

Date : 2024-05-16

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24E03-PTH01

Customer Identification : Clary Sage - Hungary - CF0118R

Type : Essential Oil

Source : *Salvia sclarea*

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 : 2024-05-14

PHYSICOCHEMICAL DATA

Refractive index : 1.4589 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2024-05-08

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
Ethanol	0.01	Aliphatic alcohol
Methacrolein	tr	Aliphatic aldehyde
2-Methyl-3-buten-2-ol	tr	Aliphatic alcohol
Isovaleral	tr	Aliphatic aldehyde
2-Methylbutyral	tr	Aliphatic aldehyde
(2E)-Hexenal	0.01	Aliphatic aldehyde
(3Z)-Hexenol	0.08	Aliphatic alcohol
(2E)-Hexenol	0.02	Aliphatic alcohol
Hexanol	0.01	Aliphatic alcohol
α -Thujene	tr	Monoterpene
α -Pinene	0.48	Monoterpene
Camphene	0.02	Monoterpene
Unknown	tr	Unknown
Benzaldehyde	0.01	Simple phenolic
Sabinene	0.02	Monoterpene
β -Pinene	0.24	Monoterpene
Octen-3-ol	0.02	Aliphatic alcohol
Octan-3-one	tr	Aliphatic ketone
<i>trans</i> -Dehydroxylinalool oxide	tr	Monoterpenic ether
Myrcene	0.83	Monoterpene
Octan-3-ol	0.02	Aliphatic alcohol
Octanal	0.01	Aliphatic aldehyde
α -Phellandrene	0.02	Monoterpene
Pseudolimonene	0.05	Monoterpene
<i>cis</i> -Dehydroxylinalool oxide	0.01	Monoterpenic ether
α -Terpinene	0.01	Monoterpene
<i>para</i> -Cymene	0.02	Monoterpene
β -Phellandrene	0.02	Monoterpene
Limonene	1.08	Monoterpene
(Z)- β -Ocimene	0.13	Monoterpene
(E)- β -Ocimene	0.30	Monoterpene
γ -Terpinene	0.01	Monoterpene
<i>cis</i> -Sabinene hydrate	tr	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (fur.)	0.02	Monoterpenic alcohol
Octanol	0.01	Aliphatic alcohol
<i>trans</i> -Linalool oxide (fur.)	0.06	Monoterpenic alcohol
Terpinolene	0.03	Monoterpene
Linalool	22.12	Monoterpenic alcohol
Hotrienol	tr	Monoterpenic alcohol
Dehydrosabinaketone	0.02	Normoterpenic ketone

Camphor	0.01	Monoterpenic ketone
Nerol oxide	0.01	Aliphatic ether
Borneol	0.02	Monoterpenic alcohol
Terpinen-4-ol	0.01	Monoterpenic alcohol
α -Terpineol	2.55	Monoterpenic alcohol
Hodiendiol (2,6-dimethylocta-3,7-diene-2,6-diol)	0.02	Monoterpenic alcohol
Unknown	0.02	Unknown
Linalyl formate	0.13	Monoterpenic ester
Nerol	0.43	Monoterpenic alcohol
Geraniol	1.31	Monoterpenic alcohol
Linalyl acetate	57.50	Monoterpenic ester
(<i>trans</i> ?)-Linalool oxide acetate (<i>fur.</i>)?	0.08	Monoterpenic ester
Geranial	0.04	Monoterpenic aldehyde
Unknown	0.01	Unknown
Neryl formate	0.06	Monoterpenic ester
Bornyl acetate	0.05	Monoterpenic ester
Unknown	0.01	Unknown
Geranyl formate	0.02	Monoterpenic ester
δ -Elemene	0.03	Sesquiterpene
Hodiendiol derivative	0.07	Oxygenated monoterpene
α -Terpinyl acetate	0.01	Monoterpenic ester
α -Cubebene	0.01	Sesquiterpene
Unknown	0.06	Monoterpenic ester
Unknown	0.05	Oxygenated monoterpene
Neryl acetate	0.93	Monoterpenic ester
α -Copaene	0.11	Sesquiterpene
β -Bourbonene	0.05	Sesquiterpene
β -Cubebene	0.04	Sesquiterpene
Geranyl acetate	2.35	Monoterpenic ester
β -Elemene	0.11	Sesquiterpene
Isocaryophyllene	0.02	Sesquiterpene
α -Gurjunene	0.04	Sesquiterpene
β -Caryophyllene	3.13	Sesquiterpene
β -Copaene	0.01	Sesquiterpene
<i>trans</i> - α -Bergamotene	0.01	Sesquiterpene
α -Humulene	0.05	Sesquiterpene
(<i>E</i>)- β -Farnesene	0.01	Sesquiterpene
α -Amorphene	0.05	Sesquiterpene
Germacrene D	1.86	Sesquiterpene
β -Selinene	0.03	Sesquiterpene
Hodiendiol derivative IV	0.04	Oxygenated monoterpene
Bicylogermacrene	0.08	Sesquiterpene
α -Selinene	0.01	Sesquiterpene
α -Muurolene	0.01	Sesquiterpene

