

Date : 2025-10-14

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25I30-PTH01

Customer Identification : Lemon Eucalyptus Organic - Brazil - E10117R

Type : Essential Oil

Source : *Eucalyptus citriodora* [syn. *Corymbia citriodora*]

Customer : Plant Therapy

Checked and approved by:

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

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia. This report is digitally signed, it is only considered valid if the digital signature is intact. The results only describe the samples that were submitted to the assays. The compliance status of the sample is provided to facilitate the reading of the report. The client remains ultimately responsible for reviewing the results presented within this report and to establish compliance of the tested batch against relevant quality criteria.



Laboratoire
PhytoChemia

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 : Jean-Christophe Fortin, M. Sc.

Date : 2025-10-14

PHYSICOCHEMICAL DATA

Refractive index : 1.4536 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2025-10-01

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
3-Methylcyclopentene	0.01	Alkene
Methylcyclopentane ?	0.01	Alkane
Isovaleral	0.01	Aliphatic aldehyde
2,4-Dimethyl-3-pentanone	tr	Aliphatic ketone
3-Methylcyclopentanol	0.01	Aliphatic alcohol
Unknown	0.01	Unknown
Unknown	0.02	Unknown
Styrene	0.01	Simple phenolic
Isobutyl isobutyrate	0.06	Aliphatic ester
1-Isopropylcyclohexene	0.01	Normonoterpene
α -Thujene	0.02	Monoterpene
α -Pinene	0.19	Monoterpene
3-Methylcyclohexanone	0.01	Aliphatic ketone
Unknown	0.01	Unknown
β -Pinene	0.47	Monoterpene
Sabinene	0.06	Monoterpene
6-Methyl-5-hepten-2-one	tr	Aliphatic ketone
Myrcene	0.12	Monoterpene
α -Phellandrene	0.01	Monoterpene
Isobutyl 2-methylbutyrate	0.01	Aliphatic ester
Isobutyl isovalerate	0.01	Aliphatic ester
α -Terpinene	0.01	Monoterpene
Isoamyl isobutyrate	0.02	Aliphatic ester
2-Methylbutyl isobutyrate	0.01	Aliphatic ester
<i>para</i> -Cymene	0.03	Monoterpene
1,8-Cineole	0.47	Monoterpenic ether
Limonene	0.15	Monoterpene
(Z)- β -Ocimene	0.13	Monoterpene
(E)- β -Ocimene	0.04	Monoterpene
Unknown	0.02	Unknown
2,6-Dimethyl-5-heptenal (melonal)	0.10	Aliphatic aldehyde
γ -Terpinene	0.12	Monoterpene
<i>para</i> -Mentha-3,8-diene	0.07	Monoterpene
Terpinolene isomer	0.02	Monoterpene
Terpinolene	0.09	Monoterpene
α -Pinene oxide	0.01	Monoterpenic ether
Unknown	0.02	Oxygenated monoterpene
Linalool	0.31	Monoterpenic alcohol
<i>cis</i> -Rose oxide	0.09	Monoterpenic ether
<i>trans</i> -Rose oxide	0.03	Monoterpenic ether

