic aldehyde
Unknown	0.01	Oxygenated monoterpene
Borneol	1.74	Monoterpenic alcohol
Terpinen-4-ol	0.64	Monoterpenic alcohol
<i>para</i> -Cymen-8-ol	0.01	Monoterpenic alcohol
α -Terpineol	0.20	Monoterpenic alcohol
Bornyl formate	0.02	Monoterpenic ester
Thymol methyl ether	0.40	Monoterpenic ether
Neral	0.02	Monoterpenic aldehyde
Carvone	0.20	Monoterpenic ketone
Carvacrol methyl ether	0.35	Monoterpenic ether
Geranial	0.03	Monoterpenic aldehyde
Bornyl acetate	0.02	Monoterpenic ester
Thymol analogue I (isothymol?)	0.04	Monoterpenic alcohol
Thymol	45.08	Monoterpenic alcohol
Thymol analogue III	0.02	Monoterpenic alcohol
Carvacrol	2.59	Monoterpenic alcohol
α -Cubebene	0.06	Sesquiterpene
Eugenol	0.16	Phenylpropanoid
Thymyl acetate	tr	Monoterpenic ester
α -Copaene	0.09	Sesquiterpene
Unknown	0.03	Unknown
Isocaryophyllene	0.03	Sesquiterpene
α -Gurjunene	0.01	Sesquiterpene
β -Caryophyllene	6.49	Sesquiterpene
Aromadendrene	0.04	Sesquiterpene
Unknown	0.01	Unknown
α -Humulene	0.06	Sesquiterpene
Unknown	0.04	Oxygenated monoterpene
allo-Aromadendrene	0.05	Sesquiterpene
(<i>E</i>)- β -Farnesene	0.05	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.03	Sesquiterpene
γ -Muurolene	0.03	Sesquiterpene
Germacrene D	0.04	Sesquiterpene
Bicyclogermacrene	0.04	Sesquiterpene
Viridiflorene	0.03	Sesquiterpene
α -Muurolene	0.03	Sesquiterpene
γ -Cadinene	0.03	Sesquiterpene
Cubebol	0.05	Sesquiterpenic alcohol

δ -Cadinene	0.20	Sesquiterpene
<i>trans</i> -Calamenene	0.02	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.03	Sesquiterpene
Geranyl butyrate	0.01	Monoterpenic ester
Caryophyllenyl alcohol	0.01	Sesquiterpenic alcohol
Spathulenol	0.03	Sesquiterpenic alcohol
Caryophyllene oxide isomer	0.01	Sesquiterpenic ether
Unknown	0.01	Oxygenated sesquiterpene
Caryophyllene oxide	0.16	Sesquiterpenic ether
Unknown	0.01	Unknown
Unknown	0.02	Unknown
Unknown	0.05	Unknown
<i>meta</i> -Camphorene	0.02	Diterpene
Unknown	0.01	Unknown
Consolidated total	99.62	

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.

