Date : November 22, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21K11-PTH07
Customer identification : Lemon Myrtle - Australia - LP0104211R
Type : Essential oil
Source : *Backhousia citriodora*
Customer : Plant Therapy

Analysis

Method: PC-MAT-014 ISO - Analysis of the composition of an essential oil or other volatile liquid by FAST GC-FID (in French); identifications validated by GC-MS.
Analyst : Seydou Ka, Ph. D.
Analysis date : November 17, 2021

Checked and approved by :

Alexis St-Gelais, M. Sc., 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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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PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid
Refractive index: 1.4872 ± 0.0003 (20 °C; method PC-MAT-016)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method. The linalool content is however higher than typically found in lemon myrtle oil, based on the Australian and ISO standards.

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Analysis summary – Consolidated contents

New readers of similar reports are encouraged to read table footnotes at least once.

Identification	%	Class
2,6-Dimethyl-1,5-heptadiene	tr	Normonoterpene
Unknown	tr	Unknown
α-Pinene	0.04	Monoterpene
β-Pinene	0.05	Monoterpene
Dehydro-1,8-cineole	tr	Monoterpenic ether
6-Methyl-5-hepten-2-one	0.91	Aliphatic ketone
Myrcene	0.18	Monoterpene
Octan-3-ol	0.02	Aliphatic alcohol
Limonene	0.39	Monoterpene
1,8-Cineole	0.06	Monoterpenic ether
(*Z*)-β-Ocimene	tr	Monoterpene
(*E*)-β-Ocimene	0.02	Monoterpene
γ-Terpinene	tr	Monoterpene
cis-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
trans-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
Rosefuran	0.01	Monoterpenic ether
Linalool	1.57	Monoterpenic alcohol
cis-Chrysanthemal?	0.02	Monoterpenic aldehyde
α-Cyclocitral	tr	Monoterpenic aldehyde
trans-para-Mentha-2,8-dien-1-ol	0.01	Monoterpenic alcohol
cis-para-Mentha-2,8-dien-1-ol	0.02	Monoterpenic alcohol
trans-para-Menth-2-en-1-ol	0.01	Monoterpenic alcohol
Isopulegol	0.06	Monoterpenic alcohol
exo-Isocitral	0.09	Monoterpenic aldehyde
trans-Chrysanthemal	0.01	Monoterpenic aldehyde
iso-Isopulegol	0.03	Monoterpenic alcohol
Citronellal	0.80	Monoterpenic aldehyde
Borneol	0.05	Monoterpenic alcohol
Isoneral	0.30	Monoterpenic aldehyde
Terpinen-4-ol	0.07	Monoterpenic alcohol
Unknown	0.11	Oxygenated monoterpene
Isogeranial	0.63	Monoterpenic aldehyde
para-Cymen-8-ol	0.03	Monoterpenic alcohol
α-Terpineol	0.22	Monoterpenic alcohol
β-Phellandren-8-ol	0.03	Monoterpenic alcohol
trans-Isopiperitenol	0.11	Monoterpenic alcohol
Unknown	0.05	Oxygenated monoterpene
cis-Isopiperitenol	0.20	Monoterpenic alcohol
Nerol	0.16	Monoterpenic alcohol
Piperitone	0.16	Monoterpenic ketone
Neral	39.67	Monoterpenic aldehyde
(*E*)-Isogeraniol?	0.14	Monoterpenic alcohol
Geraniol	1.48	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Geranial	47.43	Monoterpenic aldehyde

Citronellic acid	0.02	Monoterpenic acid
Unknown	0.19	Unknown
α-Terpinyl acetate	0.02	Monoterpenic ester
Unknown	0.09	Unknown
Geranic acid	0.01	Aliphatic acid
α-Copaene	0.10	Sesquiterpene
Unknown	0.17	Unknown
Geranyl acetate	0.12	Monoterpenic ester
β-Elemene	0.12	Sesquiterpene
Longifolene	0.01	Sesquiterpene
β-Caryophyllene	1.77	Sesquiterpene
trans-α-Bergamotene	0.01	Sesquiterpene
α-Humulene	0.13	Sesquiterpene
allo-Aromadendrene	tr	Sesquiterpene
(*E*)-β-Farnesene	0.03	Sesquiterpene
Selina-4,11-diene	tr	Sesquiterpene
Germacrene D	0.02	Sesquiterpene
Bicyclogermacrene	tr	Sesquiterpene
Viridiflorene	0.04	Sesquiterpene
α-Muurolene	0.01	Sesquiterpene
γ-Cadinene	0.07	Sesquiterpene
(3*E*,6*E*)-α-Farnesene	0.01	Sesquiterpene
δ-Cadinene	0.06	Sesquiterpene
Spathulenol	0.01	Sesquiterpenic alcohol
Caryophyllene oxide	0.14	Sesquiterpenic ether
Caryophyllene oxide isomer	0.01	Sesquiterpenic ether
Humulene epoxide II	0.01	Sesquiterpenic ether
α-Bisabolol	tr	Sesquiterpenic alcohol
meta-Camphorene	0.01	Diterpene
Unknown	0.01	Unknown
Unknown	0.01	Unknown
Unknown	0.02	Unknown
Unknown	0.04	Unknown
Unknown	0.02	Unknown
Consolidated total	**98.42%**	

