

Date : March 07, 2018

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 18B20-PLG33-1-CC

Customer identification : Camphor

Type : Essential oil

Source : *Cinnamomum camphora*

Customer : Plant Guru

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 : Sylvain Mercier, M. Sc., Chimiste

Analysis date : March 05, 2018

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Clear liquid

Refractive index: 1.4647 ± 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	0.05	0.05	Aliphatic alcohol
Isoamyl alcohol	0.01	38.15*	Aliphatic alcohol
2-Methylbutanol	tr	[38.15]*	Aliphatic alcohol
Toluene	tr	0.06*	Simple phenolic
(3Z)-Hexenol	0.01	0.01	Aliphatic alcohol
Hexanol	0.01	0.02	Aliphatic alcohol
Cyclofenchene	0.01	0.01	Monoterpene
Bornylene	0.01	0.01	Monoterpene
(4E)-2,6-Dimethyloctene	tr		Monoterpene
Hashishene	0.03	1.09*	Monoterpene
Tricyclene	0.05	0.05	Monoterpene
α -Thujene	0.04	[0.06]*	Monoterpene
α -Pinene	1.05	[1.09]*	Monoterpene
Camphene	0.89*	0.68	Monoterpene
α -Fenchene	[0.89]*	0.21	Monoterpene
Thuja-2,4(10)-diene	tr	0.44*	Monoterpene
Benzaldehyde	tr	tr	Simple phenolic
Unknown	0.01	tr	Monoterpene
β -Pinene	0.89*	0.47	Monoterpene
Sabinene	[0.89]*	[0.44]*	Monoterpene
<i>cis</i> -Carane	0.03		Monoterpene
Myrcene	2.88	2.90	Monoterpene
α -Phellandrene	1.12*	0.02	Monoterpene
Pseudolimonene	[1.12]*	1.09	Monoterpene
Δ^3 -Carene	0.30	0.30	Monoterpene
α -Terpinene	21.10	21.16*	Monoterpene
1,4-Cineole	[21.10]	[21.16]*	Monoterpenic ether
para-Cymene	67.59*	8.84	Monoterpene
Limonene	[67.59]*	20.31	Monoterpene
1,8-Cineole	[67.59]*	[38.15]*	Monoterpenic ether
(Z)- β -Ocimene	[67.59]*	tr	Monoterpene
Unknown	0.13		Monoterpene
(E)- β -Ocimene	0.03	0.04	Monoterpene
γ -Terpinene	0.16	0.17	Monoterpene
Octanol	tr	0.01	Aliphatic alcohol
Terpinolene	0.03*	0.02	Monoterpene
para-Cymenene	[0.03]*	tr	Monoterpene
ortho-Guaiacol	[0.03]*	0.01	Simple phenolic
Linalool	tr	tr	Monoterpenic alcohol
Unknown	0.18	0.19*	Monoterpenic alcohol
<i>trans</i> -para-Mentha-2,8-dien-1-ol	0.02	0.02	Monoterpenic alcohol
Limona ketone	0.01	[0.19]*	Normonoterpenic ketone
4-Hydroxy-4-methylcyclohex-2-enone	0.11*	0.13	Aliphatic alcohol
<i>cis</i> -Limonene oxide	[0.11]*	0.01	Monoterpenic ether
<i>cis</i> -para-Mentha-2,8-dien-1-ol	0.04	0.02	Monoterpenic alcohol
Unknown	0.85	0.76	Unknown
Unknown	0.21	0.20	Oxygenated monoterpene

Borneol	tr	0.01	Monoterpenic alcohol
Unknown	0.02		Oxygenated monoterpene
Terpinen-4-ol	0.02	0.01	Monoterpenic alcohol
Cryptone	0.08	0.08	Normonoterpenic ketone
<i>cis</i> -Piperitol	tr	tr	Monoterpenic alcohol
α -Phellandrene epoxide	0.02	0.02	Monoterpenic ether
<i>trans</i> -Carveol	0.03	0.02	Monoterpenic alcohol
Unknown	0.10		Unknown
Unknown	0.04	0.04	Oxygenated monoterpene
Carvone	0.03	0.02	Monoterpenic ketone
Unknown	0.02	0.02	Unknown
<i>trans</i> -Ascaridole glycol	0.11	0.12	Monoterpenic alcohol
<i>cis</i> -Ascaridole glycol?	0.12	0.13	Monoterpenic alcohol
Unknown	0.06		Unknown
Unknown	0.06		Unknown
Unknown	0.03	0.02	Unknown
Unknown	0.11	0.11	Monoterpenic alcohol
Unknown	0.17		Unknown
Unknown	0.02		Unknown
Total identified	96.90%	96.87%	

