Date : 2025-05-08

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 25D24-PTH01
Customer Identification : Organic Frankincense Serrata - India - F50115R
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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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 : Sylvain Mercier, M. Sc., Chimiste 2014-005
Date : 2025-05-01

Physicochemical data

Refractive index : 1.4653 ± 0.0003 (20 °C)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Cindy Caron B. Sc.
Date : 2025-04-25

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	0.01	Alkene
Toluene	0.03	Simple phenolic
Unknown	tr	Unknown
Unknown	0.01	Unknown
Hashishene	0.04	Monoterpene
Tricyclene	0.02	Monoterpene
α-Thujene	49.64	Monoterpene
α-Pinene	8.49	Monoterpene
Unknown	0.17	Monoterpene
α-Fenchene	0.01	Monoterpene
Camphene	0.16	Monoterpene
Thuja-2,4(10)-diene	0.01	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.01	Monoterpene
β-Pinene	0.69	Monoterpene
Sabinene	4.07	Monoterpene
Pseudolimonene isomer	0.01	Monoterpene
Myrcene	1.42	Monoterpene
2-Carene	0.01	Monoterpene
Pseudolimonene	0.01	Monoterpene
α-Phellandrene	14.99	Monoterpene
Δ3-Carene	1.25	Monoterpene
α-Terpinene	0.21	Monoterpene
meta-Cymene	0.02	Monoterpene
Carvomenthene	0.01	Aliphatic alcohol
para-Cymene	3.35	Monoterpene
Limonene	2.62	Monoterpene
1,8-Cineole	[2.18]	Monoterpenic ether
β-Phellandrene	[2.18]	Monoterpene
(*Z*)-β-Ocimene	0.49	Monoterpene
Unknown	0.05	Unknown
(*E*)-β-Ocimene	0.19	Monoterpene
Unknown	0.01	Unknown
γ-Terpinene	0.44	Monoterpene
cis-Sabinene hydrate	0.03	Monoterpenic alcohol
cis-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
Terpinolene	0.17	Monoterpene
para-Cymenene	0.03	Monoterpene
trans-Sabinene hydrate	0.04	Monoterpenic alcohol
α-Thujone	0.01	Monoterpenic ketone
Linalool	0.13	Monoterpenic alcohol

Unknown	0.02	Oxygenated monoterpene
β-Thujone	0.11	Monoterpenic ketone
Unknown	0.01	Oxygenated monoterpene
α-Campholenal	0.06	Monoterpenic aldehyde
Unknown	0.01	Unknown
allo-Ocimene	0.02	Monoterpene
trans-Pinocarveol	0.01	Monoterpenic alcohol
trans-Sabinol	0.05	Monoterpenic alcohol
trans-Verbenol	0.02	Monoterpenic alcohol
para-Menth-3-en-8-ol	0.02	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Borneol	0.02	Monoterpenic alcohol
α-Phellandren-8-ol	0.01	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Umbellulone	0.01	Monoterpenic ketone
cis-Sabinol	0.04	Monoterpenic alcohol
Terpinen-4-ol	0.30	Monoterpenic alcohol
Cryptone	0.01	Normonoterpenic ketone
meta-Cymen-8-ol	0.02	Monoterpenic alcohol
para-Cymen-8-ol	0.02	Monoterpenic alcohol
α-Terpineol	tr	Monoterpenic alcohol
Myrtenal	0.04	Monoterpenic aldehyde
Methylchavicol	3.09	Phenylpropanoid
cis-α-Phellandrene epoxide (iPr vs Me)	0.09	Monoterpenic ether
Verbenone	0.01	Monoterpenic ketone
trans-Piperitol	0.02	Monoterpenic alcohol
trans-Carveol	0.02	Monoterpenic alcohol
Cuminal	0.02	Monoterpenic aldehyde
Unknown	0.05	Unknown
Linalyl acetate	0.03	Monoterpenic ester
Unknown	0.02	Oxygenated monoterpene
Bornyl acetate	0.04	Monoterpenic ester
Thymol	0.01	Monoterpenic alcohol
Carvacrol	0.04	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer III	0.08	Monoterpenic alcohol
Unknown	0.02	Unknown
α-Terpinyl acetate	0.03	Monoterpenic ester
α-Cubebene	0.02	Sesquiterpene
Cyclosativene II	0.04	Sesquiterpene
α-Ylangene	0.04	Sesquiterpene
α-Copaene	0.15	Sesquiterpene
β-Bourbonene	0.39	Sesquiterpene
1,5-diepi-β-Bourbonene	0.03	Sesquiterpene
β-Elemene	0.05	Sesquiterpene
β-Longipinene	0.01	Sesquiterpene

