

Date : November 09, 2020

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 20J26-PSC03

Customer identification : Frankincense Sacra - BSAC09012020

Type : Essential oil

Source : *Boswellia sacra*

Customer : Pacha Soap Co.

ANALYSIS

Method: PC-MAT-014  - Analysis of the composition of an essential oil or other volatile liquid by FAST GC-FID (in French); identifications validated by GC-MS.

Analyst : Fanny Charlier, B. Sc., chimiste à l'entraînement

Analysis date : November 03, 2020

Checked and approved by :

Alexis St-Gelais, M. Sc., chimiste 2013-174

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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

PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid

Refractive index: 1.4700 ± 0.0003 (20 °C; method PC-MAT-016)

Optical rotation: $+28.0^\circ$ (20 °C, methanol, $c = 1.2$)

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
Unknown	tr	Unknown
Toluene	0.09	Simple phenolic
Unknown	0.01	Alkene
Unknown	0.04	Alkene
Unknown	0.02	Unknown
Hashishene	0.22	Monoterpene
Tricyclene	0.08	Monoterpene
α -Thujene	0.30	Monoterpene
α -Pinene	72.59	Monoterpene
Camphene	1.81	Monoterpene
α -Fenchene	0.02	Monoterpene
Thuja-2,4(10)-diene	0.62	Monoterpene
meta-Cymene	0.21	Monoterpene
β -Pinene	1.48	Monoterpene
Sabinene	1.01	Monoterpene
Pseudolimonene isomer	0.02	Monoterpene
Dehydro-1,8-cineole	0.08	Monoterpenic ether
6-Methyl-5-hepten-2-one	0.04	Aliphatic ketone
<i>trans</i> -Dehydroxylinalool oxide	0.08	Monoterpenic ether
Myrcene	0.42	Monoterpene
2-Carene	0.02	Monoterpene
Pseudolimonene	0.02	Monoterpene
α -Phellandrene	0.46	Monoterpene
Δ^3 -Carene	2.58	Monoterpene
ortho-Methylanisole	0.09	Simple phenolic
Unknown	0.05	Monoterpene
α -Terpinene	0.05	Monoterpene
ortho-Cymene	0.03	Monoterpene
para-Cymene	1.26	Monoterpene
Limonene	5.46	Monoterpene
β -Phellandrene	0.20	Monoterpene
1,8-Cineole	0.32	Monoterpenic ether
Cymene analog	0.04	Monoterpene
(<i>Z</i>)- β -Ocimene	0.12	Monoterpene
(<i>E</i>)- β -Ocimene	0.08	Monoterpene
γ -Terpinene	0.09	Monoterpene
<i>cis</i> -Sabinene hydrate	0.01	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Unknown	0.05	Oxygenated monoterpene
meta-Cymenene	0.01	Monoterpene
Terpinolene	0.06	Monoterpene
para-Cymenene	0.10	Monoterpene
α -Pinene oxide	0.09	Monoterpenic ether
6,7-Epoxyterpinene	0.04	Monoterpenic ether
Linalool	0.05	Monoterpenic alcohol

