

Date : May 17, 2021

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 21E03-PTH06


Customer identification : Eucalyptus Dives - South Africa - EG0104911R

Type : Essential oil

Source : *Eucalyptus dives*

Customer : Plant Therapy

ANALYSIS

Method: PC-MAT-014  - 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 : May 13, 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.

PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid

Refractive index: 1.4804 ± 0.0003 (20 °C; method PC-MAT-016)

CONCLUSION

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

ANALYSIS SUMMARY – CONSOLIDATED CONTENTS

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

Identification	%	Class
2-Methyl-3-buten-2-ol	tr	Aliphatic alcohol
Isovaleral	tr	Aliphatic aldehyde
Toluene	0.03	Simple phenolic
2-Methylbutyl acetate	0.01	Aliphatic ester
α -Thujene	3.61	Monoterpene
α -Pinene	0.49	Monoterpene
Camphene	0.01	Monoterpene
Sabinene	0.09	Monoterpene
β -Pinene	0.05	Monoterpene
3-Methylpentyl acetate	0.01	Aliphatic ester
Myrcene	1.76	Monoterpene
α -Phellandrene	25.16	Monoterpene
Δ^3 -Carene	0.01	Monoterpene
α -Terpinene	1.63	Monoterpene
Carvomenthene	0.01	Aliphatic alcohol
para-Cymene	5.65	Monoterpene
β -Phellandrene	2.89*	Monoterpene
1,8-Cineole	[2.89]*	Monoterpenic ether
Limonene	0.47	Monoterpene
(Z)- β -Ocimene	0.07	Monoterpene
(E)- β -Ocimene	0.53	Monoterpene
γ -Terpinene	1.09	Monoterpene
cis-Sabinene hydrate	0.01	Monoterpenic alcohol
cis-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
Terpinolene	2.79	Monoterpene
trans-Sabinene hydrate	0.01	Monoterpenic alcohol
Linalool	0.89	Monoterpenic alcohol
para-Mentha-1,3,8-triene	0.01	Monoterpene
cis-para-Menth-2-en-1-ol	0.14	Monoterpenic alcohol
trans-para-Menth-2-en-1-ol	0.10	Monoterpenic alcohol
Isopulegol	0.01	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Borneol	0.01	Monoterpenic alcohol
Unknown	0.08	Oxygenated monoterpene
Unknown	0.11	Oxygenated monoterpene
Terpinen-4-ol	4.11	Monoterpenic alcohol
Unknown	0.18	Unknown
Cryptone	0.01	Normonoterpenic ketone
para-Cymen-8-ol	0.02	Monoterpenic alcohol
α -Terpineol	0.97	Monoterpenic alcohol
cis-Piperitol	0.03	Monoterpenic alcohol
cis- α -Phellandrene epoxide (IPP vs Me)	0.10	Monoterpenic ether
trans-Piperitol	0.02	Monoterpenic alcohol
trans- α -Phellandrene epoxide (IPP vs Me)	0.02	Monoterpenic ether
Benzylacetone	0.08	Simple phenolic

