Date : March 30, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21C16-PTH10
Customer identification : Ravintsara - Madagascar - RG010493R
Type : Essential oil
Source : *Cinnamomum camphora*
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, M. Sc.
Analysis date : March 25, 2021

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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.

Méthode certifiée ISO 17025:2017 Certified method

Laboratoire PhytoChemia

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PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid
Refractive index: 1.4655 ± 0.0003 (20 °C; method PC-MAT-016)

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
(3*Z*)-Hexenol	0.01	Aliphatic alcohol
Hexanol	tr	Aliphatic alcohol
Tricyclene	0.01	Monoterpene
α-Thujene	0.80	Monoterpene
α-Pinene	4.62	Monoterpene
Camphene	0.20	Monoterpene
α-Fenchene	0.02	Monoterpene
Sabinene	11.54	Monoterpene
β-Pinene	3.34	Monoterpene
6-Methyl-5-hepten-2-one	0.02	Aliphatic ketone
Myrcene	1.40	Monoterpene
α-Phellandrene	0.08	Monoterpene
α-Terpinene	0.95	Monoterpene
Limonene	0.83	Monoterpene
1,8-Cineole	56.43	Monoterpenic ether
para-Cymene	0.34	Monoterpene
(*Z*)-β-Ocimene	0.07	Monoterpene
(*E*)-β-Ocimene	0.34	Monoterpene
γ-Terpinene	1.56	Monoterpene
cis-Sabinene hydrate	0.39	Monoterpenic alcohol
Terpinolene	0.39	Monoterpene
trans-Sabinene hydrate	0.38	Monoterpenic alcohol
Linalool	0.05	Monoterpenic alcohol
Unknown	0.01	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.11	Monoterpenic alcohol
trans-para-Menth-2-en-1-ol	0.10	Monoterpenic alcohol
Unknown	0.01	Unknown
Unknown	0.01	Unknown
Borneol	0.16	Monoterpenic alcohol
δ-Terpineol	0.67	Monoterpenic alcohol
Terpinen-4-ol	3.18	Monoterpenic alcohol
Cryptone	0.01	Normonoterpenic ketone
α-Terpineol	8.18	Monoterpenic alcohol
cis-Piperitol	0.04	Monoterpenic alcohol
Dodecane	0.06	Alkane
Unknown	0.01	Unknown
Nerol	0.08	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Carvone	0.01	Monoterpenic ketone
trans-Ascaridole glycol	0.01	Monoterpenic alcohol
Safrole	0.02	Phenylpropanoid
Unknown	0.01	Unknown
Unknown	0.02	Monoterpenic alcohol
α-Cubebene	0.01	Sesquiterpene
Eugenol	0.01	Phenylpropanoid

α-Ylangene	0.01	Sesquiterpene
β-Bourbonene	0.01	Sesquiterpene
β-Elemene	0.12	Sesquiterpene
β-Caryophyllene	0.61	Sesquiterpene
Aromadendrene	0.05	Sesquiterpene
6,9-Guaiadiene	0.02	Sesquiterpene
α-Humulene	0.84	Sesquiterpene
β-Santalene	0.02	Sesquiterpene
γ-Muurolene	0.05	Sesquiterpene
Germacrene D	0.26	Sesquiterpene
β-Selinene	0.23	Sesquiterpene
α-Selinene	0.14	Sesquiterpene
Bicyclogermacrene	0.30	Sesquiterpene
Viridiflorene	0.09	Sesquiterpene
Germacrene A	0.05	Sesquiterpene
γ-Cadinene	0.02	Sesquiterpene
δ-Cadinene	0.03	Sesquiterpene
Germacrene B	0.09	Sesquiterpene
Spathulenol	0.03	Sesquiterpenic alcohol
Caryophyllene oxide	0.04	Sesquiterpenic ether
Globulol	0.02	Sesquiterpenic alcohol
Viridiflorol	0.01	Sesquiterpenic alcohol
Guaiol	0.03	Sesquiterpenic alcohol
Humulene epoxide II	0.04	Sesquiterpenic ether
Isospathulenol	0.01	Sesquiterpenic alcohol
Neointermedeol	0.02	Sesquiterpenic alcohol
Consolidated total	**99.63%**	