α -Thujone	0.06	Monoterpenic ketone
Verbenol analog?	0.01	Monoterpenic alcohol
<i>cis</i> -para-Menth-2-en-1-ol	0.04	Monoterpenic alcohol
α -Campholenal	0.29	Monoterpenic aldehyde
<i>cis</i> -Limonene oxide	0.02	Monoterpenic ether
<i>trans</i> -Pinocarveol	0.74	Monoterpenic alcohol
<i>cis</i> -Verbenol	0.17	Monoterpenic alcohol
<i>trans</i> -Verbenol	0.54	Monoterpenic alcohol
meta-Mentha-4,6-dien-8-ol	0.25	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Pinocamphone	0.10	Monoterpenic ketone
Pinocarvone	0.02	Monoterpenic ketone
Borneol	0.23	Monoterpenic alcohol
α -Phellandren-8-ol	0.04	Monoterpenic alcohol
<i>cis</i> -Sabinol	0.01	Monoterpenic alcohol
Terpinen-4-ol	0.20	Monoterpenic alcohol
para-Cymen-8-ol	0.28	Monoterpenic alcohol
α -Terpineol	0.22	Monoterpenic alcohol
Myrtenal	0.19	Monoterpenic aldehyde
Myrtenol	0.18	Monoterpenic alcohol
<i>cis</i> - α -Phellandrene epoxide (IPP vs Me)	0.05	Monoterpenic ether
Verbenone	0.60	Monoterpenic ketone
<i>trans</i> -Carveol	0.16	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
<i>cis</i> -Carveol	0.02	Monoterpenic alcohol
Carvone	0.06	Monoterpenic ketone
Carvotanacetone	0.01	Monoterpenic ketone
Unknown	0.04	Unknown
Linalyl acetate	0.01	Monoterpenic ester
3,5-Dimethoxytoluene	0.03	Simple phenolic
Bornyl acetate	0.28	Monoterpenic ester
Unknown	0.01	Oxygenated monoterpene
Thymol	0.11	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer II	0.01	Monoterpenic alcohol
Carvacrol	0.03	Monoterpenic alcohol
Bicycloelemene	0.01	Sesquiterpene
α -Terpinyl acetate	0.07	Monoterpenic ester
α -Cubebene	0.04	Sesquiterpene
α -Copaene	0.12	Sesquiterpene
β -Bourbonene	0.29	Sesquiterpene
β -Cubebene	0.01	Sesquiterpene
β -Elemene	0.25	Sesquiterpene
α -Gurjunene	0.02	Sesquiterpene
β -Caryophyllene	0.19	Sesquiterpene
β -Copaene	0.06	Sesquiterpene
<i>trans</i> - α -Bergamotene	0.03	Sesquiterpene
Isogermacrene D	0.02	Sesquiterpene
α -Humulene	0.06	Sesquiterpene
allo-Aromadendrene	0.03	Sesquiterpene
Selina-4,11-diene	0.08	Sesquiterpene
Germacrene D	0.05	Sesquiterpene
β -Selinene	0.17	Sesquiterpene

δ-Selinene	0.01	Sesquiterpene
α-Selinene	0.08	Sesquiterpene
epi-Cubebol	0.04	Sesquiterpenic alcohol
α-Muurolene	0.06	Sesquiterpene
γ-Cadinene	0.07	Sesquiterpene
δ-Cadinene	0.11	Sesquiterpene
α-Cadinene	0.01	Sesquiterpene
α-Elemol	0.02	Sesquiterpenic alcohol
Caryophyllenyl alcohol	0.01	Sesquiterpenic alcohol
Caryophyllene oxide	0.07	Sesquiterpenic ether
Caryophyllene oxide isomer	0.01	Sesquiterpenic ether
Copaborneol	0.03	Sesquiterpenic alcohol
Humulene epoxide II	0.02	Sesquiterpenic ether
10-epi-Cubenol	0.03	Sesquiterpenic alcohol
τ-Cadinol	0.01	Sesquiterpenic alcohol
τ-Muurolol	0.01	Sesquiterpenic alcohol
(3Z)-Caryophylla-3,8(13)-dien-5β-ol	0.02	Sesquiterpenic alcohol
α-Phellandrene dimer II	0.05	Diterpene
Unknown	0.01	Oxygenated sesquiterpene
α-Phellandrene dimer III	0.01	Diterpene
meta-Camphorene	0.01	Diterpene
para-Camphorene	0.02	Diterpene
Cembrene C isomer	0.01	Diterpene
Serratol	0.01	Diterpenic alcohol
Incensole	0.01	Diterpenic alcohol
Consolidated total	97.70%	