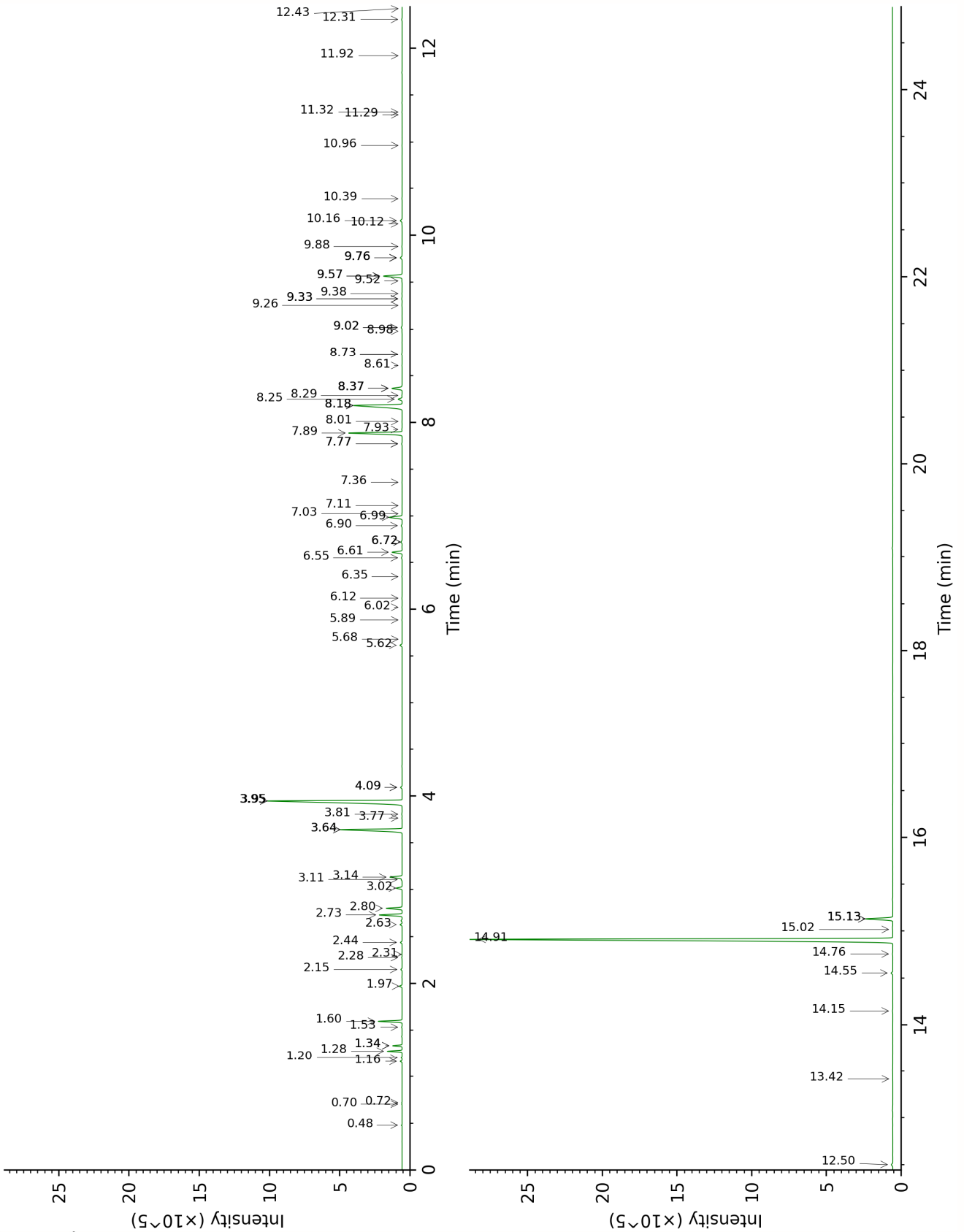
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

