



## GC/MS BATCH NUMBER: E20107

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**ESSENTIAL OIL:** EUCALYPTUS GLOBULUS  
**BOTANICAL NAME:** EUCALYPTUS GLOGULUS  
**ORIGIN:** CHINA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF EUCALUPTS BLOBULUS OIL	%
1,8-CINEOLE + $\beta$ -PHELLANDRENE	80.0
LIMONENE	8.6
$\gamma$ -TERPINENE	4.2
p-CYMENE	2.6

Comments from Robert Tisserand: Fresh, clean, green odor profile. All eight key ISO constituents are within range.

**Date :** April 06, 2018

*CERTIFICATE OF ANALYSIS - GC PROFILING*

*SAMPLE IDENTIFICATION*

**Internal code :** 18D05-PTH2-1-CC

**Customer identification :** Eucalyptus Globulus - China - E20107710R

**Type :** Essential oil

**Source :** *Eucalyptus globulus*

**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 :** Sarah-Eve Tremblay, M. Sc. A., Chimiste

**Analysis date :** April 06, 2018

Checked and approved by :

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

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*PHYSICOCHEMICAL DATA*

**Physical aspect:** Clear liquid

**Refractive index:**  $1.4615 \pm 0.0003$  (20 °C)

*CONCLUSION*

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

## ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
Ethanol	0.12	0.12	Aliphatic alcohol
Isoamyl alcohol	0.01	80.00*	Aliphatic alcohol
(3Z)-Hexenol	tr	tr*	Aliphatic alcohol
$\alpha$ -Thujene	tr	tr	Monoterpene
$\alpha$ -Pinene	0.89	0.89	Monoterpene
Camphene	0.01	tr	Monoterpene
Thuja-2,4(10)-diene	tr	0.02*	Monoterpene
Sabinene	0.18*	[0.02]*	Monoterpene
$\beta$ -Pinene	[0.18]*	0.17	Monoterpene
<i>trans</i> -para-Menthane	0.01		Monoterpene
Myrcene	0.50*	0.50	Monoterpene
<i>trans</i> -Dehydroxylinalool oxide	[0.50]*	0.03	Monoterpenic ether
$\alpha$ -Phellandrene	0.59*	0.56	Monoterpene
Pseudolimonene	[0.59]*	0.01	Monoterpene
$\Delta^3$ -Carene	0.01		Monoterpene
$\alpha$ -Terpinene	0.15	0.15	Monoterpene
para-Cymene	91.57	2.60	Monoterpene
1,8-Cineole	[91.57]*	[80.00]*	Monoterpenic ether
Limonene	[91.57]*	8.57	Monoterpene
$\beta$ -Phellandrene	[91.57]*	[80.00]*	Monoterpene
(Z)- $\beta$ -Ocimene	0.30	0.31	Monoterpene
(E)- $\beta$ -Ocimene	0.08	0.09	Monoterpene
$\gamma$ -Terpinene	4.18	4.24	Monoterpene
<i>cis</i> -Sabinene hydrate	0.01	0.02*	Monoterpenic alcohol
Unknown	0.02	0.02	Oxygenated monoterpene
<i>cis</i> -Linalool oxide (fur.)	0.02	0.02	Monoterpenic alcohol
Isoterpinolene	0.29*	0.02	Monoterpene
Terpinolene	[0.29]*	0.28	Monoterpene
$\gamma$ -Campholenal	[0.29]*	[tr]*	Aliphatic alcohol
<i>trans</i> -Linalool oxide (fur.)	0.05*	[0.02]*	Monoterpenic alcohol
para-Cymenene	[0.05]*	0.05	Monoterpene
$\alpha$ -Pinene oxide	0.01	0.03	Monoterpenic ether
Linalool	0.06	0.04	Monoterpenic alcohol
Isoamyl isovalerate	0.03	0.03*	Aliphatic ester
Amyl isovalerate	0.04	[0.03]*	Aliphatic ester
endo-Fenchol	0.02	0.01	Monoterpenic alcohol
$\alpha$ -Campholenal	0.01	0.01	Monoterpenic aldehyde
allo-Ocimene	0.02	0.01	Monoterpene
<i>trans</i> -Pinocarveol	0.08	0.08*	Monoterpenic alcohol
neo-allo-Ocimene	tr		Monoterpene
Isopulegol	tr		Monoterpenic alcohol
meta-Mentha-4,6-dien-8-ol	0.01		Monoterpenic alcohol
Citronellal	tr	tr	Monoterpenic aldehyde
Pinocarvone	0.02	0.02	Monoterpenic ketone
Borneol	0.01	0.40*	Monoterpenic alcohol
$\delta$ -Terpineol	0.02	0.03	Monoterpenic alcohol
Terpinen-4-ol	0.19	0.18*	Monoterpenic alcohol
Cryptone	0.01	[0.08]*	Normonoterpenic ketone