(Z)- α -Bisabolene	0.05	Sesquiterpene
Cubebol	0.02	Sesquiterpenic alcohol
γ -Cadinene	0.05	Sesquiterpene
δ -Cadinene	0.04	Sesquiterpene
β -Sesquiphellandrene	0.02	Sesquiterpene
Octyl tiglate?	tr	Aliphatic ester
Isocaryophyllene epoxide B	0.01	Sesquiterpenic ether
1,5-Epoxyalsalvia-4(14)-ene	0.01	Sesquiterpenic ether
Spathulenol	0.04	Sesquiterpenic alcohol
Caryophyllene oxide isomer	0.03	Sesquiterpenic ether
Caryophyllene oxide	0.44	Sesquiterpenic ether
Unknown	0.02	Oxygenated sesquiterpene
Guaiol	0.02	Sesquiterpenic alcohol
Torilenol	0.01	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
allo-Aromadendrene epoxide?	0.04	Sesquiterpenic ether
τ -Cadinol	0.01	Sesquiterpenic alcohol
τ -Muurolol	0.01	Sesquiterpenic alcohol
β -Eudesmol	0.02	Sesquiterpenic alcohol
α -Eudesmol	0.01	Sesquiterpenic alcohol
α -Cadinol	0.02	Sesquiterpenic alcohol
Bulnesol	0.02	Sesquiterpenic alcohol
Unknown	0.02	Unknown
Eudesma-4(15),7-dien-1 β -ol	tr	Sesquiterpenic alcohol
Cyclocolorenone	0.02	Sesquiterpenic ketone
Benzyl benzoate	0.02	Phenolic ester
Unknown	0.01	Unknown
Phytone	0.01	Terpenic ketone
Unknown	0.01	Unknown
Unknown	0.01	Unknown
Geranyl- <i>para</i> -cymene	0.01	Diterpene
Manoyl oxide	0.01	Diterpenic ether
Manool	0.01	Diterpenic alcohol
Sclareol	1.14	Diterpenic alcohol
Consolidated total	99.40	