Neral	0.01	Monoterpenic aldehyde
Piperitone	40.86	Monoterpenic ketone
Geraniol	0.09	Monoterpenic alcohol
Thymol	0.02	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer II	0.08	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer III	0.10	Monoterpenic alcohol
Bicycloelemene	0.03	Sesquiterpene
α -Terpinyl acetate	0.04	Monoterpenic ester
Methyl (<i>E</i>)-cinnamate	0.02	Phenylpropanoid ester
β -Elemene	0.02	Sesquiterpene
Unknown	0.01	Unknown
(<i>Z</i>)-Jasmone	0.02	Jasmonate
α -Gurjunene	0.11	Sesquiterpene
β -Caryophyllene	0.57	Sesquiterpene
(<i>cis?</i>)-6-Hydroxy-para-menth-1-en-3-one	0.03	Monoterpenic alcohol
Aromadendrene	0.13	Sesquiterpene
α -Humulene	0.07	Sesquiterpene
allo-Aromadendrene	0.32	Sesquiterpene
Germacrene D	0.02	Sesquiterpene
Unknown	0.06	Unknown
Viridiflorene	0.49	Sesquiterpene
Bicyclogermacrene	0.74	Sesquiterpene
δ -Cadinene	0.04	Sesquiterpene
α -Elemol	0.03	Sesquiterpenic alcohol
Epiglobulol	0.02	Sesquiterpenic alcohol
Spathulenol	0.08	Sesquiterpenic alcohol
Globulol	0.22	Sesquiterpenic alcohol
Viridiflorol	0.13	Sesquiterpenic alcohol
Ledol	0.03	Sesquiterpenic alcohol
Eudesm-5-en-11-ol analog	0.06	Sesquiterpenic alcohol
Rosifoliol	0.05	Sesquiterpenic alcohol
γ -Eudesmol	0.07	Sesquiterpenic alcohol
Isospathulenol	0.08	Sesquiterpenic alcohol
τ -Cadinol	0.01	Sesquiterpenic alcohol
β -Eudesmol	0.06	Sesquiterpenic alcohol
α -Eudesmol	0.06	Sesquiterpenic alcohol
(2 <i>E</i> ,6 <i>E</i>)-Farnesol	0.02	Sesquiterpenic alcohol
α -Phellandrene dimer II	0.02	Diterpene
Cryptomeridiol	0.01	Sesquiterpenic alcohol
Consolidated total	98.08%	

*: Individual compounds concentration could not be found due to overlapping coelutions on columns considered

[xx]: Duplicate percentage due to coelutions, not taken into account in the consolidated total

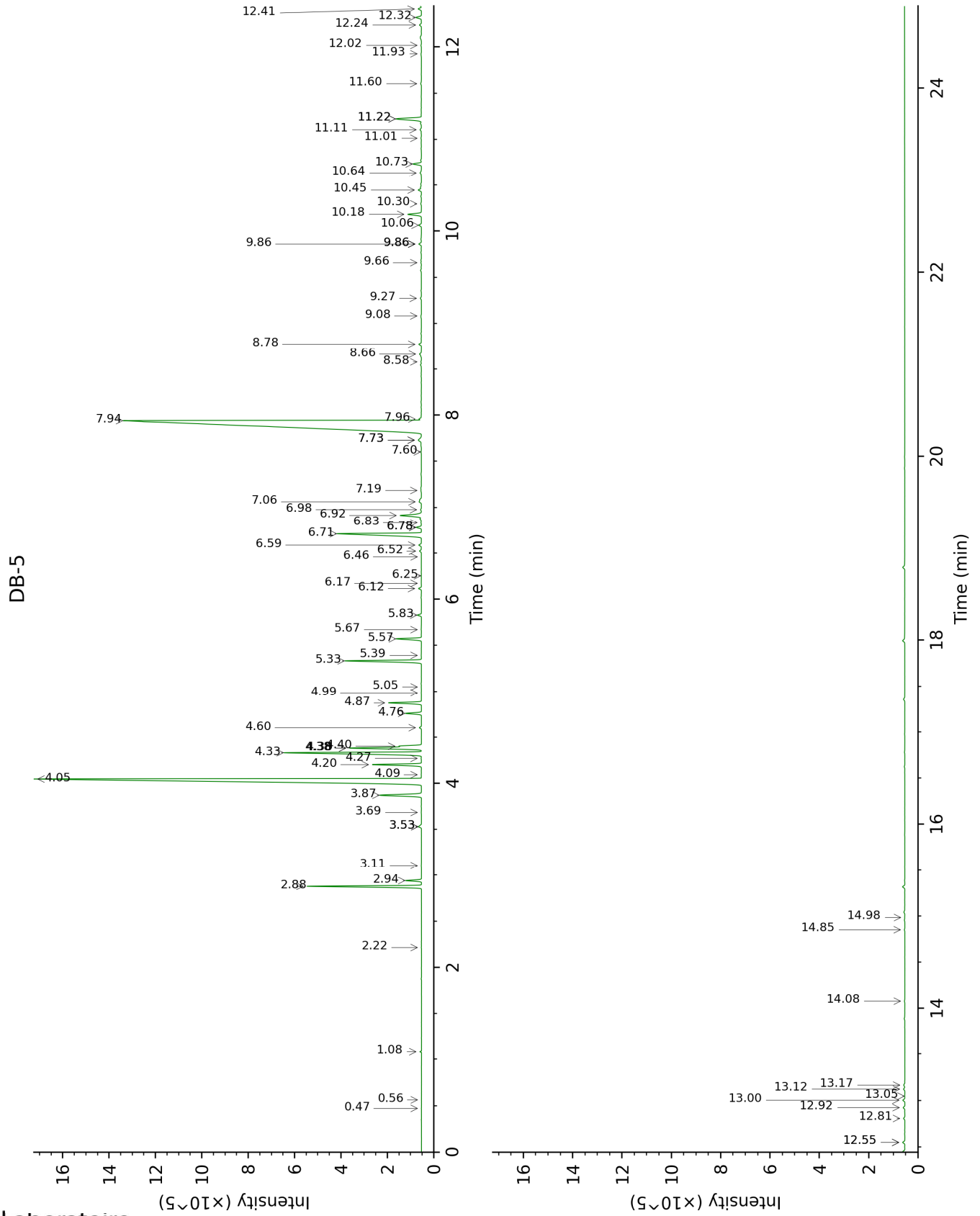
tr: The compound has been detected below 0.005% of total signal.