tr: The compound has been detected below 0.005% of 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.

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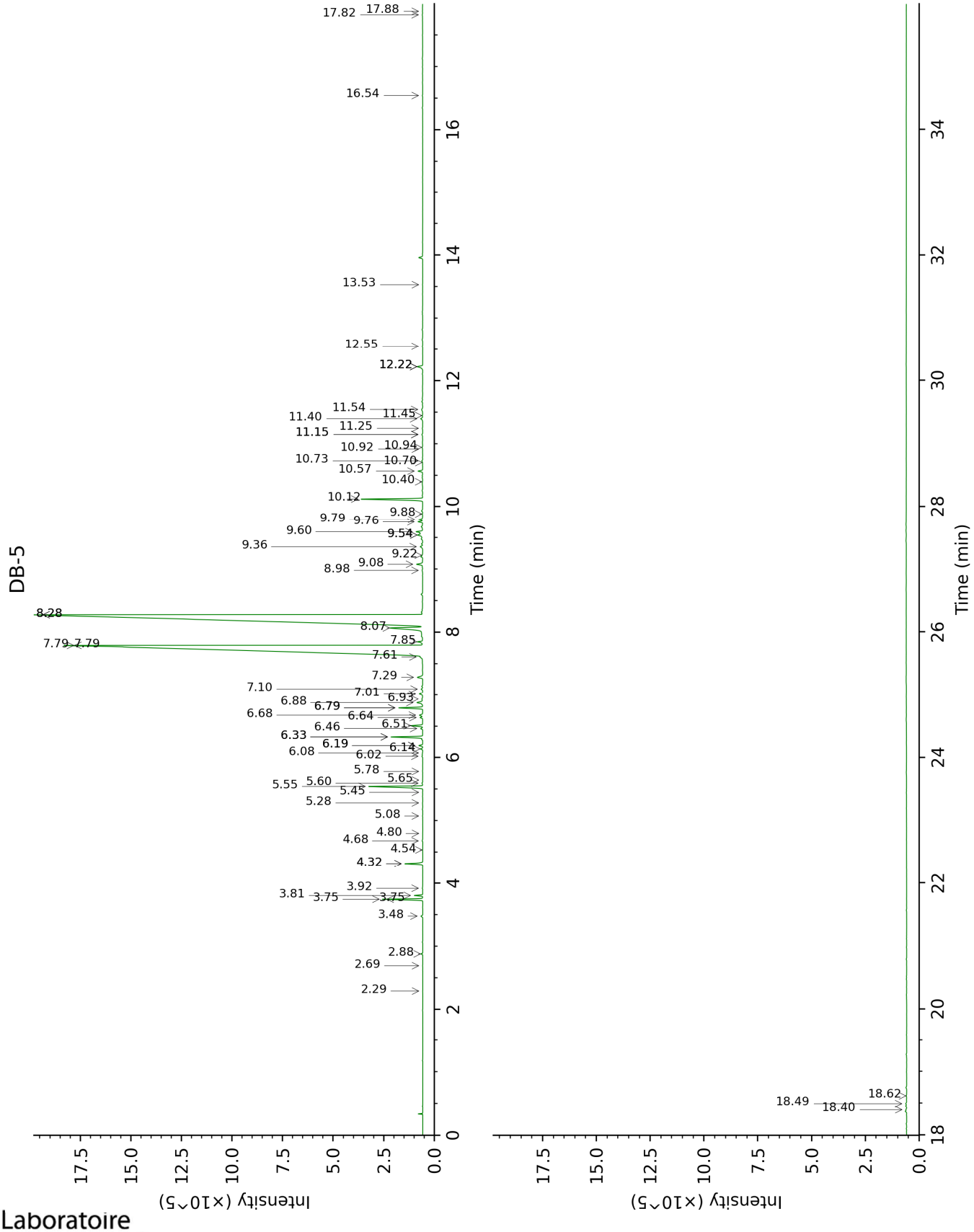
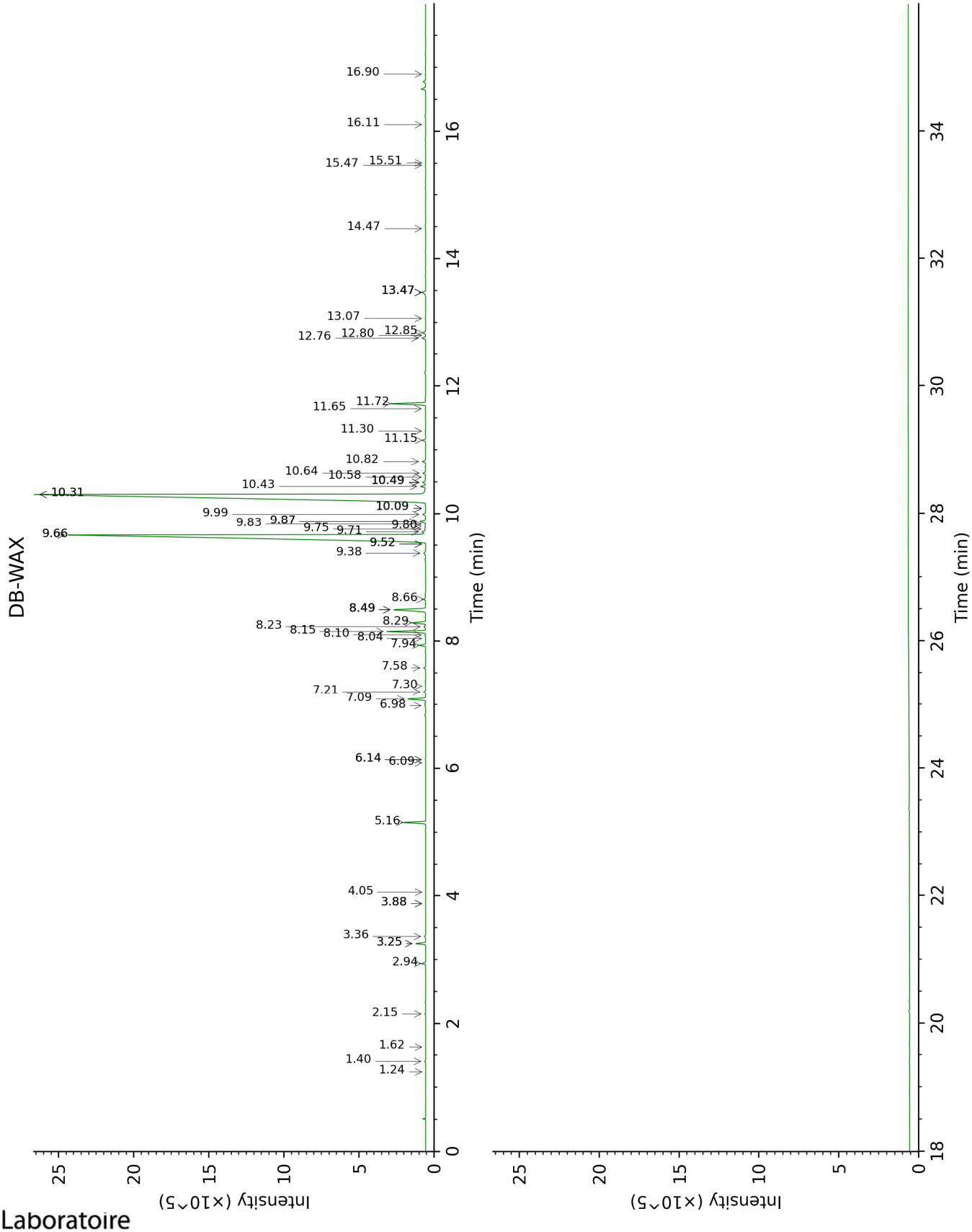