para-Cymen-8-ol	0.01	0.01	Monoterpenic alcohol
$\alpha$ -Terpineol	0.38	[0.40]*	Monoterpenic alcohol
$\alpha$ -Terpinyl acetate	tr	0.01	Monoterpenic ester
Unknown	0.01		Unknown
$\alpha$ -Gurjunene	tr	tr	Sesquiterpene
$\beta$ -Caryophyllene	0.01	tr	Sesquiterpene
Aromadendrene	tr	[0.18]*	Sesquiterpene
<b>Total identified</b>	<b>99.90%</b>	<b>99.53%</b>	

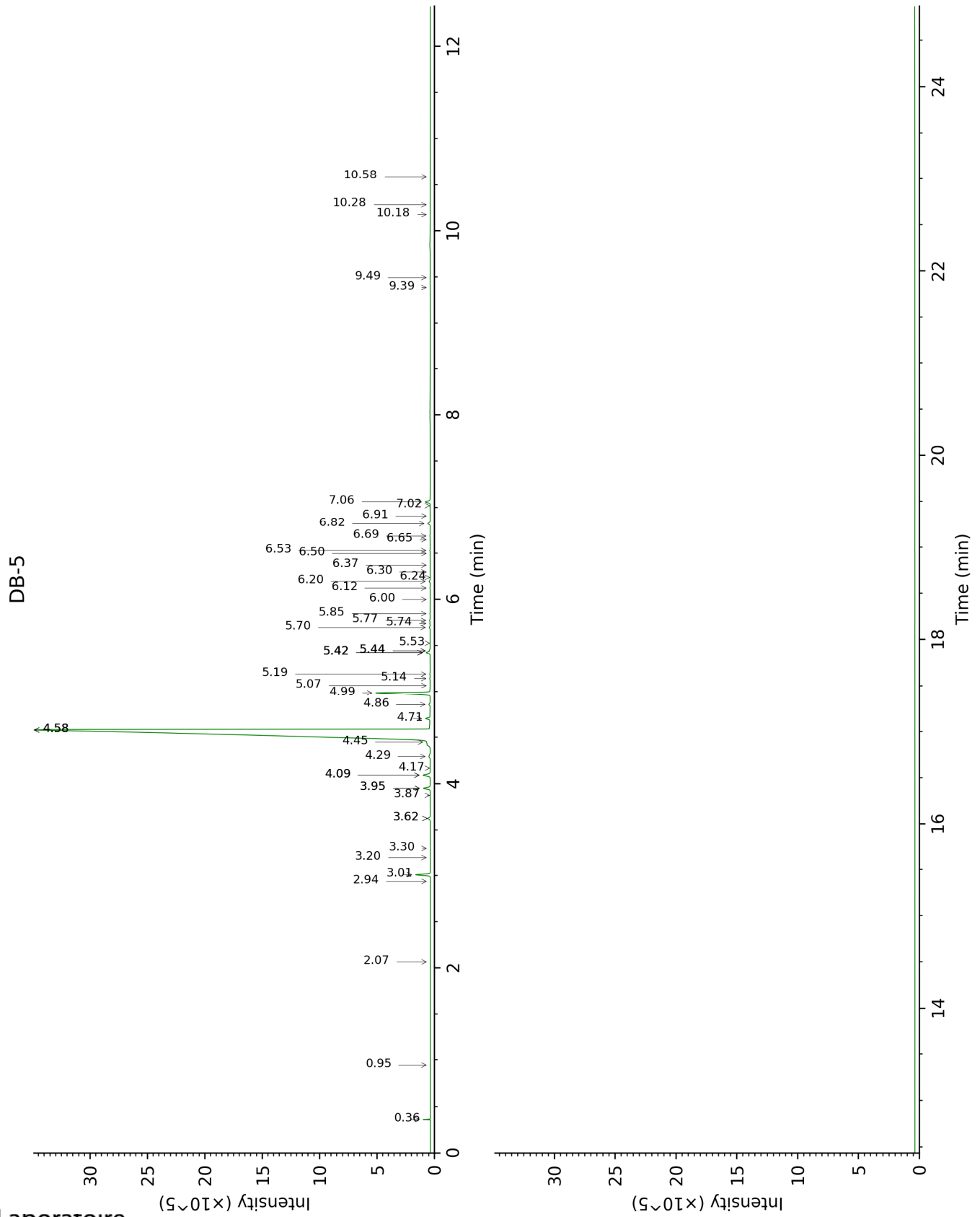
\*: Two or more compounds are coeluting on this column

