

Date : 2026-06-08

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

**Internal code :** 26D10-PTH01

**Customer Identification :** Lemon Eucalyptus ORGANIC - Brazil - E10118

**Type :** Essential Oil

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

**Customer :** Plant Therapy

Checked and approved by:

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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*Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.*

*This report is an update of the version first issued on 2026-04-13 to make a correction in the sample identification section.*



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

**Date :** 2026-04-11

## PHYSICOCHEMICAL DATA

**Refractive index :**  $1.4539 \pm 0.0003$  (20 °C)

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

**Analyst :** Cindy Caron B. Sc.

**Date :** 2026-04-13

## 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
Isovaleral	0.01	Aliphatic aldehyde
2,4-Dimethyl-3-pentanone	tr	Aliphatic ketone
Hexanal	tr	Aliphatic aldehyde
3-Methylcyclopentanol	0.01	Aliphatic alcohol
Ethyl 2-methylbutyrate	tr	Aliphatic ester
(3Z)-Hexenol	tr	Aliphatic alcohol
Unknown	0.02	Unknown
Unknown	0.03	Unknown
Isobutyl propionate	0.01	Aliphatic ester
Styrene	0.01	Simple phenolic
Isobutyl isobutyrate	0.06	Aliphatic ester
$\alpha$ -Thujene	0.02	Monoterpene
$\alpha$ -Pinene	0.20	Monoterpene
Unknown	0.01	Unknown
$\beta$ -Pinene	0.55	Monoterpene
Sabinene	0.07	Monoterpene
Myrcene	0.12	Monoterpene
$\alpha$ -Phellandrene	0.01	Monoterpene
Isobutyl 2-methylbutyrate	tr	Aliphatic ester
Isobutyl isovalerate	0.01	Aliphatic ester
$\alpha$ -Terpinene	0.01	Monoterpene
Isoamyl isobutyrate	0.03	Aliphatic ester
2-Methylbutyl isobutyrate	0.01	Aliphatic ester
<i>para</i> -Cymene	0.04	Monoterpene
Unknown	0.05	Unknown
Limonene	0.47	Monoterpene
1,8-Cineole	tr	Monoterpenic ether
Unknown	0.07	Unknown
(Z)- $\beta$ -Ocimene	0.09	Monoterpene
Unknown	0.02	Unknown
(E)- $\beta$ -Ocimene	0.04	Monoterpene
2,6-Dimethyl-5-heptenal (melonal)	0.18	Aliphatic aldehyde
$\gamma$ -Terpinene	0.11	Monoterpene
<i>para</i> -Mentha-3,8-diene	0.05	Monoterpene
Terpinolene isomer	0.01	Monoterpene
Terpinolene	0.06	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	0.01	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Linalool	0.30	Monoterpenic alcohol
<i>cis</i> -Rose oxide	0.05	Monoterpenic ether

Phenylethyl alcohol	0.02	Simple phenolic
<i>trans</i> -Rose oxide	0.02	Monoterpenic ether
Unknown	0.08	Oxygenated normonoterpene
neo-Isopulegol	0.03	Monoterpenic alcohol
Isopulegol	4.34	Monoterpenic alcohol
Menthone	0.08	Monoterpenic ketone
Citronellal	73.51	Monoterpenic aldehyde
Borneol	0.50	Monoterpenic alcohol
iso-Isopulegol	2.34	Monoterpenic alcohol
neiso-Isopulegol	0.29	Monoterpenic alcohol
<i>trans</i> -Isopulegone	0.01	Monoterpenic ketone
Isopulegol isomer	0.08	Monoterpenic alcohol
Terpinen-4-ol	0.02	Monoterpenic alcohol
$\alpha$ -Terpineol	0.07	Monoterpenic alcohol
<i>trans</i> -Pulegol	0.01	Monoterpenic alcohol
Unknown	0.07	Oxygenated monoterpene
Nerol	0.06	Monoterpenic alcohol
Citronellol	6.68	Monoterpenic alcohol
Pulegone	tr	Monoterpenic ketone
Neral	0.06	Monoterpenic aldehyde
Geraniol	0.07	Monoterpenic alcohol
Unknown	0.11	Unknown
Unknown	0.09	Unknown
Geranial	0.07	Monoterpenic aldehyde
Citronellyl formate	0.01	Monoterpenic ester
Unknown	0.02	Unknown
Benzyl isobutyrate	0.07	Phenolic ester
Citronellic acid	0.46	Monoterpenic acid
8-Hydroxy-neo-menthol	0.71	Monoterpenic alcohol
8-Hydroxymenthol	0.02	Monoterpenic alcohol
Citronellyl acetate	0.36	Monoterpenic ester
Eugenol	0.07	Phenylpropanoid
8-Hydroxy-iso-menthol	0.99	Monoterpenic alcohol
Neryl acetate	0.02	Monoterpenic ester
8-Hydroxy-neoiso-menthol	0.01	Monoterpenic alcohol
Geranyl acetate	0.03	Monoterpenic ester
$\beta$ -Elemene	0.04	Sesquiterpene
Benzyl isovalerate	0.05	Phenolic ester
( <i>Z</i> )-Jasmone	0.08	Jasmonate
$\beta$ -Caryophyllene	1.19	Sesquiterpene
$\alpha$ -Humulene	0.08	Sesquiterpene
allo-Aromadendrene	0.01	Sesquiterpene
( <i>E</i> )- $\beta$ -Farnesene	0.01	Sesquiterpene
Germacrene D	0.06	Sesquiterpene
Isoamyl phenylacetate	0.02	Phenolic ester