Sibirene	0.01	Sesquiterpene
Unknown	0.04	Unknown
α-Gurjunene	0.02	Sesquiterpene
Methyleugenol	0.19	Phenylpropanoid
β-Ylangene	0.10	Sesquiterpene
β-Copaene	0.07	Sesquiterpene
trans-α-Bergamotene	0.06	Sesquiterpene
Isogermacrene D	0.05	Sesquiterpene
cis-Muurola-4(15),5-diene	0.03	Sesquiterpene
γ-Muurolene	0.08	Sesquiterpene
Germacrene D	0.44	Sesquiterpene
Unknown	0.44	Sesquiterpene
Bicyclogermacrene	0.05	Sesquiterpene
α-Muurolene	0.03	Sesquiterpene
γ-Cadinene	0.05	Sesquiterpene
δ-Cadinene	0.89	Sesquiterpene
α-Elemol	0.03	Sesquiterpenic alcohol
Isocaryophyllene epoxide B	0.01	Sesquiterpenic ether
Elemicin	0.04	Phenylpropanoid
Guaiol	0.02	Sesquiterpenic alcohol
4,10-diepi-Guaiol	0.07	Sesquiterpenic alcohol
Unknown	0.02	Unknown
β-Eudesmol	0.01	Sesquiterpenic alcohol
Bulnesol	0.05	Sesquiterpenic alcohol
Shyobunol	0.01	Sesquiterpenic alcohol
α-Phellandrene dimer II	0.17	Diterpene
α-Phellandrene dimer III	0.04	Diterpene
α-Phellandrene dimer IV	0.02	Diterpene
Verticilla-4(20),7,11-triene	0.05	Diterpene
Cembrenol	0.01	Diterpenic alcohol
Serratol	0.05	Diterpenic alcohol
Consolidated total	**99.31**	