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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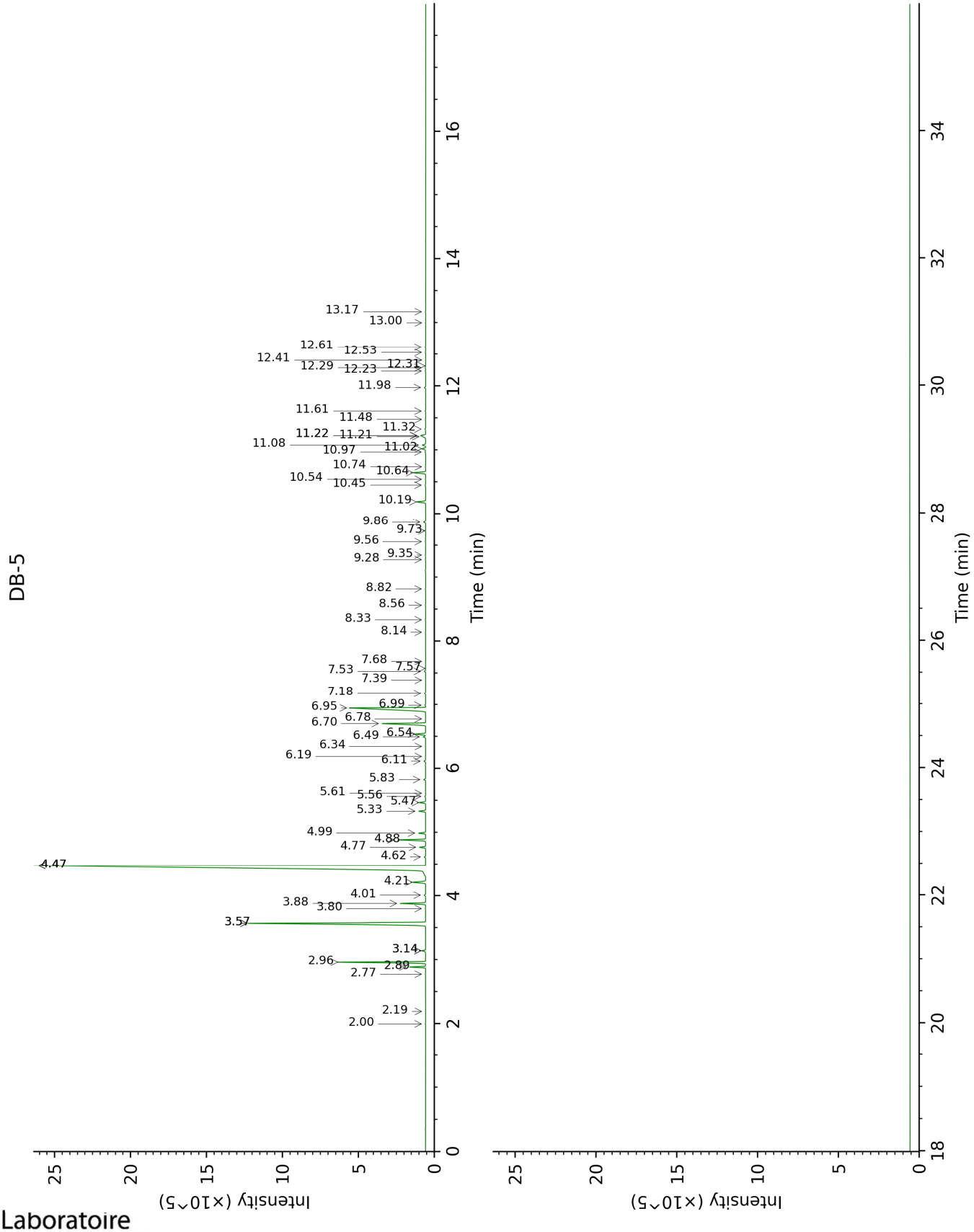
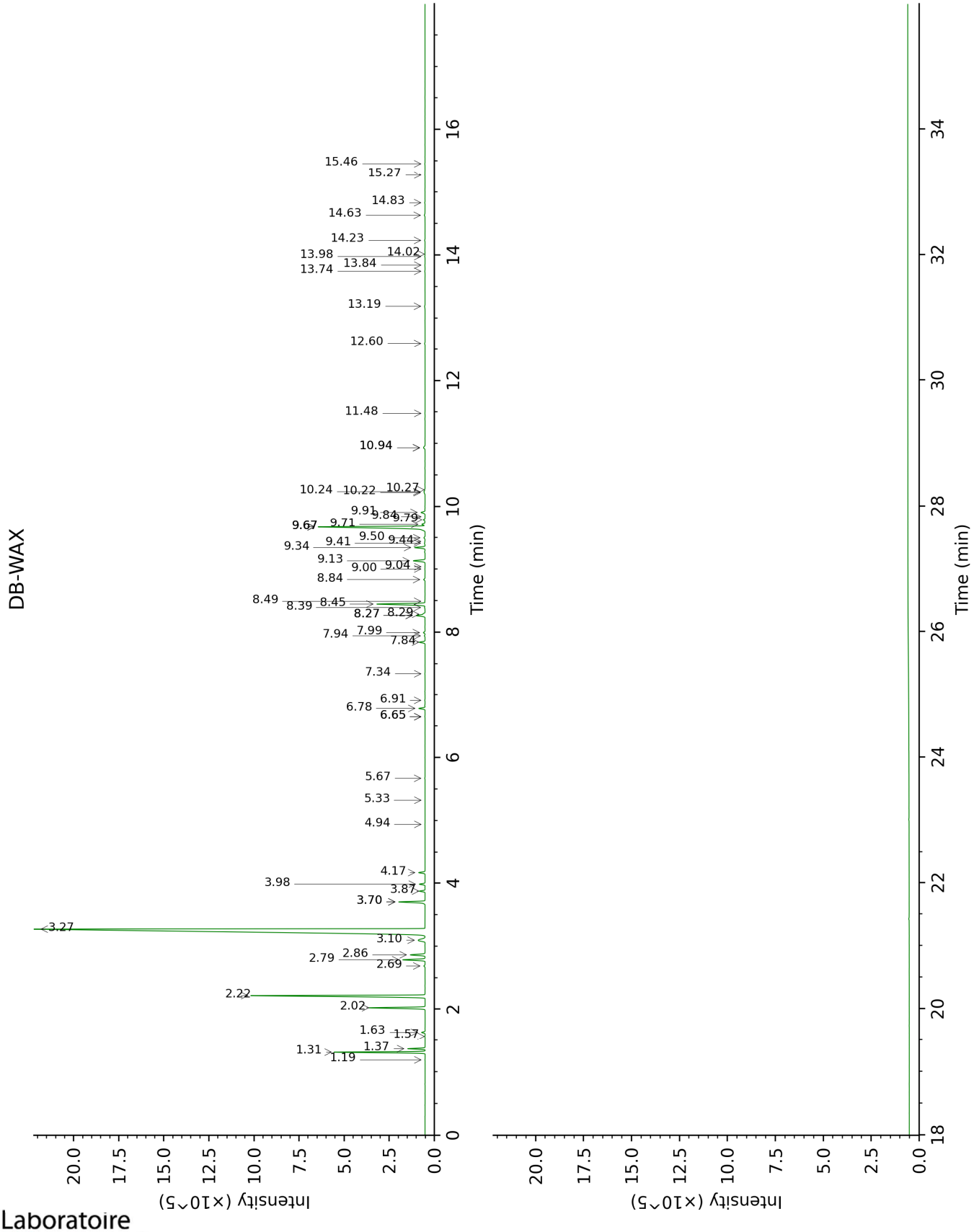

