

Date : 2026-02-11

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25J23-PTH02

Customer Identification : Frankincense Serrata - India - F40117R

Type : Essential Oil

Source : *Boswellia serrata*

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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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 2025-10-30 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 : Jean-Christophe Fortin, M. Sc.

Date : 2025-10-30

PHYSICOCHEMICAL DATA

Refractive index : 1.46 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2025-10-27

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
(E)-2-Methyl-1,3-pentadiene	tr	Alkene
Toluene	0.01	Simple phenolic
Unknown	0.01	Monoterpene
Unknown	0.02	Unknown
Hashishene	0.14	Monoterpene
Tricyclene	0.02	Monoterpene
α -Thujene	66.53	Monoterpene
α -Pinene	9.65	Monoterpene
Unknown	0.36	Monoterpene
Camphene	0.17	Monoterpene
α -Fenchene	0.01	Monoterpene
Thuja-2,4(10)-diene	0.02	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.04	Monoterpene
Sabinene	4.93	Monoterpene
β -Pinene	0.39	Monoterpene
Myrcene	0.65	Monoterpene
2-Carene	0.01	Monoterpene
α -Phellandrene	1.22	Monoterpene
Δ^3 -Carene	4.09	Monoterpene
α -Terpinene	0.26	Monoterpene
<i>meta</i> -Cymene	0.07	Monoterpene
Carvomenthene	0.03	Aliphatic alcohol
<i>para</i> -Cymene	1.75	Monoterpene
Unknown	0.16	Unknown
Limonene	1.63	Monoterpene
β -Phellandrene	0.35	Monoterpene
(Z)- β -Ocimene	0.46	Monoterpene
Unknown	0.06	Unknown
(E)- β -Ocimene	0.26	Monoterpene
Unknown	0.02	Unknown
γ -Terpinene	0.57	Monoterpene
<i>cis</i> -Sabinene hydrate	0.09	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Isoterpinolene	0.02	Monoterpene
Terpinolene	0.22	Monoterpene
<i>para</i> -Cymenene	0.02	Monoterpene
α -Pinene oxide	0.01	Monoterpenic ether
<i>trans</i> -Sabinene hydrate	0.08	Monoterpenic alcohol
α -Thujone	0.03	Monoterpenic ketone
Linalool	0.09	Monoterpenic alcohol

β -Thujone	0.21	Monoterpenic ketone
Unknown	0.02	Oxygenated monoterpene
Unknown	0.01	Oxygenated monoterpene
<i>cis-para</i> -Menth-2-en-1-ol	0.07	Monoterpenic alcohol
Unknown	0.02	Unknown
allo-Ocimene	0.03	Monoterpene
<i>trans</i> -Pinocarveol	0.02	Monoterpenic alcohol
<i>trans</i> -Sabinol	0.06	Monoterpenic alcohol
<i>trans</i> -Verbenol	0.03	Monoterpenic alcohol
<i>para</i> -Menth-3-en-8-ol	0.01	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Unknown	0.03	Oxygenated monoterpene
Borneol	0.01	Monoterpenic alcohol
α -Phellandren-8-ol	0.03	Monoterpenic alcohol
<i>cis</i> -Sabinol	0.07	Monoterpenic alcohol
Umbellulone	0.02	Monoterpenic ketone
Terpinen-4-ol	0.52	Monoterpenic alcohol
<i>meta</i> -Cymen-8-ol	0.02	Monoterpenic alcohol
Cryptone	0.01	Normonoterpenic ketone
<i>para</i> -Cymen-8-ol	0.03	Monoterpenic alcohol
α -Terpineol	0.05	Monoterpenic alcohol
Methylchavicol	1.35	Phenylpropanoid
<i>cis</i> - α -Phellandrene epoxide (iPr vs Me)	0.03	Monoterpenic ether
Verbenone	0.03	Monoterpenic ketone
<i>trans</i> -Piperitol	0.02	Monoterpenic alcohol
<i>trans</i> -Carveol	0.02	Monoterpenic alcohol
Cuminal	0.02	Monoterpenic aldehyde
Carvone	0.01	Monoterpenic ketone
Unknown	0.02	Unknown
Piperitone	0.03	Monoterpenic ketone
Linalyl acetate	0.02	Monoterpenic ester
Unknown	0.04	Oxygenated monoterpene
Bornyl acetate	0.04	Monoterpenic ester
Thymol	0.01	Monoterpenic alcohol
Thymol analogue II	0.04	Monoterpenic alcohol
<i>para</i> -Menth-5-en-1,2-diol isomer II	0.03	Monoterpenic alcohol
Carvacrol	0.04	Monoterpenic alcohol
<i>para</i> -Menth-5-en-1,2-diol isomer III	0.01	Monoterpenic alcohol
α -Terpinyl acetate	0.05	Monoterpenic ester
α -Ylangene	0.02	Sesquiterpene
α -Copaene	0.09	Sesquiterpene
β -Bourbonene	0.56	Sesquiterpene
1,5-diepi- β -Bourbonene	0.04	Sesquiterpene
Unknown	0.02	Unknown
β -Elemene	0.08	Sesquiterpene

