

Date : 2026-06-09

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 26F09-PTH01

Customer Identification : Organic Frankincense Frereana - Somalia - FE0115

Type : Essential Oil

Source : *Boswellia frereana*

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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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

This report is an update of the version first issued on 2026-05-27 to update the sample identification section.

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 : 2026-05-27

PHYSICOCHEMICAL DATA

Refractive index : 1.4655 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2026-05-21

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-Methyl-2-butanone	0.04	Aliphatic ketone
Unknown	0.01	Unknown
4-Methyl-2-pentanone (Methyl isobutyl ketone)	0.02	Aliphatic ketone
Toluene	0.04	Simple phenolic
Hexadiene isomer?	0.02	Alkene
Unknown	0.02	Alkene
(Z)-Salvene	0.05	Normonoterpene
(E)-Salvene	0.02	Normonoterpene
Unknown	0.01	Unknown
Unknown	0.07	Monoterpene
Unknown	0.15	Unknown
Hashishene	0.42	Monoterpene
Tricyclene	0.02	Monoterpene
α -Thujene	43.51	Monoterpene
α -Pinene	11.55	Monoterpene
Thujadiene isomer	3.29	Monoterpene
α -Fenchene	0.01	Monoterpene
Camphene	0.21	Monoterpene
Thuja-2,4(10)-diene	0.09	Monoterpene
Sabinene	5.62	Monoterpene
β -Pinene	0.66	Monoterpene
Pseudolimonene isomer	0.04	Monoterpene
Dehydro-1,8-cineole	0.01	Monoterpenic ether
6-Methyl-5-hepten-2-one	0.07	Aliphatic ketone
Myrcene	0.55	Monoterpene
6-Methyl-5-hepten-2-ol	0.02	Aliphatic alcohol
2,7-Dimethyl-2,6-octadiene	0.22	Monoterpene
Pseudolimonene	0.02	Monoterpene
α -Phellandrene	0.93	Monoterpene
Δ^3 -Carene	0.08	Monoterpene
α -Terpinene	0.63	Monoterpene
Carvomenthene	tr	Aliphatic alcohol
<i>meta</i> -Cymene	0.56	Monoterpene
<i>para</i> -Cymene	12.42	Monoterpene
Unknown	0.53	Unknown
Limonene	1.50	Monoterpene
β -Phellandrene	0.55	Monoterpene
1,8-Cineole	1.27	Monoterpenic ether
<i>ortho</i> -Cymene	0.01	Monoterpene

Unknown	0.04	Unknown
(Z)- β -Ocimene	0.03	Monoterpene
Unknown	0.26	Unknown
(E)- β -Ocimene	0.02	Monoterpene
γ -Terpinene	0.82	Monoterpene
cis-Sabinene hydrate	0.07	Monoterpenic alcohol
Unknown	0.06	Oxygenated monoterpene
cis-Linalool oxide (fur.)	0.02	Monoterpenic alcohol
Terpinolene	0.19	Monoterpene
para-Cymenene	0.16	Monoterpene
trans-Sabinene hydrate	0.07	Monoterpenic alcohol
α -Thujone	0.02	Monoterpenic ketone
Linalool	0.14	Monoterpenic alcohol
Unknown	0.06	Oxygenated monoterpene
β -Thujone	0.84	Monoterpenic ketone
Dehydrosabinaketone	0.04	Normonoterpenic ketone
Unknown	0.02	Oxygenated monoterpene
cis-para-Menth-2-en-1-ol	0.12	Monoterpenic alcohol
trans-para-Mentha-2,8-dien-1-ol	0.10	Monoterpenic alcohol
α -Campholenal	0.09	Monoterpenic aldehyde
Unknown	0.04	Unknown
trans-Pinocarveol	0.12	Monoterpenic alcohol
cis-Verbenol	0.10	Monoterpenic alcohol
trans-Sabinol	0.20	Monoterpenic alcohol
trans-Verbenol	0.11	Monoterpenic alcohol
meta-Mentha-4,6-dien-8-ol	0.05	Monoterpenic alcohol
Sabinaketone	0.11	Normonoterpenic ketone
Unknown	0.03	Oxygenated monoterpene
Pinocarpone	0.03	Monoterpenic ketone
Unknown	0.17	Oxygenated monoterpene
α -Phellandren-8-ol	0.10	Monoterpenic alcohol
Unknown	0.03	Oxygenated monoterpene
cis-Sabinol	0.32	Monoterpenic alcohol
Umbellulone	0.17	Monoterpenic ketone
Terpinen-4-ol	3.73	Monoterpenic alcohol
Cryptone	0.06	Normonoterpenic ketone
Thuj-3-en-10-al	0.15	Monoterpenic aldehyde
para-Cymen-8-ol	0.30	Monoterpenic alcohol
α -Terpineol	0.42	Monoterpenic alcohol
Myrtenal	0.04	Monoterpenic aldehyde
Myrtenol	0.01	Monoterpenic alcohol
cis-Piperitol	0.08	Monoterpenic alcohol
cis- α -Phellandrene epoxide (iPr vs Me)	0.11	Monoterpenic ether
Verbenone	0.08	Monoterpenic ketone
trans-Piperitol	0.08	Monoterpenic alcohol