Unknown	0.06	Oxygenated normonoterpene
Isopulegol	4.57	Monoterpenic alcohol
Menthone	0.08	Monoterpenic ketone
iso-Isopulegol	2.39	Monoterpenic alcohol
Citronellal	73.95	Monoterpenic aldehyde
Borneol	0.02	Monoterpenic alcohol
neoiso-Isopulegol	0.32	Monoterpenic alcohol
trans-Isopulegone	0.02	Monoterpenic ketone
Isopulegol isomer	0.09	Monoterpenic alcohol
Terpinen-4-ol	0.03	Monoterpenic alcohol
para-Cymen-8-ol	0.02	Monoterpenic alcohol
α -Terpineol	0.06	Monoterpenic alcohol
trans-Pulegol	0.01	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Nerol	0.06	Monoterpenic alcohol
Citronellol	5.89	Monoterpenic alcohol
Pulegone	0.03	Monoterpenic ketone
Neral	0.05	Monoterpenic aldehyde
Unknown	0.06	Unknown
Geraniol	0.13	Monoterpenic alcohol
Methyl citronellate	0.01	Monoterpenic ester
Geranial	0.05	Monoterpenic aldehyde
Citronellyl formate	0.01	Monoterpenic ester
Benzyl isobutyrate	0.02	Phenolic ester
4-Vinylguaiaicol	0.05	Simple phenolic
Citronellic acid	0.28	Monoterpenic acid
8-Hydroxy-neo-menthol	0.79	Monoterpenic alcohol
8-Hydroxy-iso-menthol	0.36	Monoterpenic alcohol
Eugenol	0.06	Phenylpropanoid
Citronellyl acetate	0.78	Monoterpenic ester
Neryl acetate	0.03	Monoterpenic ester
8-Hydroxy-neoiso-menthol	0.02	Monoterpenic alcohol
Geranyl acetate	0.07	Monoterpenic ester
Isobutyl phenylacetate	0.01	Phenolic ester
β -Elemene	0.03	Sesquiterpene
(Z)-Jasmone	0.09	Jasmonate
Benzyl isovalerate	0.07	Phenolic ester
Methyleugenol	0.01	Phenylpropanoid
β -Caryophyllene	1.15	Sesquiterpene
α -Humulene	0.08	Sesquiterpene
allo-Aromadendrene	0.02	Sesquiterpene
Germacrene D	0.07	Sesquiterpene
Isoamyl phenylacetate	0.03	Phenolic ester
Bicyclogermacrene	0.09	Sesquiterpene
α -Murolene	0.01	Sesquiterpene

γ -Cadinene	0.01	Sesquiterpene
δ -Cadinene	0.03	Sesquiterpene
α -Elemol	0.02	Sesquiterpenic alcohol
Germacrene B	0.02	Sesquiterpene
Spathulenol	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.06	Sesquiterpenic ether
Caryophyllene oxide isomer	0.01	Sesquiterpenic ether
α -Cadinol	0.01	Sesquiterpenic alcohol
Unknown	0.04	Oxygenated diterpene
Unknown	0.01	Oxygenated diterpene
Unknown	0.04	Oxygenated diterpene
Unknown	0.01	Oxygenated diterpene
Unknown	0.01	Oxygenated diterpene
Unknown	0.63	Oxygenated diterpene
Unknown	0.03	Oxygenated diterpene
Unknown	0.03	Oxygenated diterpene
Unknown	0.03	Oxygenated diterpene
Unknown	0.09	Oxygenated diterpene
Unknown	0.16	Oxygenated diterpene
Unknown	0.04	Oxygenated diterpene
Unknown	0.02	Oxygenated diterpene
Unknown	0.04	Oxygenated diterpene
Unknown	0.03	Unknown
Unknown	0.01	Unknown
Unknown	0.01	Oxygenated diterpene
Unknown	0.03	Oxygenated diterpene
Unknown	0.02	Unknown
Unknown	0.03	Unknown
Unknown	0.01	Unknown
Unknown	0.02	Unknown
Unknown	0.04	Unknown
Unknown	0.01	Oxygenated diterpene
Unknown	0.06	Unknown
Unknown	0.01	Unknown
Unknown	0.02	Unknown
Unknown	0.20	Unknown
Unknown	0.12	Unknown
Unknown	0.23	Unknown
Unknown	0.11	Unknown
Unknown	0.75	Unknown
Consolidated total	97.89	