β-Longipinene	0.01	Sesquiterpene
Methyleugenol	0.11	Phenylpropanoid
β-Ylangene	0.08	Sesquiterpene
β-Copaene	0.07	Sesquiterpene
<i>trans</i> -α-Bergamotene	0.05	Sesquiterpene
Isogermacrene D	0.05	Sesquiterpene
<i>cis</i> -Muurolo-4(15),5-diene	0.01	Sesquiterpene
γ-Muurolene	0.04	Sesquiterpene
Germacrene D	0.13	Sesquiterpene
Unknown	0.13	Sesquiterpene
Bicyclogermacrene	0.03	Sesquiterpene
α-Muurolene	0.01	Sesquiterpene
γ-Cadinene	0.03	Sesquiterpene
δ-Cadinene	0.12	Sesquiterpene
Elemicin	0.03	Phenylpropanoid
α-Phellandrene dimer II	0.05	Diterpene
α-Phellandrene dimer III	0.02	Diterpene
α-Phellandrene dimer IV	0.01	Diterpene
(3 <i>E</i>)-Cembrene A	0.03	Diterpene
Verticilla-4(20),7,11-triene	0.02	Diterpene
Cembrenol	0.02	Diterpenic alcohol
Serratol	0.11	Diterpenic alcohol
Consolidated total	99.57	

