

Date : February 27, 2023

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 23B21-PTH02

Customer identification : Coriander Seed - USA - CK0109R

Type : Essential oil

Source : *Coriandrum sativum*

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 : Sylvain Mercier, M. Sc., Chimiste 2014-005

Analysis date : February 23, 2023

Checked and approved by :

Alexis St-Gelais, Ph. D., Chimiste 2013-174

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PHYSICOCHEMICAL DATA

Physical aspect: Clear liquid

Refractive index: 1.4648 ± 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
Ethanol	tr	Aliphatic alcohol
Methyl 2-methylbutyrate	0.01	Aliphatic ester
Hexanol	0.01	Aliphatic alcohol
Tricyclene	0.03	Monoterpene
α -Thujene	0.04	Monoterpene
α -Pinene	4.98	Monoterpene
Camphene	0.88	Monoterpene
Thuja-2,4(10)-diene	tr	Monoterpene
β -Pinene	0.41	Monoterpene
Sabinene	0.26	Monoterpene
6-Methyl-5-hepten-2-one	0.02	Aliphatic ketone
Myrcene	1.04	Monoterpene
6-Methyl-5-hepten-2-ol	0.04	Aliphatic alcohol
α -Phellandrene	0.02	Monoterpene
Pseudolimonene	0.02	Monoterpene
Δ^3 -Carene	0.02	Monoterpene
α -Terpinene	0.07	Monoterpene
para-Cymene	1.30	Monoterpene
Limonene	3.16	Monoterpene
1,8-Cineole	0.11	Monoterpenic ether
β -Phellandrene	0.15	Monoterpene
(Z)- β -Ocimene	0.04	Monoterpene
(E)- β -Ocimene	0.06	Monoterpene
γ -Terpinene	6.00	Monoterpene
cis-Sabinene hydrate	0.06	Monoterpenic alcohol
cis-Linalool oxide (fur.)	0.13	Monoterpenic alcohol
para-Cymenene	0.01	Monoterpene
Terpinolene	0.60	Monoterpene
trans-Linalool oxide (fur.)	0.08	Monoterpenic alcohol
2-Hexylfuran	0.01	Furan
Linalool	68.90	Monoterpenic alcohol
Camphor	4.93	Monoterpenic ketone
Isopulegol	0.03	Monoterpenic alcohol
Citronellal	0.01	Monoterpenic aldehyde
Borneol	0.18	Monoterpenic alcohol
cis-Linalool oxide (pyr.)	0.02	Monoterpenic alcohol
Terpinen-4-ol	0.11	Monoterpenic alcohol
Nonanol	0.02	Aliphatic alcohol
trans-Linalool oxide (pyr.)	0.01	Monoterpenic alcohol
para-Cymen-8-ol	0.02	Monoterpenic alcohol
α -Terpineol	1.21	Monoterpenic alcohol
Myrtenal	0.01	Monoterpenic aldehyde
Myrtenol	0.02	Monoterpenic alcohol
Hodiendiol (2,6-dimethylocta-3,7-diene-2,6-diol)	0.06	Monoterpenic alcohol

Verbenone	0.03	Monoterpenic ketone
Octyl acetate	0.01	Aliphatic ester
Nerol	0.03	Monoterpenic alcohol
Citronellol	0.05	Monoterpenic alcohol
Neral	0.02	Monoterpenic aldehyde
Geraniol	1.33	Monoterpenic alcohol
(2E)-Decenal	0.01	Aliphatic aldehyde
Geranial	0.03	Monoterpenic aldehyde
Decanol	0.02	Aliphatic alcohol
Safrole	0.04	Phenylpropanoid
Myrtenyl acetate	0.09	Monoterpenic ester
Citronellyl acetate	0.01	Monoterpenic ester
Neryl acetate	0.03	Monoterpenic ester
<i>trans</i> -Myrtanyl acetate	0.02	Monoterpenic ester
Geranyl acetate	2.27	Monoterpenic ester
β -Caryophyllene	0.17	Sesquiterpene
α -Humulene	0.06	Sesquiterpene
(2E)-Dodecenal	0.01	Aliphatic aldehyde
Germacrene D	0.03	Sesquiterpene
Bicyclogermacrene	0.03	Sesquiterpene
(E)-Nerolidol	0.03	Sesquiterpenic alcohol
Spathulenol	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.05	Sesquiterpenic ether
Tetradecanal	0.01	Aliphatic aldehyde
meta-Camphorene	0.02	Diterpene
para-Camphorene	0.01	Diterpene
Consolidated total	99.53%	

