Date : May 24, 2019

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 19E14-PTH06-1-SCC
Customer identification : Balm Mint Bush - Australia - BP010186R
Type : Essential oil
Source : *Prostanthera melissifolia*
Customer : Plant Therapy

Analysis

Method: PC-PA-014-17J19 - Analysis of the composition of an essential oil, or other volatile liquid, by FAST GC-FID (in French); identifications validated by GC-MS.
Analyst : Sylvain Mercier, M. Sc., Chimiste
Analysis date : May 22, 2019

Checked and approved by :

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

This report is digitally signed, it is only considered valid if the digital signature is intact.

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PHYSICOCHEMICAL DATA

Physical aspect: Clear liquid
Refractive index: 1.4712 ± 0.0003 (20 °C)

CONCLUSION

No adulterant or diluent were detected using this method. However, Phytochemia can make no guarantee that this oil corresponds to the stated species, as there is yet no scientific reference about the expected composition for this species.

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ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
Hashishene	0.02	18.95*	Monoterpene
Tricyclene	0.03	0.02	Monoterpene
α-Thujene	0.07	0.06	Monoterpene
α-Pinene	19.73	[18.95]*	Monoterpene
Camphene	0.19*	0.17	Monoterpene
α-Fenchene	[0.19]*	0.02	Monoterpene
Thuja-2,4(10)-diene	0.01	0.02*	Monoterpene
β-Pinene	0.22*	0.20*	Monoterpene
Sabinene	[0.22]*	[0.02]*	Monoterpene
Myrcene	0.07	0.06	Monoterpene
α-Phellandrene	0.06	0.05	Monoterpene
α-Terpinene	0.01	0.01	Monoterpene
para-Cymene	0.51	0.50	Monoterpene
Limonene	23.69*	1.11	Monoterpene
1,8-Cineole	[23.69]*	22.29	Monoterpenic ether
(*Z*)-β-Ocimene	0.02	0.01	Monoterpene
(*E*)-β-Ocimene	0.01	0.02	Monoterpene
γ-Terpinene	0.75	0.75	Monoterpene
cis-Linalool oxide (fur.)	0.03	0.03	Monoterpenic alcohol
Terpinolene	0.09*	0.04	Monoterpene
trans-Linalool oxide (fur.)	[0.09]*	0.05	Monoterpenic alcohol
para-Cymenene	[0.09]*	0.01	Monoterpene
α-Pinene oxide	0.04	0.05	Monoterpenic ether
Verbenol analog?	14.92*	0.01	Monoterpenic alcohol
Linalool	[14.92]*	15.09	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.05	0.06	Monoterpenic alcohol
trans-Pinocarveol	0.02	0.02	Monoterpenic alcohol
trans-para-Menth-2-en-1-ol	0.08	0.08	Monoterpenic alcohol
trans-Verbenol	0.04	0.04	Monoterpenic alcohol
δ-Terpineol	0.02	0.01	Monoterpenic alcohol
Unknown	0.01	0.02	Oxygenated monoterpene
Terpinen-4-ol	3.05	3.12*	Monoterpenic alcohol
Cryptone	0.11*	0.01	Normonoterpenic ketone
4-Methylacetophenone	[0.11]*	[0.10]*	Simple phenolic
Unknown	[0.11]*		Unknown
Unknown	0.02		Unknown
para-Cymen-8-ol	0.07	0.10	Monoterpenic alcohol
α-Terpineol	1.24	1.27	Monoterpenic alcohol
cis-Piperitol	0.02	0.03	Monoterpenic alcohol
Myrtenol	0.02	0.01	Monoterpenic alcohol
α-Phellandrene epoxide	0.05	0.05	Monoterpenic ether
Verbenone	0.01	0.02	Monoterpenic ketone
trans-Piperitol	0.08	0.10	Monoterpenic alcohol
Piperitone	32.42	33.11*	Monoterpenic ketone
Geraniol	0.03	0.03	Monoterpenic alcohol
Phellandral	0.01	0.01	Monoterpenic aldehyde
cis-Verbenyl acetate	0.01	0.01	Monoterpenic ester
para-Cymen-7-ol	0.03	0.01	Monoterpenic alcohol