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

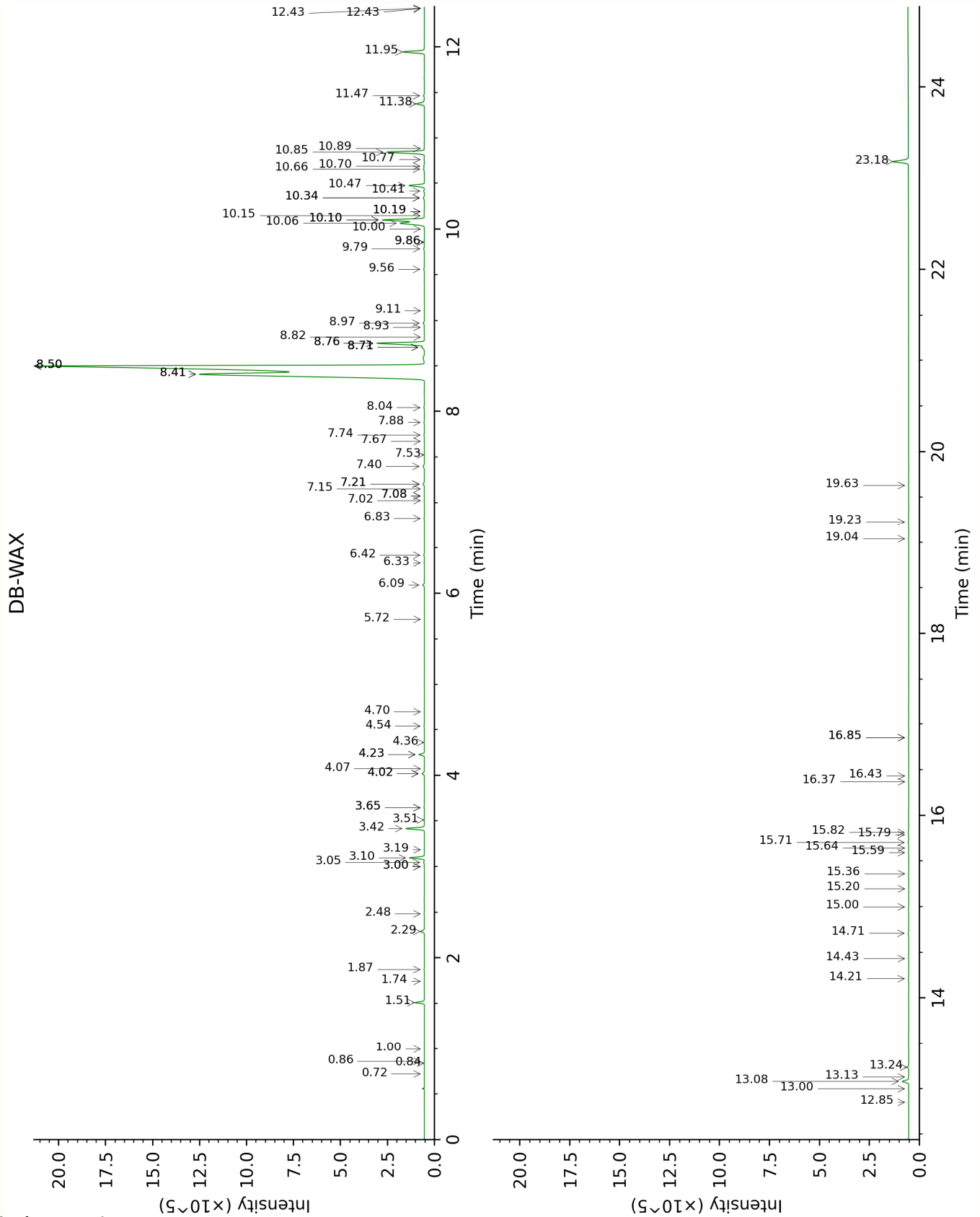
Note: no correction