

Date : 2024-01-22

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24A15-PTH06

Customer Identification : Organic Lavender - Greece - L50118R

Type : Essential Oil

Source : *Lavandula angustifolia*

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

Date : 2024-01-22

PHYSICOCHEMICAL DATA

Refractive index : 1.4621 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2024-01-16

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	tr	Aliphatic aldehyde
1,4-Cyclohexadiene	tr	Alkene
Isovaleral	0.01	Aliphatic aldehyde
2-Methylbutyral	tr	Aliphatic aldehyde
Isoamyl alcohol	0.01	Aliphatic alcohol
2-Methylbutanol	tr	Aliphatic alcohol
Toluene	tr	Simple phenolic
Butyl acetate	0.02	Aliphatic ester
Methyl hexyl ether	0.10	Aliphatic ether
(3Z)-Hexenol	0.01	Aliphatic alcohol
Hexanol	0.06	Aliphatic alcohol
Butyl propionate	0.01	Aliphatic ester
Hashishene	tr	Monoterpene
Tricyclene	0.02	Monoterpene
α -Thujene	0.13	Monoterpene
α -Pinene	0.29	Monoterpene
Camphene	0.13	Monoterpene
Benzaldehyde	0.02	Simple phenolic
Sabinene	0.03	Monoterpene
β -Pinene	0.05	Monoterpene
Octen-3-ol	0.18	Aliphatic alcohol
Octan-3-one	1.06	Aliphatic ketone
Myrcene	0.64	Monoterpene
Butyl butyrate	0.09	Aliphatic ester
Octan-3-ol	0.17	Aliphatic alcohol
α -Phellandrene	0.04	Monoterpene
<i>cis</i> -Dehydroxylinalool oxide	0.01	Monoterpenic ether
Δ^3 -Carene	0.09	Monoterpene
α -Terpinene	0.06	Monoterpene
Hexyl acetate	0.52	Aliphatic ester
<i>meta</i> -Cymene	0.03	Monoterpene
<i>para</i> -Cymene	0.19	Monoterpene
Limonene	0.29	Monoterpene
β -Phellandrene	0.08	Monoterpene
1,8-Cineole	0.66	Monoterpenic ether
Lavender lactone	0.01	Aliphatic lactone
(Z)- β -Ocimene	5.54	Monoterpene
(E)- β -Ocimene	3.57	Monoterpene
γ -Terpinene	0.20	Monoterpene
<i>cis</i> -Sabinene hydrate	0.07	Monoterpenic alcohol

<i>cis</i> -Linalool oxide (fur.)	0.21	Monoterpenic alcohol
Octanol	0.02	Aliphatic alcohol
α -Pinene oxide analog	0.05	Monoterpenic ether
<i>trans</i> -Linalool oxide (fur.)	0.14	Monoterpenic alcohol
Terpinolene	0.10	Monoterpene
<i>trans</i> -Sabinene hydrate	0.09	Monoterpenic alcohol
Linalool	30.09	Monoterpenic alcohol
Hotrienol	0.03	Monoterpenic alcohol
(<i>Z</i>)-6-Methyl-3,5-heptadien-2-one	0.03	Aliphatic ketone
Hexyl propionate	0.05	Aliphatic ester
Octen-3-yl acetate	0.91	Aliphatic ester
Unknown	0.04	Unknown
Octan-3-yl acetate	0.09	Aliphatic ester
allo-Ocimene	0.09	Monoterpene
(<i>Z</i>)-Myroxide	0.03	Monoterpenic ether
Camphor	0.32	Monoterpenic ketone
(<i>E</i>)-Myroxide	0.05	Monoterpenic ether
Hexyl isobutyrate	0.08	Aliphatic ester
Nerol oxide	0.02	Aliphatic ether
Borneol	0.54	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (pyr.)	0.02	Monoterpenic alcohol
Lavandulol	0.92	Monoterpenic alcohol
(3 <i>E</i> ,5 <i>Z</i>)-Undeca-1,3,5-triene	0.06	Alkene
Terpinen-4-ol	5.53	Monoterpenic alcohol
<i>trans</i> -Linalool oxide (pyr.)	0.01	Monoterpenic alcohol
Cryptone	0.10	Normoterpenic ketone
<i>meta</i> -Cymen-8-ol	0.07	Monoterpenic alcohol
<i>para</i> -Cymen-8-ol	0.06	Monoterpenic alcohol
α -Terpineol	1.04	Monoterpenic alcohol
Hodiendiol (2,6-dimethylocta-3,7-diene-2,6-diol)	0.03	Monoterpenic alcohol
Hexyl butyrate	0.39	Aliphatic ester
Verbenone	0.02	Monoterpenic ketone
Unknown	0.01	Unknown
(3 <i>E</i> ,5 <i>E</i>)-2,6-Dimethylocta-3,5,7-trien-2-ol	0.03	Monoterpenic alcohol
Octyl acetate	0.02	Aliphatic ester
<i>trans</i> -Carveol	0.01	Monoterpenic alcohol
Bornyl formate	0.04	Monoterpenic ester
Nerol	0.16	Monoterpenic alcohol
Hexyl 2-methylbutyrate	0.05	Aliphatic ester
Neral	0.02	Monoterpenic aldehyde
Carvone	0.02	Monoterpenic ketone
Hexyl isovalerate	0.01	Aliphatic ester
Linalyl acetate	29.64	Monoterpenic ester
Geraniol	0.41	Monoterpenic alcohol