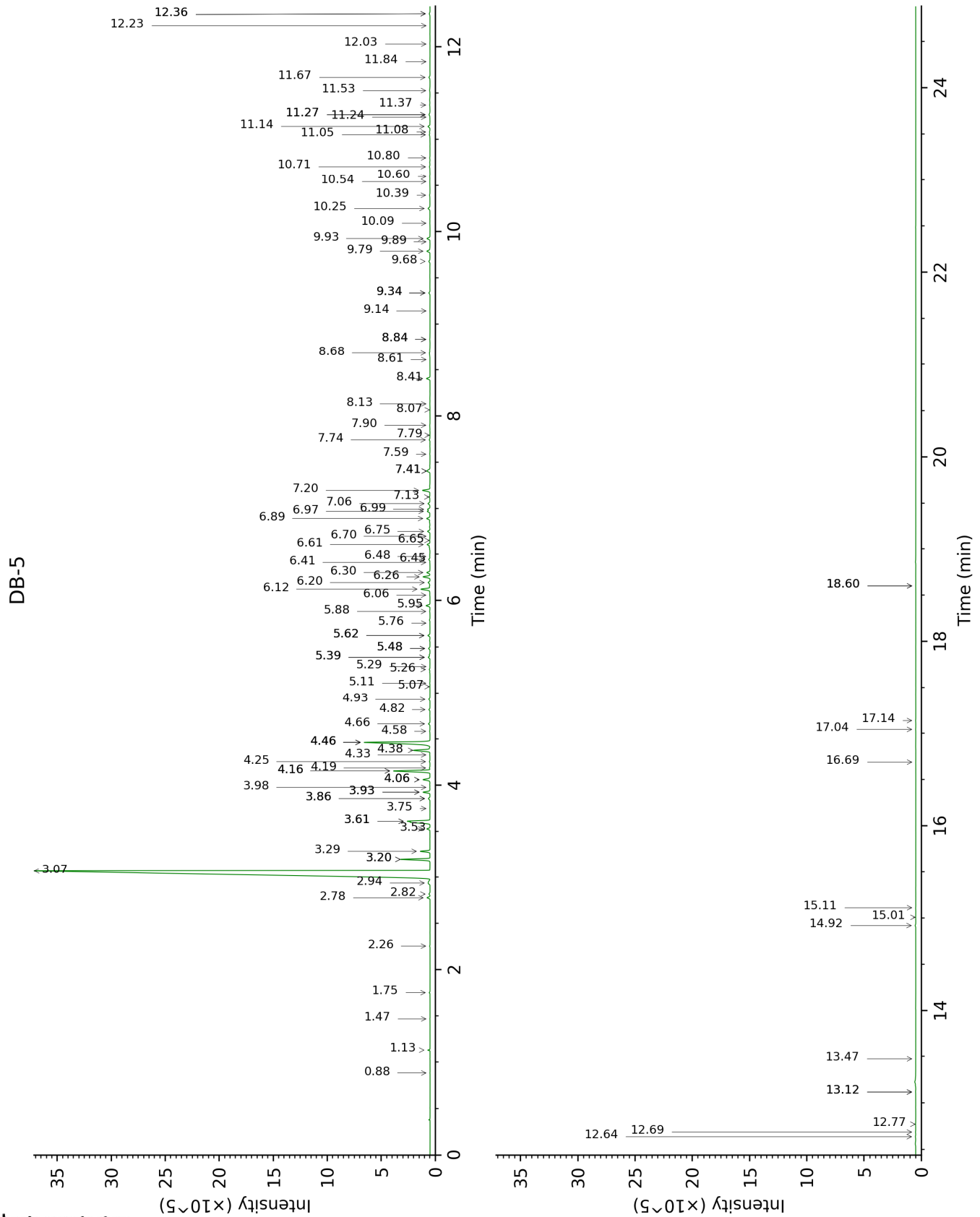
tr: The compound has been detected below 0.005% of total signal.