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

Note: no correction factor was applied

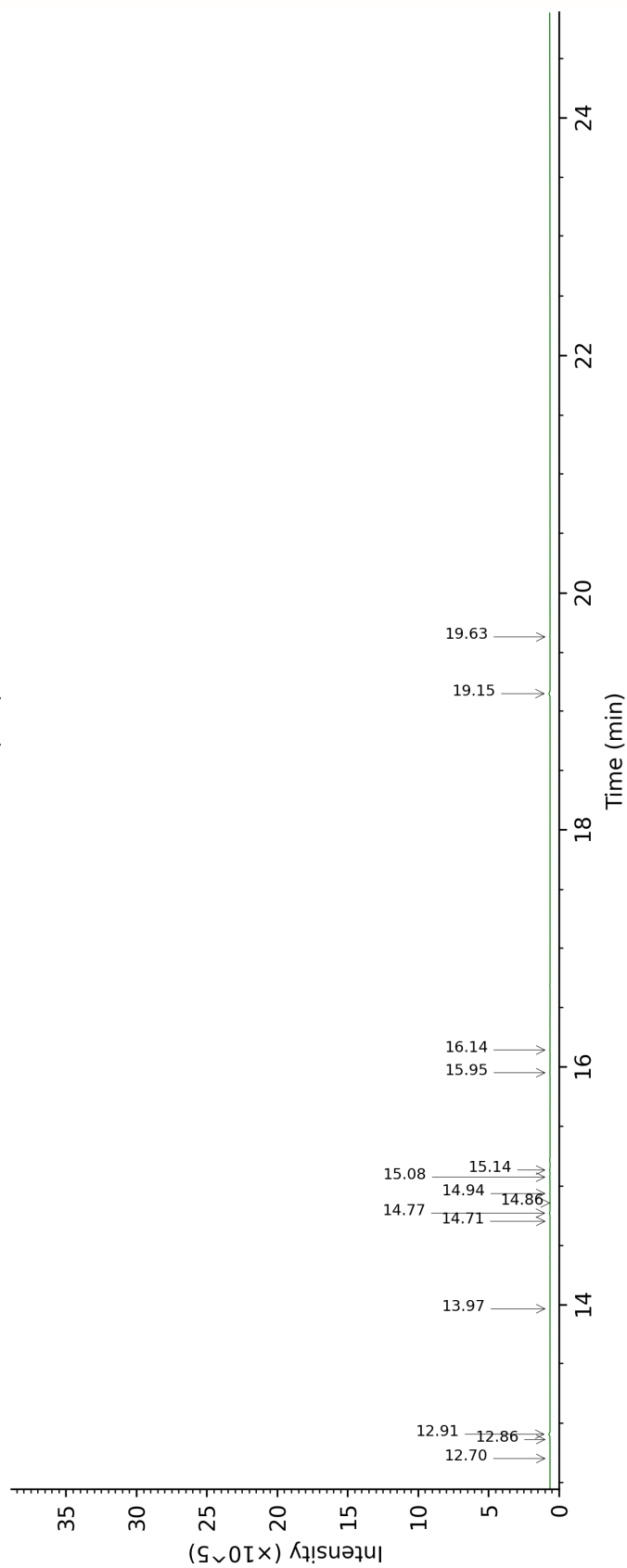
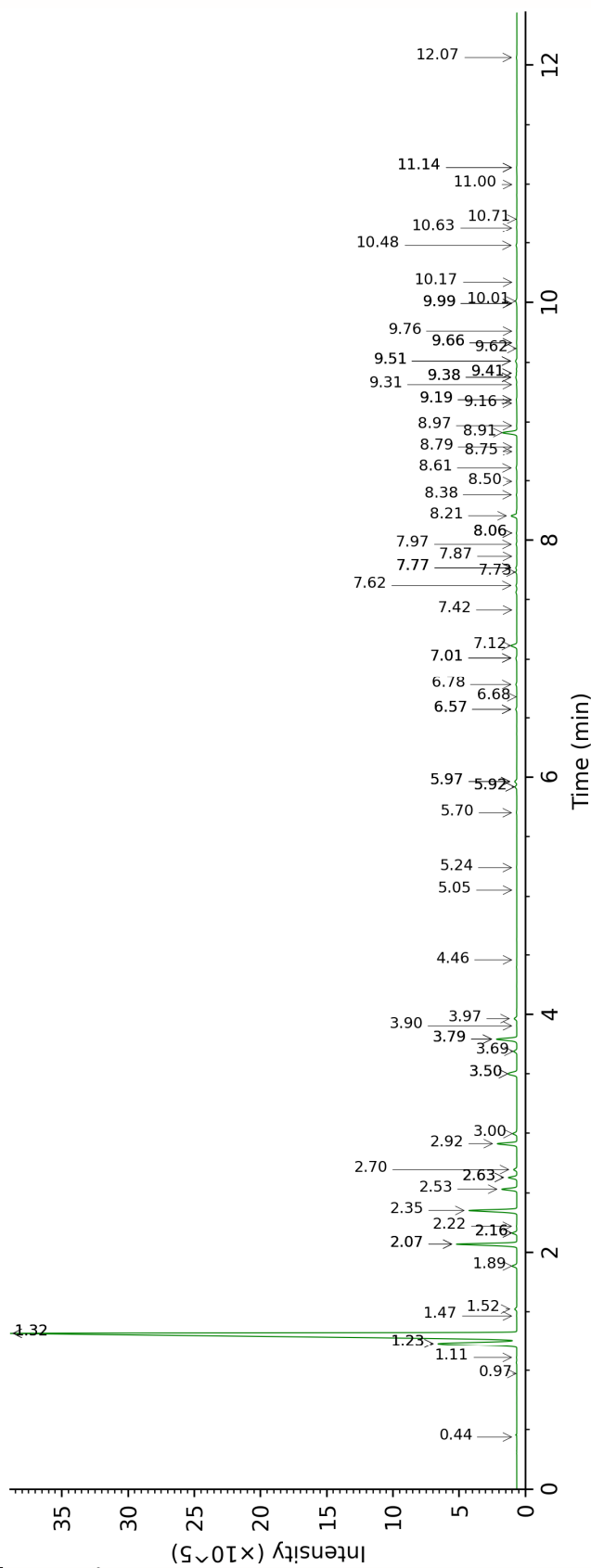
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

