Date : 2023-08-28

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 23H22-PTH02
Customer Identification : Eucalyptus Dives - S. Africa - EG0105R
Type : Essential Oil
Source : *Eucalyptus dives*
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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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 : Amélie Simard, Analyste
Date : 2023-08-24

Physicochemical data

Refractive index : 1.4801 ± 0.0003 (20 °C)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Dany Massé B. Sc. Chimiste
Date : 2023-08-23

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
2-Methylbutanol	tr	Aliphatic alcohol
Toluene	0.02	Simple phenolic
Isoamyl acetate	0.01	Aliphatic ester
2-Methylbutyl acetate	0.01	Aliphatic ester
α-Thujene	2.78	Monoterpene
α-Pinene	0.35	Monoterpene
Camphene	0.01	Monoterpene
Sabinene	0.25	Monoterpene
β-Pinene	0.06	Monoterpene
3-Methylpentyl acetate	0.01	Aliphatic ester
Myrcene	1.34	Monoterpene
α-Phellandrene	20.83	Monoterpene
Δ3-Carene	0.01	Monoterpene
α-Terpinene	1.12	Monoterpene
Carvomenthene	0.02	Aliphatic alcohol
para-Cymene	3.13	Monoterpene
Limonene	0.45	Monoterpene
β-Phellandrene	1.59	Monoterpene
1,8-Cineole	1.48	Monoterpenic ether
(*Z*)-β-Ocimene	0.06	Monoterpene
(*E*)-β-Ocimene	0.40	Monoterpene
γ-Terpinene	0.73	Monoterpene
cis-Sabinene hydrate	0.02	Monoterpenic alcohol
cis-Linalool oxide (fur.)	0.03	Monoterpenic alcohol
para-Cymenene	0.03	Monoterpene
Terpinolene	2.14	Monoterpene
Methyl benzoate	0.01	Phenolic ester
trans-Sabinene hydrate	0.02	Monoterpenic alcohol
Linalool	1.11	Monoterpenic alcohol
para-Mentha-1,3,8-triene	0.01	Monoterpene
cis-para-Menth-2-en-1-ol	0.86	Monoterpenic alcohol
Cosmene	0.01	Monoterpene
trans-para-Menth-2-en-1-ol	0.62	Monoterpenic alcohol
Isopulegol	0.02	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Lilac aldehyde A	0.02	Monoterpenic aldehyde
iso-Isopulegol	0.02	Monoterpenic alcohol
Unknown	0.04	Oxygenated monoterpene
Unknown	0.06	Oxygenated monoterpene
Terpinen-4-ol	4.71	Monoterpenic alcohol

Unknown	0.04	Unknown
Cryptone	0.01	Normonoterpenic ketone
para-Cymen-8-ol	0.01	Monoterpenic alcohol
α-Terpineol	1.31	Monoterpenic alcohol
cis-Piperitol	0.21	Monoterpenic alcohol
cis-α-Phellandrene epoxide (iPr vs Me)	0.04	Monoterpenic ether
trans-Piperitol	0.25	Monoterpenic alcohol
Citronellol	0.03	Monoterpenic alcohol
Neral	0.06	Monoterpenic aldehyde
Benzylacetone	0.09	Simple phenolic
Piperitone	50.53	Monoterpenic ketone
Geraniol	0.17	Monoterpenic alcohol
Thymol	0.02	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer II	0.02	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer III	0.03	Monoterpenic alcohol
Bicycloelemene	0.04	Sesquiterpene
α-Terpinyl acetate	0.16	Monoterpenic ester
Eugenol	0.02	Phenylpropanoid
Methyl (*E*)-cinnamate	0.06	Phenylpropanoid ester
β-Elemene	0.04	Sesquiterpene
(*Z*)-Jasmone	0.02	Jasmonate
Unknown	0.03	Unknown
(*trans*?)-6-Hydroxy-*para*-menth-1-en-3-one	0.02	Monoterpenic alcohol
β-Caryophyllene	0.05	Sesquiterpene
(*cis*?)-6-Hydroxy-*para*-menth-1-en-3-one	0.01	Monoterpenic alcohol
Aromadendrene	0.02	Sesquiterpene
α-Humulene	0.02	Sesquiterpene
allo-Aromadendrene	0.06	Sesquiterpene
Germacrene D	0.01	Sesquiterpene
Unknown	0.03	Unknown
Bicyclogermacrene	0.50	Sesquiterpene
Aromadendra-1(10),4(15)-diene	0.02	Sesquiterpene
δ-Cadinene	0.01	Sesquiterpene
α-Elemol	0.05	Sesquiterpenic alcohol
Spathulenol	0.06	Sesquiterpenic alcohol
Unknown	0.01	Oxygenated sesquiterpene
Globulol	0.06	Sesquiterpenic alcohol
Viridiflorol	0.04	Sesquiterpenic alcohol
Eudesm-5-en-11-ol analog	0.02	Sesquiterpenic alcohol
Ledol	0.02	Sesquiterpenic alcohol
Torilenol	0.01	Oxygenated sesquiterpene
Rosifoliol	0.02	Sesquiterpenic alcohol
γ-Eudesmol	0.05	Sesquiterpenic alcohol
Isospathulenol	0.05	Sesquiterpenic alcohol
τ-Cadinol	0.01	Sesquiterpenic alcohol