factor was applied

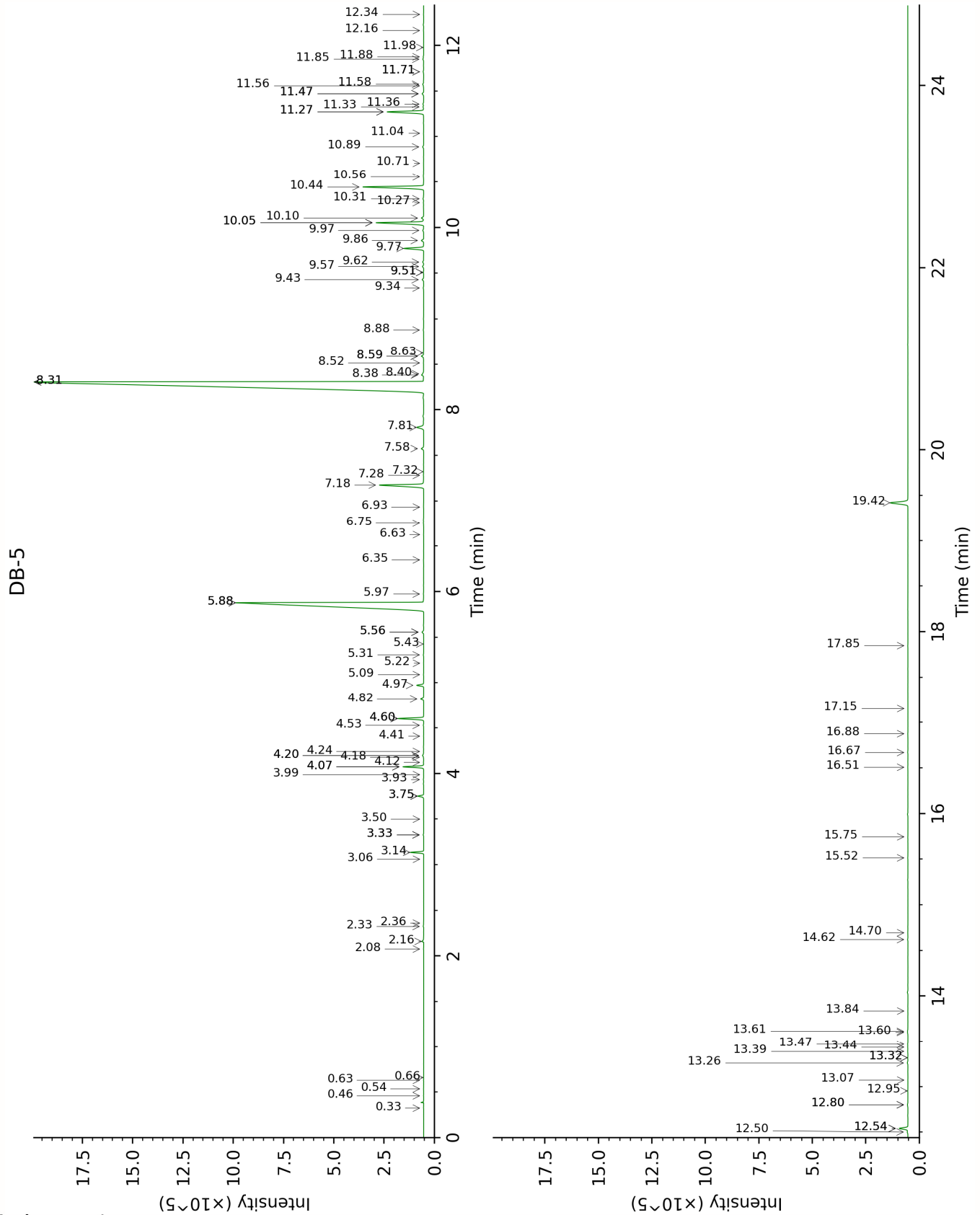
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