<i>trans</i> -Carveol	0.05	Monoterpenic alcohol
Citronellol	0.07	Monoterpenic alcohol
Cuminal	0.16	Monoterpenic aldehyde
Carvone	0.03	Monoterpenic ketone
Carvotanacetone	0.08	Monoterpenic ketone
Piperitone	0.02	Monoterpenic ketone
Unknown	0.08	Oxygenated monoterpene
Unknown	0.03	Unknown
Unknown	0.02	Unknown
Unknown	0.04	Unknown
Bornyl acetate	0.21	Monoterpenic ester
Cuminol	0.05	Monoterpenic alcohol
Thymol	0.12	Monoterpenic alcohol
Carvacrol	0.13	Monoterpenic alcohol
<i>exo</i> -2-Hydroxycineole acetate	0.02	Monoterpenic ester
α -Cubebene	0.03	Sesquiterpene
Citronellyl acetate	0.05	Monoterpenic ester
α -Copaene	0.05	Sesquiterpene
β -Bourbonene	1.10	Sesquiterpene
1,5-diepi- β -Bourbonene	0.08	Sesquiterpene
β -Elemene	0.10	Sesquiterpene
β -Caryophyllene	0.03	Sesquiterpene
β -Ylangene	0.11	Sesquiterpene
β -Copaene	0.13	Sesquiterpene
Isogermacrene D	0.07	Sesquiterpene
α -Humulene	0.02	Sesquiterpene
Germacrene D	0.03	Sesquiterpene
β -Selinene	0.02	Sesquiterpene
γ -Cadinene	0.04	Sesquiterpene
δ -Cadinene	0.03	Sesquiterpene
Caryophyllene oxide	0.02	Sesquiterpenic ether
Viridiflorol	0.03	Sesquiterpenic alcohol
τ -Cadinol	0.05	Sesquiterpenic alcohol
α -Phellandrene dimer I	0.05	Diterpene
α -Phellandrene dimer II	0.62	Diterpene
α -Phellandrene dimer III	0.07	Diterpene
α -Phellandrene dimer IV	0.09	Diterpene
α -Phellandrene dimer VI	0.02	Diterpene
α -Phellandrene dimer VII	0.02	Diterpene
α -Phellandrene dimer VIII	0.01	Diterpene
Serratol	0.03	Diterpenic alcohol
Consolidated total	99.02	