β-Eudesmol	0.06	Sesquiterpenic alcohol
α-Eudesmol	0.06	Sesquiterpenic alcohol
Aromadendrane-4,10-diol	0.01	Sesquiterpenic alcohol
(2*E*,6*E*)-Farnesol	0.02	Sesquiterpenic alcohol
α-Phellandrene dimer II	0.01	Diterpene
Cryptomeridiol	0.01	Sesquiterpenic alcohol
α-Phellandrene dimer IV	0.03	Diterpene
Consolidated total	**98.94**	

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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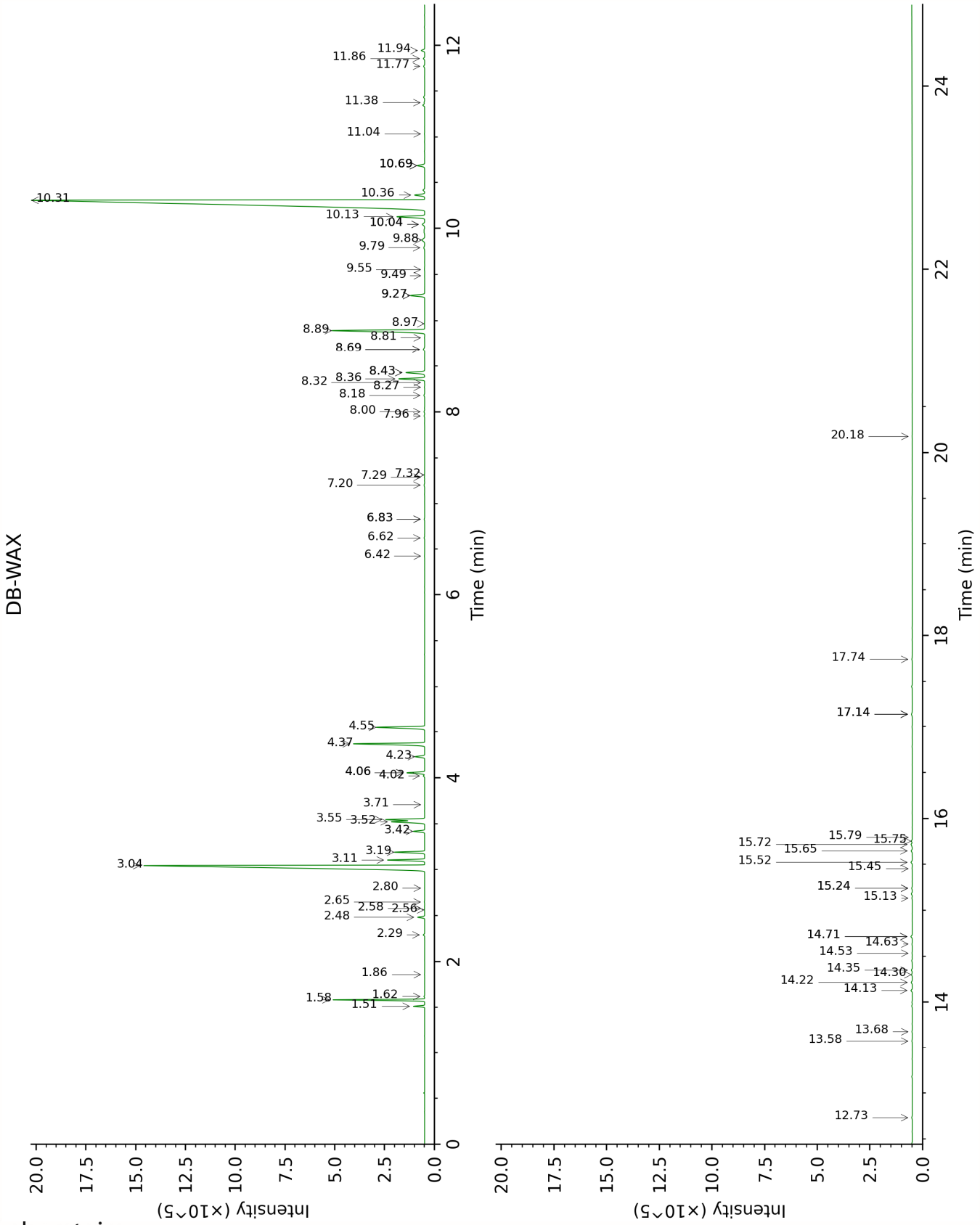

