Date : 2025-03-11

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 25B26-PTH01
Customer Identification : Frankincense Serrata - India - F40114R
Type : Essential Oil
Source : *Boswellia serrata*
Customer : Plant Therapy

Checked an approved by:

Alexis St-Gelais, Ph. D., 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.

Méthode certifiée ISO 17025:2017 Certified method

Laboratoire PhytoChemia

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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 : 2025-03-12

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 : 2025-02-26

Conclusion

No adulterant, contaminant or diluent has been detected using this method.

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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	0.03	Simple phenolic
4,4-Dimethyl-2-cyclopenten-1-one?	tr	Aliphatic ketone
(*Z*)-Salvene	tr	Normonoterpene
Santene	tr	Normonoterpene
Styrene	tr	Simple phenolic
Unknown	0.02	Unknown
Hashishene	0.17	Monoterpene
Tricyclene	0.01	Monoterpene
α-Thujene	69.07	Monoterpene
α-Pinene	7.74	Monoterpene
Unknown	0.30	Monoterpene
α-Fenchene	0.01	Monoterpene
Camphene	0.10	Monoterpene
Thuja-2,4(10)-diene	0.01	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.04	Monoterpene
Sabinene	4.71	Monoterpene
β-Pinene	0.48	Monoterpene
Myrcene	1.37	Monoterpene
2-Carene	0.01	Monoterpene
Pseudolimonene	0.01	Monoterpene
α-Phellandrene	1.50	Monoterpene
Δ3-Carene	2.67	Monoterpene
α-Terpinene	0.17	Monoterpene
meta-Cymene	0.10	Monoterpene
para-Cymene	2.26	Monoterpene
Unknown	0.24	Unknown
1,8-Cineole	0.02	Monoterpenic ether
β-Phellandrene	0.36	Monoterpene
Limonene	1.62	Monoterpene
Unknown	0.01	Unknown
(*Z*)-β-Ocimene	0.28	Monoterpene
Unknown	0.08	Unknown
(*E*)-β-Ocimene	0.14	Monoterpene
Unknown	0.11	Unknown
γ-Terpinene	0.39	Monoterpene
cis-Sabinene hydrate	0.12	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
para-Cymenene	0.01	Monoterpene
Terpinolene	0.14	Monoterpene

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6,7-Epoxymyrcene	0.01	Monoterpenic ether
trans-Sabinene hydrate	0.09	Monoterpenic alcohol
α-Thujone	0.03	Monoterpenic ketone
Linalool	0.10	Monoterpenic alcohol
Verbenol analog?	0.01	Monoterpenic alcohol
β-Thujone	0.24	Monoterpenic ketone
Unknown	0.04	Oxygenated monoterpene
cis-para-Menth-2-en-1-ol	0.10	Monoterpenic alcohol
Unknown	0.02	Unknown
allo-Ocimene	0.02	Monoterpene
trans-Pinocarveol	0.02	Monoterpenic alcohol
trans-Sabinol	0.07	Monoterpenic alcohol
trans-Verbenol	0.03	Monoterpenic alcohol
meta-Mentha-4,6-dien-8-ol	0.06	Monoterpenic alcohol
α-Phellandren-8-ol	0.03	Monoterpenic alcohol
Umbellulone	0.03	Monoterpenic ketone
cis-Sabinol	0.08	Monoterpenic alcohol
Terpinen-4-ol	0.56	Monoterpenic alcohol
Cryptone	0.03	Normonoterpenic ketone
meta-Cymen-8-ol	0.02	Monoterpenic alcohol
para-Cymen-8-ol	0.03	Monoterpenic alcohol
α-Terpineol	0.05	Monoterpenic alcohol
Methylchavicol	1.28	Phenylpropanoid
cis-α-Phellandrene epoxide (iPr vs Me)	0.06	Monoterpenic ether
Verbenone	0.01	Monoterpenic ketone
trans-Piperitol	0.02	Monoterpenic alcohol
trans-Carveol	0.02	Monoterpenic alcohol
cis-Carveol	0.02	Monoterpenic alcohol
Cuminal	0.01	Monoterpenic aldehyde
Carvotanacetone	0.01	Monoterpenic ketone
Piperitone	0.11	Monoterpenic ketone
Linalyl acetate	0.02	Monoterpenic ester
Unknown	0.02	Unknown
Unknown	0.03	Oxygenated monoterpene
Bornyl acetate	0.03	Monoterpenic ester
para-Cymen-7-ol	0.02	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer II	0.02	Monoterpenic alcohol
Carvacrol	0.02	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer III	0.07	Monoterpenic alcohol
Unknown	0.03	Monoterpenic alcohol
Unknown	0.02	Unknown
Unknown	0.01	Unknown
α-Terpinyl acetate	0.03	Monoterpenic ester
Cyclosativene II	0.02	Sesquiterpene
α-Ylangene	0.03	Sesquiterpene