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

Note: no correction factor was applied

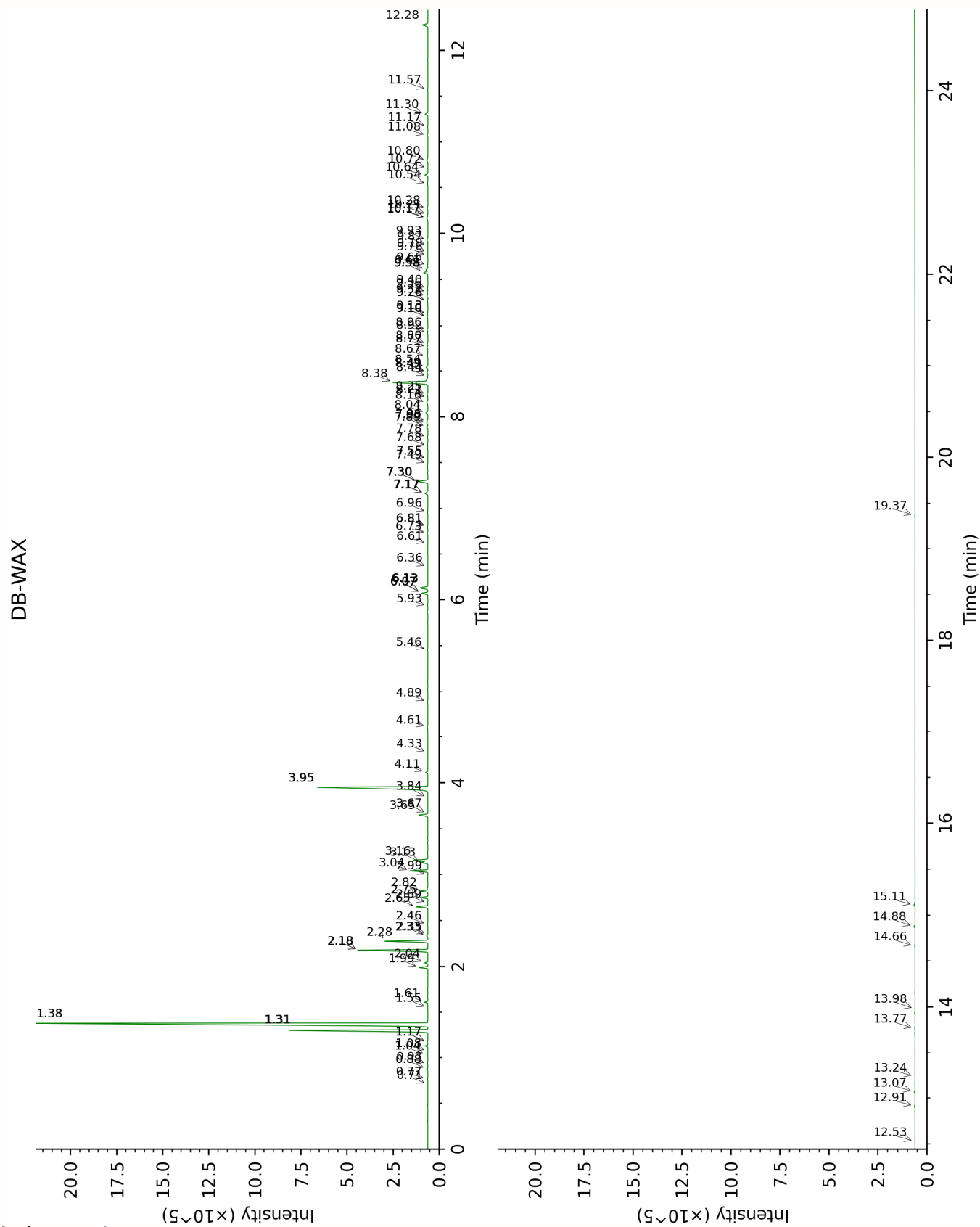
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies