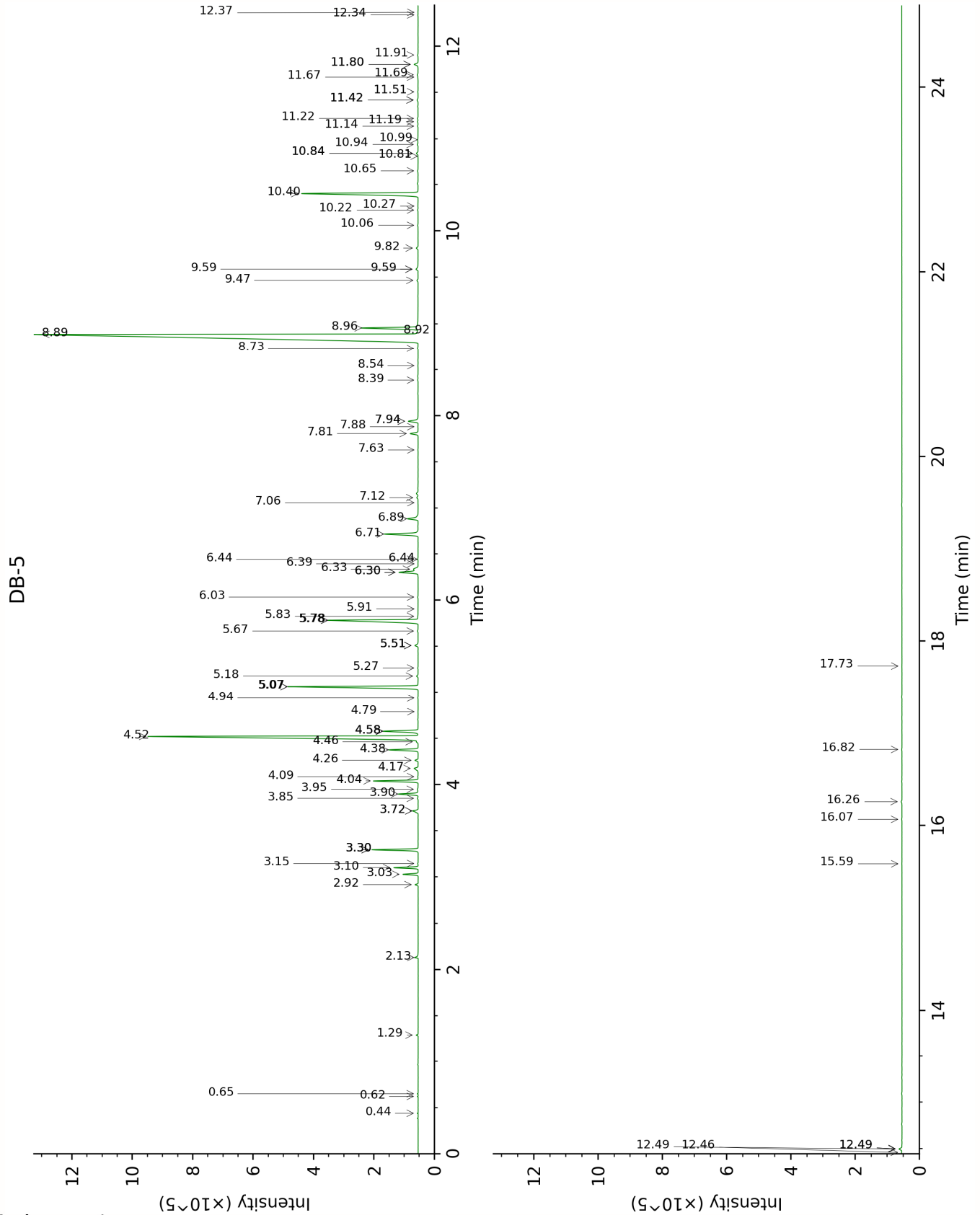
Bracketed value ([xx]): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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Thyme (Thymol / Red) - Greece - T40114R

DB-WAX





FULL ANALYSIS DATA

Isobutyral	Column DB-WAX			Column DB-5		
	0.48	786.7	0.02	0.44	539.7	0.01
Isovaleral	0.72	889.8	0.01	0.62	643.1	0.01
2-Methylbutyral	0.70	883.4	0.01	0.65	653.3	0.01
Methyl 2-methylbutyrate	1.20	979.1	0.05	1.29	775.9	0.06
(3Z)-Hexenol	5.62	1350.8	0.19	2.13	858.2	0.15
Tricyclene	1.16	972.4	0.11	2.92	920.1	0.11
α -Thujene	1.34*	1001.8	[0.57]	3.03	927.5	0.56
α -Pinene	1.28	991.8	0.93	3.10	932.2	0.90
β -Fenchene	1.34*	1001.8	[0.57]	3.15	935.2	0.02
Unknown SAOF I [m/z 91, 92 (47), 65 (11)... 134 (1)]	2.28	1097.3	0.03	3.30*	945.1	[1.80]
Camphene	1.60	1028.3	1.77	3.30*	945.1	[1.80]
α -Fenchene	1.53	1021.8	0.03	3.30*	945.1	[1.80]
β -Pinene	1.97	1066.2	0.22	3.72*	972.9	[0.33]
Sabinene	2.15	1084.3	0.10	3.72*	972.9	[0.33]
Unknown ORVU I [m/z 93, 79 (73), 67 (49), 95 (42), 91 (41), 121 (38)...]	2.31	1100.7	0.02	3.85	981.9	0.04
Octen-3-ol	6.61	1423.0	0.89	3.90	985.0	0.86
Octan-3-one	3.81	1218.9	0.04	3.95	988.3	0.06
Myrcene	2.73	1134.4	1.83	4.04	994.3	1.83
Octan-3-ol	5.89	1370.3	0.02	4.09	997.4	0.02
α -Phellandrene	2.63	1126.2	0.16	4.18	1003.3	0.27
Δ^3 -Carene	2.44	1111.1	0.14	4.26	1008.9	0.14
α -Terpinene	2.80	1140.1	1.26	4.38	1016.0	1.27
<i>meta</i> -Cymene	3.95*	1229.4	[16.87]	4.46	1021.5	0.09
<i>para</i> -Cymene	3.95*	1229.4	[16.87]	4.52	1025.1	16.75
1,8-Cineole	3.14	1166.6	1.09	4.58*	1028.6	[1.66]
Limonene	3.02	1157.2	0.49	4.58*	1028.6	[1.66]
β -Phellandrene	3.11	1164.5	0.06	4.58*	1028.6	[1.66]
(Z)- β -Ocimene	3.64*	1206.8	[6.31]	4.79	1041.8	0.01
(E)- β -Ocimene	3.77	1215.9	0.02	4.94	1051.2	0.02
γ -Terpinene	3.64*	1206.8	[6.31]	5.07*	1059.2	[6.30]
2-Methylbutyl butyrate	4.09*	1240.1	[0.14]	5.07*	1059.2	[6.30]
<i>cis</i> -Sabinene hydrate	6.72*	1431.1	[0.12]	5.18	1066.3	0.08
<i>cis</i> -Linalool oxide (fur.)	6.35	1403.5	0.02	5.27	1071.8	0.02
<i>trans</i> -Linalool	6.72*	1431.1	[0.12]	5.51*	1087.1	[0.18]