Thymol	0.03	0.01	Monoterpenic alcohol
Unknown	0.01		Unknown
Bicycloelemene	0.13	0.13	Sesquiterpene
α-Terpinyl acetate	0.04	0.04	Monoterpenic ester
α-Copaene	0.01	0.01	Sesquiterpene
Methyl (*E*)-cinnamate	0.01	0.01	Phenylpropanoid ester
β-Elemene	0.03	0.68*	Sesquiterpene
Unknown	0.05*	0.01	Sesquiterpene
α-Gurjunene	[0.05]*	0.04	Sesquiterpene
β-Caryophyllene	0.66	[0.68]*	Sesquiterpene
γ-Maaliene	0.03	[0.68]*	Sesquiterpene
β-Gurjunene	0.04	0.05	Sesquiterpene
α-Maaliene	0.01	0.01	Sesquiterpene
Aromadendrene	0.07	[3.12]*	Sesquiterpene
α-Humulene	0.07	0.06	Sesquiterpene
allo-Aromadendrene	0.09	0.08	Sesquiterpene
γ-Gurjunene	0.01	0.02	Sesquiterpene
β-Selinene	0.01	[33.11]*	Sesquiterpene
Unknown	0.01		Sesquiterpene
Viridiflorene	0.10	0.10	Sesquiterpene
δ-Cadinene	0.01	[0.10]*	Sesquiterpene
Unknown	0.01		Unknown
Spathulenol	0.02	0.02	Sesquiterpenic alcohol
Caryophyllene oxide isomer	0.02*	tr	Sesquiterpenic ether
Caryophyllene oxide	[0.02]*	0.03	Sesquiterpenic ether
γ-Eudesmol	0.01	0.01	Sesquiterpenic alcohol
Unknown		[0.20]*	Unknown
Carvotanacetone		0.03	Monoterpenic ketone
Total identified	**99.30%**	**98.94%**	

*: Two or more compounds are coeluting on this column
[xx]: Duplicate percentage due to coelutions, not taken account in the identified total
tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