Bicyclogermacrene	0.05	Sesquiterpene
γ-Cadinene	0.01	Sesquiterpene
δ-Cadinene	0.04	Sesquiterpene
α-Elemol	0.01	Sesquiterpenic alcohol
Germacrene B	0.01	Sesquiterpene
Spathulenol	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.08	Sesquiterpenic ether
Caryophyllene oxide isomer	0.02	Sesquiterpenic ether
α-Cadinol	0.01	Sesquiterpenic alcohol
Unknown	0.04	Oxygenated diterpene
Unknown	0.01	Oxygenated diterpene
Unknown	0.06	Oxygenated diterpene
Unknown	0.01	Oxygenated diterpene
Unknown	0.02	Oxygenated diterpene
Unknown	0.99	Oxygenated diterpene
Unknown	0.03	Oxygenated diterpene
Unknown	0.03	Oxygenated diterpene
Unknown	0.05	Oxygenated diterpene
Unknown	0.05	Oxygenated diterpene
Unknown	0.29	Oxygenated diterpene
Unknown	0.01	Oxygenated diterpene
Unknown	0.04	Oxygenated diterpene
Unknown	0.02	Unknown
Unknown	0.02	Oxygenated diterpene
Unknown	0.07	Oxygenated diterpene
Unknown	0.03	Unknown
Unknown	0.05	Unknown
Unknown	0.03	Unknown
Unknown	0.10	Unknown
Unknown	0.01	Unknown
Unknown	0.09	Unknown
Unknown	0.22	Unknown
Unknown	[0.27]	Unknown
Unknown	[0.27]	Unknown
Unknown	0.93	Unknown
<b>Consolidated total</b>	<b>99.43</b>	