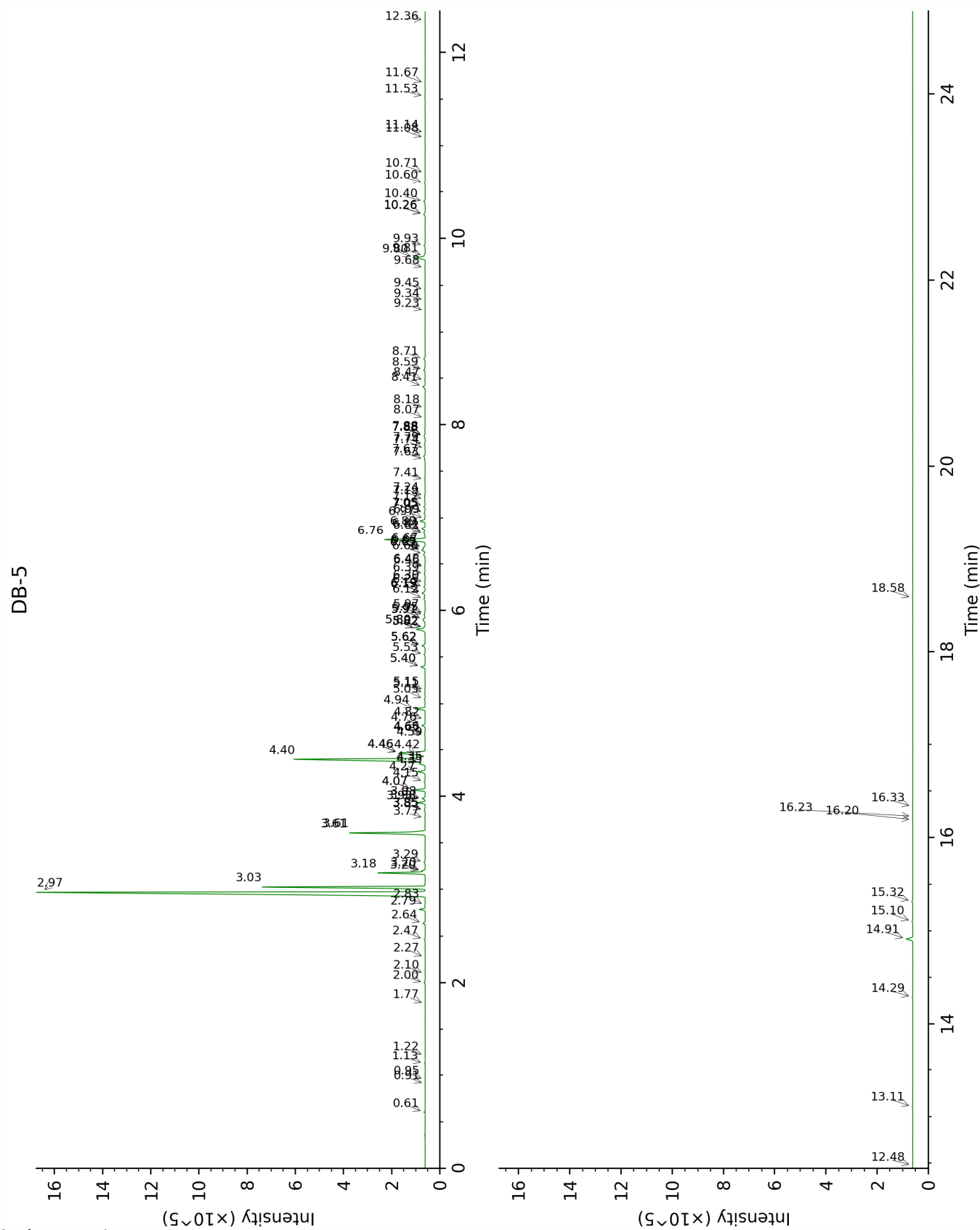
between columns, the algorithm is set to prioritize data from the most standard DB-5 column, and smallest values so as to avoid overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report 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-Methyl-2-butanone	Column DB-WAX			Column DB-5		
	0.77	899.5	0.04	0.61	648.5	0.04
Unknown BODA I [m/z 93, 91 (70), 77 (48), 108 (42)]				0.91	727.3	0.01
4-Methyl-2-pentanone (Methyl isobutyl ketone)	1.17*	969.8	[0.05]	0.95	733.8	0.02
Toluene	1.38*	1003.4	[43.43]	1.13	759.2	0.04
Hexadiene isomer?				1.22	772.8	0.02
Unknown BOCA I [m/z 109, 67 (32), 81 (14), 41 (12), 124 (10)]	0.71	879.7	tr	1.77	833.3	0.02
(Z)-Salvene	0.88	922.6	0.05	2.00	852.5	0.05
(E)-Salvene	0.93	931.4	0.02	2.10	860.9	0.02
Unknown BOCA II [m/z 79, 78 (45), 91 (28), 77 (28), 41 (13), 80 (12), 107 (11)... 122 (1)]	1.08	955.4	0.01	2.27	875.7	0.01
Unknown BOFR I [m/z 93, 91 (75), 121 (61), 77 (58), 79 (38), 92 (26), 43 (24), 41 (23), 105 (22), 107 (19), 136 (16)]	1.04	948.2	0.07	2.47	892.1	0.07
Unknown BOFR II [m/z 93, 91 (72), 121 (58), 77 (49), 79 (41), 43 (22), 105 (20), 107 (20), 41 (18), 136 (17), 92 (17)]				2.64	906.3	0.15
Hashishene	1.31*	991.1	[11.96]	2.79	916.4	0.42
Tricyclene	1.17*	969.8	[0.05]	2.83	919.2	0.02
α -Thujene	1.38*	1003.4	[43.43]	2.97	928.7	43.51
α -Pinene	1.31*	991.1	[11.96]	3.03	932.5	11.55
Thujadiene isomer	2.28	1092.7	3.25	3.18	942.6	3.29
α -Fenchene	1.55	1021.4	0.01	3.20*	944.2	[0.19]
Camphene	1.61	1027.3	0.21	3.20*	944.2	[0.19]
Thuja-2,4(10)-diene	2.18*	1083.0	[5.67]	3.29	950.2	0.09
Sabinene	2.18*	1083.0	[5.67]	3.61*	971.4	[6.27]
β -Pinene	1.99	1064.4	0.66	3.61*	971.4	[6.27]
Pseudolimonene isomer	2.33	1098.4	0.09	3.77	982.0	0.04