Geranial	0.02	Monoterpenic aldehyde
2,6-Dimethyl-1,7-octadiene-3,6-diol	0.01	Monoterpenic alcohol
Bornyl acetate	0.13	Monoterpenic ester
Lavandulyl acetate	3.75	Monoterpenic ester
Hexyl tiglate	0.06	Aliphatic ester
Hodiendiol derivative	0.04	Oxygenated monoterpene
Unknown	0.04	Oxygenated monoterpene
Unknown	0.04	Oxygenated monoterpene
Neryl acetate	0.29	Monoterpenic ester
α -Copaene	0.01	Sesquiterpene
Daucene	0.01	Sesquiterpene
β -Bourbonene	0.04	Sesquiterpene
Geranyl acetate	0.48	Monoterpenic ester
7-epi-Sesquithujene	0.07	Sesquiterpene
Hexyl hexanoate	0.08	Aliphatic ester
Isocaryophyllene	0.01	Sesquiterpene
Sesquithujene	0.05	Sesquiterpene
β -Caryophyllene	3.27	Sesquiterpene
α -Santalene	0.39	Sesquiterpene
Lavandulyl isobutyrate	0.01	Monoterpenic ester
Coumarin	0.02	Coumarin
<i>trans</i> - α -Bergamotene	0.13	Sesquiterpene
Sesquisabinene A	0.05	Sesquiterpene
epi- β -Santalene	0.02	Sesquiterpene
α -Humulene	0.13	Sesquiterpene
β -Santalene	0.03	Sesquiterpene
Lavandulyl butyrate?	0.07	Monoterpenic ester
(<i>E</i>)- β -Farnesene	2.95	Sesquiterpene
Germacrene D	0.27	Sesquiterpene
<i>trans</i> - β -Bergamotene	0.05	Sesquiterpene
Isodaucene	0.01	Sesquiterpene
Hodiendiol derivative II	0.01	Oxygenated monoterpene
β -Bisabolene	0.03	Sesquiterpene
γ -Cadinene	0.08	Sesquiterpene
Lavandulyl isovalerate	0.02	Monoterpenic ester
δ -Cadinene	0.01	Sesquiterpene
β -Sesquiphellandrene	0.02	Sesquiterpene
Isocaryophyllene epoxide B	0.02	Sesquiterpenic ether
<i>cis</i> -Sesquisabinene hydrate	0.02	Sesquiterpenic alcohol
(<i>E</i>)-Nerolidol	0.02	Sesquiterpenic alcohol
Caryophyllene oxide isomer	0.04	Sesquiterpenic ether
Caryophyllene oxide	0.30	Sesquiterpenic ether
τ -Cadinol	0.04	Sesquiterpenic alcohol
(3 <i>Z</i>)-Caryophylla-3,8(13)-dien-5 β -ol	0.01	Sesquiterpenic alcohol
Unknown	0.01	Unknown