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

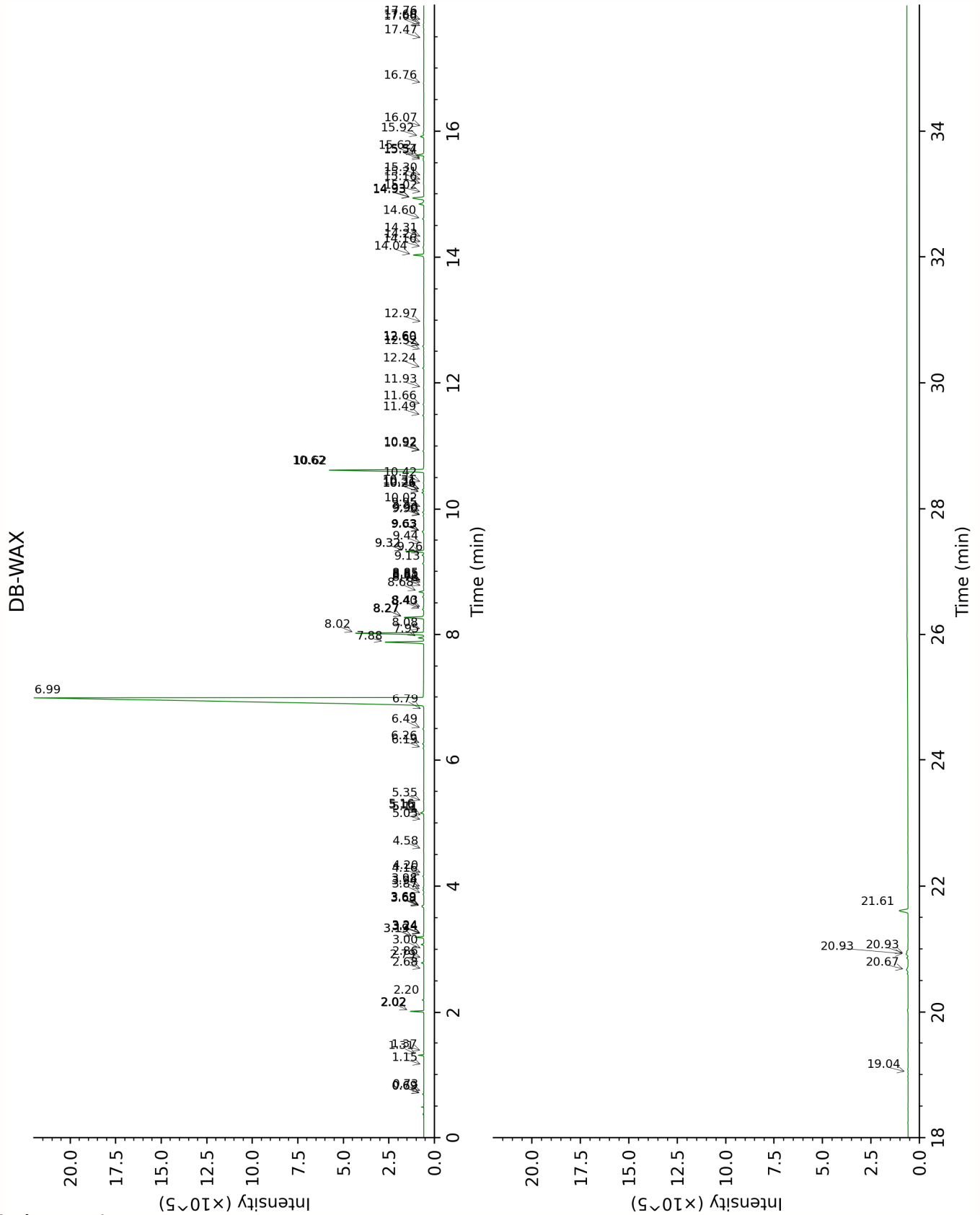
Note: no correction factor was applied

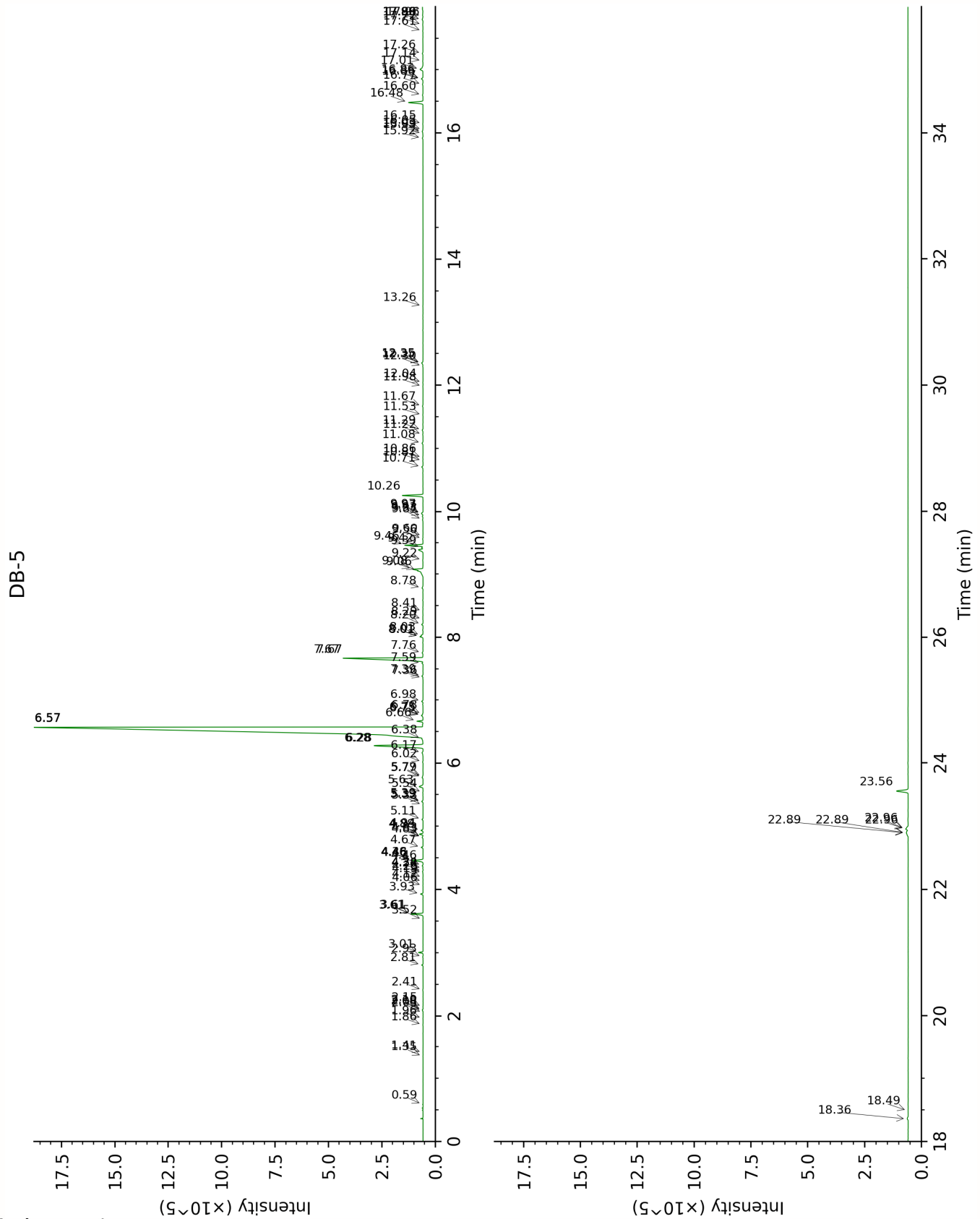
**About "consolidated" data:** The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

Isovaleral	Column DB-WAX			Column DB-5		
	0.73	884.5	0.01	0.59	642.8	0.01
2,4-Dimethyl-3-pentanone	1.15	963.2	0.01	1.35	791.9	tr
Hexanal				1.41	800.6	tr
3-Methylcyclopentanol	5.11	1304.2	0.01	1.86	840.9	0.01
Ethyl 2-methylbutyrate				1.96	849.5	tr
(3Z)-Hexenol				2.05	856.5	tr
Unknown COCI I [m/z 55, 83 (89), 82 (70), 67 (66), 41 (55), 69 (46), 111 (37)... 126 (2)]	0.69*	870.3	[0.05]	2.08	859.6	0.02
Unknown COCI II [m/z 55, 83 (79), 67 (65), 41 (63), 82 (60), 69 (58)... 111 (27), 126 (9)]	0.69*	870.3	[0.05]	2.10	861.0	0.03
Isobutyl propionate				2.15	864.9	0.01
Styrene	3.69*	1204.0	[0.10]	2.41	887.3	0.01