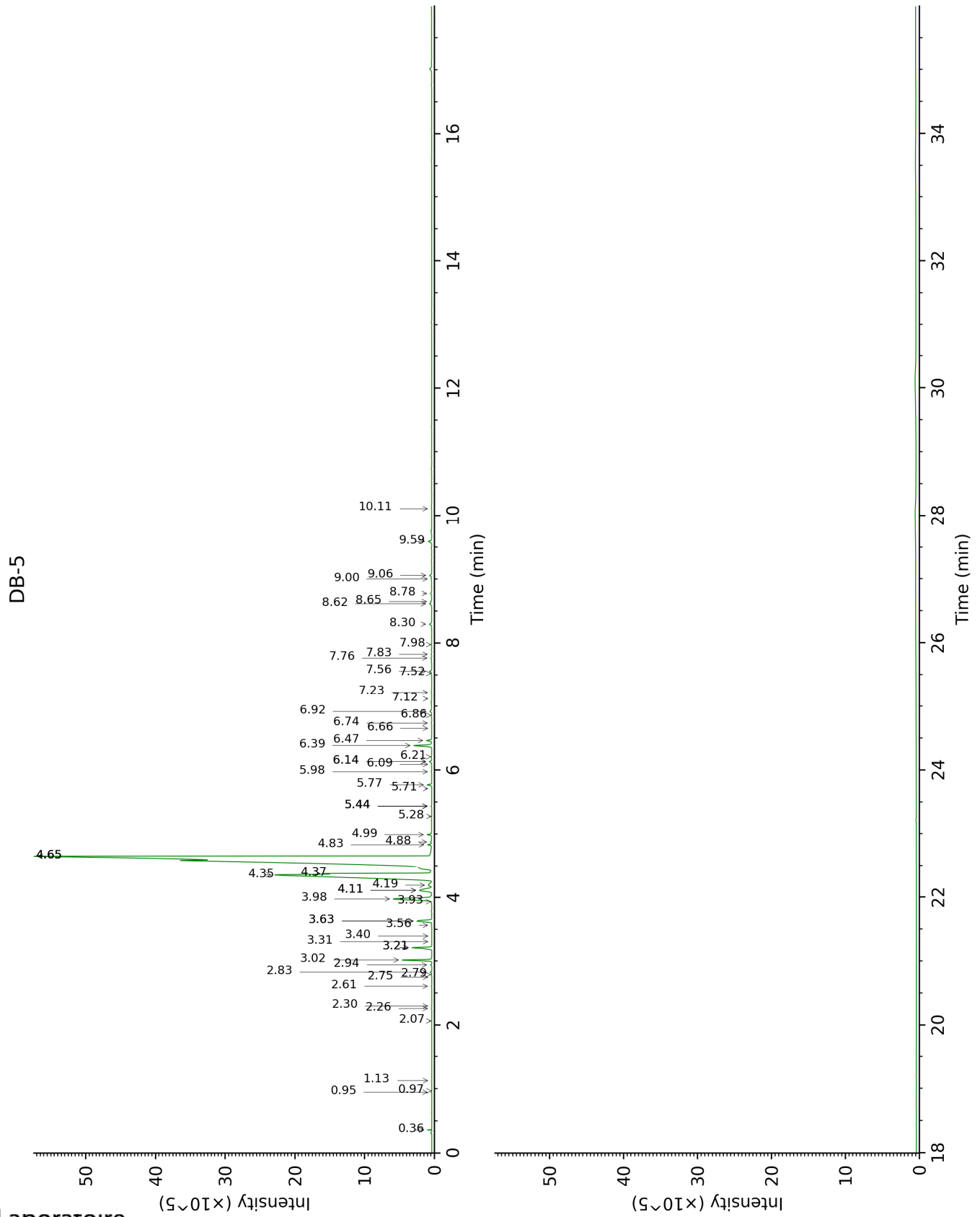
*: Two or more compounds are coeluting on this column