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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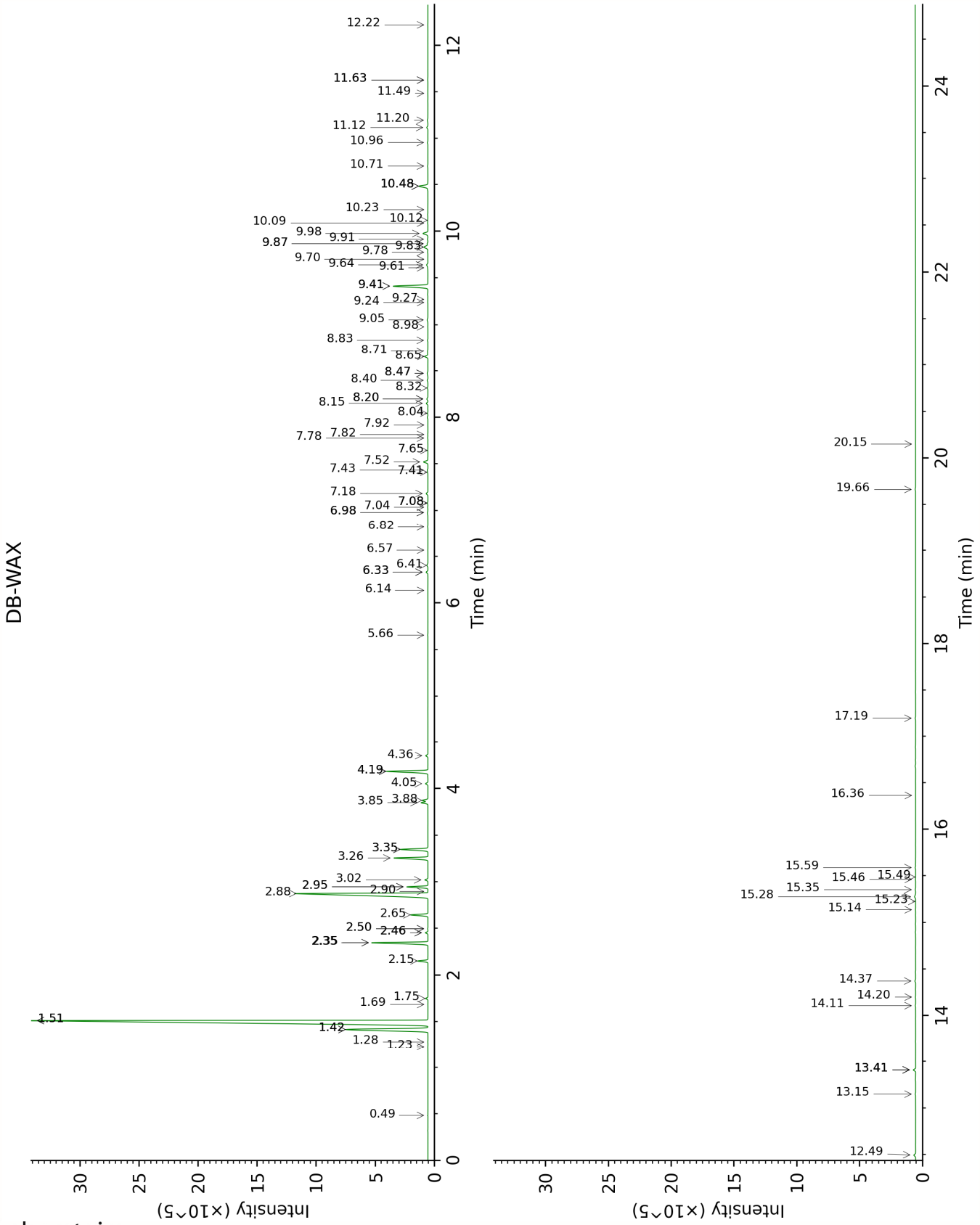
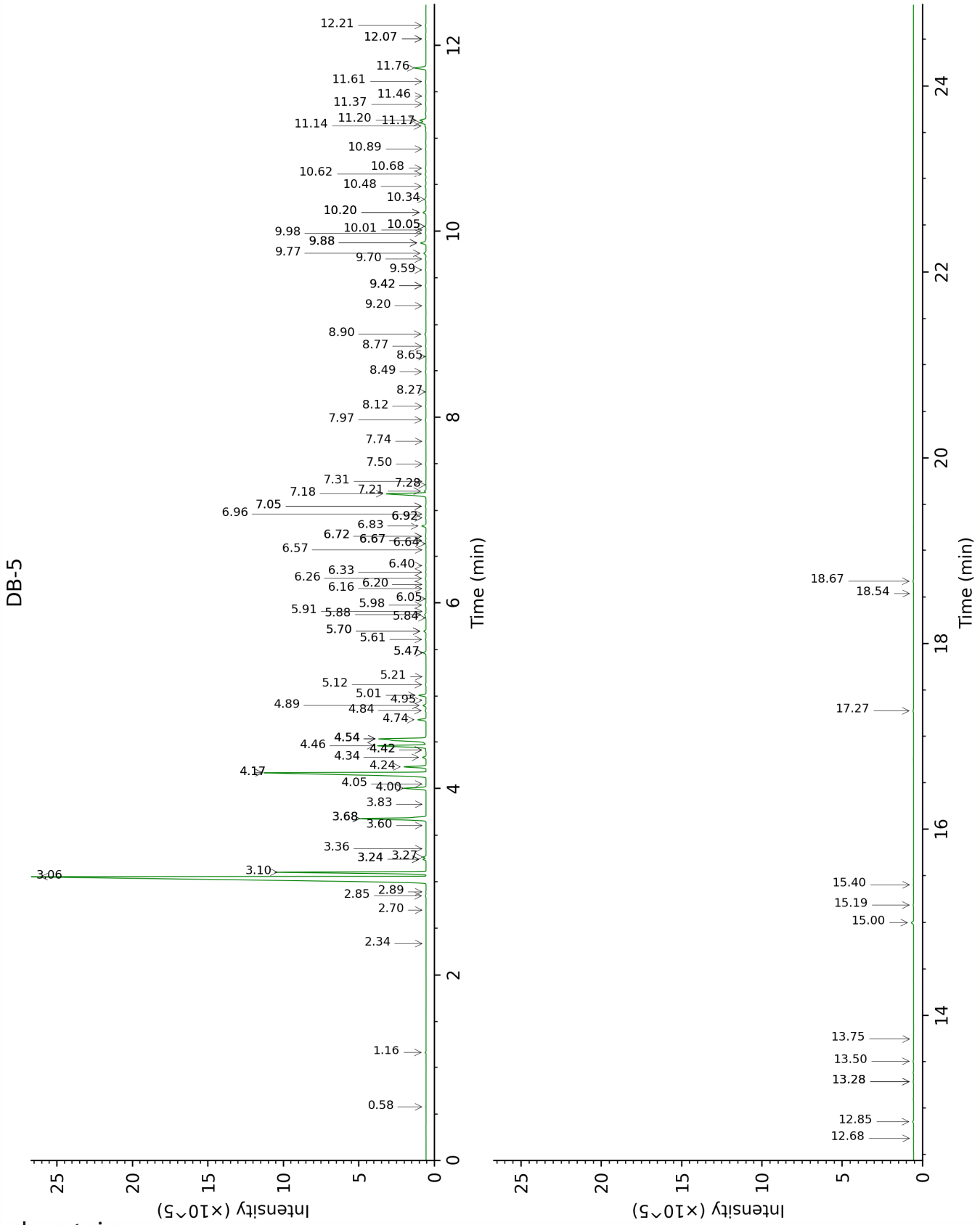