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

Note: no correction factor was applied

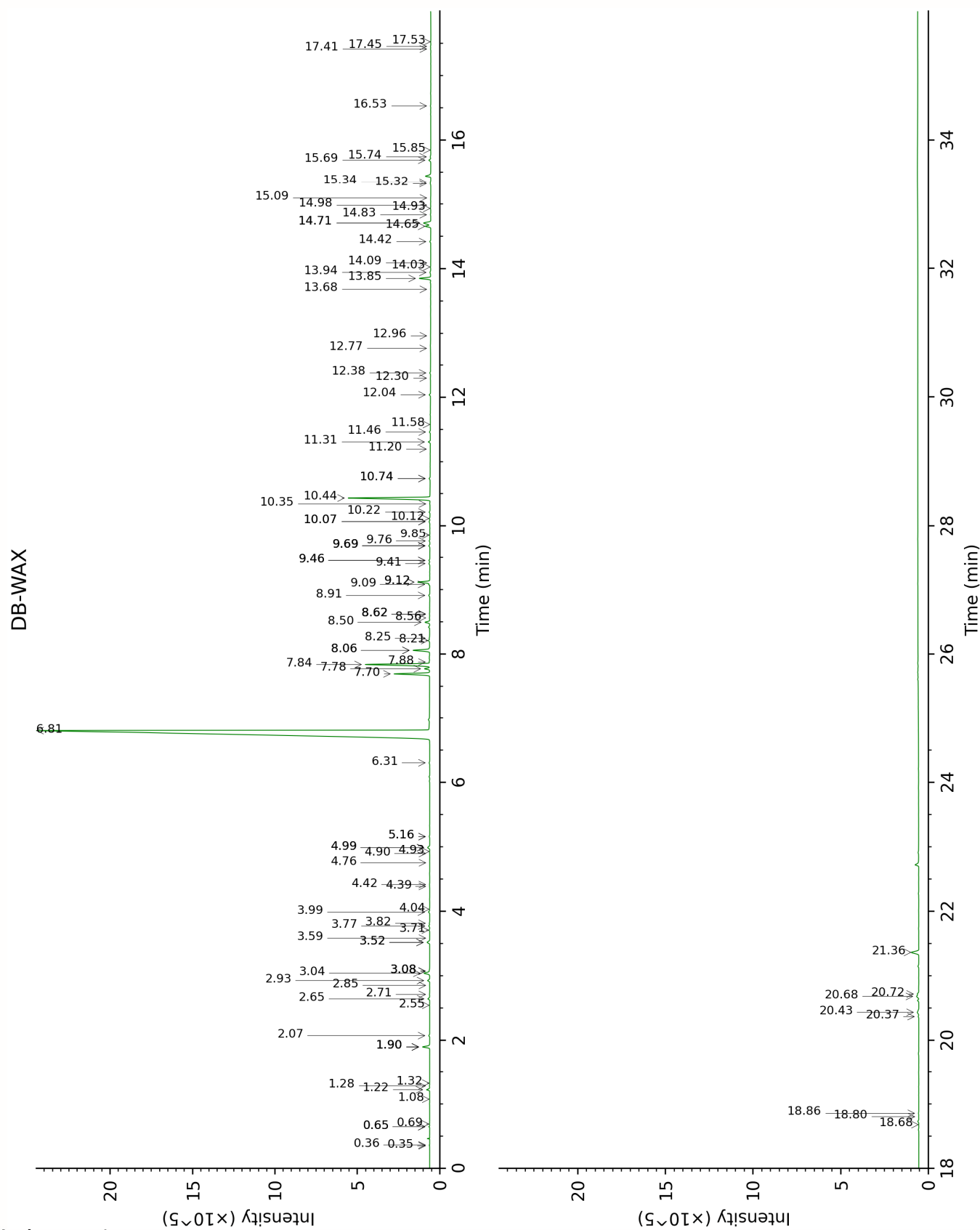
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm is set to prioritize data from the most standard DB-5 column, and smallest values so as to avoid

