

Date : 2023-08-24

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 23H17-PTH01

Customer Identification : Pomelo - Thailand - PB3100R

Type : Essential Oil

Source : *Citrus maxima*

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 : 2023-08-22

PHYSICOCHEMICAL DATA

Refractive index : 1.4735 ± 0.0003 (20 °C)

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

Analyst : Dany Massé B. Sc. Chimiste

Date : 2023-08-17

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
α -Thujene	tr	Monoterpene
α -Pinene	0.52	Monoterpene
α -Fenchene	tr	Monoterpene
Camphene	0.01	Monoterpene
β -Pinene	0.41	Monoterpene
Sabinene	0.18	Monoterpene
6-Methyl-5-hepten-2-one	0.01	Aliphatic ketone
Myrcene	1.83	Monoterpene
Pseudolimonene	0.02	Monoterpene
α -Phellandrene	0.43	Monoterpene
Δ^3 -Carene	0.01	Monoterpene
α -Terpinene	0.02	Monoterpene
<i>para</i> -Cymene	0.06	Monoterpene
Limonene	92.12	Monoterpene
β -Phellandrene	2.17	Monoterpene
(Z)- β -Ocimene	0.01	Monoterpene
(E)- β -Ocimene	0.09	Monoterpene
γ -Terpinene	0.03	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	0.03	Monoterpenic alcohol
Terpinolene	0.02	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	0.02	Monoterpenic alcohol
Linalool	0.14	Monoterpenic alcohol
Nonanal	0.01	Aliphatic aldehyde
<i>trans-para</i> -Mentha-2,8-dien-1-ol	0.05	Monoterpenic alcohol
<i>cis</i> -Limonene oxide	0.04	Monoterpenic ether
<i>trans</i> -Limonene oxide	0.02	Monoterpenic ether
<i>cis-para</i> -Mentha-2,8-dien-1-ol	0.03	Monoterpenic alcohol
<i>cis</i> - β -Terpineol	0.01	Monoterpenic alcohol
<i>trans</i> - β -Terpineol	0.01	Monoterpenic alcohol
Borneol	tr	Monoterpenic alcohol
Terpinen-4-ol	0.06	Monoterpenic alcohol
Cryptone	0.02	Normonoterpenic ketone
α -Terpineol	0.13	Monoterpenic alcohol
Unknown	0.02	Unknown
Unknown	0.01	Unknown
<i>trans</i> -Isopiperitenol	0.02	Monoterpenic alcohol
Decanal	0.02	Aliphatic aldehyde
<i>trans</i> -Carveol	0.04	Monoterpenic alcohol
<i>cis</i> -Carveol	0.04	Monoterpenic alcohol
Nerol	0.08	Monoterpenic alcohol

Citronellol	0.02	Monoterpenic alcohol
Neral	0.04	Monoterpenic aldehyde
Carvone	0.03	Monoterpenic ketone
Unknown	0.02	Unknown
Geraniol	0.08	Monoterpenic alcohol
Geranial	0.07	Monoterpenic aldehyde
<i>trans</i> -Carvone oxide	0.01	Monoterpenic ketone
Limonen-10-ol	0.01	Monoterpenic alcohol
Cuminol	0.01	Monoterpenic alcohol
Perilla alcohol	0.01	Monoterpenic alcohol
<i>para</i> -Mentha-1,8-diene-4-hydroperoxide	0.02	Monoterpenic peroxide
Limonene hydroperoxide IV	0.01	Monoterpenic peroxide
<i>trans-para</i> -Mentha-6,8-diene-2-hydroperoxide	0.01	Monoterpenic peroxide
α -Copaene	0.01	Sesquiterpene
Geranyl acetate	0.04	Monoterpenic ester
β -Elemene	0.01	Sesquiterpene
Methyleugenol	0.01	Phenylpropanoid
β -Caryophyllene	0.07	Sesquiterpene
α -Humulene	0.01	Sesquiterpene
Unknown	0.01	Unknown
Germacrene D	0.30	Sesquiterpene
Unknown	0.01	Sesquiterpene
α -Selinene	0.01	Sesquiterpene
γ -Cadinene	0.03	Sesquiterpene
δ -Cadinene	0.02	Sesquiterpene
Salviadienol?	0.02	Sesquiterpenic alcohol
(<i>E</i>)-Nerolidol	0.01	Sesquiterpenic alcohol
Spathulenol	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.01	Sesquiterpenic ether
Torilenol	0.01	Oxygenated sesquiterpene
Alismol	0.01	Sesquiterpenic alcohol
Unknown	0.04	Unknown
Nootkatone	0.01	Sesquiterpenic ketone
Consolidated total	99.70	