α-Copaene	0.09	Sesquiterpene
β-Bourbonene	0.40	Sesquiterpene
1,5-diepi-β-Bourbonene	0.04	Sesquiterpene
β-Elemene	0.02	Sesquiterpene
β-Longipinene	0.07	Sesquiterpene
Unknown	0.04	Unknown
Methyleugenol	0.08	Phenylpropanoid
β-Ylangene	0.06	Sesquiterpene
β-Copaene	0.05	Sesquiterpene
trans-α-Bergamotene	0.04	Sesquiterpene
Isogermacrene D	0.04	Sesquiterpene
all*o*-Aromadendrene	0.04	Sesquiterpene
γ-Muurolene	0.03	Sesquiterpene
Germacrene D	0.09	Sesquiterpene
γ-Humulene?	0.08	Sesquiterpene
Bicyclogermacrene	0.01	Sesquiterpene
α-Muurolene	0.01	Sesquiterpene
γ-Cadinene	0.02	Sesquiterpene
Kessane	0.15	Sesquiterpenic ether
Elemicin	0.02	Phenylpropanoid
Guaiol	0.01	Sesquiterpenic alcohol
4,10-diepi-Guaiol	0.02	Sesquiterpenic alcohol
β-Eudesmol	0.01	Sesquiterpenic alcohol
Bulnesol	0.01	Sesquiterpenic alcohol
α-Phellandrene dimer II	0.04	Diterpene
α-Phellandrene dimer III	0.01	Diterpene
(3*E*)-Cembrene A	0.03	Diterpene
Verticilla-4(20),7,11-triene	0.02	Diterpene
Cembrenol	0.01	Diterpenic alcohol
Serratol	0.06	Diterpenic alcohol
Consolidated total	**99.49**	

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.