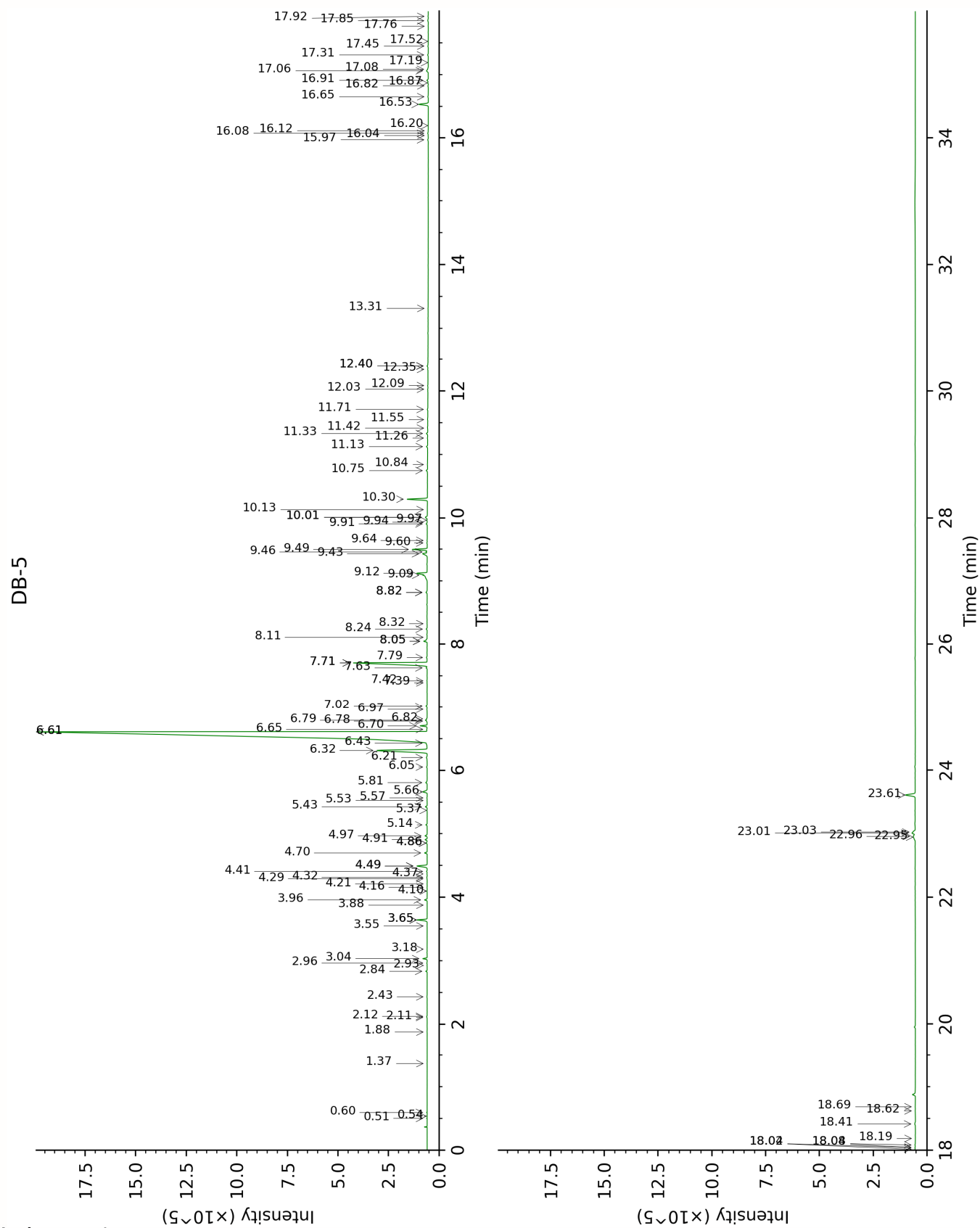
overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report to access the full untreated data and perform their own calculations if needed.