Dehydro-1,8-cineole	2.99	1151.3	0.01	3.85*	987.8	[0.09]
6-Methyl-5-hepten-2-one	4.89	1295.2	0.07	3.85*	987.8	[0.09]
Myrcene	2.75	1132.8	0.54	3.93	993.3	0.55
6-Methyl-5-hepten-2-ol	6.81*	1431.9	[0.05]	3.98*	996.3	[0.24]
2,7-Dimethyl-2,6-octadiene	2.04	1069.4	0.22	3.98*	996.3	[0.24]
Pseudolimonene	2.69	1127.9	0.02	4.07*	1002.5	[0.98]
α -Phellandrene	2.65	1124.9	0.93	4.07*	1002.5	[0.98]
Δ^3 -Carene	2.46	1109.9	0.04	4.15	1007.9	0.08
α -Terpinene	2.82	1138.3	0.55	4.27	1015.1	0.63
Carvomenthene	2.36	1100.5	tr	4.35*	1020.5	[0.57]
<i>meta</i> -Cymene	3.95*	1225.9	[12.90]	4.35*	1020.5	[0.57]
<i>para</i> -Cymene	3.95*	1225.9	[12.90]	4.40	1023.6	12.42
Unknown BODA IV [m/z 109, 43 (58), 95 (26)... 137 (15)...]	6.07*	1377.5	[0.59]	4.42	1024.7	0.53
Limonene	3.04	1155.6	1.50	4.46*	1027.6	[3.31]
β -Phellandrene	3.13	1162.7	0.55	4.46*	1027.6	[3.31]
1,8-Cineole	3.16	1164.6	1.27	4.46*	1027.6	[3.31]
<i>ortho</i> -Cymene	4.33	1254.0	0.01	4.59	1035.5	0.01
Unknown ARAN I [m/z 43, 55 (65), 41 (34), 67 (32), 107 (30), 122 (26)... 125 (10)]	5.46	1332.7	0.04	4.65	1039.7	0.04
(Z)- β -Ocimene	3.67	1204.7	0.01	4.66	1040.4	0.03
Unknown BOFR III [m/z 109, 43 (57), 91 (28), 67 (25), 93 (24), 95 (22), 77 (21), 137 (21), 41 (17), 79 (14)...]	7.17*	1459.2	[0.36]	4.76	1046.5	0.26
(E)- β -Ocimene	3.84	1217.5	0.02	4.82	1050.5	0.02
γ -Terpinene	3.65	1203.4	0.84	4.94	1058.0	0.82
<i>cis</i> -Sabinene hydrate	6.73	1425.9	0.08	5.05	1064.9	0.07
Unknown PIMA I [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	4.61	1274.5	0.06	5.11	1069.0	0.06
<i>cis</i> -Linalool oxide (fur.)	6.36	1398.2	0.02	5.15	1071.2	0.02
Terpinolene	4.11	1237.9	0.19	5.40*	1087.0	[0.36]
<i>para</i> -Cymenene	6.13*	1381.8	[0.87]	5.40*	1087.0	[0.36]
<i>trans</i> -Sabinene hydrate	7.78	1505.3	0.05	5.53	1095.6	0.07