DB-5
17.82
17.88
16.54
13.53
12.55
12.22
11.54
11.40
11.45
11.15
11.25
10.92
10.94
10.73
10.70
10.57
10.40
10.12
9.88
9.79
9.76
9.60
9.54
9.36
9.22
8.98
9.08
8.28
8.07
7.79
7.79
7.85
7.61
7.29
7.10
7.01
6.93
6.88
6.79
6.68
6.64
6.46
6.51
6.33
6.19
6.14
6.08
6.02
5.78
5.65
5.55
5.60
5.45
5.28
5.08
4.80
4.68
4.54
4.32
3.92
3.81
3.75
3.75
3.48
2.88
2.69
2.29
18.62
18.49
18.40
Time (min)
Intensity (×10^5)


DB-WAX
16.90
16.11
15.47
15.51
14.47
13.47
13.07
12.76
12.80
12.85
11.65
11.72
11.30
11.15
10.82
10.64
10.58
10.49
10.43
10.31
10.09
9.99
9.83
9.87
9.75
9.71
9.80
9.66
9.52
9.38
8.66
8.49
8.29
8.23
8.15
8.10
8.04
7.94
7.58
7.30
7.21
7.09
6.98
6.14
6.09
5.16
4.05
3.88
3.36
3.25
2.94
2.15
1.62
1.40
1.24
Time (min)
Intensity (×10^5)

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
2,6-Dimethyl-1,5-heptadiene	2.29	885	tr	1.24	965	tr
Unknown [m/z 67, 109 (89), 124 (85), 41 (41), 81 (35), 55 (24)...]	2.69	916	tr	1.62	1014	0.01
α-Pinene	2.88	929	0.04	1.40	992	0.04
β-Pinene	3.48	970	0.05	2.15	1066	0.03
Dehydro-1,8-cineole	3.75*	988	0.93	3.25*	1159	0.40
6-Methyl-5-hepten-2-one	3.75*	988	[0.93]	5.16	1299	0.91
Myrcene	3.81	992	0.18	2.94	1134	0.17
Octan-3-ol	3.92	1000	0.02	6.14*	1369	0.02
Limonene	4.32*	1025	0.45	3.25*	1159	[0.40]
1,8-Cineole	4.32*	1025	[0.45]	3.36	1167	0.06
(*Z*)-β-Ocimene	4.54	1039	tr	3.88*	1207	0.01
(*E*)-β-Ocimene	4.68	1048	0.02	4.06	1220	0.01
γ-Terpinene	4.80	1056	tr	3.88*	1207	[0.01]
cis-Linalool oxide (fur.)	5.08	1073	0.01			
trans-Linalool oxide (fur.)	5.28	1086	0.01	6.98	1431	0.05
Rosefuran	5.45	1097	0.01	6.09	1366	tr
Linalool	5.55	1103	1.57	8.15	1518	1.57
cis-Chrysanthemal?	5.60	1106	0.02	6.14*	1369	[0.02]
α-Cyclocitral	5.65	1109	tr			
trans-para-Mentha-2,8-dien-1-ol	5.78	1118	0.01			
cis-para-Mentha-2,8-dien-1-ol	6.02	1134	0.02	9.52*	1625	tr
trans-para-Menth-2-en-1-ol	6.08	1137	0.01			
Isopulegol	6.14	1141	0.06	8.23	1524	0.10
exo-Isocitral	6.19*	1144	0.10	7.58	1475	0.09
trans-Chrysanthemal	6.19*	1144	[0.10]	7.30	1454	0.01
iso-Isopulegol	6.33*	1153	0.80	8.10	1514	0.03
Citronellal	6.33*	1153	[0.80]	7.09	1438	0.80
Borneol	6.46	1162	0.05	9.83	1650	0.02
Isoneral	6.51	1165	0.30	7.94	1501	0.27
Terpinen-4-ol	6.64	1173	0.07	8.66	1557	0.10
Unknown [m/z 84, 83 (74), 137 (56), 41 (47), 93 (43), 108 (40)... 152 (2)]	6.68	1176	0.11	9.71	1640	0.18