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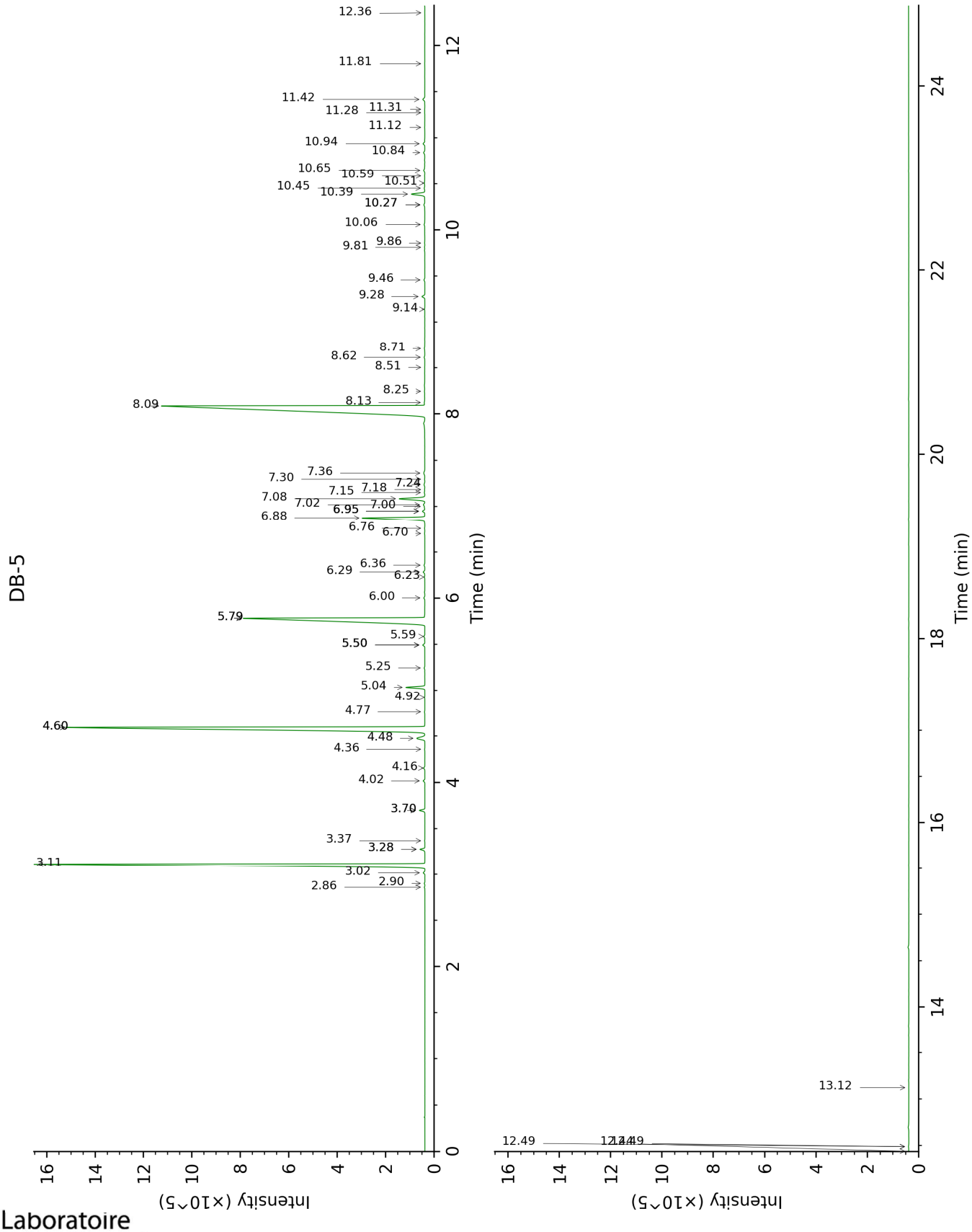
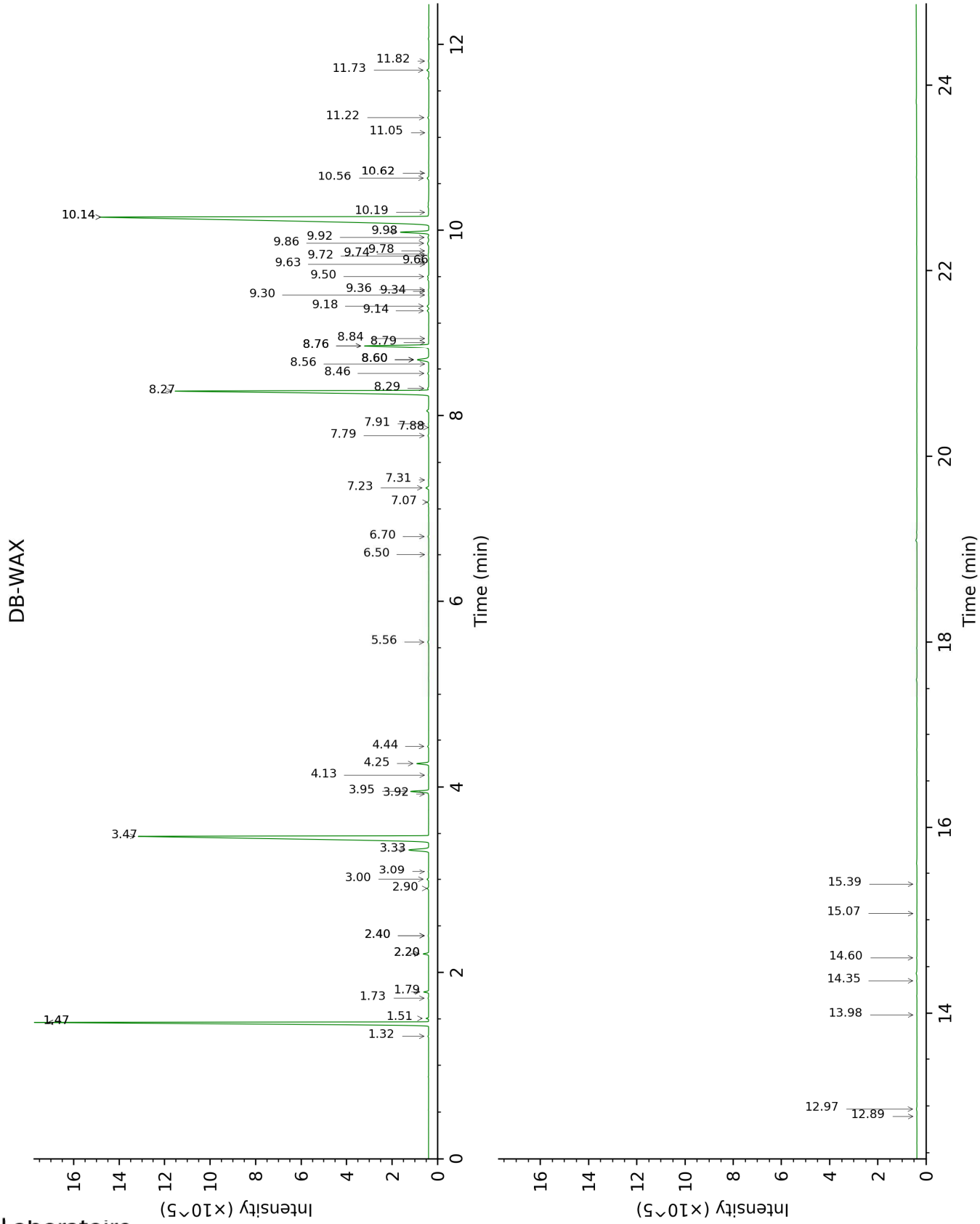