α -Thujone	5.93	1367.3	0.02	5.62*	1101.6	[0.27]
Linalool	7.89	1514.0	0.14	5.62*	1101.6	[0.27]
Unknown BOSE I [m/z 109, 81 (54), 91 (32), 79 (22)...]	6.07*	1377.5	[0.59]	5.80*	1113.0	[0.90]
β -Thujone	6.13*	1381.8	[0.87]	5.80*	1113.0	[0.90]
Dehydrosabinaketone	8.44	1557.0	0.04	5.82*	1114.2	[0.06]
Unknown BOSE II [m/z 109, 91 (57), 93 (47), 81 (44), 77 (40)... 154 (1)]				5.82*	1114.2	[0.06]
<i>cis-para</i> -Menth-2-en-1-ol	7.96	1519.1	0.12	5.91*	1119.9	[0.30]
<i>trans-para</i> -Mentha-2,8-dien-1-ol	8.77	1582.8	0.10	5.91*	1119.9	[0.30]
α -Campholenal	6.81*	1431.9	[0.05]	5.95	1122.8	0.09
Unknown BOSE III [m/z 111, 43 (22), 55 (14), 41 (12), 110 (11)...]				5.97	1123.8	0.04
<i>trans</i> -Pinocarveol	8.96	1598.0	0.10	6.12	1134.0	0.12
<i>cis</i> -Verbenol	9.10*	1608.7	[0.08]	6.19*	1138.3	[0.30]
<i>trans</i> -Sabinol	9.61	1650.8	0.20	6.19*	1138.3	[0.30]
<i>trans</i> -Verbenol	9.32	1627.2	0.13	6.25	1142.5	0.11
<i>meta</i> -Mentha-4,6-dien-8-ol	9.13	1611.3	0.05	6.30	1145.7	0.05
Sabinaketone	8.49*	1560.8	[0.10]	6.39	1151.7	0.11
Unknown BOCA III [m/z 97, 81 (96), 109 (80), 43 (53), 53 (40), 41 (36), 56 (29), 95 (25)... 152 (1)]	7.30*	1469.1	[1.11]	6.46	1156.3	0.03
Pinocarvone	7.68	1498.2	0.02	6.48	1157.0	0.03
Unknown CALU II [m/z 95, 110 (38), 81 (21), 79 (16)... 152 (7)]	7.49	1483.3	0.05	6.60	1165.2	0.17
α -Phellandren-8-ol	9.93	1677.2	0.10	6.65*	1168.3	[0.33]
Unknown CALU III [m/z 95, 110 (43), 81 (28), 41 (15)... 152 (8)]	7.55	1487.7	0.03	6.65*	1168.3	[0.33]
<i>cis</i> -Sabinol	10.64	1737.1	0.32	6.65*	1168.3	[0.33]
Umbellulone	8.67	1575.1	0.18	6.68	1170.0	0.17
Terpinen-4-ol	8.38	1552.2	3.75	6.76	1175.7	3.73
Cryptone	8.92	1595.2	0.04	6.82	1179.5	0.06
Thuj-3-en-10-al	8.54	1565.2	0.17	6.84	1180.9	0.15