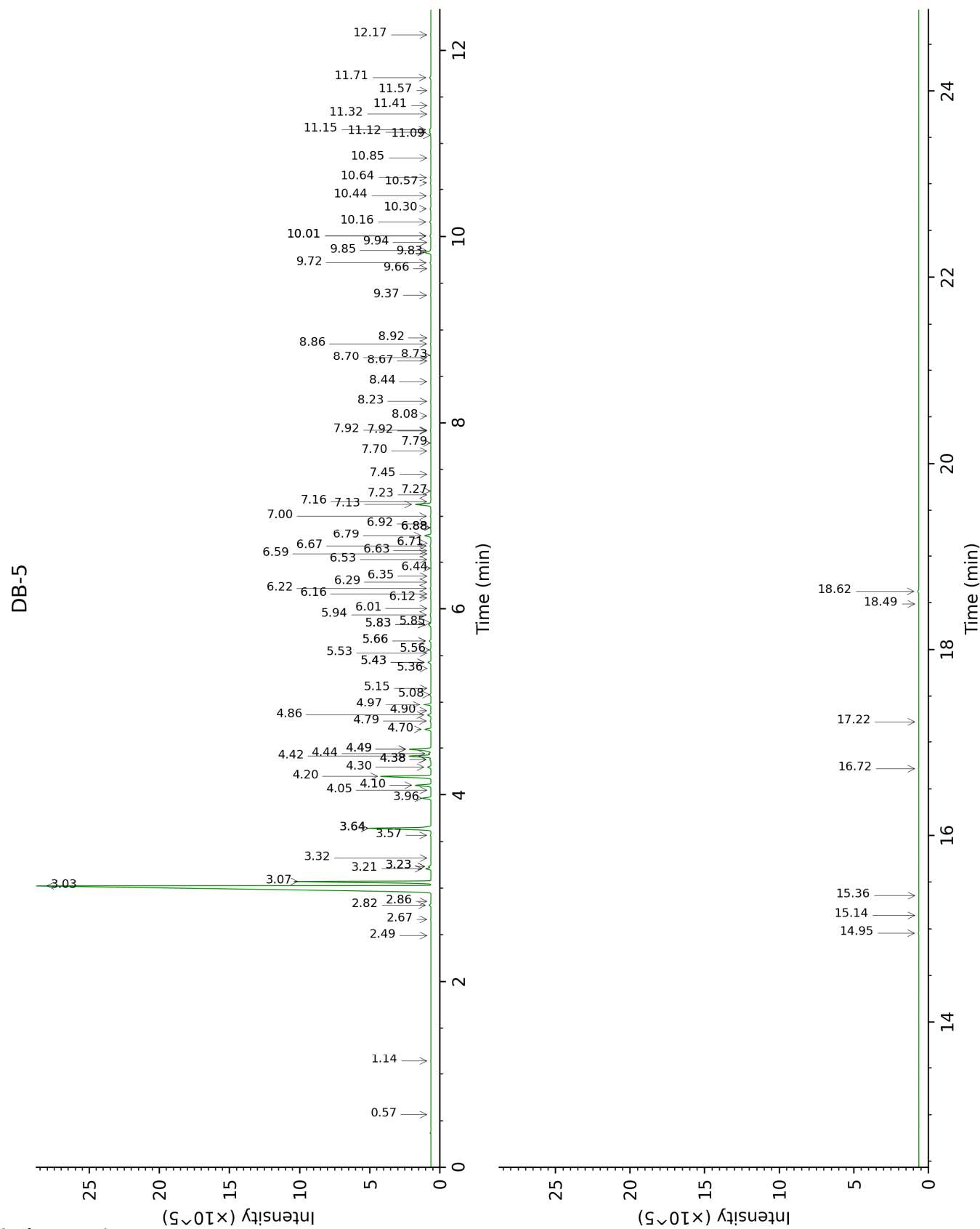
This page was intentionally left blank. The following pages present the complete data of the analysis.