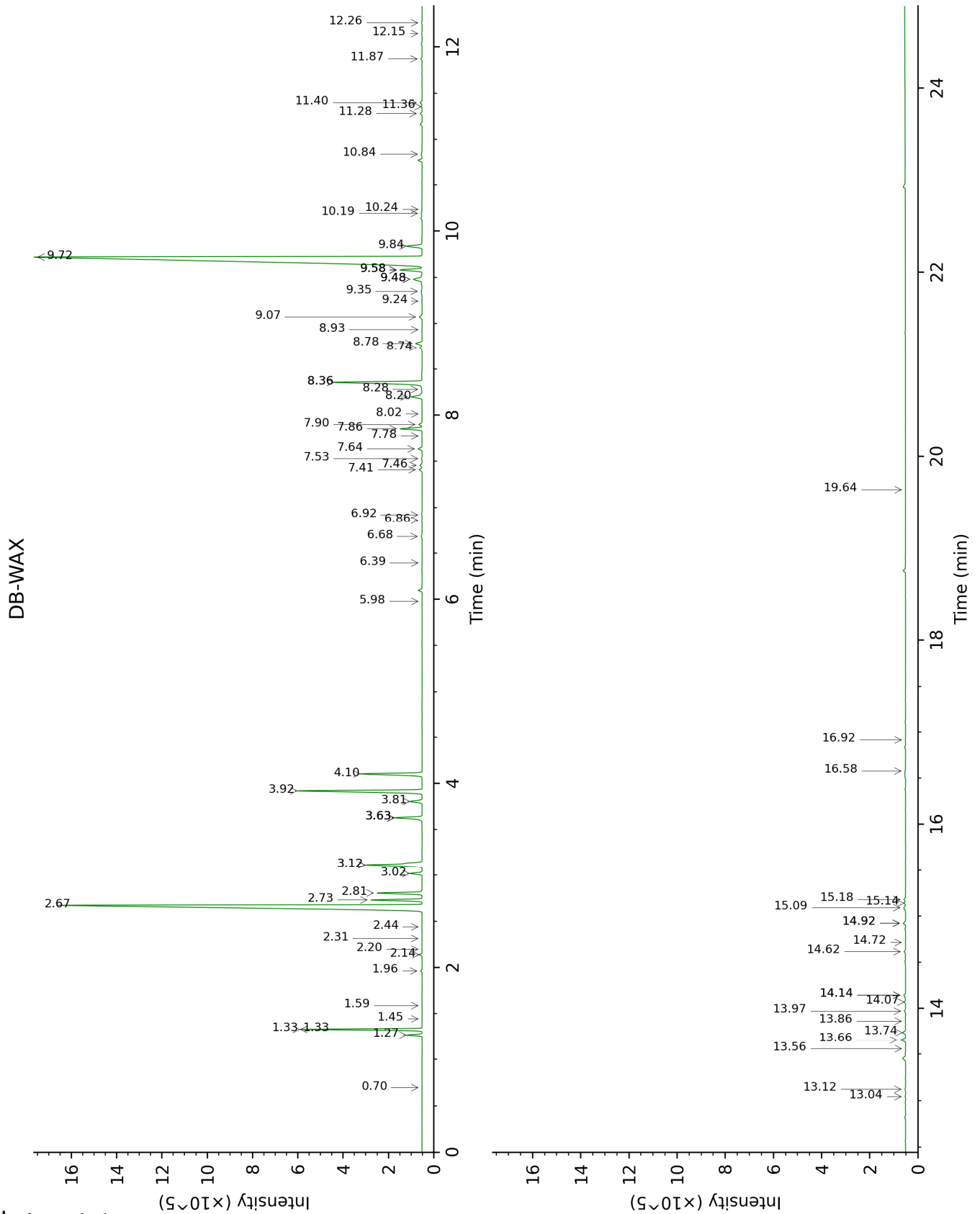
Note: no correction factor was applied

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.

This page was intentionally left blank. The following pages present the complete data of the analysis.





FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
2-Methyl-3-buten-2-ol	0.47	600	tr	1.44	1011	tr
Isovaleral	0.56	639	tr	0.70	883	tr
Toluene	1.08	758	0.03	1.33*	1000	3.62
2-Methylbutyl acetate	2.22	877	0.01	2.20	1088	0.01
α -Thujene	2.88	928	3.61	1.33*	1000	[3.62]
α -Pinene	2.94	932	0.49	1.27	990	0.49
Camphene	3.11	943	0.01	1.59	1026	tr
Sabinene	3.53*	972	0.14	2.14	1082	0.09
β -Pinene	3.53*	972	[0.14]	1.96	1064	0.05
3-Methylpentyl acetate	3.69	982	0.01	3.63*	1204	1.16
Myrcene	3.87	995	1.76	2.73	1133	1.76
α -Phellandrene	4.05	1007	25.16	2.67	1128	25.09
Δ 3-Carene	4.09	1010	0.01	2.44	1110	tr
α -Terpinene	4.20	1016	1.63	2.81	1139	1.63
Carvomenthene	4.27	1021	0.01	2.32	1099	0.01
para-Cymene	4.33	1025	5.65	3.92	1226	5.63