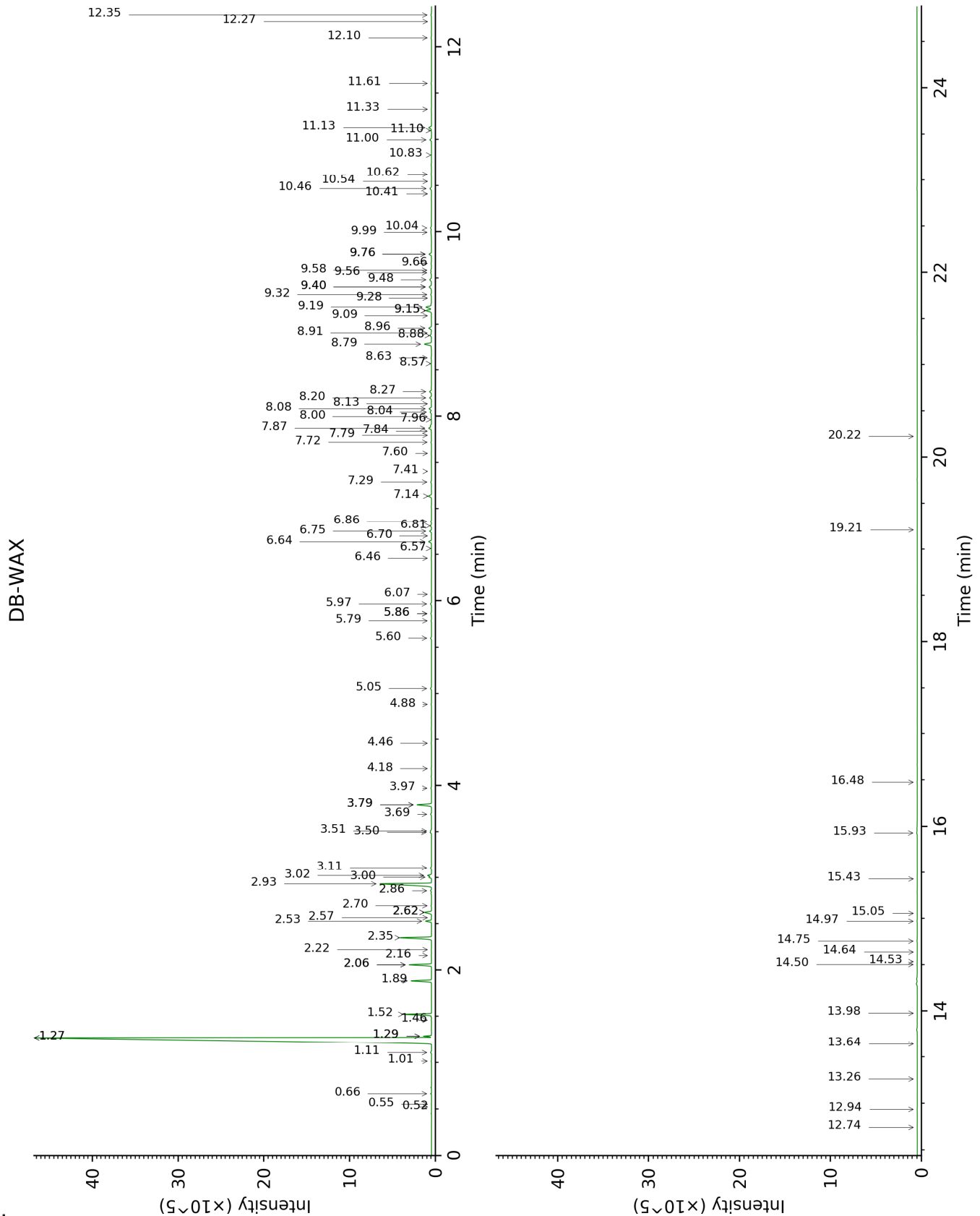
Note: no correction factor was applied

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.

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





FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Unknown [m/z 93, 91 (70), 77 (48), 108 (42)]	0.88	723	tr	0.52	821	tr
Toluene	1.13	758	0.09	1.29*	1002	0.39
Unknown [m/z 109, 67 (33), 41 (16), 81 (13)... 124 (8)]	1.47	807	0.01	0.55	833	0.01
Unknown [m/z 109, 67 (32), 81 (14), 41 (12), 124 (10)]	1.75	831	0.04	0.66	880	0.04
Unknown [m/z 79, 78 (45), 91 (28), 77 (28), 41 (13), 80 (12), 107 (11)... 122 (1)]	2.26	874	0.02	1.01	954	0.02
Hashishene	2.78	915	0.22	1.27*	1000	72.94
Tricyclene	2.82	918	0.08	1.11	971	0.08
α -Thujene	2.94	926	0.30	1.29*	1002	[0.39]
α -Pinene	3.07	934	72.59	1.27*	1000	[72.94]
Camphene	3.20*	943	1.81	1.52	1027	1.81
α -Fenchene	3.20*	943	[1.81]	1.46	1020	0.02
Thuja-2,4(10)-diene	3.29	949	0.62	2.06*	1083	1.63
meta-Cymene	3.53	965	0.21	2.62*	1133	0.66
β -Pinene	3.61*	971	2.54	1.88	1065	1.48
Sabinene	3.61*	971	[2.54]	2.06*	1083	[1.63]
Pseudolimonene isomer	3.75	980	0.02	2.22	1100	0.02
Dehydro-1,8-cineole	3.86*	987	0.15	2.86	1152	0.08
6-Methyl-5-hepten-2-one	3.86*	987	[0.15]	4.88	1303	0.04
<i>trans</i> -Dehydroxylinalool oxide	3.93*	992	0.49	3.11	1172	0.08
Myrcene	3.93*	992	[0.49]	2.62*	1133	[0.66]
2-Carene	3.98	995	0.02	2.16	1094	0.02
Pseudolimonene	4.06*	1001	0.56	2.57	1128	0.02
α -Phellandrene	4.06*	1001	[0.56]	2.53	1125	0.46
Δ 3-Carene	4.16*	1007	2.65	2.35	1111	2.58
ortho-Methylanisole	4.16*	1007	[2.65]	5.60	1356	0.09
Unknown [m/z 117, 132 (88), 115 (68), 91 (55), 77 (20)]	4.19	1009	0.05			