Ethanol	Column DB-WAX			Column DB-5		
	1.00	911.8	tr	0.33	499.5	0.01
Methacrolein	0.72	840.6	0.01	0.46	550.6	tr
2-Methyl-3-buten-2-ol	1.74	1014.7	0.01	0.54	609.1	tr
Isovaleral	0.86	889.1	tr	0.63	641.8	tr
2-Methylbutyral	0.84	881.9	tr	0.66	652.2	tr
(2E)-Hexenal	3.65*	1174.9	[0.03]	2.08	850.4	0.01
(3Z)-Hexenol	6.09	1351.2	0.10	2.16	857.4	0.08
(2E)-Hexenol	6.42	1374.6	0.04	2.32	870.9	0.02
Hexanol	5.72	1324.3	0.01	2.36	874.0	0.01
α -Thujene				3.06	926.5	tr
α -Pinene	1.51	991.8	0.49	3.14	931.5	0.48
Camphene	1.87	1027.1	0.02	3.33*	944.2	[0.03]
Unknown ERPU I [m/z 137, 82 (95), 67 (94), 43 (73), 55 (49), 93 (35)...]	3.00*	1126.1	[0.02]	3.33*	944.2	[0.03]
Benzaldehyde	7.67	1466.7	0.02	3.50	955.6	0.01
Sabinene	2.48	1085.3	0.02	3.75*	972.3	[0.25]
β -Pinene	2.29	1067.0	0.24	3.75*	972.3	[0.25]
Octen-3-ol	7.08*	1422.5	[0.02]	3.93	984.3	0.02
Octan-3-one	4.23*	1216.8	[0.31]	3.99	987.9	tr
<i>trans</i> -Dehydroxylinalool oxide	3.65*	1174.9	[0.03]	4.07*	993.5	[0.83]
Myrcene	3.10	1133.5	0.83	4.07*	993.5	[0.83]
Octan-3-ol	6.34	1368.6	0.02	4.12	996.7	0.02
Octanal	4.70	1249.5	0.01	4.18	1000.5	0.01
α -Phellandrene	3.00*	1126.1	[0.02]	4.20*	1001.7	[0.07]
Pseudolimonene	3.05	1129.7	0.05	4.20*	1001.7	[0.07]
<i>cis</i> -Dehydroxylinalool oxide	4.02*	1202.2	[0.14]	4.24	1004.7	0.01
α -Terpinene	3.19	1140.2	0.01	4.41	1015.2	0.01
<i>para</i> -Cymene	4.36	1226.1	0.02	4.53	1022.7	0.02
β -Phellandrene	3.51	1164.8	0.02	4.60*	1027.3	[1.08]
Limonene	3.42	1157.7	1.08	4.60*	1027.3	[1.08]
(Z)- β -Ocimene	4.02*	1202.2	[0.14]	4.82	1040.8	0.13
(E)- β -Ocimene	4.23*	1216.8	[0.31]	4.98	1050.6	0.30
γ -Terpinene	4.07	1206.0	0.01	5.09	1057.9	0.01
<i>cis</i> -Sabinene hydrate	7.15	1428.1	0.01	5.22	1065.8	tr
<i>cis</i> -Linalool oxide (fur.)	6.83	1404.2	0.02	5.31	1071.5	0.02
Octanol	8.41*†	1522.2	[29.66]	5.43	1079.0	0.01