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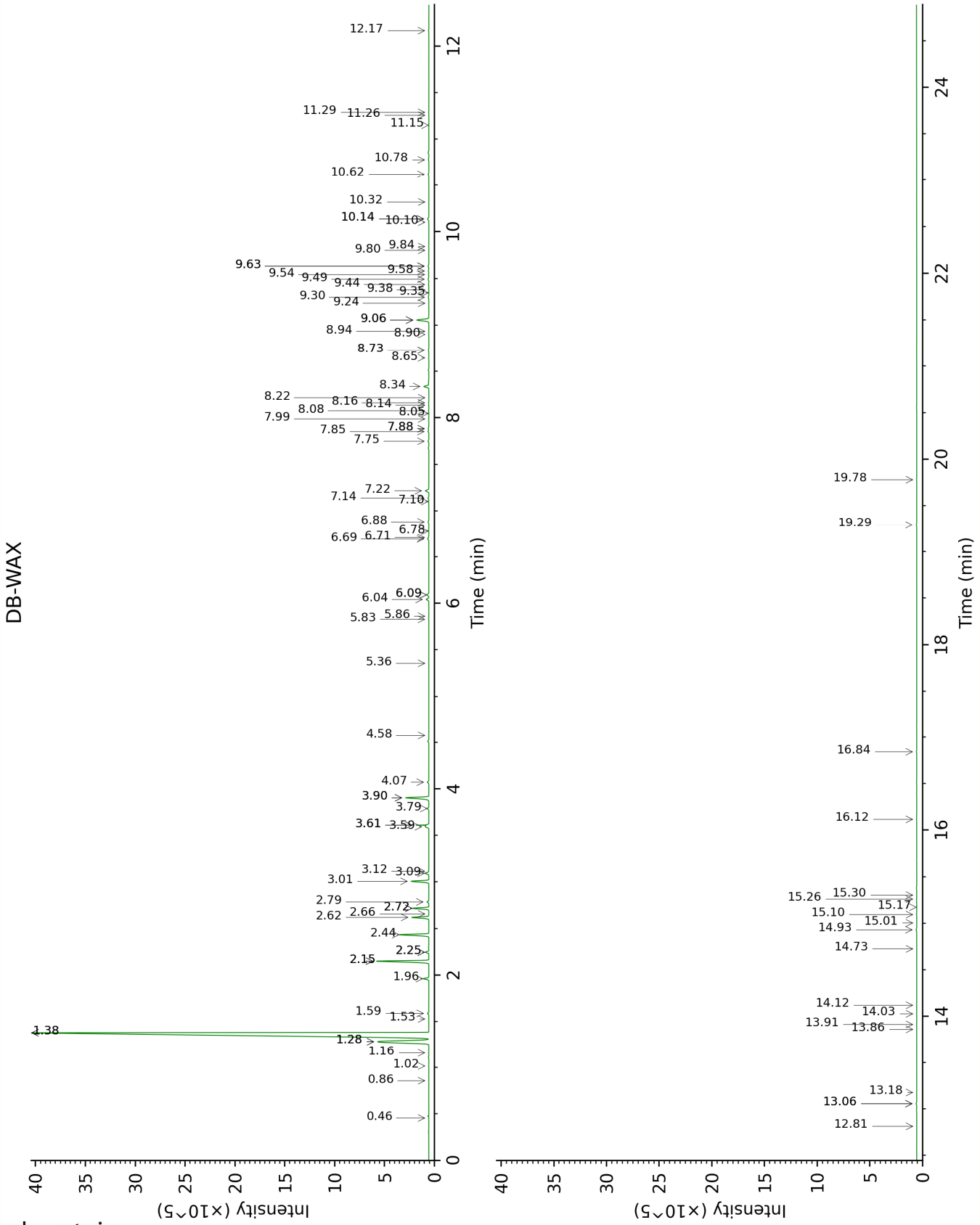
DB-WAX
Time (min)
Intensity (×10^5)
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11.29
11.26
11.15
10.78
10.62
10.32
10.14
10.10
9.80
9.84
9.63
9.58
9.54
9.49
9.44
9.38
9.35
9.30
9.24
9.06
8.94
8.90
8.73
8.65
8.34
8.22
8.16
8.14
8.08
8.05
7.99
7.88
7.85
7.75
7.22
7.14
7.10
6.88
6.78
6.69
6.71
6.09
6.04
5.86
5.83
5.36
4.58
4.07
3.90
3.79
3.61
3.59
3.12
3.09
3.01
2.79
2.72
2.66
2.62
2.44
2.25
2.15
1.96
1.59
1.53
1.38
1.28
1.16
1.02
0.86
0.46
19.78
19.29
16.84
16.12
15.30
15.26
15.17
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15.01
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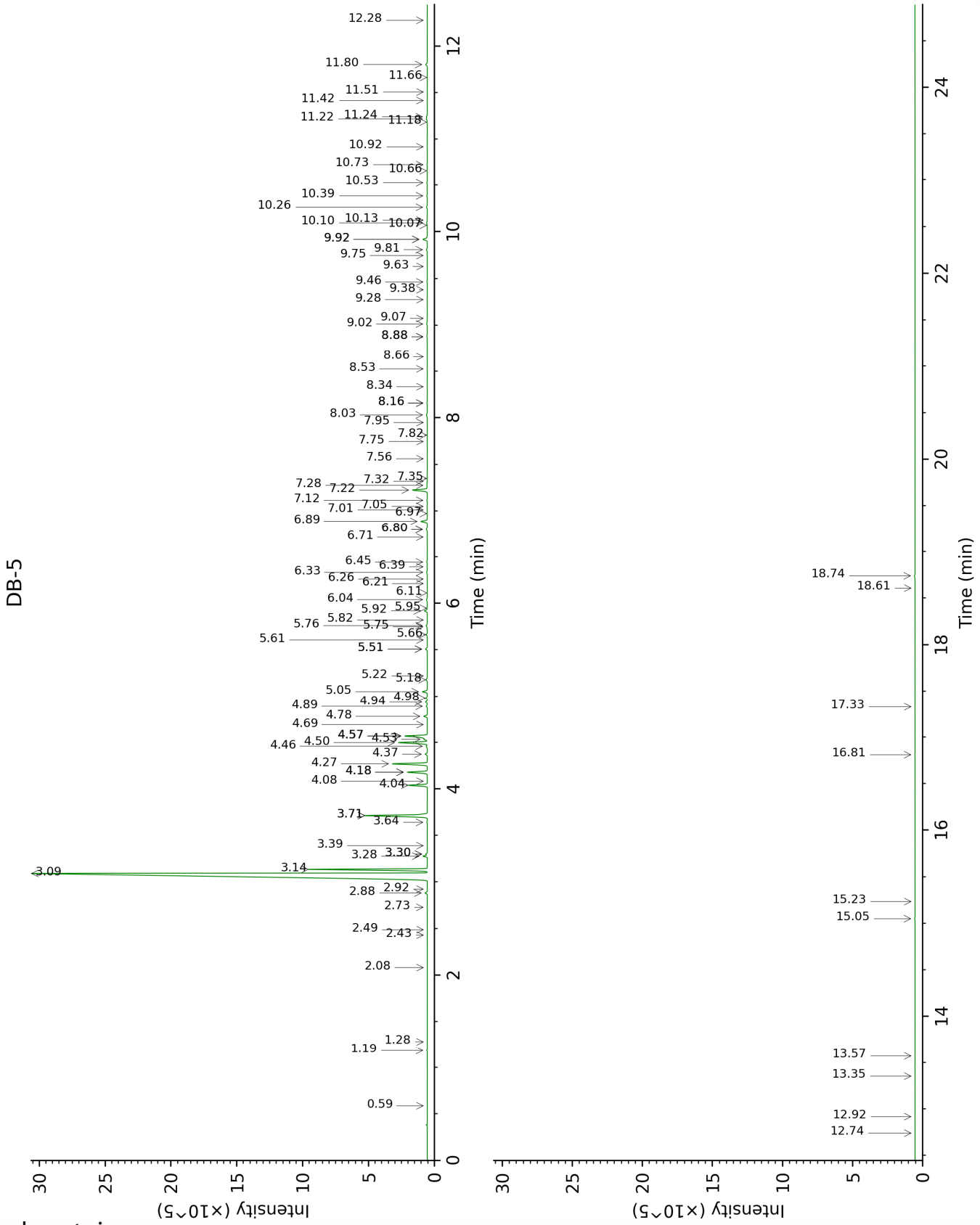
14.12
14.03
13.91
13.86
13.18
13.06
12.81