α-Terpinene	4.26	1013	0.05	2.70	1139	0.04
ortho-Cymene	4.33	1018	0.03	3.79*	1226	1.27
para-Cymene	4.38	1021	1.26	3.79*	1226	[1.27]
Limonene	4.46*	1027	5.95	2.93	1158	5.46
β-Phellandrene	4.46*	1027	[5.95]	3.00	1164	0.20
1,8-Cineole	4.46*	1027	[5.95]	3.02	1165	0.32
Cymene analog	4.58	1034	0.04	4.18	1256	0.03
(Z)-β-Ocimene	4.66	1039	0.12	3.50	1204	0.12
(E)-β-Ocimene	4.82	1049	0.08	3.69	1218	0.08
γ-Terpinene	4.93	1056	0.09	3.51	1205	0.08
cis-Sabinene hydrate	5.07	1065	0.01	6.57	1427	0.03
Unknown [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	5.11	1068	0.02	4.46	1276	0.03
Unknown [m/z 43, 94 (63), 109 (61), 59 (55), 79 (51)...152 (2)]	5.26	1077	0.05	6.86	1449	0.08
meta-Cymenene	5.29	1079	0.01	5.86*	1375	0.07
Terpinolene	5.39*	1085	0.14	3.97	1240	0.06
para-Cymenene	5.39*	1085	[0.14]	5.97	1383	0.10
α-Pinene oxide	5.48*	1091	0.11	5.06	1316	0.09
6,7-Epoxymyrcene	5.48*	1091	[0.11]	5.78	1369	0.04
Linalool	5.62*	1100	0.16	7.72	1514	0.05
α-Thujone	5.62*	1100	[0.16]	5.86*	1375	[0.07]
Verbenol analog?	5.76	1109	0.01	7.96	1533	0.02
cis-para-Menth-2-en-1-ol	5.88	1117	0.04	7.84	1524	0.03
α-Campholenal	5.95	1121	0.29	6.64	1433	0.30
cis-Limonene oxide	6.06	1128	0.02	6.07	1390	0.04
trans-Pinocarveol	6.12	1132	0.74	8.79	1598	0.72
cis-Verbenol	6.20	1137	0.17	8.88	1605	0.14
trans-Verbenol	6.26	1141	0.54	9.15*	1627	0.56
meta-Mentha-4,6-dien-8-ol	6.30	1144	0.25	8.96	1612	0.28
Unknown [m/z 109, 81 (39), 41 (38), 95 (24)... 152 (1)]	6.41	1151	0.02			
Pinocamphone	6.45	1153	0.10	6.81	1446	0.12
Pinocarvone	6.48	1155	0.02	7.60	1505	0.03
Borneol	6.61	1164	0.23	9.40*	1648	0.29
α-Phellandren-8-ol	6.65	1166	0.04	9.76*	1677	0.24
cis-Sabinol	6.70	1169	0.01	10.54	1743	0.01
Terpinen-4-ol	6.75	1173	0.20	8.20	1552	0.19
para-Cymen-8-ol	6.90	1182	0.28	11.13	1794	0.27
α-Terpineol	6.97	1187	0.22	9.48	1655	0.19
Myrtenal	6.99	1189	0.19	8.27	1557	0.19