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

3-Methylcyclopentene	Column DB-WAX			Column DB-5		
	0.36	668.3	0.01	0.51	608.8	0.01
Methylcyclopentane ?	0.35	641.1	0.01	0.54	621.1	0.01
Isovaleral	0.69	885.6	0.01	0.60	642.1	0.01
2,4-Dimethyl-3-pentanone	1.08	962.9	0.01	1.37	791.9	tr
3-Methylcyclopentanol	4.90	1304.2	0.01	1.88	840.1	0.01
Unknown COCI I [m/z 55, 83 (89), 82 (70), 67 (66), 41 (55), 69 (46), 111 (37)... 126 (2)]	0.65*	869.0	[0.03]	2.11	859.6	0.01
Unknown COCI II [m/z 55, 83 (79), 67 (65), 41 (63), 82 (60), 69 (58)... 111 (27), 126 (9)]	0.65*	869.0	[0.03]	2.12	860.9	0.02
Styrene	3.59	1208.6	0.01	2.43	887.0	0.01
Isobutyl isobutyrate	1.90*	1063.9	[0.53]	2.84	917.6	0.06
1-Isopropylcyclohexene	1.32	1004.5	tr	2.93	923.7	0.01
α-Thujene	1.28	999.2	0.02	2.96	926.2	0.02
α-Pinene	1.22	988.6	0.18	3.04	930.9	0.19
3-Methylcyclohexanone	4.39	1268.8	0.01	3.18	940.9	0.01
Unknown COCI III [m/z 99, 81 (98), 55 (51), 43 (42), 41 (34)... 109? (2)]	1.90*	1063.9	[0.53]	3.55	965.4	0.01
β-Pinene	1.90*	1063.9	[0.53]	3.64*	971.8	[0.53]
Sabinene	2.07	1082.1	0.06	3.64*	971.8	[0.53]
6-Methyl-5-hepten-2-one	4.76	1296.5	tr	3.88	987.4	tr
Myrcene	2.64	1132.6	0.12	3.96	993.0	0.12
α-Phellandrene	2.55	1124.6	0.01	4.10	1002.3	0.01
Isobutyl 2-methylbutyrate	2.85	1149.5	0.01	4.16	1006.2	0.01
Isobutyl isovalerate	3.08*	1167.5	[0.04]	4.21	1009.6	0.01
α-Terpinene	2.71	1138.1	0.01	4.29	1014.8	0.01
Isoamyl isobutyrate	3.08*	1167.5	[0.04]	4.32	1016.2	0.02
2-Methylbutyl isobutyrate	3.08*	1167.5	[0.04]	4.37	1019.6	0.01
para-Cymene	3.82	1225.8	0.03	4.41	1022.0	0.03
1,8-Cineole	3.04	1164.8	0.47	4.49*	1027.4	[0.66]
Limonene	2.93	1155.6	0.15	4.49*	1027.4	[0.66]