DB-WAX
Time (min)
Intensity (×10^5)
12.22
11.63
11.49
11.20
11.12
10.96
10.71
10.48
10.23
10.12
10.09
9.98
9.91
9.87
9.83
9.78
9.70
9.64
9.61
9.41
9.27
9.24
9.05
8.98
8.83
8.71
8.65
8.47
8.40
8.32
8.20
8.15
8.04
7.92
7.82
7.78
7.65
7.52
7.43
7.41
7.18
7.08
7.04
6.98
6.82
6.57
6.41
6.33
6.14
5.66
4.36
4.19
4.05
3.88
3.85
3.35
3.26
3.02
2.95
2.90
2.88
2.65
2.50
2.46
2.35
2.15
1.75
1.69
1.51
1.42
1.28
1.23
0.49
20.15
19.66
17.19
16.36
15.59
15.49
15.46
15.35
15.28
15.23
15.14
14.37
14.20
14.11
13.41
13.15
12.49


DB-5
Time (min)
Intensity (×10^5)
12.21
12.07
11.76
11.61
11.46
11.37
11.20
11.17
11.14
10.89
10.68
10.62
10.48
10.34
10.20
10.05
10.01
9.98
9.88
9.77
9.70
9.59
9.42
9.20
8.90
8.77
8.65
8.49
8.27
8.12
7.97
7.74
7.50
7.31
7.28
7.21
7.18
7.05
6.96
6.92
6.83
6.72
6.67
6.64
6.57
6.40
6.33
6.26
6.20
6.16
6.05
5.98
5.91
5.88
5.84
5.70
5.61
5.47
5.21
5.12
5.01
4.95
4.89
4.84
4.74
4.54
4.46
4.42
4.34
4.24
4.17
4.05
4.00
3.83
3.68
3.60
3.36
3.27
3.24
3.10
3.06
2.89
2.85
2.70
2.34
1.16
0.58
18.67
18.54
17.27
15.40
15.19
15.00
13.75
13.50
13.28
12.85
12.68