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

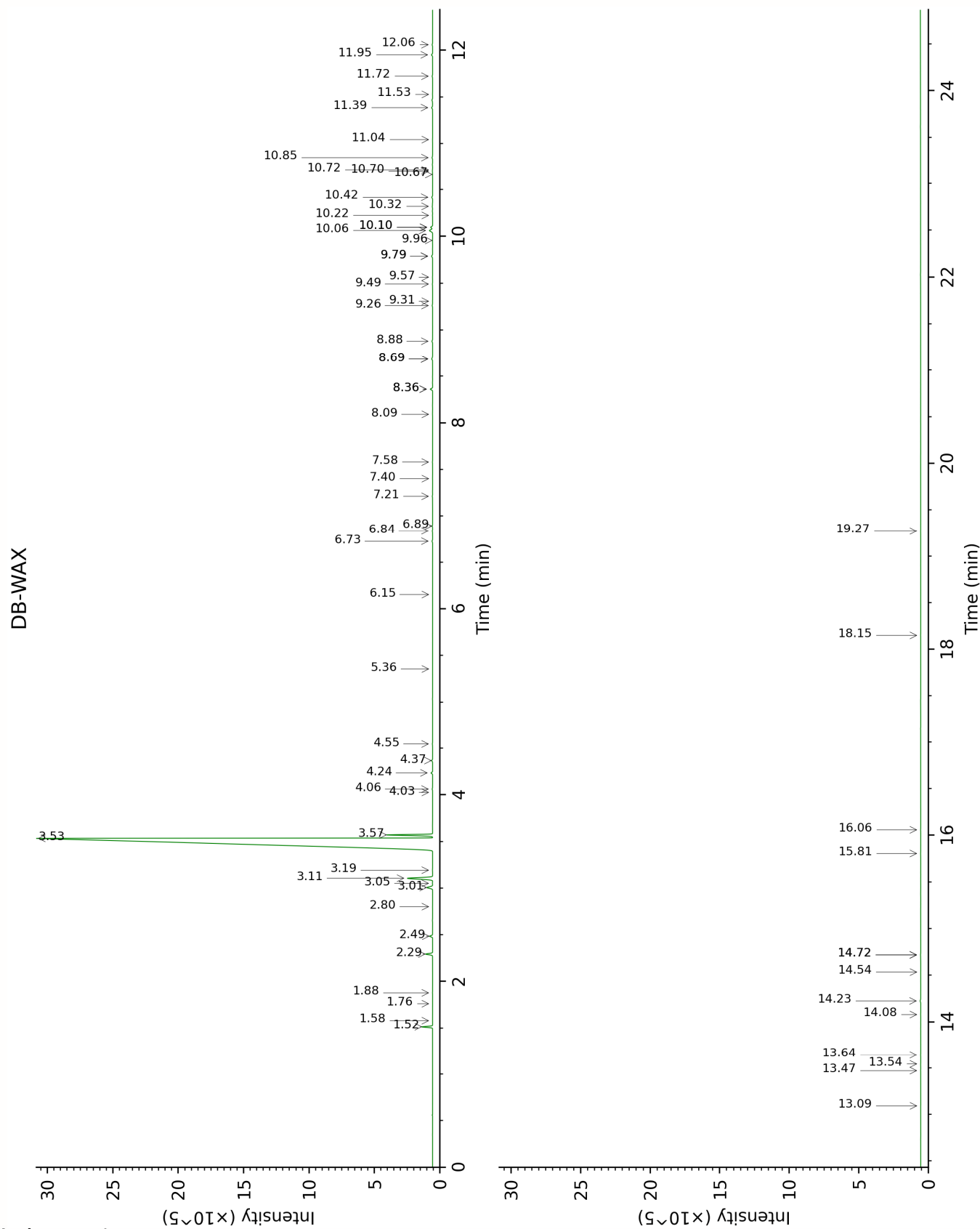
Note: no correction factor was applied