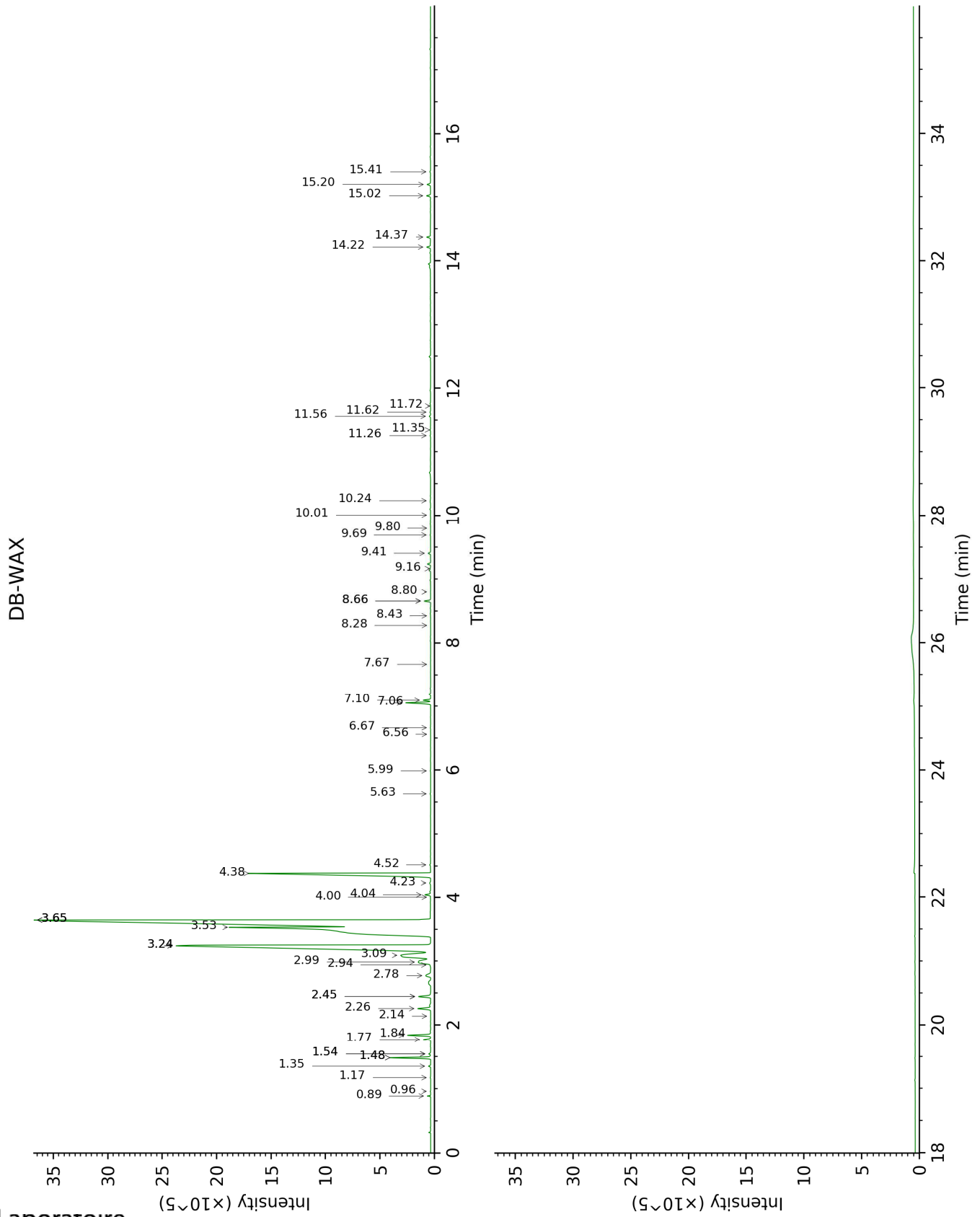
[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

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	495	0.05	0.89	901	0.05
Isoamyl alcohol	0.95	727	0.01	3.65*	1180	38.15
2-Methylbutanol	0.97	730	tr	3.65*	1180	[38.15]
Toluene	1.13	753	tr	1.54*	1002	0.06
(3Z)-Hexenol	2.07	852	0.01	5.99	1347	0.01
Hexanol	2.26	869	0.01	5.63	1321	0.02
Cyclofenchene	2.30	872	0.01	0.96	913	0.01
Bornylene	2.61	898	0.01	1.17	947	0.01
(4E)-2,6-Dimethyloctene	2.75	908	tr			
Hashishene	2.79	910	0.03	1.48*	996	1.09
Tricyclene	2.83	913	0.05	1.35	976	0.05
α -Thujene	2.94	921	0.04	1.54*	1002	[0.06]
α -Pinene	3.02	926	1.05	1.48*	996	[1.09]
Camphene	3.21*	939	0.89	1.84	1031	0.68
α -Fenchene	3.21*	939	[0.89]	1.77	1024	0.21
Thuja-2,4(10)-diene	3.31	945	tr	2.45*	1087	0.44
Benzaldehyde	3.40	951	tr	7.67	1469	tr
Unknown [m/z 93, 91 (60), 121 (55), 136 (42), 79 (40)]	3.56	962	0.01	2.14	1059	tr
β -Pinene	3.63*	966	0.89	2.26	1070	0.47
Sabinene	3.63*	966	[0.89]	2.45*	1087	[0.44]
<i>cis</i> -Carane	3.93	986	0.03			
Myrcene	3.98	989	2.88	3.09	1138	2.90
α -Phellandrene	4.11*	998	1.12	2.94	1126	0.02
Pseudolimonene	4.11*	998	[1.12]	2.99	1129	1.09
Δ^3 -Carene	4.19	1003	0.30	2.78	1113	0.30
α -Terpinene	4.35†	1014	21.10	3.24*	1149	21.16
1,4-Cineole	4.37†	1015	[21.10]	3.24*	1149	[21.16]
para-Cymene	4.65*	1032	67.59	4.38	1232	8.84
Limonene	4.65*	1032	[67.59]	3.53	1171	20.31
1,8-Cineole	4.65*	1032	[67.59]	3.65*	1180	[38.15]
(Z)- β -Ocimene	4.65*	1032	[67.59]	4.00	1206	tr
Unknown [m/z 93, 136 (45), 79 (41), 91 (33), 77 (25)...]	4.83	1044	0.13			
(E)- β -Ocimene	4.88	1046	0.03	4.23	1222	0.04
γ -Terpinene	4.99	1054	0.16	4.04	1208	0.17
Octanol	5.28	1072	tr	8.43	1526	0.01
Terpinolene	5.44*	1082	0.03	4.52	1242	0.02
para-Cymenene	5.44*	1082	[0.03]	6.56	1388	tr
ortho-Guaiacol	5.44*	1082	[0.03]	11.72	1793	0.01
Linalool	5.71	1099	tr	8.28	1515	tr
Unknown [m/z	5.77	1103	0.18	8.66*	1544	0.19