DB-5
12.36
11.81
11.42
11.28
11.31
11.12
10.94
10.84
10.65
10.59
10.51
10.45
10.39
10.27
10.06
9.81
9.86
9.46
9.28
9.14
8.71
8.62
8.51
8.25
8.13
8.09
7.36
7.30
7.24
7.18
7.15
7.08
7.02
7.00
6.95
6.88
6.76
6.70
6.36
6.29
6.23
6.00
5.79
5.59
5.50
5.25
5.04
4.92
4.77
4.60
4.48
4.36
4.16
4.02
3.70
3.37
3.28
3.11
3.02
2.90
2.86
13.12
12.49
Time (min)
Intensity (×10^5)


DB-WAX
Time (min)
Intensity (×10^5)
11.82
11.73
11.22
11.05
10.62
10.56
10.19
10.14
9.98
9.92
9.86
9.78
9.74
9.72
9.66
9.63
9.50
9.36
9.34
9.30
9.18
9.14
8.84
8.79
8.76
8.60
8.56
8.46
8.29
8.27
7.91
7.88
7.79
7.31
7.23
7.07
6.70
6.50
5.56
4.44
4.25
4.13
3.95
3.92
3.47
3.33
3.09
3.00
2.90
2.40
2.20
1.79
1.73
1.51
1.47
1.32
15.39
15.07
14.60
14.35
13.98
12.97
12.89

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Hashishene	2.86	915	0.02	1.47*	995	18.95
Tricyclene	2.90	918	0.03	1.32	972	0.02
α-Thujene	3.02	925	0.07	1.51	999	0.06
α-Pinene	3.11	932	19.73	1.47*	995	[18.95]
Camphene	3.28*	943	0.19	1.79	1026	0.17
α-Fenchene	3.28*	943	[0.19]	1.73	1020	0.02
Thuja-2,4(10)-diene	3.37	949	0.01	2.40*	1084	0.02
β-Pinene	3.70*	970	0.22	2.20*	1065	0.20
Sabinene	3.70*	970	[0.22]	2.40*	1084	[0.02]
Myrcene	4.02	992	0.07	3.00	1132	0.06
α-Phellandrene	4.16	1001	0.06	2.90	1125	0.05
α-Terpinene	4.36	1014	0.01	3.09	1139	0.01
para-Cymene	4.48	1021	0.51	4.25	1226	0.50
Limonene	4.60*	1029	23.69	3.32	1157	1.11
1,8-Cineole	4.60*	1029	[23.69]	3.47	1168	22.29
(*Z*)-β-Ocimene	4.77	1039	0.02	3.92	1202	0.01
(*E*)-β-Ocimene	4.92	1049	0.01	4.13	1217	0.02
γ-Terpinene	5.04	1056	0.75	3.95	1204	0.75
cis-Linalool oxide (fur.)	5.25	1070	0.03	6.70	1400	0.03
Terpinolene	5.50*	1086	0.09	4.44	1239	0.04
trans-Linalool oxide (fur.)	5.50*	1086	[0.09]	7.07	1428	0.05
para-Cymenene	5.50*	1086	[0.09]	6.50	1386	0.01
α-Pinene oxide	5.59	1092	0.04	5.56	1319	0.05
Verbenol analog?	5.78*	1104	14.92	8.56	1539	0.01
Linalool	5.78*	1104	[14.92]	8.27	1517	15.09
cis-para-Menth-2-en-1-ol	6.00	1118	0.05	8.30	1519	0.06
trans-Pinocarveol	6.23	1133	0.02	9.36	1601	0.02
trans-para-Menth-2-en-1-ol	6.28	1137	0.08	9.14	1584	0.08
trans-Verbenol	6.36	1142	0.04	9.72	1630	0.04
δ-Terpineol	6.70	1164	0.02	9.63	1623	0.01
Unknown [m/z 95, 110 (43), 81 (28), 41 (15)... 152 (8)]	6.76	1168	0.01	7.91	1490	0.02
Terpinen-4-ol	6.88	1175	3.05	8.76*	1554	3.12
Cryptone	6.95*	1180	0.11	9.34	1600	0.01
4-Methylacetophenone	6.95*	1180	[0.11]	10.62*†	1703	[0.10]
Unknown [m/z 109, 43 (37), 124 (19), 82 (18), 95 (16), 110 (15), 55 (15)...]	6.95*	1180	[0.11]			
Unknown [m/z 43, 71 (51), 55 (48), 41 (37), 56 (33), 83 (24), 111	7.00	1184	0.02			