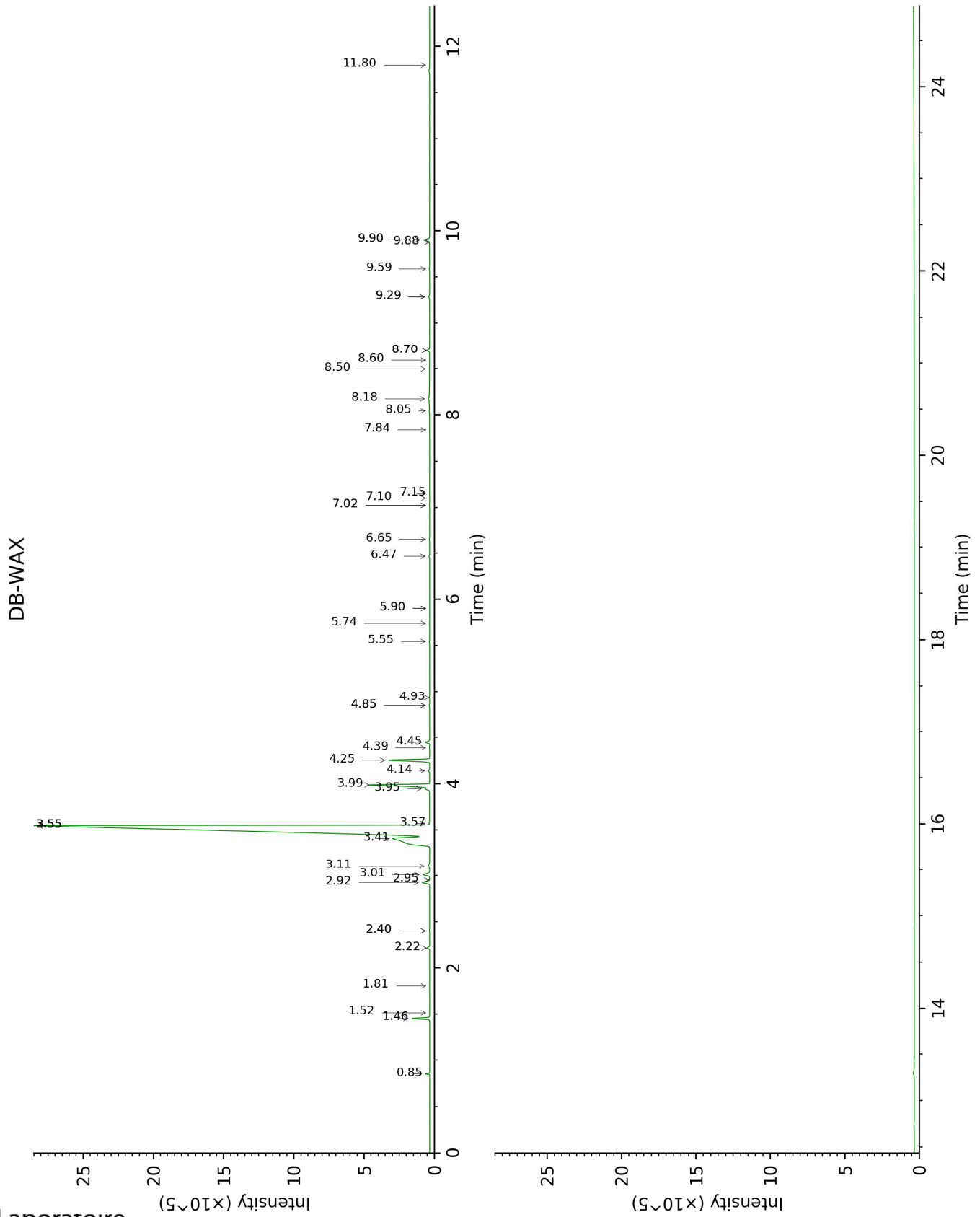
[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