Isobutyl isobutyrate	2.02*	1064.2	[0.60]	2.81	917.5	0.06
$\alpha$ -Thujene	1.37	998.6	0.02	2.93	926.0	0.02
$\alpha$ -Pinene	1.31	988.8	0.20	3.01	930.8	0.20
Unknown COCI III [m/z 99, 81 (98), 55 (51), 43 (42), 41 (34)... 109? (2)]	2.02*	1064.2	[0.60]	3.52	965.4	0.01
$\beta$ -Pinene	2.02*	1064.2	[0.60]	3.61*	971.6	[0.62]
Sabinene	2.20	1082.0	0.07	3.61*	971.6	[0.62]
Myrcene	2.79	1132.6	0.12	3.93	992.9	0.12
$\alpha$ -Phellandrene	2.68	1124.4	0.01	4.06	1001.6	0.01
Isobutyl 2-methylbutyrate	3.00	1149.4	0.01	4.12	1005.8	tr
Isobutyl isovalerate	3.19*	1164.6	[0.48]	4.19	1009.8	0.01
$\alpha$ -Terpinene	2.86	1138.1	0.02	4.26	1014.7	0.01
Isoamyl isobutyrate	3.24*	1168.1	[0.05]	4.28	1016.0	0.03
2-Methylbutyl isobutyrate	3.24*	1168.1	[0.05]	4.34	1019.4	0.01
<i>para</i> -Cymene	3.98	1225.5	0.04	4.38	1021.9	0.04
Unknown COCI XLIII [m/z 59, 43 (11), 109 (10), 41 (10), 127	6.19	1382.8	0.05	4.46*	1027.3	[0.69]