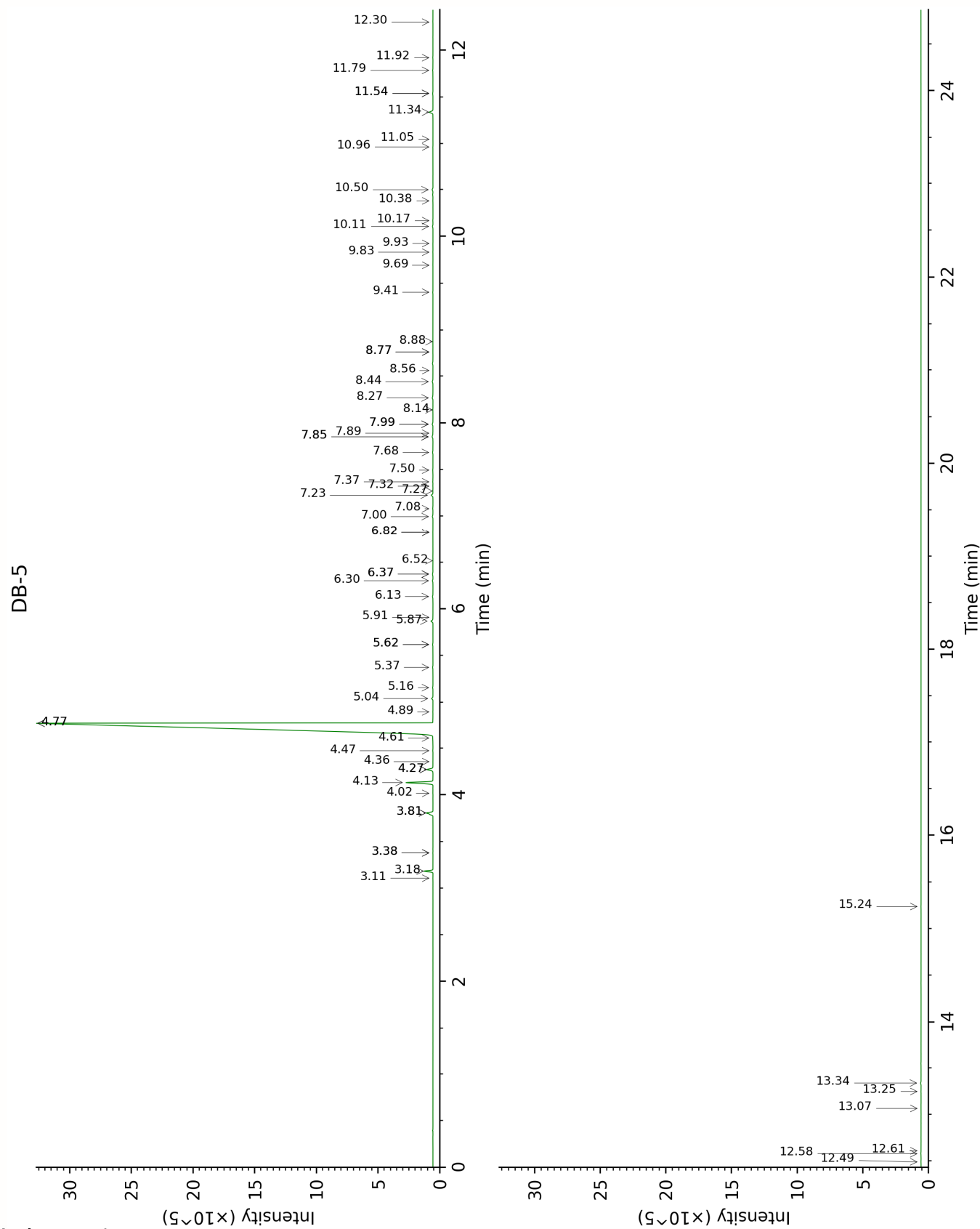
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm 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.