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

Note: no correction factor was applied

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FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Ethanol	0.36	496	0.12	0.85	901	0.12
Isoamyl alcohol	0.95	728	0.01	3.55*	1176	80.00
(3Z)-Hexenol	2.07	854	tr	5.90*	1345	tr
$\alpha$ -Thujene	2.94	922	tr	1.52	1001	tr
$\alpha$ -Pinene	3.01	927	0.89	1.46	994	0.89
Camphene	3.20	940	0.01	1.81	1029	tr
Thuja-2,4(10)-diene	3.30	946	tr	2.40*	1086	0.02
Sabinene	3.62*	968	0.18	2.40*	1086	[0.02]
$\beta$ -Pinene	3.62*	968	[0.18]	2.22	1068	0.17
<i>trans</i> -para-Menthane	3.87	985	0.01			
Myrcene	3.95*	990	0.50	3.01	1135	0.50
<i>trans</i> -Dehydroxylinalool oxide	3.95*	990	[0.50]	3.57	1177	0.03
$\alpha$ -Phellandrene	4.09*	999	0.59	2.92	1128	0.56
Pseudolimonene	4.09*	999	[0.59]	2.95	1130	0.01
$\Delta^3$ -Carene	4.17	1004	0.01			
$\alpha$ -Terpinene	4.30	1012	0.15	3.11	1142	0.15
para-Cymene	4.45†	1022	91.57	4.26	1228	2.60
1,8-Cineole	4.58*†	1030	[91.57]	3.55*	1176	[80.00]
Limonene	4.58*†	1030	[91.57]	3.41	1165	8.57
$\beta$ -Phellandrene	4.58*†	1030	[91.57]	3.55*	1176	[80.00]
(Z)- $\beta$ -Ocimene	4.71	1038	0.30	3.95	1206	0.31
(E)- $\beta$ -Ocimene	4.86	1048	0.08	4.14	1219	0.09
$\gamma$ -Terpinene	4.99	1056	4.18	3.99	1208	4.24
<i>cis</i> -Sabinene hydrate	5.07	1061	0.01	7.02*	1426	0.02
Unknown [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	5.14	1066	0.02	4.93	1276	0.02
<i>cis</i> -Linalool oxide (fur.)	5.19	1069	0.02	6.65	1399	0.02
Isoterpinolene	5.42*	1083	0.29	4.39	1237	0.02
Terpinolene	5.42*	1083	[0.29]	4.45	1241	0.28
$\gamma$ -Campholenal	5.42*	1083	[0.29]	5.90*	1345	[tr]
<i>trans</i> -Linalool oxide (fur.)	5.44*	1084	0.05	7.02*	1426	[0.02]
para-Cymenene	5.44*	1084	[0.05]	6.47	1386	0.05
$\alpha$ -Pinene oxide	5.53	1090	0.01	5.55	1320	0.03
Linalool	5.70	1100	0.06	8.18	1512	0.04
Isoamyl isovalerate	5.74	1103	0.03	4.85*	1270	0.03
Amyl isovalerate	5.77	1105	0.04	4.85*	1270	[0.03]
endo-Fenchol	5.85	1110	0.02	8.50	1537	0.01

α-Campholenal	6.00	1120	0.01	7.15	1436	0.01
allo-Ocimene	6.12	1128	0.02	5.74	1334	0.01
<i>trans</i> -Pinocarveol	6.20	1132	0.08	9.29*	1598	0.08
neo-allo-Ocimene	6.24	1135	tr			
Isopulegol	6.30	1139	tr			
meta-Mentha-4,6-dien-8-ol	6.37	1143	0.01			
Citronellal	6.50	1152	tr	7.10	1432	tr
Pinocarvone	6.53	1154	0.02	8.05	1502	0.02
Borneol	6.65	1161	0.01	9.90*	1648	0.40
δ-Terpineol	6.69	1164	0.02	9.59	1622	0.03
Terpinen-4-ol	6.82	1172	0.19	8.70*	1553	0.18
Cryptone	6.91	1178	0.01	9.29*	1598	[0.08]
para-Cymen-8-ol	7.02	1185	0.01	11.80	1806	0.01
α-Terpineol	7.06	1188	0.38	9.90*	1648	[0.40]
α-Terpinyl acetate	9.39	1345	tr	9.88	1646	0.01
Unknown [m/z 43, 95 (62), 107 (45), 110 (41), 55 (28), 67 (25)...]	9.49	1352	0.01			
α-Gurjunene	10.18	1400	tr	7.84	1487	tr
β-Caryophyllene	10.28	1408	0.01	8.60	1545	tr
Aromadendrene	10.58	1431	tr	8.70*	1553	[0.18]
<b>Total identified</b>		<b>99.90%</b>			<b>99.53%</b>	
<b>Total reported</b>		<b>99.93%</b>			<b>99.55%</b>	

\*: 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