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FULL ANALYSIS DATA

	Column DB-WAX			Column DB-5		
(*E*)-2-Methyl-1,3-pentadiene	0.46	765.4	tr	0.59	631.4	tr
Toluene	1.38*	1006.3	[68.75]	1.19	760.7	0.03
4,4-Dimethyl-2-cyclopenten-1-one?				1.28	774.4	tr
(*Z*)-Salvene	0.86	920.3	tr	2.08	854.0	tr
Santene	1.02	947.3	0.01	2.43	883.1	tr
Styrene	3.61*	1204.4	[0.49]	2.49	887.9	tr
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)]				2.73	907.5	0.02
Hashishene	1.28*	993.1	[7.83]	2.88	917.7	0.17
Tricyclene	1.16	971.6	0.01	2.92	920.4	0.01
α-Thujene	1.38*	1006.3	[68.75]	3.09	931.6	69.07
α-Pinene	1.28*	993.1	[7.83]	3.14	934.5	7.74
Unknown SAOF I [m/z 91, 92 (47), 65 (11)... 134 (1)]	2.25*	1094.1	[0.30]	3.28	943.9	0.30
α-Fenchene	1.53	1021.3	0.01	3.30*	945.3	[0.11]
Camphene	1.59	1027.4	0.10	3.30*	945.3	[0.11]
Thuja-2,4(10)-diene	2.15*	1084.4	[4.69]	3.39	951.3	0.01
3,7,7-Trimethylcyclohepta-1,3,5-triene	2.72*	1133.3	[1.41]	3.64	968.0	0.04
Sabinene	2.15*	1084.4	[4.69]	3.71*	972.8	[5.19]
β-Pinene	1.96	1065.2	0.48	3.71*	972.8	[5.19]
Myrcene	2.72*	1133.3	[1.41]	4.04	994.3	1.37
2-Carene	2.25*	1094.1	[0.30]	4.08	997.2	0.01
Pseudolimonene	2.66	1128.5	0.01	4.18*	1003.6	[1.51]
α-Phellandrene	2.62	1125.6	1.50	4.18*	1003.6	[1.51]
Δ3-Carene	2.44	1110.8	2.64	4.27	1009.3	2.67
α-Terpinene	2.79	1138.7	0.16	4.37	1015.8	0.17
meta-Cymene	3.90*	1226.2	[2.34]	4.46	1021.2	0.10
para-Cymene	3.90*	1226.2	[2.34]	4.50	1023.6	2.26
Unknown BODA IV [m/z 109, 43 (58), 95 (26)... 137 (15)...]	6.04	1381.5	0.27	4.53	1025.9	0.24
1,8-Cineole	3.12	1165.1	0.02	4.57*	1028.0	[2.04]
β-Phellandrene	3.09	1163.2	0.36	4.57*	1028.0	[2.04]
Limonene	3.01	1156.4	1.62	4.57*	1028.0	[2.04]
Unknown BOSA IV				4.69	1035.8	0.01