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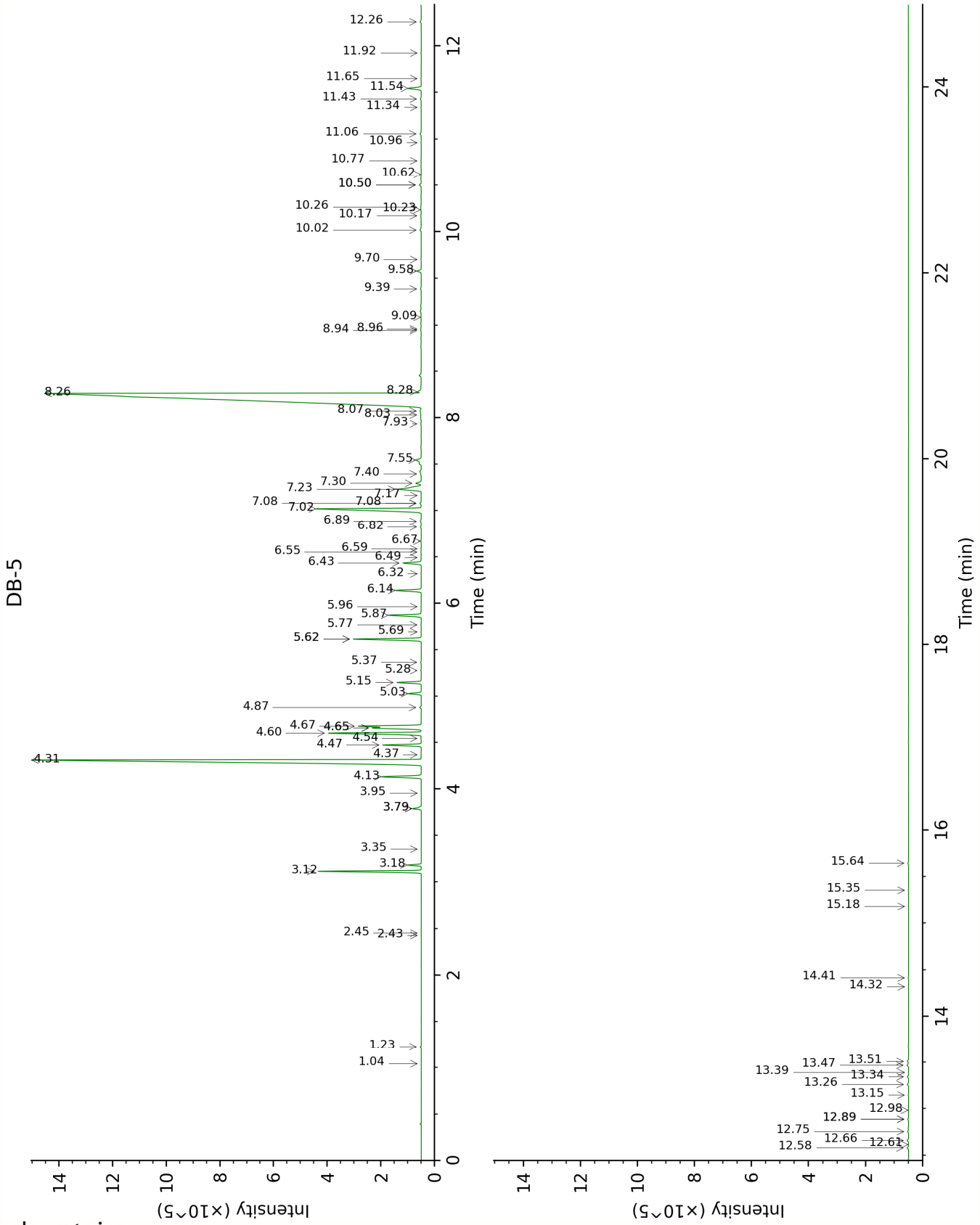
DB-5
Time (min)
Intensity (×10^5)
12.26
11.92
11.65
11.54
11.43
11.34
11.06
10.96
10.77
10.62
10.50
10.26
10.23
10.17
10.02
9.70
9.58
9.39
9.09
8.94
8.96
8.26
8.28
8.07
8.03
7.93
7.55
7.40
7.30
7.23
7.17
7.08
7.08
7.02
6.89
6.82
6.67
6.59
6.55
6.49
6.43
6.32
6.14
5.96
5.87
5.77
5.69
5.62
5.37
5.28
5.15
5.03
4.87
4.67
4.65
4.60
4.54
4.47
4.37
4.31
4.13
3.95
3.79
3.35
3.18
3.12
2.45
2.43
1.23
1.04
15.64
15.35
15.18
14.41
14.32
13.47
13.51
13.39
13.34
13.26
13.15
12.98
12.89
12.75
12.66
12.61
12.58