β -Phellandrene	4.38*†	1028	3.36	3.12*	1163	2.90
1,8-Cineole	4.38*†	1028	[3.36]	3.12*	1163	[2.90]
Limonene	4.40†	1029	[3.36]	3.02	1156	0.47
(Z)- β -Ocimene	4.60	1042	0.07	3.63*	1204	[1.16]
(E)- β -Ocimene	4.76	1052	0.53	3.81	1217	0.53
γ -Terpinene	4.87	1059	1.09	3.63*	1204	[1.16]
cis-Sabinene hydrate	4.98	1066	0.01	6.68	1426	0.05
cis-Linalool oxide (fur.)	5.05	1070	0.01	6.40	1405	0.01
Terpinolene	5.33	1088	2.79	4.10	1240	2.62
trans-Sabinene hydrate	5.39	1092	0.01	7.78	1508	0.01
Linalool	5.57	1103	0.89	7.86	1514	0.90
para-Mentha-1,3,8-triene	5.67	1110	0.01	5.98	1374	tr
cis-para-Menth-2-en-1-ol	5.83	1120	0.14	7.90	1518	0.14
trans-para-Menth-2-en-1-ol	6.12	1138	0.10	8.74	1583	0.12
Isopulegol	6.17	1142	0.01	8.02	1527	tr
Unknown [m/z 95, 43 (74), 109 (72), 82 (62), 110 (50)... 152 (14)]	6.26	1147	0.01	6.86	1440	0.02
Borneol	6.46	1160	0.01	9.58*	1652	0.97
Unknown [m/z 95, 110 (38), 81 (21), 79 (16)... 152 (7)]	6.52	1164	0.08	7.46	1484	0.10