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*Plus que des analyses... des conseils*

(8)...						
Limonene	3.19*	1164.6	[0.48]	4.46*	1027.3	[0.69]
1,8-Cineole	3.24*	1168.1	[0.05]	4.46*	1027.3	[0.69]
Unknown COCI XLIV [m/z 59, 43 (12), 109 (11), 41 (10), 127 (8)...	6.26	1387.8	0.07	4.46*	1027.3	[0.69]
(Z)- $\beta$ -Ocimene	3.68	1202.9	0.09	4.67	1040.3	0.09
Unknown COCI V [m/z 125, 69 (75), 41 (34), 55 (25), 93 (22)... 140 (3)]	4.58	1270.1	0.02	4.83*	1050.4	[0.06]
(E)- $\beta$ -Ocimene	3.87	1217.6	0.04	4.83*	1050.4	[0.06]
2,6-Dimethyl-5- heptenal (melonal)	5.16*	1308.2	[0.24]	4.88	1053.6	0.18
$\gamma$ -Terpinene	3.69*	1204.0	[0.10]	4.94	1057.5	0.11
<i>para</i> -Mentha-3,8- diene	3.94	1222.5	0.05	5.11	1068.5	0.05
Terpinolene isomer	4.20	1241.9	0.01	5.34	1082.8	0.01
Terpinolene	4.16	1238.7	0.06	5.39*	1086.5	[0.07]
<i>trans</i> -Linalool oxide (fur.)	6.79	1426.9	0.01	5.39*	1086.5	[0.07]
Unknown COCI VI [m/z 67, 82 (79), 81 (34), 41 (32), 55 (16)... 152 (5)]	5.05	1304.7	0.02	5.54	1095.5	0.01
Linalool	7.95	1514.5	0.30	5.63	1101.5	0.30
<i>cis</i> -Rose oxide	5.16*	1308.2	[0.24]	5.77	1110.8	0.05
Phenylethyl alcohol	11.93	1843.0	0.03	5.79	1111.9	0.02
<i>trans</i> -Rose oxide	5.35	1321.5	0.03	6.02	1126.6	0.02
Unknown COCI VIII [m/z 41, 69 (87), 82 (66), 67 (55), 109 (46)... 142 (18)]	9.26	1617.5	0.09	6.16	1136.2	0.08
neo-Isopulegol	8.08	1524.5	0.03	6.28*	1143.5	[4.32]
Isopulegol	8.02	1520.3	4.34	6.28*	1143.5	[4.32]
Menthone	6.49	1404.8	0.07	6.38	1150.4	0.08
Citronellal	6.99	1441.9	73.51	6.57*	1162.4	[76.35]
Borneol	9.64*	1648.2	[0.14]	6.57*	1162.4	[76.35]
iso-Isopulegol	7.88	1509.2	2.34	6.57*	1162.4	[76.35]
neoiso-Isopulegol	8.68	1571.6	0.28	6.66	1168.7	0.29
<i>trans</i> -Isopulegone	8.81	1582.0	0.01	6.75*	1174.5	[0.11]
Isopulegol isomer	8.40	1549.7	0.08	6.75*	1174.5	[0.11]
Terpinen-4-ol	8.43	1552.1	0.03	6.78	1176.1	0.02
$\alpha$ -Terpineol	9.64*	1648.2	[0.14]	6.98	1189.1	0.07