oxide (fur.)						
Terpinolene	4.09*	1240.1	[0.14]	5.51*	1087.1	[0.18]
<i>para</i> -Cymenene	6.12	1387.0	0.02	5.51*	1087.1	[0.18]
<i>trans</i> -Sabinene hydrate	7.77*	1510.0	[0.05]	5.67	1096.8	0.05
Nonanal	5.68	1355.5	tr	5.78*	1104.1	[5.11]
Linalool	7.89	1518.9	5.16	5.78*	1104.1	[5.11]
Hotrienol	8.61	1574.9	0.02	5.83	1106.8	0.03
endo-Fenchol	8.18*	1541.7	[6.47]	5.91	1111.9	0.01
Unknown CYFL II [m/z 81, 79 (19), 41 (12), 92 (8), 77 (8)...]	6.02	1380.0	0.02	6.03	1120.1	0.02
<i>trans</i> -Pinocarveol	8.98	1604.0	0.03	6.30*†	1137.2	[1.03]
Camphor	6.99	1451.3	1.32	6.30*†	1137.2	[1.03]
<i>trans-para</i> -Menth-2-en-1-ol	8.73*	1584.6	[0.05]	6.34*†	1139.3	[0.31]
Camphene hydrate	8.29	1550.1	0.03	6.39	1143.0	0.01
<i>trans</i> -Chrysanthemal	7.03	1454.1	0.01	6.44*	1146.2	[0.03]
Unknown DRMO V [m/z 123, 81 (60), 67 (49), 95 (36), 41 (29), 68 (25)...152 (2)]	7.11	1460.5	0.01	6.44*	1146.2	[0.03]
Borneol	9.57*	1651.6	[1.94]	6.72	1163.5	1.74
Terpinen-4-ol	8.37*	1556.0	[1.03]	6.89	1174.6	0.64
<i>para</i> -Cymen-8-ol	11.32	1798.5	0.02	7.06	1185.7	0.01
α -Terpineol	9.57*	1651.6	[1.94]	7.12†	1189.1	0.09
Bornyl formate	7.77*	1510.0	[0.05]	7.63	1222.8	0.02
Thymol methyl ether	8.25	1546.9	0.40	7.81	1234.7	0.40
Neral	9.26	1626.2	0.04	7.88	1239.6	0.02
Carvone	9.76*	1667.4	[0.21]	7.94*	1243.6	[0.55]
Carvacrol methyl ether	8.37*	1556.0	[1.03]	7.94*	1243.6	[0.55]
Geranial	9.88	1677.1	0.04	8.39	1273.3	0.03
Bornyl acetate	8.01	1528.5	0.02	8.54	1283.8	0.02
Thymol analogue I (isothymol?)	14.76	2119.0	0.04	8.73	1296.5	0.04
Thymol	14.91	2134.7	44.84	8.89	1306.9	45.08
Thymol analogue III	15.02	2145.3	0.02	8.92	1309.2	0.02
Carvacrol	15.13*	2156.7	[2.57]	8.96	1311.8	2.59