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





FULL ANALYSIS DATA

α-Thujene	Column DB-WAX			Column DB-5		
	1.58	998.8	tr	3.11	926.7	tr
α -Pinene	1.52	991.6	0.51	3.18	931.6	0.52
α -Fenchene	1.76	1015.9	tr	3.38*	944.4	[0.01]
Camphene	1.88	1026.8	0.01	3.38*	944.4	[0.01]
β -Pinene	2.30	1066.1	0.41	3.81*	972.5	[0.59]
Sabinene	2.49	1084.3	0.18	3.81*	972.5	[0.59]
6-Methyl-5-hepten-2-one	5.36	1298.1	tr	4.02	986.3	0.01
Myrcene	3.11	1133.7	1.84	4.13	993.9	1.83
Pseudolimonene	3.05	1129.5	0.02	4.27*	1003.0	[0.45]
α -Phellandrene	3.01	1126.0	0.43	4.27*	1003.0	[0.45]
Δ^3 -Carene	2.80	1110.3	tr	4.36	1008.4	0.01
α -Terpinene	3.19	1140.3	0.02	4.47	1015.7	0.02
<i>para</i> -Cymene	4.37	1228.8	0.06	4.61*†	1024.2	[0.02]
Limonene	3.53	1166.5	92.12	4.77*†	1034.0	[94.40]
β -Phellandrene	3.57	1169.4	2.17	4.77*†	1034.0	[94.40]
(<i>Z</i>)- β -Ocimene	4.03	1204.0	0.01	4.89	1041.6	0.01
(<i>E</i>)- β -Ocimene	4.24	1219.2	0.09	5.04	1051.0	0.09
γ -Terpinene	4.06	1206.6	0.03	5.16	1058.3	0.03
<i>cis</i> -Linalool oxide (fur.)	6.84	1404.3	0.03	5.37	1071.8	0.03
Terpinolene	4.55	1241.8	0.02	5.62*	1087.1	[0.03]
<i>trans</i> -Linalool oxide (fur.)	7.21	1432.0	0.02	5.62*	1087.1	[0.03]
Linalool	8.36*	1517.7	[0.15]	5.87	1102.7	0.14
Nonanal	6.15	1355.1	tr	5.91	1105.3	0.01
<i>trans-para</i> -Mentha-2,8-dien-1-ol	9.26	1586.9	0.04	6.13	1119.4	0.05
<i>cis</i> -Limonene oxide	6.73	1396.0	0.04	6.30	1130.2	0.04
<i>trans</i> -Limonene oxide	6.90	1408.4	0.02	6.37*	1134.7	[0.05]
<i>cis-para</i> -Mentha-2,8-dien-1-ol	9.79*	1629.0	[0.07]	6.37*	1134.7	[0.05]
<i>cis</i> - β -Terpineol	9.31	1590.4	0.01	6.52	1143.9	0.01
<i>trans</i> - β -Terpineol	9.96	1642.5	0.01	6.82*	1163.3	[0.01]
Borneol	10.10*	1653.8	[0.13]	6.82*	1163.3	[0.01]
Terpinen-4-ol	8.88	1557.6	0.05	7.00	1174.4	0.06
Cryptone	9.49	1605.1	0.02	7.08	1179.7	0.02
α -Terpineol	10.10*	1653.8	[0.13]	7.23	1189.0	0.13