DB-WAX



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Plus que des analyses... des conseils



FULL ANALYSIS DATA

(E)-2-Methyl-1,3-pentadiene	Column DB-WAX			Column DB-5		
	0.44	765.0	0.01	0.57	631.0	tr
Toluene	1.32*	1007.4	[66.61]	1.14	759.0	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)]	0.98	948.5	0.01	2.49	891.8	0.01
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)]				2.67	906.1	0.02
Hashishene	1.23*	993.6	[9.75]	2.82	916.2	0.14
Tricyclene	1.11	972.3	0.02	2.86	919.0	0.02
α -Thujene	1.32*	1007.4	[66.61]	3.03	930.1	66.53
α -Pinene	1.23*	993.6	[9.75]	3.07	933.2	9.65
Unknown SAOF I [m/z 91, 92 (47), 65 (11)... 134 (1)]	2.16*	1094.4	[0.36]	3.21	942.4	0.36
Camphene	1.52	1028.4	0.17	3.23*	944.0	[0.16]
α -Fenchene	1.47	1022.4	0.01	3.23*	944.0	[0.16]
Thuja-2,4(10)-diene	2.07*	1084.8	[4.94]	3.32	950.0	0.02
3,7,7-Trimethylcyclohepta-1,3,5-triene	2.63*	1134.1	[0.68]	3.57	966.3	0.04
Sabinene	2.07*	1084.8	[4.94]	3.64*	971.4	[5.32]
β -Pinene	1.89	1065.7	0.39	3.64*	971.4	[5.32]
Myrcene	2.63*	1134.1	[0.68]	3.96	993.0	0.65
2-Carene	2.16*	1094.4	[0.36]	4.05	998.8	0.01
α -Phellandrene	2.53	1126.2	1.21	4.10	1002.3	1.22
Δ^3 -Carene	2.35	1111.9	4.10	4.20	1008.5	4.09
α -Terpinene	2.70	1139.4	0.26	4.30	1014.8	0.26
meta-Cymene	3.79*	1225.8	[1.84]	4.38*	1019.9	[0.09]
Carvomenthene	2.22	1100.3	0.03	4.38*	1019.9	[0.09]
para-Cymene	3.79*	1225.8	[1.84]	4.42	1022.3	1.75
Unknown BODA IV [m/z 109, 43 (58), 95 (26)... 137 (15)...]	5.92*	1380.7	[0.17]	4.44	1024.0	0.16
Limonene	2.92	1156.9	1.63	4.49*	1027.0	[1.97]
β -Phellandrene	3.00	1163.7	0.35	4.49*	1027.0	[1.97]
(Z)- β -Ocimene	3.50*	1204.2	[1.03]	4.70	1040.4	0.46