(23)...]						
para-Cymen-8-ol	7.02	1185	0.07	11.73	1796	0.10
α-Terpineol	7.08	1189	1.24	9.98	1651	1.27
cis-Piperitol	7.15	1194	0.02	9.74	1632	0.03
Myrtenol	7.18	1196	0.02	11.05	1740	0.01
α-Phellandrene epoxide	7.24	1199	0.05	11.22	1753	0.05
Verbenone	7.30	1203	0.01	9.78	1635	0.02
trans-Piperitol	7.36	1208	0.08	10.56†	1698	0.10
Piperitone	8.09	1258	32.42	10.14*	1664	33.11
Geraniol	8.13	1261	0.03	11.82	1805	0.03
Phellandral	8.25	1269	0.01	10.19	1668	0.01
cis-Verbenyl acetate	8.51	1287	0.01	8.84	1561	0.01
para-Cymen-7-ol	8.62	1295	0.03	14.35	2035	0.01
Thymol	8.71	1302	0.03	15.39	2136	0.01
Unknown [m/z 69, 41 (58), 114 (29), 43 (25), 83 (24), 123 (20)...]	9.14	1326	0.01			
Bicycloelemene	9.28	1335	0.13	7.23	1439	0.13
α-Terpinyl acetate	9.46	1348	0.04	9.92	1646	0.04
α-Copaene	9.81	1373	0.01	7.31	1445	0.01
Methyl (*E*)-cinnamate	9.86	1376	0.01	13.98	2000	0.01
β-Elemene	10.06	1391	0.03	8.60*	1543	0.68
Unknown [m/z 105, 161 (84), 91 (80), 204 (75), 119 (69), 189 (64)]	10.27*	1406	0.05	7.88	1487	0.01
α-Gurjunene	10.27*	1406	[0.05]	7.79	1480	0.04
β-Caryophyllene	10.39	1414	0.66	8.60*	1543	[0.68]
γ-Maaliene	10.45	1419	0.03	8.60*	1543	[0.68]
β-Gurjunene	10.51	1423	0.04	8.46	1531	0.05
α-Maaliene	10.59	1429	0.01	8.79	1557	0.01
Aromadendrene	10.65	1434	0.07	8.76*	1554	[3.12]
α-Humulene	10.84	1449	0.07	9.50	1613	0.06
allo-Aromadendrene	10.94	1456	0.09	9.18	1587	0.08
γ-Gurjunene	11.12	1469	0.01	9.30	1597	0.02
β-Selinene	11.28	1481	0.01	10.14*	1664	[33.11]
Unknown [m/z 95, 59 (96), 110 (84), 43 (79), 109 (67), 67 (29)...220 (1)]	11.31	1484	0.01			
Viridiflorene	11.42	1492	0.10	9.86	1641	0.10
δ-Cadinene	11.81	1521	0.01	10.62*†	1703	[0.10]
Unknown [m/z 69, 81 (58), 95 (52), 41 (50), 83 (46), 55 (46), 109 (41)...]	12.36	1565	0.01			
Spathulenol	12.44	1571	0.02	14.60	2058	0.02
Caryophyllene oxide isomer	12.49*	1575	0.02	12.89	1899	tr
Caryophyllene oxide	12.49*	1575	[0.02]	12.97	1906	0.03
γ-Eudesmol	13.12	1626	0.01	15.07	2104	0.01

Unknown [m/z 85, 61 (78), 56 (60), 41 (56), 58 (38), 115 (33)...]		2.20*	1065	[0.20]
Carvotanacetone		9.66	1626	0.03
Total identified	**99.30%**		**98.94%**	
Total reported	**99.37%**		**98.97%**	

*: Two or more compounds are coeluting on this column
[xx]: Duplicate percentage due to coelutions, not taken account in the identified 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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