[m/z 67, 93 (70), 82 (70), 121 (42), 107 (39), 91 (33), 79 (28)...]						
(*Z*)-β-Ocimene	3.59	1203.1	0.27	4.78	1041.3	0.28
Unknown BOFR III [m/z 109, 43 (57), 91 (28), 67 (25), 93 (24), 95 (22), 77 (21), 137 (21), 41 (17), 79 (14)...]	7.14	1462.3	0.09	4.89	1048.1	0.08
(*E*)-β-Ocimene	3.79	1217.7	0.14	4.94	1051.0	0.14
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)...]				4.98	1053.9	0.11
γ-Terpinene	3.61*	1204.4	[0.49]	5.05	1058.3	0.39
cis-Sabinene hydrate	6.69	1429.2	0.13	5.18	1066.3	0.12
Unknown PIMA I [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	4.58	1275.9	0.01	5.22	1068.9	0.01
para-Cymenene	6.09*	1385.0	[0.21]	5.51*	1087.0	[0.16]
Terpinolene	4.07	1238.6	0.14	5.51*	1087.0	[0.16]
6,7-Epoxymyrcene	5.86	1368.5	0.01	5.61	1093.1	0.01
trans-Sabinene hydrate	7.75	1508.0	0.08	5.66	1096.7	0.09
α-Thujone	5.83	1366.1	0.03	5.75	1101.9	0.03
Linalool	7.85	1516.1	0.09	5.76	1102.8	0.10
Verbenol analog?	8.05	1531.2	0.01	5.82	1106.6	0.01
β-Thujone	6.09*	1385.0	[0.21]	5.92	1112.8	0.24
Unknown BOSE II [m/z 109, 91 (57), 93 (47), 81 (44), 77 (40)... 154 (1)]				5.95	1114.7	0.04
cis-para-Menth-2-en-1-ol	7.88*	1518.5	[0.09]	6.04	1120.5	0.10
Unknown BOSE III [m/z 111, 43 (22), 55 (14), 41 (12), 110 (11)...]				6.11	1125.1	0.02
allo-Ocimene	5.36	1332.1	0.01	6.21	1131.5	0.02

trans-Pinocarveol	8.94	1600.3	0.02	6.26	1134.6	0.02
trans-Sabinol	9.58	1652.7	0.06	6.33	1139.2	0.07
trans-Verbenol	9.30	1629.9	0.08	6.39	1143.1	0.03
meta-Mentha-4,6-dien-8-ol	9.06*	1610.1	[1.33]	6.44	1146.3	0.06
α-Phellandren-8-ol				6.71	1163.4	0.03
Umbellulone	8.65	1577.7	0.03	6.80*	1168.7	[0.11]
cis-Sabinol	10.62	1739.0	0.08	6.80*	1168.7	[0.11]
Terpinen-4-ol	8.34	1553.7	0.54	6.89	1174.5	0.56
Cryptone	8.90	1597.7	0.01	6.97	1180.0	0.03
meta-Cymen-8-ol	11.26	1793.1	0.01	7.01	1182.5	0.02
para-Cymen-8-ol	11.29	1795.8	0.02	7.05	1184.9	0.03
α-Terpineol	9.54	1649.6	0.05	7.12	1189.1	0.05
Methylchavicol	9.06*	1610.1	[1.33]	7.22	1196.1	1.28
cis-α-Phellandrene epoxide (iPr vs Me)	10.78	1752.4	0.06	7.28	1199.3	0.06
Verbenone	9.38	1636.3	0.01	7.32	1202.1	0.01
trans-Piperitol	10.14*	1698.0	[0.16]	7.35	1204.0	0.02
trans-Carveol	11.15	1784.1	0.01	7.56	1218.2	0.02
cis-Carveol				7.75	1230.5	0.02
Cuminal	10.32	1713.4	0.02	7.82	1235.1	0.01
Carvotanacetone	9.24	1624.7	0.01	7.95	1244.2	0.01
Piperitone	9.63*	1656.9	[0.09]	8.03	1249.6	0.11
Linalyl acetate	7.99	1526.7	0.02	8.16*	1258.1	[0.03]
Unknown CIGL III [m/z 43, 97 (78), 41 (45), 55 (35), 69 (28), 107 (24), 83 (23)...]	13.18	1966.5	0.02	8.16*	1258.1	[0.03]
Unknown BOSE VI [m/z 109, 41 (22), 81 (14), 43 (11)... 152 (4)]				8.34	1269.9	0.03
Bornyl acetate	8.08	1533.5	0.04	8.53	1282.7	0.03
para-Cymen-7-ol	13.92	2036.6	0.02	8.66	1291.4	0.02
para-Menth-5-en-1,2-diol isomer II	14.12	2056.6	0.02	8.88*	1306.3	[0.06]
Carvacrol	15.10	2152.9	0.02	8.88*	1306.3	[0.06]
para-Menth-5-en-1,2-diol isomer III	14.93	2136.5	0.08	9.02	1315.9	0.07
Unknown MEAL I [m/z 97, 112 (92), 83 (62), 43 (44), 41 (25)... 170? (4)]	14.73	2115.9	0.01	9.08	1320.1	0.03
Unknown SCMO III [m/z 43, 97 (99), 107 (47), 41 (35), 55	13.06*	1955.3	[0.08]	9.28	1334.3	0.02