<i>trans</i> -Linalool oxide (fur.)	7.20*	1432.1	[0.10]	5.56*	1087.2	[0.09]
Terpinolene	4.54	1238.5	0.03	5.56*	1087.2	[0.09]
Linalool	8.41*†	1522.2	[29.66]	5.88*	1107.4	[22.13]
Hotrienol	9.11	1576.2	tr	5.88*	1107.4	[22.13]
Dehydrosabinaketone	8.93	1562.2	0.02	5.98	1113.5	0.02
Camphor	7.53	1455.8	0.01	6.35	1137.5	0.01
Nerol oxide	7.08*	1422.5	[0.02]	6.63	1155.2	0.01
Borneol	10.10*	1655.1	[2.60]	6.76	1163.4	0.02
Terpinen-4-ol	8.82	1554.0	0.01	6.94	1174.9	0.01
α-Terpineol	10.10*	1655.1	[2.60]	7.18	1190.4	2.55
Hodiendiol (2,6-dimethylocta-3,7-diene-2,6-diol)	13.13	1913.8	0.02	7.28	1197.2	0.02
Unknown SASC VI [m/z 43, 71 (80), 67 (55), 59 (51), 68 (44), 41 (43)...]				7.32	1199.8	0.02
Linalyl formate	8.71*	1545.4	[0.17]	7.58	1216.5	0.13
Nerol	11.38	1760.7	0.55	7.81	1232.0	0.43
Geraniol	11.95	1809.3	1.31	8.31*	1265.4	[58.81]
Linalyl acetate	8.50*†	1529.1	[49.87]	8.31*	1265.4	[58.81]
(<i>trans</i> ?) -Linalool oxide acetate (fur.)?	8.97	1565.7	0.08	8.38*†	1270.6	[0.09]
Geranial	10.42	1680.4	0.04	8.40*†	1271.4	[0.03]
Unknown MISC V [m/z 121, 43 (75), 95 (57), 41 (34), 93 (33), 69 (28)...]				8.52	1279.4	0.01
Neryl formate	9.79	1629.8	0.06	8.59*	1284.3	[0.11]
Bornyl acetate	8.50*†	1529.1	[49.87]	8.59*	1284.3	[0.11]
Unknown MISC VI [m/z 43, 121 (74), 93 (42), 95 (38), 107 (29), 41 (29), 136 (28)...]				8.63	1286.8	0.01
Geranyl formate	10.19*	1662.4	[0.03]	8.88	1303.9	0.02
δ-Elementene	7.20*	1432.1	[0.10]	9.34	1336.3	0.03
Hodiendiol derivative	13.24	1923.6	0.08	9.43	1342.8	0.07
α-Terpinyl acetate	10.00	1647.1	0.01	9.51*	1348.3	[0.02]
α-Cubebene	7.02	1418.7	0.01	9.51*	1348.3	[0.02]
Unknown MISC VII [m/z 43, 121 (52), 93 (48), 79 (33), 41 (30), 136 (26), 81 (25)...]				9.58	1352.9	0.06
Unknown SASC III	11.47	1768.1	0.06	9.62	1356.3	0.05

[m/z 43, 79 (46), 71 (30), 94 (25), 41 (23), 81 (21)... 197 (0)]						
Neryl acetate	10.48	1685.2	0.94	9.77	1366.8	0.93
α-Copaene	7.40	1446.5	0.11	9.86	1372.9	0.11
β-Bourbonene	7.74	1471.8	0.03	9.97	1380.7	0.05
β-Cubebene	8.04	1494.1	0.04	10.05*	1386.7	[2.36]
Geranyl acetate	10.85	1716.3	2.35	10.05*	1386.7	[2.36]
β-Elemene	8.71*	1545.4	[0.17]	10.10	1390.2	0.11
Isocaryophyllene	8.50*†	1529.1	[49.87]	10.27	1402.1	0.02
α-Gurjunene	7.88	1482.0	0.03	10.31	1405.1	0.04
β-Caryophyllene	8.76*	1548.8	[3.16]	10.44	1414.7	3.13
β-Copaene	8.71*	1545.4	[0.17]	10.56	1423.1	0.01
<i>trans</i> -α-Bergamotene	8.76*	1548.8	[3.16]	10.71	1434.5	0.01
α-Humulene	9.56	1611.8	0.05	10.89	1448.0	0.05
(<i>E</i>)-β-Farnesene	9.86*	1635.6	[0.02]	11.04	1459.1	0.01
α-Amorphene	9.86*	1635.6	[0.02]	11.27*	1476.6	[1.91]
Germacrene D	10.06	1652.2	1.86	11.27*	1476.6	[1.91]
β-Selinene	10.15	1658.8	0.03	11.33	1480.7	0.03
Hodiendiol derivative IV				11.36	1482.9	0.04
Bicyclogermacrene	10.34*	1674.3	[0.09]	11.47*	1491.4	[0.08]
α-Selinene	10.19*	1662.4	[0.03]	11.47*	1491.4	[0.08]
α-Murolene	10.34*	1674.3	[0.09]	11.56	1497.8	0.01
(<i>Z</i>)-α-Bisabolene	10.66	1700.7	0.06	11.58	1499.1	0.05
Cubebol	12.85	1888.5	0.02	11.71*	1509.6	[0.04]
γ-Cadinene	10.70	1703.4	0.05	11.71*	1509.6	[0.04]
δ-Cadinene	10.77	1709.5	0.03	11.85	1520.4	0.04
β-Sesquiphellandrene	10.89	1719.7	0.02	11.88	1522.5	0.02
Octyl tiglate?				11.98	1530.5	tr
Isocaryophyllene epoxide B	12.43*	1851.4	[0.02]	12.16	1545.1	0.01
1,5-Epoxyvalial-4(14)-ene	12.43*	1851.4	[0.02]	12.34	1558.9	0.01
Spathulenol	14.71	2060.9	0.06	12.50	1571.6	0.04
Caryophyllene oxide isomer	13.00	1902.0	0.03	12.54*	1574.8	[0.43]
Caryophyllene oxide	13.08	1909.4	0.44	12.54*	1574.8	[0.43]
Unknown MISC CLIX [m/z 91, 119 (91), 79 (86), 93 (85), 41 (74), 107 (68), 105 (67), 134 (65)... 220 (1)]				12.80*	1595.2	[0.04]
Guaiol	14.43	2034.7	0.02	12.80*	1595.2	[0.04]
Torilenol	15.79	2166.2	0.01	12.95	1607.3	0.01