DB-5
Intensity (×10^5)
Time (min)
13.17
13.00
12.61
12.53
12.41
12.29
12.23
12.31
11.98
11.61
11.48
11.32
11.22
11.21
11.08
10.97
11.02
10.74
10.64
10.54
10.45
10.19
9.86
9.73
9.56
9.28
9.35
8.82
8.56
8.33
8.14
7.68
7.53
7.57
7.39
7.18
6.95
6.99
6.70
6.78
6.49
6.54
6.34
6.19
6.11
5.83
5.61
5.56
5.47
5.33
4.99
4.88
4.77
4.62
4.47
4.21
4.01
3.88
3.80
3.57
3.14
2.96
2.89
2.77
2.19
2.00


DB-WAX
Intensity (×10^5)
Time (min)
15.46
15.27
14.83
14.63
14.23
13.98
14.02
13.74
13.84
13.19
12.60
11.48
10.94
10.24
10.22
10.27
9.91
9.84
9.79
9.67
9.71
9.50
9.44
9.34
9.41
9.13
9.00
9.04
8.84
8.49
8.39
8.45
8.27
8.29
7.94
7.99
7.84
7.34
6.78
6.91
6.65
5.67
5.33
4.94
4.17
3.98
3.87
3.70
3.27
3.10
2.79
2.86
2.69
2.22
2.02
1.63
1.57
1.31
1.37
1.19

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
(3*Z*)-Hexenol	2.00	856	0.01	5.67	1349	0.02
Hexanol	2.19	873	tr	5.33	1324	tr
Tricyclene	2.77	919	0.01	1.19	972	0.01
α-Thujene	2.89	927	0.80	1.37	1001	0.81
α-Pinene	2.96	932	4.62	1.31	993	4.61
Camphene	3.14*	944	0.22	1.63	1028	0.20
α-Fenchene	3.14*	944	[0.22]	1.57	1022	0.02
Sabinene	3.57*	973	14.89	2.22	1087	11.54
β-Pinene	3.57*	973	[14.89]	2.02	1068	3.34
6-Methyl-5-hepten-2-one	3.80	988	0.02	4.94	1296	0.01
Myrcene	3.88	994	1.40	2.79	1135	1.38
α-Phellandrene	4.01	1002	0.08	2.69	1127	0.08
α-Terpinene	4.21	1015	0.95	2.86	1141	0.95
Limonene	4.48*	1032	57.79	3.10	1159	0.83
1,8-Cineole	4.48*	1032	[57.79]	3.27	1173	56.43
para-Cymene	4.48*	1032	[57.79]	3.98	1227	0.34
(*Z*)-β-Ocimene	4.62	1041	0.07	3.70*	1206	1.63
(*E*)-β-Ocimene	4.77	1051	0.34	3.87	1219	0.34
γ-Terpinene	4.88	1058	1.56	3.70*	1206	[1.63]
cis-Sabinene hydrate	4.99	1065	0.39	6.78	1431	0.38
Terpinolene	5.33	1086	0.39	4.17	1240	0.39
trans-Sabinene hydrate	5.47	1095	0.38	7.84	1510	0.37
Linalool	5.56	1101	0.05	7.94	1518	0.04
Unknown [m/z 119, 109 (94), 43 (61), 95 (56), 91 (48), 77 (32), 152 (32), 137 (31), 134 (24)]	5.61	1104	0.01	8.29	1545	0.10
cis-para-Menth-2-en-1-ol	5.83	1118	0.11	7.99	1522	0.11
trans-para-Menth-2-en-1-ol	6.11	1136	0.10	8.84	1588	0.10
Unknown [m/z 109, 124 (45), 119 (41), 43 (35), 91 (28), 95 (25)...]	6.19	1141	0.01	6.65*	1421	0.01
Unknown [m/z 71, 85 (48), 43 (42), 57 (38), 58 (37), 41 (21), ... 155 (12)]	6.34	1151	0.01			
Borneol	6.49	1161	0.16	9.67*	1656	8.60
δ-Terpineol	6.54	1164	0.67	9.34	1629	0.67
Terpinen-4-ol	6.70	1174	3.18	8.45	1558	3.18
Cryptone	6.78	1179	0.01	9.04	1604	0.01