FULL ANALYSIS DATA

(*E*)-2-Methyl-1,3-pentadiene	**Column DB-WAX**			**Column DB-5**		
	0.49	756.0	0.01	0.58	628.6	0.01
Toluene	1.51*	1002.4	[49.71]	1.16	757.4	0.03
Unknown BOCA II [m/z 79, 78 (45), 91 (28), 77 (28), 41 (13), 80 (12), 107 (11)... 122 (1)]	1.23	962.1	0.01	2.34	875.8	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)]				2.70	905.7	0.01
Hashishene	1.42*	992.8	[8.52]	2.85	916.0	0.04
Tricyclene	1.28	970.8	0.01	2.89	918.8	0.02
α-Thujene	1.51*	1002.4	[49.71]	3.06	929.7	49.64
α-Pinene	1.42*	992.8	[8.52]	3.10	933.0	8.49
Unknown SAOF I [m/z 91, 92 (47), 65 (11)... 134 (1)]	2.46*	1095.8	[0.17]	3.24*†	942.3	[0.17]
α-Fenchene	1.68	1019.7	0.01	3.24*†	942.3	[0.17]
Camphene	1.75	1026.2	0.16	3.27*†	944.0	[0.16]
Thuja-2,4(10)-diene	2.35*	1085.8	[4.09]	3.36	950.0	0.01
3,7,7-Trimethylcyclohepta-1,3,5-triene	2.95*	1134.3	[1.42]	3.60	966.7	0.01
β-Pinene	2.15	1066.3	0.69	3.68*	971.7	[4.77]
Sabinene	2.35*	1085.8	[4.09]	3.68*	971.7	[4.77]
Pseudolimonene isomer	2.50*	1099.1	[0.02]	3.83	982.0	0.01
Myrcene	2.95*	1134.3	[1.42]	4.00	993.6	1.42
2-Carene	2.46*	1095.8	[0.17]	4.05	996.7	0.01
Pseudolimonene	2.90	1130.4	0.01	4.17*	1004.7	[14.98]
α-Phellandrene	2.88	1128.7	14.99	4.17*	1004.7	[14.98]
Δ3-Carene	2.65	1110.8	1.25	4.24	1008.8	1.25
α-Terpinene	3.02	1140.1	0.21	4.34	1015.2	0.21
meta-Cymene	4.19*	1227.9	[3.38]	4.42*	1020.3	[0.04]
Carvomenthene	2.50*	1099.1	[0.02]	4.42*	1020.3	[0.04]
para-Cymene	4.19*	1227.9	[3.38]	4.46	1023.2	3.35
Limonene	3.26	1158.4	2.62	4.54*	1027.9	[4.80]
1,8-Cineole	3.35*	1165.6	[2.06]	4.54*	1027.9	[4.80]
β-Phellandrene	3.35*	1165.6	[2.06]	4.54*	1027.9	[4.80]
(*Z*)-β-Ocimene	3.85*†	1203.8	[0.50]	4.74	1040.9	0.49