Unknown BOFR III [m/z 109, 43 (57), 91 (28), 67 (25), 93 (24), 95 (22), 77 (21), 137 (21), 41 (17), 79 (14)...]	7.01*	1462.3	[0.10]	4.79	1046.1	0.06
(E)-β-Ocimene	3.69	1218.2	0.27	4.86	1050.2	0.26
Unknown BOFR IV [m/z 109, 45 (67), 41 (40), 67 (39), 81 (33), 79 (27), 95 (24), 91 (23), 82 (21), 55 (21), 93 (20)...]	6.57*	1429.1	[0.10]	4.90	1053.1	0.02
γ-Terpinene	3.50*	1204.2	[1.03]	4.97	1057.6	0.57
cis-Sabinene hydrate	6.57*	1429.1	[0.10]	5.08	1064.5	0.09
Unknown PIMA I [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	4.46	1275.2	0.01	5.15	1068.8	0.01
Isoterpinolene	3.90	1234.1	0.02	5.36	1082.4	0.02
Terpinolene	3.97	1238.6	0.22	5.43*	1086.6	[0.24]
para-Cymenene	5.97*	1384.0	[0.20]	5.43*	1086.6	[0.24]
α-Pinene oxide	5.05	1317.2	0.01	5.53	1092.9	0.01
trans-Sabinene hydrate	7.62	1508.5	0.08	5.56	1095.1	0.08
α-Thujone	5.70	1364.8	0.03	5.66*	1101.1	[0.12]
Linalool	7.73	1517.2	0.09	5.66*	1101.1	[0.12]
β-Thujone	5.97*	1384.0	[0.20]	5.83*	1112.4	[0.23]
Unknown BOSE I [m/z 109, 81 (54), 91 (32), 79 (22)...]	5.92*	1380.7	[0.17]	5.83*	1112.4	[0.23]
Unknown BOSE II [m/z 109, 91 (57), 93 (47), 81 (44), 77 (40)... 154 (1)]				5.85	1113.7	0.01
cis-para-Menth-2-en-1-ol	7.77*	1520.1	[0.10]	5.94	1119.2	0.07
Unknown BOSE III [m/z 111, 43 (22), 55 (14), 41 (12), 110 (11)...]				6.01	1123.6	0.02
allo-Ocimene	5.24	1331.0	0.03	6.12	1131.0	0.03
trans-Pinocarveol	8.79	1600.6	0.01	6.16	1133.8	0.02
trans-Sabinol	9.41*	1651.1	[0.05]	6.22	1137.6	0.06

<i>trans</i> -Verbenol	9.16	1630.4	0.04	6.29	1142.0	0.03
<i>para</i> -Menth-3-en-8-ol	8.38	1568.4	0.05	6.35	1146.2	0.01
Unknown BOSE IV [m/z 109, 81 (39), 41 (38), 95 (24)... 152 (1)]				6.44	1151.7	0.01
Unknown RHGR XIX [m/z 109, 43 (75), 137 (46), 67 (31), 93 (25)... 152 (4)]				6.53	1157.7	0.03
Borneol	9.41*	1651.1	[0.05]	6.59	1161.7	0.01
α -Phellandren-8-ol	9.76	1680.1	0.02	6.63	1163.9	0.03
<i>cis</i> -Sabinol	10.48	1740.6	0.08	6.68	1167.1	0.07
Umbellulone	8.50	1577.3	0.02	6.71	1169.2	0.02
Terpinen-4-ol	8.21	1554.5	0.52	6.79	1174.4	0.52
<i>meta</i> -Cymen-8-ol	11.14*	1797.5	[0.03]	6.88*	1180.4	[0.03]
Cryptone	8.75	1597.6	0.01	6.88*	1180.4	[0.03]
<i>para</i> -Cymen-8-ol	11.14*	1797.5	[0.03]	6.92	1183.0	0.03
α -Terpineol	9.38*	1648.3	[0.16]	7.00	1188.4	0.05
Methylchavicol	8.91	1610.2	1.36	7.13	1196.7	1.35
<i>cis</i> - α -Phellandrene epoxide (iPr vs Me)	10.63	1753.7	0.04	7.16	1198.6	0.03
Verbenone	9.19*	1632.8	[0.05]	7.23	1203.4	0.03
<i>trans</i> -Piperitol	9.99*	1699.1	[0.02]	7.27	1206.0	0.02
<i>trans</i> -Carveol	11.00	1785.2	0.01	7.45	1218.2	0.02
Cuminal	10.17	1714.1	0.01	7.70	1235.2	0.02
Carvone	9.62	1668.1	0.02	7.79	1241.1	0.01
Unknown CALU IV [m/z 43, 97 (69), 107 (46), 41 (28), 55 (21), 109 (20)...]	10.71	1760.2	0.04	7.92	1250.0	0.02
Piperitone	9.51*	1659.5	[0.14]	7.92	1250.5	0.03
Linalyl acetate	7.77*	1520.1	[0.10]	8.08	1261.0	0.02
Unknown BOSE VI [m/z 109, 41 (22), 81 (14), 43 (11)... 152 (4)]				8.23	1271.7	0.04
Bornyl acetate	7.87	1527.7	0.02	8.44	1286.1	0.04
Thymol	14.71	2132.0	0.01	8.67	1301.3	0.01
Thymol analogue II	14.86	2147.6	0.01	8.70	1303.7	0.04
<i>para</i> -Menth-5-en-1,2-diol isomer II	13.97	2059.4	0.02	8.73	1305.9	0.03
Carvacrol	14.94	2155.6	0.02	8.86	1310.7	0.04
<i>para</i> -Menth-5-en-1,2-diol isomer III	14.77	2138.9	0.04	8.92	1315.3	0.01
α -Terpinyl acetate	9.31	1643.3	0.03	9.37	1347.7	0.05