(Z)- β -Ocimene	3.52*	1203.6	[0.23]	4.70	1040.5	0.13
(E)- β -Ocimene	3.71	1217.9	0.04	4.86*	1050.4	[0.06]
Unknown COCI V [m/z 125, 69 (75), 41 (34), 55 (25), 93 (22)... 140 (3)]	4.42	1271.0	0.02	4.86*	1050.4	[0.06]
2,6-Dimethyl-5-heptenal (melonal)	4.99*	1310.8	[0.18]	4.91	1053.8	0.10
γ -Terpinene	3.52*	1203.6	[0.23]	4.97	1057.7	0.12
<i>para</i> -Mentha-3,8-diene	3.77	1222.6	0.07	5.14	1068.7	0.07
Terpinolene isomer	4.04	1242.2	0.02	5.37	1083.2	0.02
Terpinolene	3.99	1238.9	0.08	5.43	1086.8	0.09
α -Pinene oxide	5.16*	1323.3	[0.04]	5.53	1093.0	0.01
Unknown COCI VI [m/z 67, 82 (79), 81 (34), 41 (32), 55 (16)... 152 (5)]	4.93	1306.5	0.01	5.57	1095.7	0.02
Linalool	7.78	1517.7	0.32	5.66	1101.7	0.31
<i>cis</i> -Rose oxide	4.99*	1310.8	[0.18]	5.81	1111.1	0.09
<i>trans</i> -Rose oxide	5.16*	1323.3	[0.04]	6.05	1127.0	0.03
Unknown COCI VIII [m/z 41, 69 (87), 82 (66), 67 (55), 109 (46)... 142 (18)]	9.09	1621.0	0.06	6.20	1136.8	0.06
Isopulegol	7.84	1523.0	4.61	6.32	1143.9	4.57
Menthone	6.31	1406.8	0.05	6.43	1151.5	0.08
iso-Isopulegol	7.70	1511.5	2.39	6.61*	1163.1	[77.06]
Citronellal	6.81	1444.2	73.95	6.61*	1163.1	[77.06]
Borneol	9.46*	1651.5	[0.07]	6.65	1165.6	0.02
neoiso-Isopulegol	8.50	1574.2	0.31	6.70	1169.2	0.32
<i>trans</i> -Isopulegone	8.62*	1584.2	[0.02]	6.78	1174.2	0.02
Isopulegol isomer	8.21	1552.0	0.08	6.79	1175.0	0.09
Terpinen-4-ol	8.25	1554.9	0.03	6.82	1176.4	0.03
<i>para</i> -Cymen-8-ol	11.20	1797.9	0.01	6.97	1186.4	0.02
α -Terpineol	9.46*	1651.5	[0.07]	7.02	1189.5	0.06
<i>trans</i> -Pulegol	9.68*	1670.1	[0.08]	7.39	1214.4	0.01
Unknown COCI IX [m/z 69, 55 (65), 43 (47), 41 (44), 83 (42), 75 (37), 125 (36)... 154 (1)]				7.42	1216.5	0.02
Nerol	10.74*	1758.8	[0.07]	7.63	1230.5	0.06
Citronellol	10.44	1733.0	5.89	7.71*	1235.8	[5.92]
Pulegone	8.62*	1584.2	[0.02]	7.71*	1235.8	[5.92]