Phytone	0.01	Terpenic ketone
Unknown	0.01	Unknown
Consolidated total	99.24	

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

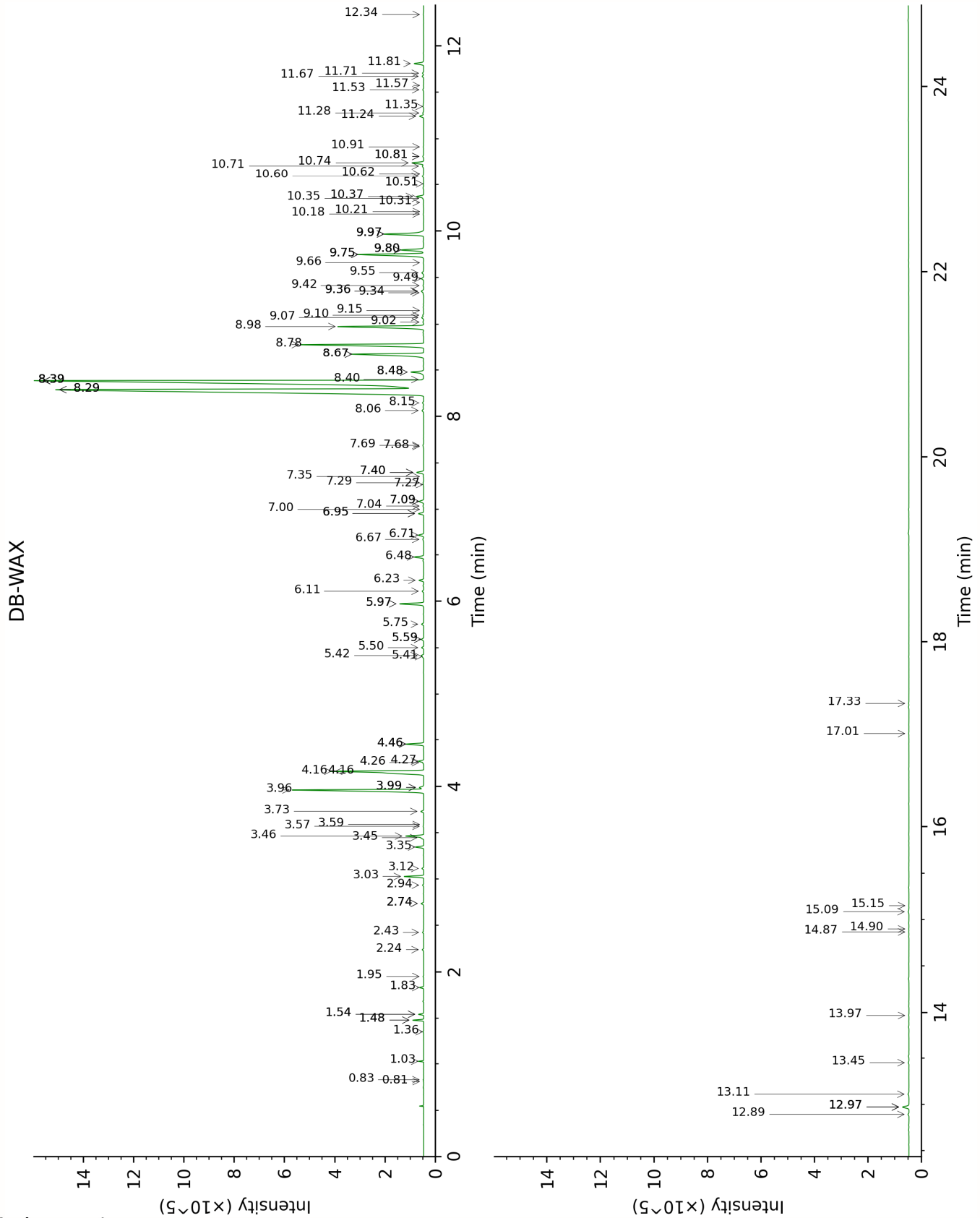