Unknown BOFR III [m/z 109, 43 (57), 91 (28), 67 (25), 93 (24), 95 (22), 77 (21), 137 (21), 41 (17), 79 (14)...]	7.44	1463.6	0.05	4.84	1047.1	0.05
(*E*)-β-Ocimene	4.05	1218.4	0.18	4.89	1050.6	0.19
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)...]	6.98*	1430.3	[0.07]	4.95	1054.2	0.01
γ-Terpinene	3.88*†	1205.5	[0.42]	5.01	1058.1	0.44
cis-Sabinene hydrate	6.98*	1430.3	[0.07]	5.12	1065.3	0.03
cis-Linalool oxide (fur.)	6.57	1400.3	0.01	5.21	1070.7	0.01
Terpinolene	4.36	1240.0	0.17	5.47*	1087.1	[0.20]
para-Cymenene	6.33*	1383.3	[0.15]	5.47*	1087.1	[0.20]
trans-Sabinene hydrate	8.04	1509.0	0.03	5.61	1096.2	0.04
α-Thujone	6.14	1369.4	0.01	5.70*	1101.8	[0.14]
Linalool	8.15	1517.1	0.13	5.70*	1101.8	[0.14]
Unknown BOSE I [m/z 109, 81 (54), 91 (32), 79 (22)...]	6.33*	1383.3	[0.15]	5.84	1111.0	0.02
β-Thujone	6.40	1388.5	0.10	5.88	1113.2	0.11
Unknown BOSE II [m/z 109, 91 (57), 93 (47), 81 (44), 77 (40)... 154 (1)]				5.91	1115.5	0.01
α-Campholenal	7.08*	1437.7	[0.04]	5.98	1119.9	0.06
Unknown BOSE III [m/z 111, 43 (22), 55 (14), 41 (12), 110 (11)...]				6.05	1124.3	0.01
allo-Ocimene	5.66	1335.4	0.02	6.16	1131.3	0.02
trans-Pinocarveol	9.27	1603.4	0.02	6.20	1134.3	0.01
trans-Sabinol	9.92	1654.9	0.04	6.26	1138.5	0.05
trans-Verbenol	9.61	1630.5	0.01	6.33	1142.8	0.02
para-Menth-3-en-8-ol	8.83	1569.3	0.03	6.40	1147.4	0.02
Unknown RHGR XIX [m/z 109, 43 (75), 137 (46), 67 (31), 93 (25)...				6.57	1158.3	0.02

152 (4)]						
Borneol	9.87*	1651.0	[0.06]	6.64	1162.7	0.02
α-Phellandren-8-ol	10.23	1680.2	0.01	6.67*	1164.8	[0.03]
Unknown CALU III [m/z 95, 110 (43), 81 (28), 41 (15)... 152 (8)]	7.78	1488.7	0.02	6.67*	1164.8	[0.03]
Umbellulone	8.98	1580.4	0.01	6.72*	1167.8	[0.05]
cis-Sabinol	10.96	1740.8	0.04	6.72*	1167.8	[0.05]
Terpinen-4-ol	8.65	1555.6	0.28	6.83	1175.0	0.30
Cryptone	9.24	1600.8	0.01	6.92*	1181.2	[0.03]
meta-Cymen-8-ol	11.63*	1797.5	[0.02]	6.92*	1181.2	[0.03]
para-Cymen-8-ol	11.63*	1797.5	[0.02]	6.96	1183.7	0.02
α-Terpineol	9.87*	1651.0	[0.06]	7.05*	1189.2	[0.04]
Myrtenal	8.71	1560.1	0.04	7.05*	1189.2	[0.04]
Methylchavicol	9.41*	1614.8	[3.11]	7.18	1198.0	3.09
cis-α-Phellandrene epoxide (iPr vs Me)	11.12	1754.3	0.10	7.21	1199.8	0.09
Verbenone	9.70	1637.8	0.01	7.28	1204.2	0.01
trans-Piperitol	10.48*	1701.0	[0.91]	7.31	1206.5	0.02
trans-Carveol	11.49	1785.1	0.01	7.50	1219.2	0.02
Cuminal	10.70	1719.6	0.03	7.74	1235.8	0.02
Unknown CALU IV [m/z 43, 97 (69), 107 (46), 41 (28), 55 (21), 109 (20)...]	11.20	1760.9	0.06	7.97	1251.4	0.05
Linalyl acetate	8.20*	1520.7	[0.10]	8.12	1261.4	0.03
Unknown BOSE VI [m/z 109, 41 (22), 81 (14), 43 (11)... 152 (4)]				8.27	1271.9	0.02
Bornyl acetate	8.32	1529.7	0.04	8.49	1286.7	0.04
Thymol	15.23	2131.9	0.01	8.65	1297.8	0.01
Carvacrol	15.46	2155.6	0.02	8.77	1305.8	0.04
para-Menth-5-en-1,2-diol isomer III	15.28	2136.8	0.13	8.90	1311.6	0.08
Unknown SCMO III [m/z 43, 97 (99), 107 (47), 41 (35), 55 (30)...]	13.41*	1957.1	[0.19]	9.20	1333.1	0.02
α-Terpinyl acetate	9.78	1643.8	0.03	9.42*	1348.5	[0.04]
α-Cubebene	6.82	1418.6	0.02	9.42*	1348.5	[0.04]
Cyclosativene II	7.04	1434.4	0.02	9.59	1360.4	0.04
α-Ylangene	7.08*	1437.7	[0.04]	9.70	1368.7	0.04
α-Copaene	7.18	1445.2	0.15	9.76	1373.1	0.15
β-Bourbonene	7.52	1470.0	0.39	9.88*	1381.0	[0.43]
1,5-diepi-β-	7.41	1461.9	0.03	9.88*	1381.0	[0.43]