<i>trans</i> -Pulegol	9.90*	1669.6	[0.05]	7.36	1214.0	0.01
Unknown COCI IX [m/z 69, 55 (65), 43 (47), 41 (44), 83 (42), 75 (37), 125 (36)... 154 (1)]				7.39	1216.4	0.07
Nerol	10.92*	1755.5	[0.07]	7.59	1230.3	0.06
Citronellol	10.62*	1729.8	[6.76]	7.67*	1235.7	[6.72]
Pulegone	8.85*	1584.6	[0.01]	7.67*	1235.7	[6.72]
Neral	9.32*	1622.7	[1.04]	7.76	1241.5	0.06
Geraniol	11.49	1803.9	0.07	8.01*	1259.0	[0.17]
Unknown COCI X [m/z 59, 41 (68), 43 (53), 97 (44), 69 (35)...]	10.26*	1699.6	[0.12]	8.01*	1259.0	[0.17]
Unknown COCI XI [m/z 59, 41 (62), 43 (51), 97 (42), 69 (37)...]	10.31*	1703.1	[0.08]	8.03	1260.4	0.09
Geranial	9.95	1674.1	0.07	8.20	1272.1	0.07
Citronellyl formate	8.76	1577.5	0.03	8.29	1278.0	0.01
Unknown COCI XII [m/z 85, 41 (23), 67 (21), 82 (16), 43 (10)... 170? (1)]	12.60*	1902.7	[0.08]	8.42	1286.5	0.02
Benzyl isobutyrate	10.62*	1729.8	[6.76]	8.78	1308.5	0.07
Citronellic acid	15.62	2195.4	0.46	9.06†	1328.0	0.52
8-Hydroxy-neo- menthol	14.04	2037.8	0.71	9.08†	1329.6	0.60
8-Hydroxymenthol				9.22	1340.1	0.02
Citronellyl acetate	9.32*	1622.7	[1.04]	9.39	1351.6	0.36
Eugenol	14.60	2093.0	0.09	9.42	1353.9	0.07
8-Hydroxy-iso- menthol	14.93*	2125.7	[1.01]	9.46	1356.7	0.99
Neryl acetate	10.02	1680.0	0.01	9.56	1363.8	0.02
8-Hydroxy-neoiso- menthol	15.02	2134.5	0.02	9.60	1367.1	0.01
Geranyl acetate	10.42	1712.6	0.03	9.87	1386.0	0.03
β-Elemene	8.27*	1539.8	[1.24]	9.93	1390.1	0.04
Benzyl isovalerate	11.66	1819.3	0.05	9.97*	1393.4	[0.12]
(Z)-Jasmone	12.24	1870.7	0.08	9.97*	1393.4	[0.12]
β-Caryophyllene	8.27*	1539.8	[1.24]	10.26	1414.1	1.19
α-Humulene	9.13	1606.8	0.07	10.71	1447.9	0.08
allo-Aromadendrene	8.85*	1584.6	[0.01]	10.81	1455.3	0.01
(E)-β-Farnesene	9.44	1631.9	0.01	10.86	1459.1	0.01

Germacrene D	9.64*	1648.2	[0.14]	11.08	1476.2	0.06
Isoamyl phenylacetate	12.97	1937.4	0.03	11.22	1486.5	0.02
Bicyclogermacrene	9.90*	1669.6	[0.05]	11.29	1491.8	0.05
γ-Cadinene	10.26*	1699.6	[0.12]	11.53	1509.9	0.01
δ-Cadinene	10.31*	1703.1	[0.08]	11.67	1521.0	0.04
α-Elemol				11.98	1545.5	0.01
Germacrene B	10.92*	1755.5	[0.07]	12.04	1550.5	0.01
Spathulenol	14.23	2056.7	0.02	12.30	1570.6	0.02
Caryophyllene oxide	12.60*	1902.7	[0.08]	12.35*	1574.9	[0.11]
Caryophyllene oxide isomer	12.52	1896.1	0.02	12.35*	1574.9	[0.11]
α-Cadinol	15.30	2162.2	0.03	13.26	1648.7	0.01
Unknown COCI XVIII [m/z 81, 69 (87), 93 (74), 121 (71), 41 (70), 205 (47)... 290 (18)]				15.92	1881.1	0.04
Unknown COCI XIX [m/z 69, 41 (48), 81 (36), 121 (34), 83 (32), 55 (30)... 290 (t)]				15.99	1887.5	0.01
Unknown COCI XX [m/z 81, 93 (70), 121 (64), 69 (64), 41 (56), 205 (50)... 290 (19)]	14.16	2049.7	0.07	16.03	1890.7	0.06
Unknown COCI XXI [m/z 165, 69 (87), 205 (72), 81 (67), 41 (65)... 290 (4)]	14.31	2064.9	0.01	16.05	1893.3	0.01
Unknown COCI XXII [m/z 165, 205 (96), 69 (72), 41 (61), 81 (49)... 290 (6)]				16.15	1902.0	0.02
Unknown COCI XXIII [m/z 81, 137 (85), 95 (48), 69 (44)... 308? (t)]	14.93*	2125.7	[1.01]	16.48	1933.8	0.99
Unknown COCI XXIV [m/z 137, 81 (81), 95 (41), 183 (38)...]	15.21	2154.0	0.02	16.60	1944.9	0.03
Unknown COCI XXV [m/z 69, 81 (53), 41 (51), 137 (39), 121 (33)...]	15.16	2148.3	0.03	16.77	1960.9	0.03
Unknown COCI XXVI	15.54	2187.3	0.05	16.86*	1969.5	[0.10]