Note: no correction factor was applied

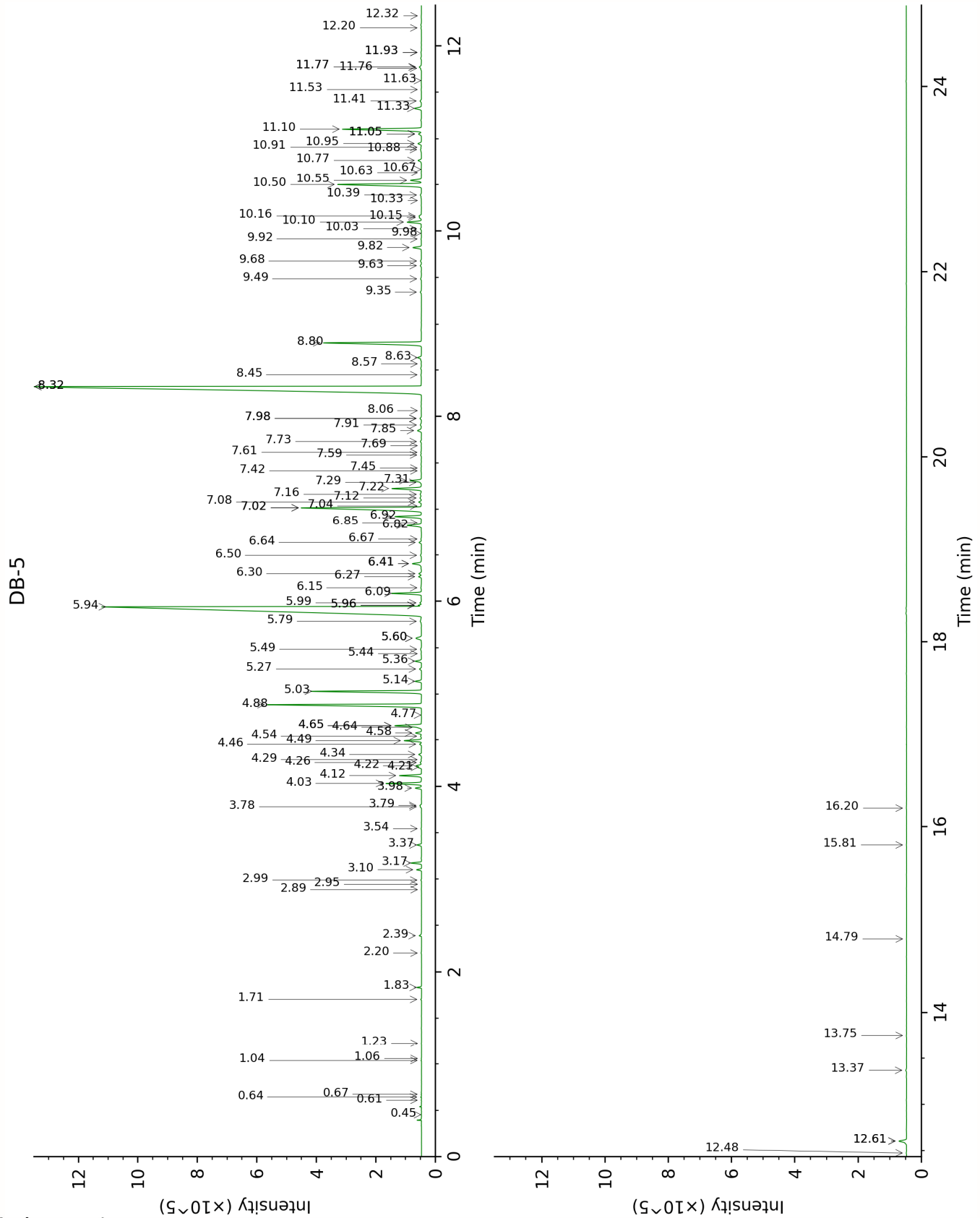
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