FULL ANALYSIS DATA

	Column DB-WAX			Column DB-5		
2-Methylbutanol	3.71	1180.0	0.01	1.04	734.6	tr
Toluene	1.62	1002.6	0.02	1.23	760.1	0.02
Isoamyl acetate	2.58	1093.1	0.01	2.43	876.3	0.01
2-Methylbutyl acetate	2.56	1091.6	0.01	2.45	878.4	0.01
α-Thujene	1.58	999.1	2.80	3.12	927.2	2.78
α-Pinene	1.51	991.2	0.35	3.18	931.6	0.35
Camphene	1.86	1024.9	0.01	3.35	942.8	0.01
Sabinene	2.48	1084.0	0.25	3.79*	971.3	[0.31]
β-Pinene	2.29	1065.7	0.06	3.79*	971.3	[0.31]
3-Methylpentyl acetate	4.06*	1206.1	[0.73]	3.95	982.1	0.01
Myrcene	3.11	1133.6	1.36	4.13	993.8	1.34
α-Phellandrene	3.04	1128.9	20.92	4.31	1005.5	20.83
Δ3-Carene	2.80	1110.1	0.01	4.37	1009.0	0.01
α-Terpinene	3.19	1140.2	1.12	4.47	1015.5	1.12
Carvomenthene	2.65	1098.6	0.02	4.54	1019.9	0.02
para-Cymene	4.37	1229.1	3.16	4.60	1023.5	3.13
Limonene	3.42	1157.6	0.45	4.65*†	1027.0	[1.54]
β-Phellandrene	3.52	1165.6	1.59	4.65*†	1027.0	[1.54]
1,8-Cineole	3.55	1167.5	1.48	4.67*†	1028.2	[1.96]
(*Z*)-β-Ocimene	4.02	1203.7	0.06	4.87	1040.7	0.06
(*E*)-β-Ocimene	4.23	1218.9	0.40	5.03	1050.4	0.40
γ-Terpinene	4.06*	1206.1	[0.73]	5.15	1057.9	0.73
cis-Sabinene hydrate	7.20	1431.2	0.04	5.28	1065.9	0.02
cis-Linalool oxide (fur.)	6.83*	1403.9	[0.02]	5.37	1071.4	0.03
para-Cymenene	6.62	1388.4	0.03	5.62*	1086.9	[2.17]
Terpinolene	4.55	1242.2	2.14	5.62*	1086.9	[2.17]
Methyl benzoate	8.97	1564.2	0.01	5.69	1091.7	0.01
trans-Sabinene hydrate	8.27	1510.6	0.01	5.77	1096.4	0.02
Linalool	8.36	1517.6	1.11	5.87	1102.9	1.11
para-Mentha-1,3,8-triene	6.42	1374.3	0.01	5.96	1108.7	0.01
cis-para-Menth-2-en-1-ol	8.43*	1522.9	[0.88]	6.14	1119.8	0.86
Cosmene	6.83*	1403.9	[0.02]	6.32	1131.1	0.01
trans-para-Menth-2-en-1-ol	9.27*	1587.7	[0.67]	6.43	1138.5	0.62