Neral	9.12*	1623.9	[0.82]	7.79	1241.6	0.05
Unknown COCI XI [m/z 59, 41 (62), 43 (51), 97 (42), 69 (37)...]	10.07*	1701.7	[0.08]	8.05*	1259.1	[0.19]
Geraniol	11.31	1807.6	0.13	8.05*	1259.1	[0.19]
Methyl citronellate	7.88	1525.9	0.03	8.11	1263.4	0.01
Geranial	9.76	1676.2	0.05	8.24	1272.2	0.05
Citronellyl formate	8.56	1579.5	0.02	8.32	1278.0	0.01
Benzyl isobutyrate	10.35	1725.2	0.02	8.82*	1308.8	[0.08]
4-Vinylguaiaacol	14.71*	2126.5	[0.69]	8.82*	1308.8	[0.08]
Citronellic acid				9.09*†	1328.2	[0.26]
8-Hydroxy-neo-menthol	13.85	2042.4	0.79	9.12*†	1330.2	[0.67]
8-Hydroxy-iso-menthol	14.66	2121.3	0.38	9.43	1352.2	0.36
Eugenol	14.42	2097.6	0.06	9.46	1354.1	0.06
Citronellyl acetate	9.12*	1623.9	[0.82]	9.50	1357.0	0.78
Neryl acetate	9.85	1683.7	0.02	9.60	1364.3	0.03
8-Hydroxy-neoiso-menthol	14.83	2139.4	0.03	9.64	1367.0	0.02
Geranyl acetate	10.22	1714.3	0.06	9.91	1386.4	0.07
Isobutyl phenylacetate	11.58	1831.9	0.01	9.94	1388.3	0.01
β-Elemene	8.06*	1540.1	[1.19]	9.97	1390.6	0.03
(Z)-Jasmone	12.04	1873.1	0.09	10.01*	1393.8	[0.15]
Benzyl isovalerate	11.46	1821.4	0.07	10.01*	1393.8	[0.15]
Methyleugenol	12.96	1958.2	0.01	10.13	1402.4	0.01
β-Caryophyllene	8.06*	1540.1	[1.19]	10.30	1414.5	1.15
α-Humulene	8.92	1607.1	0.07	10.75	1448.3	0.08
allo-Aromadendrene	8.62*	1584.2	[0.02]	10.84	1455.4	0.02
Germacrene D	9.41	1647.5	0.08	11.13	1476.5	0.07
Isoamyl phenylacetate	12.77	1940.0	0.01	11.26	1486.7	0.03
Bicyclogermacrene	9.68*	1670.1	[0.08]	11.33	1492.1	0.09
α-Murolene	9.68*	1670.1	[0.08]	11.42	1498.4	0.01
γ-Cadinene	10.07*	1701.7	[0.08]	11.55	1508.5	0.01
δ-Cadinene	10.12	1705.8	0.06	11.71	1521.3	0.03
α-Elemol	13.68	2026.0	0.01	12.03	1546.4	0.02
Germacrene B	10.74*	1758.8	[0.07]	12.09	1550.9	0.02
Spathulenol	14.03	2059.6	0.02	12.34	1571.2	0.02
Caryophyllene oxide	12.38	1903.5	0.06	12.40*	1575.3	[0.06]
Caryophyllene oxide isomer	12.30	1896.2	0.01	12.40*	1575.3	[0.06]
α-Cadinol	15.09	2165.7	0.01	13.31	1649.8	0.01
Unknown COCI XVIII				15.97	1882.2	0.04

[m/z 81, 69 (87), 93 (74), 121 (71), 41 (70), 205 (47)... 290 (18)]						
Unknown COCI XIX [m/z 69, 41 (48), 81 (36), 121 (34), 83 (32), 55 (30)... 290 (t)]				16.04	1888.4	0.01
Unknown COCI XX [m/z 81, 93 (70), 121 (64), 69 (64), 41 (56), 205 (50)... 290 (19)]	13.94	2051.4	0.09	16.08	1891.6	0.04
Unknown COCI XXI [m/z 165, 69 (87), 205 (72), 81 (67), 41 (65)... 290 (4)]	14.09	2065.6	0.01	16.12	1895.3	0.01
Unknown COCI XXII [m/z 165, 205 (96), 69 (72), 41 (61), 81 (49)... 290 (6)]				16.20	1902.7	0.01
Unknown COCI XXIII [m/z 81, 137 (85), 95 (48), 69 (44)... 308? (t)]	14.71*	2126.5	[0.69]	16.53	1934.5	0.63
Unknown COCI XXIV [m/z 137, 81 (81), 95 (41), 183 (38)...]	14.98	2154.5	0.01	16.65	1946.0	0.03
Unknown COCI XXV [m/z 69, 81 (53), 41 (51), 137 (39), 121 (33)...]	14.93	2149.3	0.02	16.82	1962.5	0.03
Unknown COCI XXVI [m/z 81, 93 (59), 205 (55), 121 (50), 41 (43)... 290 (8)]	15.32	2188.4	0.04	16.87	1966.8	0.03
Unknown COCI XLV [m/z 81, 205 (66), 69 (58), 41 (56), 93 (56), 121 (47)... 290 (9)]	15.34	2190.9	0.04	16.91	1970.6	0.09
Unknown COCI XXVII [m/z 81, 137 (60), 69 (47), 95 (41), 41 (39), 55 (25)... 308? (t)]	15.69	2226.6	0.15	17.06	1985.0	0.16
Unknown COCI XXVIII [m/z 81, 137 (94), 95 (46), 69 (38), 41 (36)...]	15.74	2232.1	0.05	17.08	1987.3	0.04
Unknown COCI XXIX	15.85	2243.1	0.02	17.19	1997.4	0.02