[m/z 81, 93 (59), 205 (55), 121 (50), 41 (43)... 290 (8)]						
Unknown COCI XLV [m/z 81, 205 (66), 69 (58), 41 (56), 93 (56), 121 (47)... 290 (9)]	15.57	2189.9	0.05	16.86*	1969.5	[0.10]
Unknown COCI XXVII [m/z 81, 137 (60), 69 (47), 95 (41), 41 (39), 55 (25)... 308? (t)]	15.92	2225.8	0.24	17.01	1983.8	0.29
Unknown COCI XXIX [m/z 81, 137 (70), 95 (46), 69 (45), 41 (39), 55 (29)...]	16.08	2242.1	0.02	17.14	1996.2	0.01
Unknown COCI XXX [m/z 41, 69 (98), 55 (55), 81 (46), 109 (46)... 290 (8)]	16.76	2314.4	0.03	17.26	2007.6	0.04
Unknown COCI XXXII [m/z 81, 137 (68), 95 (44), 43 (40), 69 (39), 183 (35)...]	17.47	2391.1	0.01	17.62	2043.1	0.02
Unknown COCI XXXIII [m/z 69, 81 (88), 43 (85), 95 (60)... 308 (t)]	19.04	2569.1	0.01	17.72	2053.1	0.02
Unknown COCI XXXV [m/z 81, 95 (49), 69 (48), 137 (47), 43 (36)... 308 (1)]				17.80	2061.2	0.07
Unknown COCI XXXIV [m/z 81, 137 (48), 95 (39), 69 (34), 41 (26)...]	17.69	2415.8	0.04	17.86	2068.0	0.03
Unknown COCI XXXVI [m/z 69, 81 (56), 83 (52), 41 (39), 95 (42), 55 (27)...]	17.66	2411.5	0.04	17.96	2077.9	0.05
Unknown COCI XXXVII [m/z 69, 81 (63), 83 (56), 41 (39), 95 (31)...]	17.76	2422.8	0.02	17.99	2080.6	0.03
Unknown COCI XLI [m/z 69, 81 (71), 41				18.36	2117.4	0.10

(47), 83 (44), 95 (43), 43 (41)... 293 (2)...] Unknown COCI LI [m/z 69, 41 (88), 95 (60), 55 (54), 81 (47), 109 (42)...]				18.49	2130.8	0.01
Unknown COCI XLVII [m/z 81, 69 (73), 137 (60), 95 (45), 83 (41)...]				22.89*	2627.5	[0.31]
Unknown COCI XLVI [m/z 81, 69 (83), 137 (61), 95 (50), 83 (45)...]	20.67	2766.5	0.22	22.89*	2627.5	[0.31]
Unknown COCI XLIX [m/z 81, 69 (67), 137 (56), 95 (40), 83 (38)...]	20.93*	2797.7	[0.22]	22.96*	2635.4	[0.27]
Unknown COCI XLVIII [m/z 81, 69 (70), 137 (56), 95 (43), 83 (36)...]	20.93*	2797.7	[0.22]	22.96*	2635.4	[0.27]
Unknown COCI L [m/z 69, 83 (59), 81 (56), 137 (48), 41 (29), 139 (28)...]	21.61	2885.3	0.96	23.56	2710.3	0.93
<b>Total reported</b>		<b>97.98%</b>			<b>99.50%</b>	

\*: 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