Isogeranial	6.79*	1183	0.61	8.29	1528	0.63
para-Cymen-8-ol	6.79*	1183	[0.61]	11.65	1802	0.03
α-Terpineol	6.88	1188	0.22	9.87*	1653	0.28
β-Phellandren-8-ol	6.93	1192	0.03	10.82	1731	0.15
trans-Isopiperitenol	7.01	1197	0.11	10.49*	1704	0.16
Unknown [m/z 84, 41 (83), 83 (79), 91 (76), 93 (67), 119 (64), 137 (63), 109 (54), 108 (54)... 152 (4)]	7.10	1203	0.05	10.31*	1688	47.51
cis-Isopiperitenol	7.29	1215	0.20	10.43	1698	0.24
Nerol	7.61†	1237	40.05	11.15	1759	0.16
Piperitone	7.79*†	1249	[40.05]	9.99	1663	0.16
Neral	7.79*†	1249	[40.05]	9.66*	1636	39.69
(*E*)-Isogeraniol?	7.85	1253	0.14	11.30	1772	0.03
Geraniol	8.07	1268	1.48	11.72	1808	1.55
Unknown [m/z 43, 69 (77), 41 (70), 109 (54)... 152 (6)]	8.28*	1282	47.45	13.07	1929	0.02
Geranial	8.28*	1282	[47.45]	10.31*	1688	[47.51]
Citronellic acid	8.98	1330	0.02	16.11	2225	tr
Unknown [m/z 82, 59 (44), 41 (43), 95 (31), 43 (29), 81 (24)...]	9.08	1337	0.19	12.76	1900	0.18
α-Terpinyl acetate	9.22	1348	0.02	9.80	1647	0.04
Unknown [m/z 110, 95 (98), 109 (40), 43 (35), 111 (32)... 153 (13)...]	9.36	1357	0.09	13.48*	1966	0.23
Geranic acid	9.54*	1370	0.22	16.90	2308	0.01
α-Copaene	9.54*	1370	[0.22]	7.20	1447	0.10
Unknown [m/z 81, 59 (94), 41 (74), 85 (40), 43 (55)...]	9.60	1374	0.17	13.48*	1966	[0.23]
Geranyl acetate	9.76	1385	0.12	10.64	1716	0.12
β-Elemene	9.79	1388	0.12	8.49*	1544	1.88
Longifolene	9.88	1394	0.01	8.04	1509	0.01
β-Caryophyllene	10.12	1412	1.77	8.49*	1544	[1.88]
trans-α-Bergamotene	10.40	1432	0.01	8.49*	1544	[1.88]
α-Humulene	10.57	1445	0.13	9.38	1613	0.13
allo-Aromadendrene	10.70	1455	tr			
(*E*)-β-Farnesene	10.73	1457	0.03	9.66*	1636	[39.69]
Selina-4,11-diene	10.92	1471	tr	9.52*	1625	[tr]
Germacrene D	10.94	1473	0.02	9.87*	1653	[0.28]
Bicyclogermacrene	11.15*	1488	0.02	10.09*	1670	0.01
Viridiflorene	11.15*	1488	[0.02]	9.75	1644	0.04
α-Muurolene	11.25	1496	0.01	10.09*	1670	[0.01]

γ-Cadinene	11.40	1507	0.07	10.49*	1704	[0.16]
(3*E*,6*E*)-α-Farnesene	11.45	1511	0.01	10.58	1711	0.03
δ-Cadinene	11.54	1519	0.06	10.49*	1704	[0.16]
Spathulenol	12.22*	1572	0.20	14.47	2061	0.01
Caryophyllene oxide	12.22*	1572	[0.20]	12.84	1908	0.14
Caryophyllene oxide isomer	12.22*	1572	[0.20]	12.80	1904	0.01
Humulene epoxide II	12.55	1598	0.01	13.48*	1966	[0.23]
α-Bisabolol	13.53	1679	tr	15.51	2164	0.01
meta-Camphorene	16.54	1948	0.01	15.47	2160	0.02
Unknown [m/z 93, 69 (95), 135 (76), 107 (53), 41 (53), 109 (50)... 235 (10)...]	17.82	2073	0.01			
Unknown [m/z 69, 81 (56), 83 (52), 41 (39), 95 (42), 55 (27)...]	17.88	2078	0.01			
Unknown [m/z 69, 41 (38), 151 (36), 123 (34), 82 (24), 43 (23), 109 (21)...]	18.40	2132	0.02			
Unknown [m/z 69, 41 (75), 95 (53), 55 (47), 82 (40), 81 (38)...]	18.49	2141	0.04			
Unknown [m/z 69, 41 (77), 95 (55), 55 (50), 82 (46), 109 (42)...]	18.62	2154	0.02			
Total identified		**97.87%**			**98.06%**	
Total reported		**98.57%**			**98.45%**	

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