Bourbonene						
β-Elemene	8.47*	1541.7	[0.09]	9.98	1388.4	0.05
β-Longipinene	7.82	1491.6	0.01	10.01	1390.8	0.01
Sibirene	7.92	1499.3	0.01	10.05*	1393.6	[0.06]
Unknown CALU VIII [m/z 71, 100 (92), 111 (79), 69 (46), 109 (45)...]	17.19	2336.3	0.04	10.05*	1393.6	[0.06]
α-Gurjunene	7.65	1479.1	0.02	10.20*	1404.1	[0.21]
Methyleugenol	13.41*	1957.1	[0.19]	10.20*	1404.1	[0.21]
β-Ylangene	8.20*	1520.7	[0.10]	10.34	1414.7	0.10
β-Copaene	8.40	1536.0	0.06	10.48	1425.0	0.07
trans-α-Bergamotene	8.47*	1541.7	[0.09]	10.62	1435.5	0.06
Isogermacrene D	9.05	1586.0	0.08	10.68	1440.2	0.05
cis-Muurola-4(15),5-diene	9.41*	1614.8	[3.11]	10.89	1455.6	0.03
γ-Muurolene	9.64	1633.0	0.14	11.14	1474.2	0.08
Germacrene D	9.83	1648.2	0.44	11.17	1476.8	0.44
Unknown BOSE VII [m/z 91, 93 (92), 105 (71), 77 (69), 79 (68), 133 (63)... 204 (32)]	9.98	1659.9	0.47	11.20	1478.8	0.44
Bicyclogermacrene	10.12	1671.1	0.03	11.37	1491.8	0.05
α-Muurolene	10.09	1668.7	0.02	11.46	1498.2	0.03
γ-Cadinene	10.48*	1701.0	[0.91]	11.61	1510.1	0.05
δ-Cadinene	10.48*	1701.0	[0.91]	11.76	1521.7	0.89
α-Elemol	14.11	2022.7	0.03	12.07*	1546.3	[0.03]
Isocaryophyllene epoxide B	12.22	1849.5	0.01	12.07*	1546.3	[0.03]
Elemicin	15.59	2168.2	0.04	12.21	1557.7	0.04
Guaiol	14.20	2031.6	0.02	12.68	1594.1	0.02
4,10-diepi-Guaiol	14.37	2048.1	0.07	12.85	1608.4	0.07
Unknown CAIN XXXVI [m/z 214, 161 (86), 173 (82), 172 (79), 199 (75), 189 (75), 204 (70)...]	15.14	2122.9	0.02	13.28*	1644.2	[0.05]
β-Eudesmol	15.49	2158.1	0.01	13.28*	1644.2	[0.05]
Bulnesol	15.35	2144.5	0.03	13.50	1662.4	0.05
Shyobunol	16.36	2248.1	0.01	13.75	1682.8	0.01
α-Phellandrene dimer II	12.50	1873.6	0.17	15.00	1790.5	0.17
α-Phellandrene dimer III	13.15	1933.2	0.04	15.19	1806.9	0.04

α-Phellandrene dimer IV	13.41*	1957.1	[0.19]	15.40	1826.7	0.02
Verticilla-4(20),7,11-triene				17.27	2001.0	0.05
Cembrenol	20.15	2676.5	0.01	18.54	2127.4	0.01
Serratol	19.66	2617.9	0.05	18.67	2141.1	0.05
Total reported		99.12%			99.33%	

*: 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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