Unknown MISC XXXI [m/z 121, 79 (98), 93 (87), 94 (73), 91 (63), 105 (45)...]	8.09	1496.9	0.01	7.27	1191.8	0.02
Unknown MISC XXXII [m/z 121, 79 (61), 93 (55), 94 (40), 91 (39), 84 (37)...]	8.36*	1517.7	[0.15]	7.32	1195.1	0.01
<i>trans</i> - Isopiperitenol	10.70	1702.9	0.01	7.37	1198.1	0.02
Decanal	7.58	1459.0	0.02	7.50	1206.2	0.02
<i>trans</i> -Carveol	11.72	1788.4	0.04	7.68	1218.8	0.04
<i>cis</i> -Carveol	12.06	1817.9	0.04	7.85*	1230.0	[0.09]
Nerol	11.39	1760.2	0.08	7.85*	1230.0	[0.09]
Citronellol	11.04	1731.4	0.01	7.89	1232.5	0.02
Neral	9.79*	1629.0	[0.07]	7.99*	1239.0	[0.07]
Carvone	10.32	1671.7	0.03	7.99*	1239.0	[0.07]
Unknown CIGL II [m/z 43, 97 (55), 107 (44), 41 (38), 109 (32), 55 (27)...]				8.14	1249.2	0.02
Geraniol	11.95	1808.4	0.08	8.27	1257.8	0.08
Geranial	10.42	1679.6	0.06	8.44	1269.4	0.07
<i>trans</i> -Carvone oxide	11.53	1772.0	0.01	8.56	1277.3	0.01
Limonen-10-ol	13.47	1943.8	0.01	8.77*	1291.0	[0.02]
Cuminol	14.54	2042.9	0.01	8.77*	1291.0	[0.02]
Perilla alcohol	13.54	1950.4	0.01	8.88	1298.5	0.01
<i>para</i> -Mentha- 1,8-diene-4- hydroperoxide				9.41	1335.2	0.02
Limonene hydroperoxide IV				9.69	1355.5	0.01
<i>trans-para</i> - Mentha-6,8- diene-2- hydroperoxide				9.83	1365.3	0.01
α -Copaene	7.40	1445.9	0.01	9.93	1371.8	0.01
Geranyl acetate	10.85	1715.2	0.05	10.11	1384.6	0.04
β -Elemene	8.69*	1542.6	[0.08]	10.17	1388.9	0.01
Methyleugenol	13.64	1959.5	0.01	10.38	1403.8	0.01

β-Caryophyllene	8.69*	1542.6	[0.08]	10.50	1412.6	0.07
α-Humulene	9.57	1611.1	0.01	10.96	1447.2	0.01
Unknown CALU X [m/z 109, 110 (33), 43 (30), 95 (23), 71 (20), 41 (19)...]				11.05	1453.3	0.01
Germacrene D	10.06	1651.0	0.28	11.34	1474.9	0.30
Unknown ZAAR VI [m/z 81, 82 (62), 41 (37), 69 (36), 43 (36), 110 (33), 71 (32)...204 (1)]	19.27	2537.3	0.01	11.54*	1489.8	[0.03]
α-Selinene	10.22	1664.0	0.01	11.54*	1489.8	[0.03]
γ-Cadinene	10.67	1700.1	0.01	11.78	1508.4	0.03
δ-Cadinene	10.72	1704.2	0.02	11.92	1519.0	0.02
Salviadienol?	14.72*	2060.4	[0.02]	12.30	1548.8	0.02
(E)-Nerolidol	14.08	1999.8	0.01	12.49	1563.6	0.01
Spathulenol	14.72*	2060.4	[0.02]	12.58	1570.6	0.02
Caryophyllene oxide	13.09	1909.2	0.01	12.61	1573.1	0.01
Torilenol	15.81	2166.7	0.02	13.07	1608.9	0.01
Alismol	16.06	2192.1	0.01	13.25	1623.9	0.01
Unknown SCTE X [m/z 43, 93 (89), 91 (88), 79 (87), 123 (76), 81 (75)...]	14.23	2013.6	0.04	13.34	1631.4	0.04
Nootkatone	18.15	2412.0	0.01	15.24	1792.3	0.01
Total reported		99.57%			99.74%	

*: 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