Unknown [m/z 95, 110 (43), 81 (28), 41 (15)... 152 (8)]	6.59	1168	0.11	7.53	1490	0.02
Terpinen-4-ol	6.71	1176	4.11	8.36*	1554	4.26
Unknown [m/z 69, 68 (65), 110 (51), 67 (39), 41 (27), 83 (26)...]	6.78*	1181	0.18	7.64	1498	0.18
Cryptone	6.78*	1181	[0.18]	8.93	1599	0.01
para-Cymen-8-ol	6.83	1184	0.02	11.36	1801	0.03
α-Terpineol	6.92	1189	0.97	9.58*	1652	[0.97]
cis-Piperitol	6.98	1194	0.03	9.35	1633	0.08
cis-α-Phellandrene epoxide (IPP vs Me)	7.06	1199	0.10	10.84	1757	0.07
trans-Piperitol	7.19	1207	0.02	10.19	1702	0.05
trans-α-Phellandrene epoxide (IPP vs Me)	7.60	1235	0.02	11.87	1847	0.05
Benzylacetone	7.73*	1244	0.21	11.28	1795	0.08
Neral	7.73*	1244	[0.21]	9.24	1624	0.01
Piperitone	7.94	1258	40.86	9.72	1663	40.93
Geraniol	7.96	1259	0.09	11.40	1805	0.09
Thymol	8.58	1300	0.02	14.92*	2135	0.11
para-Menth-5-en-1,2-diol isomer II	8.66	1306	0.08	14.14*	2058	0.11
para-Menth-5-en-1,2-diol isomer III	8.78	1314	0.10	14.92*	2135	[0.11]
Bicycloelemene	9.08	1336	0.03	6.92	1444	0.02
α-Terpinyl acetate	9.27	1350	0.04	9.48*	1643	0.57
Methyl (E)-cinnamate	9.66	1377	0.02	13.56	2002	tr
β-Elemene	9.86*	1391	0.11	8.28	1548	0.02
Unknown [m/z 71, 100 (92), 111 (79), 69 (46), 109 (45)...]	9.86*	1391	[0.11]	16.92	2343	0.01
(Z)-Jasmone	9.86*	1391	[0.11]	12.15	1872	0.02
α-Gurjunene	10.06	1406	0.11	7.41	1481	0.14
β-Caryophyllene	10.18	1414	0.57	8.20	1541	0.60
(cis?)-6-Hydroxy-para-menth-1-en-3-one	10.30	1423	0.03			
Aromadendrene	10.45	1434	0.13	8.36*	1554	[4.26]
α-Humulene	10.64	1448	0.07	9.07	1610	0.14
allo-Aromadendrene	10.74	1456	0.32	8.78	1587	0.33
Germacrene D	11.01	1476	0.02	9.58*	1652	[0.97]
Unknown [m/z 98, 108 (84), 43 (62), 161 (38), 41 (28), 91 (26)...]	11.11	1483	0.06			

Viridiflorene	11.22*	1492	1.23	9.48*	1643	[0.57]
Bicyclogermacrene	11.22*	1492	[1.23]	9.84	1673	0.74
δ-Cadinene	11.60	1521	0.04	10.24	1705	0.01
α-Elemol	11.93	1547	0.03	13.86	2031	0.01
Epiglobulol	12.02	1554	0.02	13.04	1954	0.03
Spathulenol	12.24	1571	0.08	14.14*	2058	[0.11]
Globulol	12.32	1578	0.22	13.66	2011	0.22
Viridiflorol	12.41	1585	0.13	13.74	2019	0.14
Ledol	12.55*	1596	0.09	13.12	1961	0.03
Eudesm-5-en-11-ol analog	12.55*	1596	[0.09]	13.97	2042	0.06
Rosifoliol	12.81	1617	0.05	14.07	2051	0.06
γ-Eudesmol	12.92	1626	0.07	14.62	2104	0.07
Isospathulenol	13.00	1633	0.08	15.18	2161	0.07
τ-Cadinol	13.05	1636	0.01	14.72	2114	0.01
β-Eudesmol	13.12	1643	0.06	15.14	2157	0.07
α-Eudesmol	13.17	1646	0.06	15.09	2152	0.12
(2E,6E)-Farnesol	14.08	1723	0.02	16.58	2306	0.03
α-Phellandrene dimer II	14.85	1790	0.02	12.26	1882	0.02
Cryptomeridiol	14.98	1802	0.01	19.64	2653	tr
Total identified		97.99%			97.69%	
Total reported		98.24%			98.02%	

*: 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