Myrtenol	7.06	1193	0.18	10.46	1737	0.16
<i>cis</i> - α -Phellandrene epoxide (IPP vs Me)	7.13	1197	0.05	10.62	1750	0.04
Verbenone	7.20	1202	0.60	9.19	1630	0.58
<i>trans</i> -Carveol	7.41*	1216	0.33	11.00	1782	0.16
Unknown [m/z 43, 111 (88), 126 (74), 125 (61)... 168? (2)]	7.41*	1216	[0.33]	10.83	1768	0.01
<i>cis</i> -Carveol	7.59	1228	0.02	11.33	1811	0.02
Carvone	7.74	1239	0.06	9.66	1669	0.04
Carvotanacetone	7.79	1242	0.01	9.09	1623	0.02
Unknown [m/z 43, 82 (79), 109 (69), 110 (65), 95 (38), 41 (36)...]	7.90	1250	0.04			
Linalyl acetate	8.07	1261	0.01	7.80	1520	0.02
3,5-Dimethoxytoluene	8.13	1265	0.03	11.10	1791	0.03
Bornyl acetate	8.41	1284	0.28	7.87	1526	0.29
Unknown [m/z 43, 93 (66), 91 (44), 41 (38), 69 (35)... 152? (1)]	8.61	1298	0.01			
Thymol	8.68	1303	0.11	14.75	2133	0.04
para-Menth-5-en-1,2-diol isomer II	8.84*	1310	0.04	13.98	2056	0.01
Carvacrol	8.84*	1310	[0.04]	14.97	2155	0.03
Bicycloelemene	9.14	1332	0.01	6.70	1437	0.02
α -Terpinyl acetate	9.34*	1346	0.10	9.32	1642	0.07
α -Cubebene	9.34*	1346	[0.10]	6.46	1419	0.04
α -Copaene	9.68	1370	0.12	6.75	1441	0.18
β -Bourbonene	9.79	1378	0.29	7.14	1470	0.31
β -Cubebene	9.89	1385	0.01	7.41	1490	0.01
β -Elemene	9.92	1387	0.25	8.08	1543	0.24
α -Gurjunene	10.09	1399	0.02	7.29	1482	0.08
β -Caryophyllene	10.25	1411	0.19	8.04	1540	0.13
β -Copaene	10.39	1422	0.06	8.00	1536	0.04
<i>trans</i> - α -Bergamotene	10.54	1433	0.03	8.13	1547	0.02
Isogermacrene D	10.60	1437	0.02	8.57	1581	0.03
α -Humulene	10.71	1445	0.06	8.91	1608	0.04
allo-Aromadendrene	10.80	1452	0.03	8.63	1586	0.05
Selina-4,11-diene	11.05	1471	0.08	9.15*	1627	[0.56]
Germacrene D	11.08	1473	0.05	9.40*	1648	[0.29]
β -Selinene	11.14	1478	0.17	9.56	1661	0.09
δ -Selinene	11.24	1485	0.01	9.28	1638	0.01
α -Selinene	11.27*	1487	0.11	9.58	1663	0.08
epi-Cubebol	11.27*	1487	[0.11]	11.61	1836	0.04
α -Muurolene	11.37	1495	0.06	9.76*	1677	[0.24]
γ -Cadinene	11.53	1507	0.07	9.99	1696	0.15

δ-Cadinene	11.67	1518	0.11	10.04	1700	0.11
α-Cadinene	11.84	1531	0.01	10.41	1732	0.02
α-Elemol	12.03	1546	0.02	13.64	2024	0.01
Caryophyllenyl alcohol	12.23	1562	0.01	13.26	1988	0.01
Caryophyllene oxide	12.36*	1572	0.08	12.34	1902	0.07
Caryophyllene oxide isomer	12.36*	1572	[0.08]	12.27	1896	0.01
Copaborneol	12.64	1594	0.03	14.50	2108	0.03
Humulene epoxide II	12.69	1598	0.02	12.94	1957	0.02
10-epi-Cubenol	12.77	1605	0.03			
τ-Cadinol	13.12*	1634	0.02	14.53	2111	0.01
τ-Murolol	13.12*	1634	[0.02]	14.64	2121	0.01
(3Z)-Caryophylla-3,8(13)-dien-5β-ol	13.47	1663	0.02	16.48	2312	0.02
α-Phellandrene dimer II	14.92	1787	0.05	12.10	1880	0.05
Unknown [m/z 43, 41 (72), 95 (69), 81 (66), 67 (55), 55 (52), 79 (52), 69 (50)... 238 (1)]	15.01	1794	0.01			
α-Phellandrene dimer III	15.11	1804	0.01	12.74	1939	0.03
meta-Camphorene	16.69	1949	0.01	15.05	2164	0.01
para-Camphorene	17.04	1983	0.02	15.43	2201	0.01
Cembrene C isomer	17.14	1992	0.01	15.93	2254	0.08
Serratol	18.60*	2139	0.01	19.21	2621	0.01
Incensole	18.60*	2139	[0.01]	20.22	2745	0.01
Total identified		97.69%			97.62%	
Total reported		97.96%			97.82%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken into account in the consolidated total

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