Isobutyral	Column DB-WAX			Column DB-5		
				0.45	537.6	tr
1,4-Cyclohexadiene				0.61	630.1	tr
Isovaleral	0.83	885.2	0.01	0.64	641.6	0.01
2-Methylbutyral	0.81	878.5	tr	0.67	651.7	tr
Isoamyl alcohol	3.59	1175.0	0.01	1.04	733.5	0.01
2-Methylbutanol	3.57	1173.5	0.02	1.06	736.4	tr
Toluene	1.54*	1000.6	[0.14]	1.23	759.7	tr
Butyl acetate	1.95	1039.0	0.02	1.70	817.0	0.02
Methyl hexyl ether	1.03	923.7	0.10	1.83	827.6	0.10
(3Z)-Hexenol	5.98*	1347.9	[0.91]	2.20	857.9	0.01
Hexanol	5.59*	1320.6	[0.10]	2.39	873.3	0.06
Butyl propionate	2.74*	1110.5	[0.09]	2.89	912.2	0.01
Hashishene	1.48*	991.6	[0.29]	2.95	916.0	tr
Tricyclene	1.36	972.8	0.02	2.99	918.9	0.02
α -Thujene	1.54*	1000.6	[0.14]	3.10	926.3	0.13
α -Pinene	1.48*	991.6	[0.29]	3.18	931.1	0.29
Camphene	1.83	1027.8	0.12	3.37	943.9	0.13
Benzaldehyde				3.54	955.4	0.02
Sabinene	2.43	1083.8	0.04	3.78	970.9	0.03
β -Pinene	2.24	1066.3	0.04	3.80	971.9	0.05
Octen-3-ol	6.95*	1418.5	[0.20]	3.98	984.2	0.18
Octan-3-one	4.16*	1217.3	[4.62]	4.03	987.5	1.06
Myrcene	3.03	1132.6	0.63	4.12	993.0	0.64
Butyl butyrate	3.73	1185.8	0.10	4.20	998.8	0.09
Octan-3-ol	6.23	1366.0	0.18	4.22	1000.0	0.17
α -Phellandrene	2.94	1125.4	0.04	4.26	1002.2	0.04
<i>cis</i> -Dehydroxylinalool oxide	3.99*	1204.9	[0.19]	4.29	1004.3	0.01
Δ^3 -Carene	2.74*	1110.5	[0.09]	4.34	1007.8	0.09
α -Terpinene	3.12	1139.1	0.06	4.46	1014.8	0.06
Hexyl acetate	4.46*	1238.1	[0.63]	4.49	1017.2	0.52
<i>meta</i> -Cymene	4.26	1223.9	0.02	4.54	1020.1	0.03
<i>para</i> -Cymene	4.27	1225.0	0.19	4.58	1022.3	0.19
Limonene	3.35	1156.6	0.29	4.64*†	1026.1	[0.08]
β -Phellandrene	3.45	1164.2	0.08	4.65*†	1027.2	[0.95]
1,8-Cineole	3.46	1165.6	0.66	4.65*†	1027.2	[0.95]
Lavender lactone	9.42	1605.1	0.04	4.77	1034.4	0.01
(Z)- β -Ocimene	3.96	1203.0	5.55	4.88	1041.3	5.54
(E)- β -Ocimene	4.16*	1217.3	[4.62]	5.03	1050.9	3.57
γ -Terpinene	3.99*	1204.9	[0.19]	5.14	1057.6	0.20
<i>cis</i> -Sabinene hydrate	7.09*	1428.3	[0.21]	5.27	1065.9	0.07