[m/z 81, 137 (70), 95 (46), 69 (45), 41 (39), 55 (29)...]						
Unknown COCI XXX [m/z 41, 69 (98), 55 (55), 81 (46), 109 (46)... 290 (8)]	16.53	2315.1	0.03	17.31	2009.0	0.04
Unknown COCI LXIII [m/z 69, 41 (95), 55 (57), 109 (46), 95 (45), 67 (34)...]				17.45	2022.9	0.03
Unknown COCI LXIV [m/z 69, 41 (96), 55 (53), 109 (48), 95 (43), 67 (35)...]				17.52	2030.3	0.01
Unknown COCI XXXIII [m/z 69, 81 (88), 43 (85), 95 (60)... 308 (t)]	18.80	2570.2	0.01	17.76	2054.0	0.01
Unknown COCI XXXV [m/z 81, 95 (49), 69 (48), 137 (47), 43 (36)... 308 (1)]	18.86	2576.3	0.03	17.85	2062.6	0.03
Unknown COCI XXXIV [m/z 81, 137 (48), 95 (39), 69 (34), 41 (26)...]	17.45	2415.8	0.02	17.92	2069.7	0.02
Unknown COCI XXXVI [m/z 69, 81 (56), 83 (52), 41 (39), 95 (42), 55 (27)...]	17.41	2411.2	0.02	18.02	2079.2	0.03
Unknown COCI XXXVII [m/z 69, 81 (63), 83 (56), 41 (39), 95 (31)...]	17.53	2423.9	0.01	18.04*	2081.8	[0.03]
Unknown COCI XXXVIII [m/z 81, 137 (50), 69 (41), 95 (40)...]				18.04*	2081.8	[0.03]
Unknown COCI XXXIX [m/z 81, 137 (55), 69 (50), 95 (41), 41 (40), 59 (31)... 306? (t)]				18.08	2085.9	0.04
Unknown COCI XL [m/z 223, 69 (83), 43 (82), 81 (62), 139 (54), 41 (51)... 293 (7), 308 (t)]	18.68	2555.8	0.01	18.19	2096.3	0.01

Unknown COCI XLI [m/z 69, 81 (71), 41 (47), 83 (44), 95 (43), 43 (41)... 293 (2)...]				18.42	2119.5	0.06
Unknown COCI LII [m/z 69, 41 (75), 95 (53), 55 (47), 82 (40), 81 (38)...]				18.62	2141.0	0.01
Unknown COCI LIII [m/z 69, 41 (86), 95 (59), 55 (47), 82 (43) 109 (41)...]				18.69	2147.7	0.02
Unknown COCI XLVI [m/z 81, 69 (83), 137 (61), 95 (50), 83 (45)...]	20.37	2759.9	0.05	22.95	2630.7	0.20
Unknown COCI XLVII [m/z 81, 69 (73), 137 (60), 95 (45), 83 (41)...]	20.43	2768.1	0.15	22.96	2632.1	0.12
Unknown COCI XLIX [m/z 81, 69 (67), 137 (56), 95 (40), 83 (38)...]	20.68	2798.8	0.22	23.01	2638.7	0.23
Unknown COCI XLVIII [m/z 81, 69 (70), 137 (56), 95 (43), 83 (36)...]	20.72	2803.6	0.13	23.03	2640.7	0.11
Unknown COCI L [m/z 69, 83 (59), 81 (56), 137 (48), 41 (29), 139 (28)...]	21.36	2886.5	0.75	23.61	2714.1	0.75
Total reported	97.10%			98.65%		

*: 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