α -Ylangene	6.68	1437.1	0.02	9.66	1367.9	0.02
α -Copaene	6.78	1444.9	0.09	9.72	1372.4	0.09
β -Bourbonene	7.12	1470.2	0.57	9.83	1380.3	0.56
1,5-diepi- β -Bourbonene	7.01*	1462.3	[0.10]	9.85	1381.7	0.04
Unknown CAO IX [m/z 71, 109 (99), 85 (66), 111 (65), 100 (63), 43 (59)...]	16.14	2280.3	0.02	9.94	1387.9	0.02
β -Elemene	8.06*	1543.1	[0.05]	10.01*	1392.8	[0.09]
β -Longipinene	7.42	1492.7	0.01	10.01*	1392.8	[0.09]
Methyleugenol	12.91	1957.8	0.10	10.16	1403.4	0.11
β -Ylangene	7.77*	1520.1	[0.10]	10.30	1413.9	0.08
β -Copaene	7.97	1535.6	0.07	10.44	1424.2	0.07
<i>trans</i> - α -Bergamotene	8.06*	1543.1	[0.05]	10.58	1434.7	0.05
Isogermacrene D	8.61	1586.2	0.08	10.64	1439.4	0.05
<i>cis</i> -Muurolo-4(15),5-diene	8.97	1615.0	0.03	10.85	1455.1	0.01
γ -Muurolole	9.19*	1632.8	[0.05]	11.09	1473.4	0.04
Germacrene D	9.38*	1648.3	[0.16]	11.12	1475.8	0.13
Unknown BOSE VII [m/z 91, 93 (92), 105 (71), 77 (69), 79 (68), 133 (63)... 204 (32)]	9.51*	1659.5	[0.14]	11.15	1477.9	0.13
Bicyclogermacrene	9.66*	1672.1	[0.03]	11.32	1490.5	0.03
α -Muurolole	9.66*	1672.1	[0.03]	11.41	1497.3	0.01
γ -Cadinene	9.99*	1699.1	[0.02]	11.57	1509.5	0.03
δ -Cadinene	10.01	1700.8	0.12	11.71	1520.4	0.12
Elemicin	15.08	2169.6	0.03	12.17	1556.6	0.03
α -Phellandrene dimer II	12.07	1880.1	0.05	14.95	1789.3	0.05
α -Phellandrene dimer III	12.70	1938.7	0.01	15.14	1805.8	0.02
α -Phellandrene dimer IV	12.86	1953.7	0.01	15.36	1825.2	0.01
(3E)-Cembrene A	15.14	2175.7	0.03	16.72	1951.1	0.03
Verticilla-4(20),7,11-triene	15.95	2260.3	0.02	17.22	1998.9	0.02
Cembrenol	19.63	2676.1	0.02	18.49	2125.4	0.02
Serratol	19.15	2617.6	0.11	18.62	2139.4	0.11
Total reported		99.07%			99.54%	

*: 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