<i>cis</i> -Linalool oxide (fur.)	6.72	1400.8	0.21	5.36	1071.1	0.21
Octanol	8.39*†	1525.5	[29.42]	5.44	1076.2	0.02
α -Pinene oxide analog	5.59*	1320.6	[0.10]	5.48	1079.1	0.05
<i>trans</i> -Linalool oxide (fur.)	7.09*	1428.3	[0.21]	5.60*	1086.6	[0.25]
Terpinolene	4.46*	1238.1	[0.63]	5.60*	1086.6	[0.25]
<i>trans</i> -Sabinene hydrate	8.15	1507.0	0.05	5.79	1097.9	0.09
Linalool	8.29*†	1518.0	[30.15]	5.94	1107.8	30.09
Hotrienol	9.02	1574.6	0.03	5.96*	1108.8	[0.07]
(<i>Z</i>)-6-Methyl-3,5-heptadien-2-one	8.40	1526.4	0.03	5.96*	1108.8	[0.07]
Hexyl propionate	5.41	1307.2	0.04	5.98	1110.5	0.05
Octen-3-yl acetate	5.98*	1347.9	[0.91]	6.09	1117.0	0.91
Unknown LAAN I [m/z 82, 81 (72), 43 (64), 54 (32), 41 (20)...]	9.80*	1636.0	[0.96]	6.15	1120.9	0.04
Octan-3-yl acetate	5.42	1308.0	0.10	6.27	1128.5	0.09
allo-Ocimene	5.76	1332.2	0.08	6.30	1130.6	0.09
(<i>Z</i>)-Myroxide	7.04	1424.5	0.03	6.41*	1137.4	[0.35]
Camphor	7.40*	1451.3	[0.29]	6.41*	1137.4	[0.35]
(<i>E</i>)-Myroxide	7.29	1443.1	0.02	6.50	1143.2	0.05
Hexyl isobutyrate	5.50	1314.1	0.08	6.64	1152.0	0.08
Nerol oxide	7.00	1421.9	0.01	6.67	1154.3	0.02
Borneol	9.97*	1649.8	[1.83]	6.82	1163.9	0.54
<i>cis</i> -Linalool oxide (pyr.)	10.51	1693.3	0.01	6.85	1165.9	0.02
Lavandulol	9.80*	1636.0	[0.96]	6.92	1170.3	0.92
(3 <i>E</i> ,5 <i>Z</i>)-Undeca-1,3,5-triene	6.11	1357.6	0.06	7.02*	1176.3	[5.59]
Terpinen-4-ol	8.78	1556.0	5.53	7.02*	1176.3	[5.59]
<i>trans</i> -Linalool oxide (pyr.)	10.81*	1718.6	[0.05]	7.04	1177.5	0.01
Cryptone	9.36*	1600.3	[0.11]	7.08	1180.3	0.10
<i>meta</i> -Cymen-8-ol	11.67	1791.5	0.06	7.12	1183.0	0.07
<i>para</i> -Cymen-8-ol	11.71	1794.3	0.05	7.16	1185.5	0.06
α -Terpineol	9.97*	1649.8	[1.83]	7.22	1189.6	1.04
Hodiendiol (2,6-dimethylocta-3,7-diene-2,6-diol)	12.97*	1906.3	[0.30]	7.29	1193.8	0.03
Hexyl butyrate	6.48	1383.9	0.36	7.31	1194.9	0.39
Verbenone	9.80*	1636.0	[0.96]	7.42	1201.7	0.02

Unknown SASC VII [m/z 43, 71 (66), 59 (52), 41 (47), 68 (46)...] (3E,5E)-2,6- Dimethylocta-3,5,7- trien-2-ol	7.68	1472.0	0.02	7.44	1203.6	0.01
Octyl acetate	7.27	1441.6	0.02	7.61	1214.8	0.02
trans-Carveol	11.58	1783.2	0.01	7.69	1219.7	0.01
Bornyl formate	8.29*†	1518.0	[30.15]	7.73	1222.6	0.04
Nerol	11.24	1755.2	0.17	7.85	1230.5	0.16
Hexyl 2- methylbutyrate	6.67	1397.5	0.04	7.91	1234.6	0.05
Neral	9.66	1625.0	0.02	7.98*	1239.3	[0.06]
Carvone	10.18	1667.1	0.02	7.98*	1239.3	[0.06]
Hexyl isovalerate	6.95*	1418.5	[0.20]	8.06	1244.9	0.01
Linalyl acetate	8.39*†	1525.5	[29.42]	8.32*	1262.2	[30.05]
Geraniol	11.81	1803.4	0.41	8.32*	1262.2	[30.05]
Geranial	10.31	1677.1	0.01	8.45	1270.7	0.02
2,6-Dimethyl-1,7- octadiene-3,6-diol	14.87	2084.3	0.01	8.57	1278.6	0.01
Bornyl acetate	8.48*	1532.6	[0.47]	8.64	1283.1	0.13
Lavandulyl acetate	8.98	1570.9	3.77	8.80	1294.2	3.75
Hexyl tiglate	9.10	1580.3	0.04	9.35	1332.0	0.06
Hodiendiol derivative	13.11	1919.1	0.04	9.49	1342.0	0.04
Unknown SASC II [m/z 43, 79 (47), 71 (31), 94 (27), 81 (23), 41 (22)... 197 (0)]	11.28	1758.1	0.04	9.63	1352.0	0.04
Unknown SASC III [m/z 43, 79 (46), 71 (30), 94 (25), 41 (23), 81 (21)... 197 (0)]	11.35	1764.1	0.03	9.68	1355.5	0.04
Neryl acetate	10.37	1682.3	0.30	9.82	1365.7	0.29
α-Copaene	7.35	1448.0	0.02	9.92	1372.1	0.01
Daucene	7.40*	1451.3	[0.29]	9.98	1376.4	0.01
β-Bourbonene	7.69	1472.9	0.03	10.03	1379.9	0.04
Geranyl acetate	10.74	1712.8	0.48	10.10	1384.9	0.48
7-epi- Sesquithujene	8.06	1500.7	0.08	10.15	1388.4	0.07
Hexyl hexanoate	9.07	1578.3	0.08	10.16	1389.5	0.08
Isocaryophyllene	8.39*†	1525.5	[29.42]	10.33	1401.2	0.01
Sesquithujene	8.39*†	1525.5	[29.42]	10.39	1405.4	0.05
β-Caryophyllene	8.67*	1547.5	[3.33]	10.50	1413.9	3.27