Isopulegol	8.43*	1522.9	[0.88]	6.49	1142.2	0.02
Unknown CALU I	7.29	1437.6	0.01	6.55	1146.0	0.02

[m/z 95, 43 (74), 109 (72), 82 (62), 110 (50)... 152 (14)]						
Lilac aldehyde A				6.59	1148.3	0.02
iso-Isopulegol	8.32	1514.5	0.01	6.67	1153.5	0.02
Unknown CALU II [m/z 95, 110 (38), 81 (21), 79 (16)... 152 (7)]	7.96	1486.7	0.03	6.82	1163.3	0.04
Unknown CALU III [m/z 95, 110 (43), 81 (28), 41 (15)... 152 (8)]	8.00	1490.2	0.03	6.89	1167.3	0.06
Terpinen-4-ol	8.89	1558.5	4.70	7.02	1176.0	4.71
Unknown EUDI I [m/z 69, 68 (65), 110 (51), 67 (39), 41 (27), 83 (26)...]	8.18	1503.7	0.04	7.08*	1179.8	[0.06]
Cryptone	9.49	1604.8	0.01	7.08*	1179.8	[0.06]
para-Cymen-8-ol	11.86	1800.1	0.06	7.16	1185.1	0.01
α-Terpineol	10.13	1656.2	1.28	7.23	1189.4	1.31
cis-Piperitol	9.88	1635.9	0.20	7.30	1193.5	0.21
cis-α-Phellandrene epoxide (iPr vs Me)	11.38	1759.4	0.03	7.40	1199.8	0.04
trans-Piperitol	10.69*	1701.9	[0.36]	7.55	1209.6	0.25
Citronellol	11.04	1730.9	0.01	7.94	1235.5	0.03
Neral	9.79	1629.2	0.06	8.03	1241.9	0.06
Benzylacetone	11.77	1792.7	0.05	8.07	1244.7	0.09
Piperitone	10.31	1670.5	50.55	8.26	1257.3	50.53
Geraniol	11.94	1807.8	0.16	8.28	1258.5	0.17
Thymol	15.45	2132.0	0.01	8.94	1302.8	0.02
para-Menth-5-en-1,2-diol isomer II	14.72*	2060.0	[0.07]	8.96	1303.9	0.02
para-Menth-5-en-1,2-diol isomer III	15.52	2138.8	0.07	9.08	1312.7	0.03
Bicycloelemene	7.32	1439.4	0.01	9.39	1334.0	0.04
α-Terpinyl acetate	10.04*	1649.5	[0.15]	9.58	1347.4	0.16
Eugenol	15.13	2100.3	0.02	9.70	1356.1	0.02
Methyl (*E*)-cinnamate	14.13	2004.4	0.07	10.02	1378.2	0.06
β-Elemene	8.69*	1542.7	[0.09]	10.17	1389.1	0.04
(*Z*)-Jasmone	12.73	1876.9	0.03	10.23	1393.5	0.02
Unknown CALU VIII [m/z 71, 100 (92), 111 (79), 69				10.26	1395.5	0.03