<i>para</i> -Cymen-8-ol	11.30	1793.9	0.28	6.89	1183.8	0.30
α -Terpineol	9.58*	1648.3	[0.45]	6.97	1189.2	0.42
Myrtenal	8.49*	1560.8	[0.10]	6.99	1190.4	0.04
Myrtenol	10.72	1743.6	0.01	7.05*	1194.6	[0.11]
<i>cis</i> -Piperitol	9.36	1630.4	0.08	7.05*	1194.6	[0.11]
<i>cis</i> - α -Phellandrene epoxide (iPr vs Me)	10.80	1750.6	0.17	7.12	1199.2	0.11
Verbenone	9.40	1634.0	0.04	7.19	1203.8	0.08
<i>trans</i> -Piperitol	10.17*	1696.9	[0.18]	7.24	1206.7	0.08
<i>trans</i> -Carveol	11.17	1782.7	0.04	7.41	1218.6	0.05
Citronellol	10.54	1728.0	0.05	7.63	1233.5	0.07
Cuminal	10.28	1705.9	0.11	7.66	1236.0	0.16
Carvone	9.79	1666.0	0.02	7.74	1241.3	0.03
Carvotanacetone	9.26*	1622.6	[0.06]	7.79	1244.5	0.08
Piperitone	9.76	1663.3	0.02	7.88*	1250.7	[0.12]
Unknown BODA V [m/z 109, 119 (84), 91 (81), 134 (55)... 137 (27)...]	11.08	1774.3	0.08	7.88*	1250.7	[0.12]
Unknown CALU IV [m/z 43, 97 (69), 107 (46), 41 (28), 55 (21), 109 (20)...]				7.88*	1250.7	[0.12]
Unknown CIGL III [m/z 43, 97 (78), 41 (45), 55 (35), 69 (28), 107 (24), 83 (23)...]	13.24	1968.7	0.01	8.07	1263.7	0.02
Unknown PECH X [m/z 109, 43 (83), 95 (70), 110 (70), 99 (53), 119 (48)...]				8.18	1271.2	0.04
Bornyl acetate	8.04	1526.1	0.23	8.41	1287.1	0.21
Cuminol	13.98	2039.2	0.01	8.48	1291.6	0.05
Thymol	14.88	2127.0	0.11	8.59	1299.4	0.12
Carvacrol	15.11	2150.6	0.15	8.71	1307.5	0.13
exo-2-Hydroxycineole acetate	9.87	1672.2	0.02	9.23	1341.0	0.02
α -Cubebene	6.61	1417.2	0.02	9.34	1349.0	0.03
Citronellyl acetate	9.26*	1622.6	[0.06]	9.45	1357.0	0.05
α -Copaene	6.96	1443.8	0.06	9.68	1373.3	0.05
β -Bourbonene	7.30*	1469.1	[1.11]	9.80	1381.4	1.10
1,5-diepi- β -Bourbonene	7.17*	1459.2	[0.36]	9.82	1382.8	0.08
β -Elemene	8.25	1541.9	0.09	9.93	1390.7	0.10
β -Caryophyllene	8.21	1539.0	0.03	10.26*	1414.9	[0.14]

β-Ylangene	7.93	1517.1	0.11	10.26*	1414.9	[0.14]
β-Copaene	8.16	1534.9	0.18	10.40	1425.2	0.13
Isogermacrene D	8.80	1585.7	0.08	10.60	1440.3	0.07
α-Humulene	9.10*	1608.7	[0.08]	10.71	1448.5	0.02
Germacrene D	9.58*	1648.3	[0.45]	11.08	1476.7	0.03
β-Selinene	9.66	1654.8	0.05	11.14	1481.1	0.02
γ-Cadinene	10.17*	1696.9	[0.18]	11.53	1510.6	0.04
δ-Cadinene	10.21	1700.1	0.04	11.67	1521.6	0.03
Caryophyllene oxide	12.53	1902.9	0.02	12.36	1575.6	0.02
Viridiflorol	13.77	2018.3	0.04	12.48	1585.3	0.03
τ-Cadinol	14.66	2105.6	0.04	13.11	1636.4	0.05
α-Phellandrene dimer I	11.57	1817.1	0.04	14.29	1736.4	0.05
α-Phellandrene dimer II	12.28	1880.3	0.63	14.91	1790.6	0.62
α-Phellandrene dimer III	12.91	1938.5	0.06	15.10	1807.0	0.07
α-Phellandrene dimer IV	13.07	1952.9	0.09	15.32	1826.7	0.09
α-Phellandrene dimer VI				16.20	1906.7	0.02
α-Phellandrene dimer VII				16.23	1910.2	0.02
α-Phellandrene dimer VIII				16.33	1919.9	0.01
Serratol	19.37	2615.6	0.03	18.58	2141.2	0.03
Total reported		97.90%			99.11%	

*: 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