(30)...]						
Unknown CIAU VI [m/z 133, 105 (45), 91 (38), 119 (36)... 150 (3)]				9.38	1341.8	0.01
α-Terpinyl acetate	9.44	1641.0	0.04	9.46	1347.6	0.03
Cyclosativene II	6.71	1430.3	0.03	9.63	1359.3	0.02
α-Ylangene	6.78	1435.5	0.02	9.75	1367.5	0.03
α-Copaene	6.88	1443.3	0.09	9.81	1371.9	0.09
β-Bourbonene	7.22	1468.2	0.40	9.92*	1379.7	[0.43]
1,5-diepi-β-Bourbonene	7.10	1459.6	0.04	9.92*	1379.7	[0.43]
β-Elemene	8.22	1544.4	0.01	10.07	1390.3	0.02
β-Longipinene				10.10	1392.2	0.07
Unknown CALU VIII [m/z 71, 100 (92), 111 (79), 69 (46), 109 (45)...]	16.84	2335.6	0.05	10.13	1394.2	0.04
Methyleugenol	13.06*	1955.3	[0.08]	10.26	1403.9	0.08
β-Ylangene	7.88*	1518.5	[0.09]	10.39	1413.0	0.06
β-Copaene	8.14	1538.1	0.02	10.53	1423.4	0.05
trans-α-Bergamotene	8.16	1540.1	0.04	10.66	1433.4	0.04
Isogermacrene D	8.73*	1584.3	[0.07]	10.73	1438.3	0.04
allo-Aromadendrene	8.73*	1584.3	[0.07]	10.92	1452.7	0.04
γ-Muurolene	9.35	1633.8	0.01	11.18	1472.4	0.03
Germacrene D	9.49	1645.6	0.11	11.22	1474.9	0.09
γ-Humulene?	9.63*	1656.9	[0.09]	11.24	1476.7	0.08
Bicyclogermacrene	9.80	1670.7	0.01	11.42	1489.7	0.01
α-Muurolene	9.84	1674.0	0.02	11.51	1496.5	0.01
γ-Cadinene	10.10	1695.2	0.01	11.66	1508.3	0.02
Kessane	10.14*	1698.0	[0.16]	11.80	1519.2	0.15
Elemicin	15.26	2169.6	0.02	12.28	1556.5	0.02
Guaiol	13.86	2031.6	0.01	12.74	1592.7	0.01
4,10-diepi-Guaiol	14.03	2047.7	0.02	12.92	1606.7	0.02
β-Eudesmol	15.17	2160.9	0.01	13.35	1642.7	0.01
Bulnesol	15.00	2143.9	0.01	13.57	1660.7	0.01
α-Phellandrene dimer II	12.17	1873.7	0.04	15.05	1787.0	0.04
α-Phellandrene dimer III	12.81	1932.7	0.01	15.24	1802.9	0.01
(3*E*)-Cembrene A	15.30	2174.0	0.02	16.81	1948.3	0.03
Verticilla-4(20),7,11-triene	16.12	2258.2	0.02	17.33	1997.5	0.02
Cembrenol	19.78	2673.1	0.02	18.61	2125.3	0.01

Serratol	19.29	2614.1	0.06	18.74	2139.1	0.06
Total reported		98.46%			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

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