119, 109 (94), 43 (61), 95 (56), 91 (48), 77 (32), 152 (32), 137 (31), 134 (24)]						
<i>trans</i> -para-Mentha-2,8-dien-1-ol	5.98	1116	0.02	9.16	1583	0.02
Limona ketone	6.09	1123	0.01	8.66*	1544	[0.19]
4-Hydroxy-4-methylcyclohex-2-enone	6.14*	1126	0.11	14.22	2020	0.13
<i>cis</i> -Limonene oxide	6.14*	1126	[0.11]	6.67	1395	0.01
<i>cis</i> -para-Mentha-2,8-dien-1-ol	6.21	1130	0.04	9.69	1625	0.02
Unknown [m/z 109, 124 (45), 119 (41), 43 (35), 91 (28), 95 (25)...]	6.39	1142	0.85	7.06	1424	0.76
Unknown [m/z 109, 41 (49), 124 (41), 43 (31), 95 (28), 84 (22)... 152 (7)]	6.47	1147	0.21	7.10	1427	0.20
Borneol	6.66	1159	tr	10.01	1651	0.01
Unknown [m/z 109, 79 (18), 81 (15), 91 (12), 77 (10)... 152 (3)]	6.74	1164	0.02			
Terpinen-4-ol	6.86	1172	0.02	8.80	1555	0.01
Cryptone	6.92	1176	0.08	9.41	1602	0.08
<i>cis</i> -Piperitol	7.12	1189	tr	9.80	1634	tr
α -Phellandrene epoxide	7.23	1195	0.02	11.26	1754	0.02
<i>trans</i> -Carveol	7.52	1215	0.03	11.62	1785	0.02
Unknown [m/z 43, 97 (72), 41 (44), 71 (27), 55 (26), 82 (25)...]	7.56	1217	0.10			
Unknown [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	7.76	1231	0.04	11.56	1779	0.04
Carvone	7.82	1235	0.03	10.24	1669	0.02
Unknown [m/z 43, 97 (69), 107 (46), 41 (28), 55 (21), 109 (20)...]	7.98	1245	0.02	11.35	1761	0.02
<i>trans</i> -Ascaridole glycol	8.30	1267	0.11	14.37	2034	0.12
<i>cis</i> -Ascaridole	8.62	1288	0.12	15.02	2097	0.13

glycol?						
Unknown [m/z 95, 110 (95), 67 (31), 43 (29), 122 (18), 41 (14)...]	8.65	1290	0.06			
Unknown [m/z 112, 97 (93), 83 (60), 43 (46), 41 (20), 69 (19)...]	8.78	1299	0.06			
Unknown [m/z 111, 126 (93), 43 (90), 71 (60)...]	9.00	1314	0.03	15.41	2135	0.02
Unknown [m/z 97, 112 (92), 83 (62), 43 (44), 41 (25)... 170? (4)]	9.06	1318	0.11	15.20	2114	0.11
Unknown [m/z 43, 95 (64), 110 (47), 109 (46), 107 (43), 55 (28)...]	9.59	1356	0.17			
Unknown [m/z 71, 100 (92), 111 (79), 69 (46), 109 (45)...]	10.11	1393	0.02			
Total identified		96.90%			96.87%	
Total reported		98.91%			98.03%	

*: 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