Unknown CASA XLIV [m/z 135, 93 (66), 79 (58), 107 (54), 41 (42), 81 (41), 67 (41)... 220 (2)]				13.07	1617.1	0.01
allo-Aromadendrene epoxide?	14.21	2013.7	0.04	13.26	1632.6	0.04
τ-Cadinol	15.20	2108.1	0.01	13.32*	1637.4	[0.01]
τ-Muurolol	15.36	2124.2	0.01	13.32*	1637.4	[0.01]
β-Eudesmol	15.70	2157.9	0.05	13.39	1643.2	0.02
α-Eudesmol	15.64	2151.9	0.02	13.44	1647.1	0.01
α-Cadinol	15.82	2168.8	0.05	13.47	1649.9	0.02
Bulnesol	15.59	2147.0	0.02	13.60	1661.0	0.02
Unknown SASC VIII [m/z 81, 41 (46), 79 (46), 93 (39), 91 (33), 107 (33)... 206 (8)]				13.61	1661.9	0.02
Eudesma-4(15),7-dien-1β-ol	16.37	2224.9	0.02	13.84	1680.3	tr
Cyclocolorenone	16.85*	2274.2	[0.03]	14.62	1747.1	0.02
Benzyl benzoate	19.23	2532.3	0.03	14.70	1753.6	0.02
Unknown THAR V [m/z 123, 191 (88), 81 (86), 41 (86), 151 (80), 91 (76)...]				15.52	1825.8	0.01
Phytone	15.00	2088.6	0.02	15.75	1846.8	0.01
Unknown SASC XI [m/z 69, 81 (84), 109 (80), 43 (64), 95 (59)...]				16.51	1916.6	0.01
Unknown UNKN CXC [m/z 109, 132 (88), 157 (76), 119 (66), 91 (57), 105 (55)...]				16.67	1932.0	0.01
Geranyl- <i>para</i> -cymene	16.43	2231.3	0.01	16.88	1951.6	0.01
Manoyl oxide	16.85*	2274.2	[0.03]	17.15	1977.9	0.01
Manool	19.63	2578.0	0.01	17.85	2045.8	0.01
Sclareol	23.18	3015.9	1.14	19.42	2206.6	1.14
Total reported		99.22%			99.25%	

*: 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