(46), 109 (45)...]						
(*trans*?)-6-Hydroxy-*para*-menth-1-en-3-one	17.14*	2303.1	[0.05]	10.50*	1412.7	[0.07]
β-Caryophyllene	8.69*	1542.7	[0.09]	10.50*	1412.7	[0.07]
(*cis*?)-6-Hydroxy-*para*-menth-1-en-3-one	17.74	2367.5	0.03	10.62	1421.4	0.01
Aromadendrene	8.82	1552.5	0.01	10.76	1432.4	0.02
α-Humulene	9.56	1610.1	0.02	10.96	1446.8	0.02
allo-Aromadendrene	9.27*	1587.7	[0.67]	11.06	1454.0	0.06
Germacrene D	10.04*	1649.5	[0.15]	11.34	1475.1	0.01
Unknown EUDI II [m/z 98, 108 (84), 43 (62), 161 (38), 41 (28), 91 (26)...]				11.43	1481.8	0.03
Bicyclogermacrene	10.36	1675.1	0.46	11.54	1490.2	0.50
Aromadendra-1(10),4(15)-diene	10.69*	1701.9	[0.36]	11.65	1498.0	0.02
δ-Cadinene	10.69*	1701.9	[0.36]	11.92	1519.2	0.01
α-Elemol	14.35	2025.3	0.05	12.26	1545.4	0.05
Spathulenol	14.72*	2060.0	[0.07]	12.58	1570.5	0.06
Unknown HEBR VI [m/z 109, 43 (95), 81 (81), 93 (76), 69 (75), 95 (74), 107 (71)... 204 (22), 220 (6)]				12.61	1573.3	0.01
Globulol	14.22	2012.7	0.06	12.66	1576.7	0.06
Viridiflorol	14.30	2020.7	0.04	12.75	1584.3	0.04
Eudes*m*-5-en-11-ol analog	14.53	2042.8	0.02	12.89*	1594.6	[0.04]
Ledol	13.68	1962.6	0.02	12.89*	1594.6	[0.04]
Torilenol	15.80	2165.7	0.01	12.98	1602.3	0.01
Rosifoliol	14.63	2052.3	0.02	13.15	1615.5	0.02
γ-Eudesmol	15.24*	2111.0	[0.03]	13.26	1625.0	0.05
Isospathulenol	15.75	2161.6	0.05	13.34	1631.8	0.05
τ-Cadinol	15.24*	2111.0	[0.03]	13.39	1635.7	0.01
β-Eudesmol	15.72	2158.1	0.08	13.47	1642.0	0.06
α-Eudesmol	15.65	2151.2	0.06	13.51	1645.5	0.06
Aromadendrane-4,10-diol	17.14*	2303.1	[0.05]	14.32	1712.6	0.01
(2*E*,6*E*)-Farnesol	17.14*	2303.1	[0.05]	14.41	1720.9	0.02
α-Phellandrene				15.18	1787.3	0.01

dimer II						
Cryptomeridiol	20.18	2642.3	0.01	15.35	1802.3	0.01
α-Phellandrene dimer IV	13.58	1953.3	0.03	15.64	1828.7	0.03
Total reported		98.94%			98.93%	

*: 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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