α-Cubebene	6.55	1418.5	0.06	9.47	1347.9	0.06
Eugenol	14.55	2098.5	0.16	9.59*	1356.3	[0.14]
Thymyl acetate	11.29	1796.0	tr	9.59*	1356.3	[0.14]
α-Copaene	6.90	1444.6	0.09	9.82	1372.4	0.09
Unknown MEPU VII [m/z 148, 133 (66), 105 (46), 43 (33), 77 (15)...]				10.06	1389.6	0.03
Isocaryophyllene	7.93	1521.8	0.04	10.22	1401.2	0.03
α-Gurjunene	7.36	1479.1	0.02	10.27	1404.2	0.01
β-Caryophyllene	8.18*	1541.7	[6.47]	10.40	1414.2	6.49
Aromadendrene	8.37*	1556.0	[1.03]	10.65	1433.0	0.04
Unknown CASA XV [m/z 79, 67 (75), 93 (47), 81 (47), 55 (46), 41 (43)...]				10.81	1444.8	0.01
α-Humulene	9.02*	1607.1	[0.09]	10.84*	1447.0	[0.10]
Unknown THVU I [m/z 151, 166 (40), 105 (26)...]				10.84*	1447.0	[0.10]
allo-Aromadendrene	8.73*	1584.6	[0.05]	10.94	1454.2	0.05
(E)-β-Farnesene	9.33*	1631.9	[0.05]	10.99	1458.0	0.05
trans-Cadina-1(6),4-diene	9.02*	1607.1	[0.09]	11.14	1468.9	0.03
γ-Muurolene	9.33*	1631.9	[0.05]	11.19	1472.5	0.03
Germacrene D	9.52	1647.4	0.04	11.22	1475.1	0.04
Bicyclogermacrene	9.76*	1667.4	[0.21]	11.42*	1490.0	[0.07]
Viridiflorene	9.38	1636.5	0.03	11.42*	1490.0	[0.07]
α-Muurolene	9.76*	1667.4	[0.21]	11.51	1496.5	0.03
γ-Cadinene	10.12	1696.7	0.03	11.67	1508.6	0.03
Cubebol	12.31	1886.5	0.05	11.69	1510.6	0.05
δ-Cadinene	10.16	1699.5	0.20	11.80*	1519.4	[0.23]
trans-Calamenene	10.96	1768.2	0.02	11.80*	1519.4	[0.23]
trans-Cadina-1,4-diene	10.39	1719.3	0.03	11.91	1527.4	0.03
Geranyl butyrate	11.92	1852.0	0.02	12.34	1561.3	0.01
Caryophyllenyl alcohol	13.42	1988.8	0.01	12.37	1563.5	0.01
Spathulenol	14.15	2059.3	0.04	12.46	1570.5	0.03
Caryophyllene oxide isomer	12.43	1897.0	0.01	12.50*	1573.5	[0.18]
Unknown THVU II [m/z 161, 187 (29), 105 (24), 91 (23),				12.50*	1573.5	[0.18]

93 (23)... 205 (19), 220? (2)]						
Caryophyllene oxide	12.50	1903.6	0.16	12.50*	1573.5	[0.18]
Unknown UNKN XX [m/z 81, 136 (68), 135 (58), 150 (44), 93 (34), 121 (30)...]				15.59	1834.8	0.01
Unknown THVU XVI [m/z 81, 136 (62), 135 (56), 150 (39), 93 (33), 121 (24)...]				16.07	1878.6	0.02
Unknown THVU III [m/z 136, 81 (96), 135 (76), 93 (48), 150 (47), 121 (43), 137 (28)...]				16.26	1896.0	0.05
<i>meta</i> -Camphorene	15.13*	2156.7	[2.57]	16.82	1949.3	0.02
Unknown UNKN XXIV [m/z 135, 43 (51), 150 (36), 109 (30), 93 (27), 95 (21)...]				17.73	2037.1	0.01
Total reported		99.04%			99.55%	

*: 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