α -Santalene	8.48*	1532.6	[0.47]	10.55	1417.2	0.39
Lavandulyl isobutyrate	9.55	1616.2	0.10	10.64	1423.8	0.01
Coumarin	17.33	2336.7	0.02	10.67	1426.4	0.02
<i>trans</i> - α -Bergamotene	8.67*	1547.5	[3.33]	10.77	1433.6	0.13
Sesquisabinene A	9.36*	1600.3	[0.11]	10.88	1442.3	0.05
epi- β -Santalene	9.15	1584.2	0.02	10.91	1444.1	0.02
α -Humulene	9.49	1611.2	0.10	10.95	1447.2	0.13
β -Santalene	9.34	1598.9	0.03	11.05*	1454.8	[0.12]
Lavandulyl butyrate?	10.71	1709.8	0.07	11.05*	1454.8	[0.12]
(<i>E</i>)- β -Farnesene	9.75*	1632.1	[2.98]	11.10	1458.7	2.95
Germacrene D	9.97*	1649.8	[1.83]	11.33	1475.4	0.27
<i>trans</i> - β -Bergamotene	9.75*	1632.1	[2.98]	11.41	1481.2	0.05
Isodaucene	10.21	1669.3	0.01	11.53	1490.4	0.01
Hodiendiol derivative II	12.97*	1906.3	[0.30]	11.63	1497.6	0.01
β -Bisabolene	10.35	1680.8	0.03	11.76	1507.6	0.03
γ -Cadinene	10.60	1700.5	0.08	11.77*	1508.7	[0.09]
Lavandulyl isovalerate	10.91	1727.3	0.02	11.77*	1508.7	[0.09]
δ -Cadinene	10.62	1702.7	0.01	11.93*	1521.0	[0.03]
β -Sesquiphellandrene	10.81*	1718.6	[0.05]	11.93*	1521.0	[0.03]
Isocaryophyllene epoxide B	12.34	1850.0	0.02	12.20	1541.7	0.02
<i>cis</i> -Sesquisabinene hydrate	13.45	1950.4	0.03	12.32	1551.9	0.02
(<i>E</i>)-Nerolidol	13.97	1998.1	0.01	12.48	1563.8	0.02
Caryophyllene oxide isomer	12.89	1899.1	0.04	12.61*	1574.0	[0.34]
Caryophyllene oxide	12.97*	1906.3	[0.30]	12.61*	1574.0	[0.34]
τ -Cadinol	15.09	2105.7	0.05	13.37	1635.3	0.04
(3 <i>Z</i>)-Caryophylla-3,8(13)-dien-5 β -ol	17.01	2301.7	0.01	13.75	1666.9	0.01
Unknown LAAN IX [m/z 43, 93 (89), 91 (54), 79 (52), 121 (51)....]	15.15	2112.2	0.01	14.79	1755.2	0.01
Phytone	14.90	2087.4	0.01	15.81	1844.8	0.01
Unknown LAAN VI [m/z 175, 43 (33),				16.20	1880.8	0.01

218 (22), 109 (19), 176 (16), 69 (14)...					
Total reported		98.61%		99.28%	

*: 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