α-Terpineol	6.95	1190	8.18	9.67*	1656	[8.60]
cis-Piperitol	6.99	1193	0.04	9.41	1634	0.05
Dodecane	7.18	1205	0.06			
Unknown [m/z 83, 55 (23), 43 (15), 71 (14), 82 (13), 98 (11), ... 153 (4)]	7.39	1219	0.01			
Nerol	7.53	1228	0.08	10.94*	1762	0.16
Unknown [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	7.57	1232	0.01			
Carvone	7.68	1239	0.01	9.84	1670	0.01
trans-Ascaridole glycol	8.14	1270	0.01	14.02	2042	0.01
Safrole	8.33	1283	0.02	11.48	1808	0.01
Unknown [m/z 112, 97 (93), 83 (60), 43 (46), 41 (20), 69 (19)...]	8.56	1298	0.01			
Unknown [m/z 97, 112 (92), 83 (62), 43 (44), 41 (25)... 170? (4)]	8.82	1316	0.02	14.83	2122	0.02
α-Cubebene	9.28	1348	0.01	6.65*	1421	[0.01]
Eugenol	9.35	1353	0.01	14.63	2102	0.06
α-Ylangene	9.56	1368	0.01	6.91	1440	0.02
β-Bourbonene	9.73	1380	0.01	7.34	1472	0.02
β-Elemene	9.86	1390	0.12	8.27*	1544	0.65
β-Caryophyllene	10.19	1413	0.61	8.27*	1544	[0.65]
Aromadendrene	10.45	1433	0.05	8.39	1553	0.04
6,9-Guaiadiene	10.54	1440	0.02	8.49	1561	0.03
α-Humulene	10.64	1447	0.84	9.13	1612	0.85
β-Santalene	10.74	1454	0.02	9.00	1601	0.02
γ-Muurolene	10.97	1471	0.05	9.44	1637	0.02
Germacrene D	11.02	1475	0.26	9.67*	1656	[8.60]
β-Selinene	11.08	1480	0.23	9.71	1659	0.23
α-Selinene	11.21	1489	0.14	9.79	1665	0.16
Bicyclogermacrene	11.22*	1491	0.40	9.91	1675	0.30
Viridiflorene	11.22*	1491	[0.40]	9.50	1642	0.09
Germacrene A	11.32	1498	0.05	10.22	1701	0.05
γ-Cadinene	11.48	1510	0.02	10.24	1702	0.08
δ-Cadinene	11.61	1520	0.03	10.27	1705	0.03
Germacrene B	11.98	1549	0.09	10.94*	1762	[0.16]
Spathulenol	12.23	1569	0.03	14.23	2063	0.03
Caryophyllene oxide	12.28	1573	0.04	12.60	1908	0.03
Globulol	12.32	1576	0.02	13.74	2015	0.02
Viridiflorol	12.41	1583	0.01	13.84	2025	0.02
Guaiol	12.53	1592	0.03	13.98	2038	0.01
Humulene epoxide II	12.61	1599	0.04	13.19	1963	0.05

Isospathulenol	13.00	1631	0.01	15.27	2166	tr
Neointermedeol	13.17	1645	0.02	15.46	2185	0.02
Total identified		**99.75%**			**99.49%**	
Total reported		**99.83%**			**99.61%**	

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