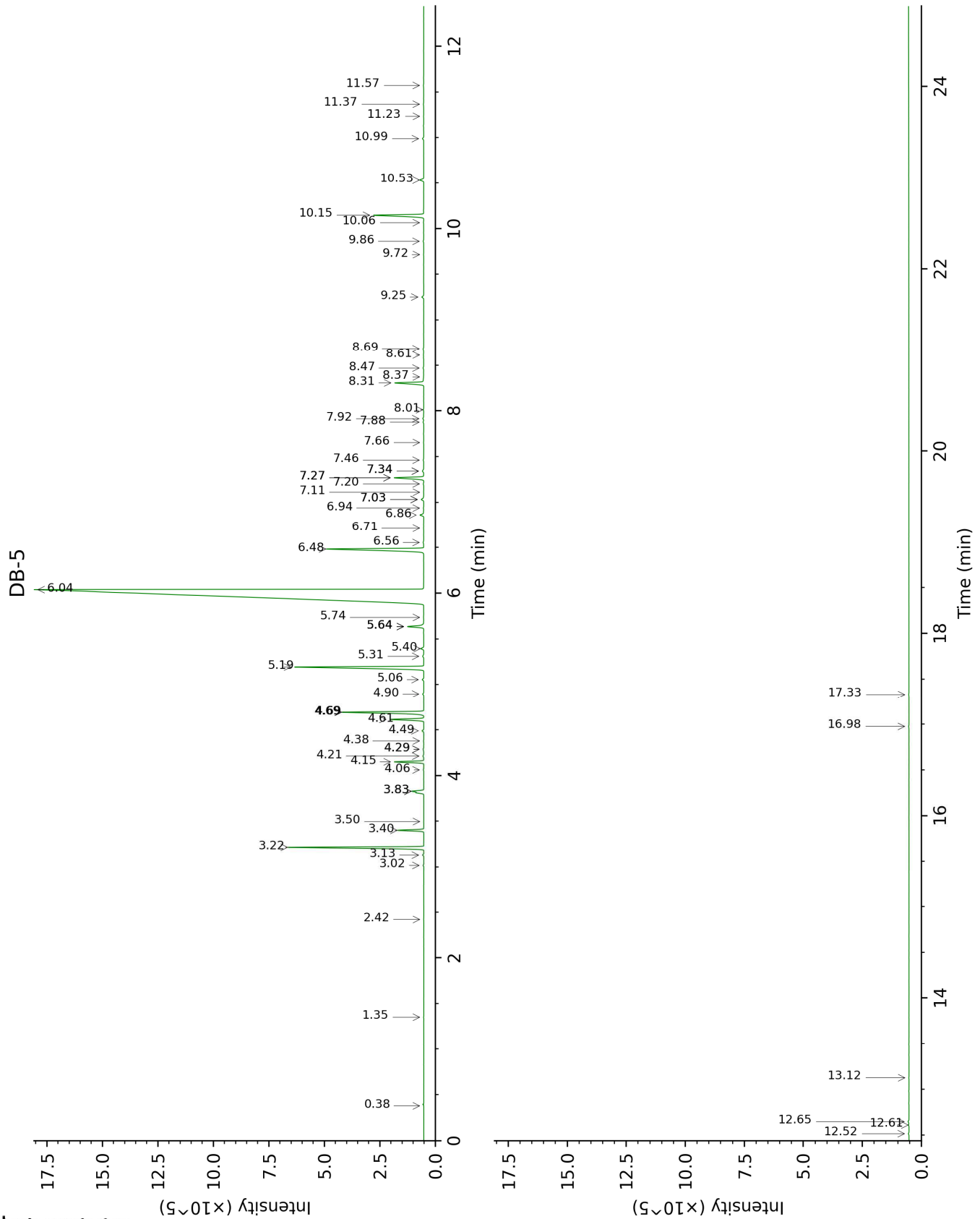
tr: The compound has been detected below 0.005% of total signal.

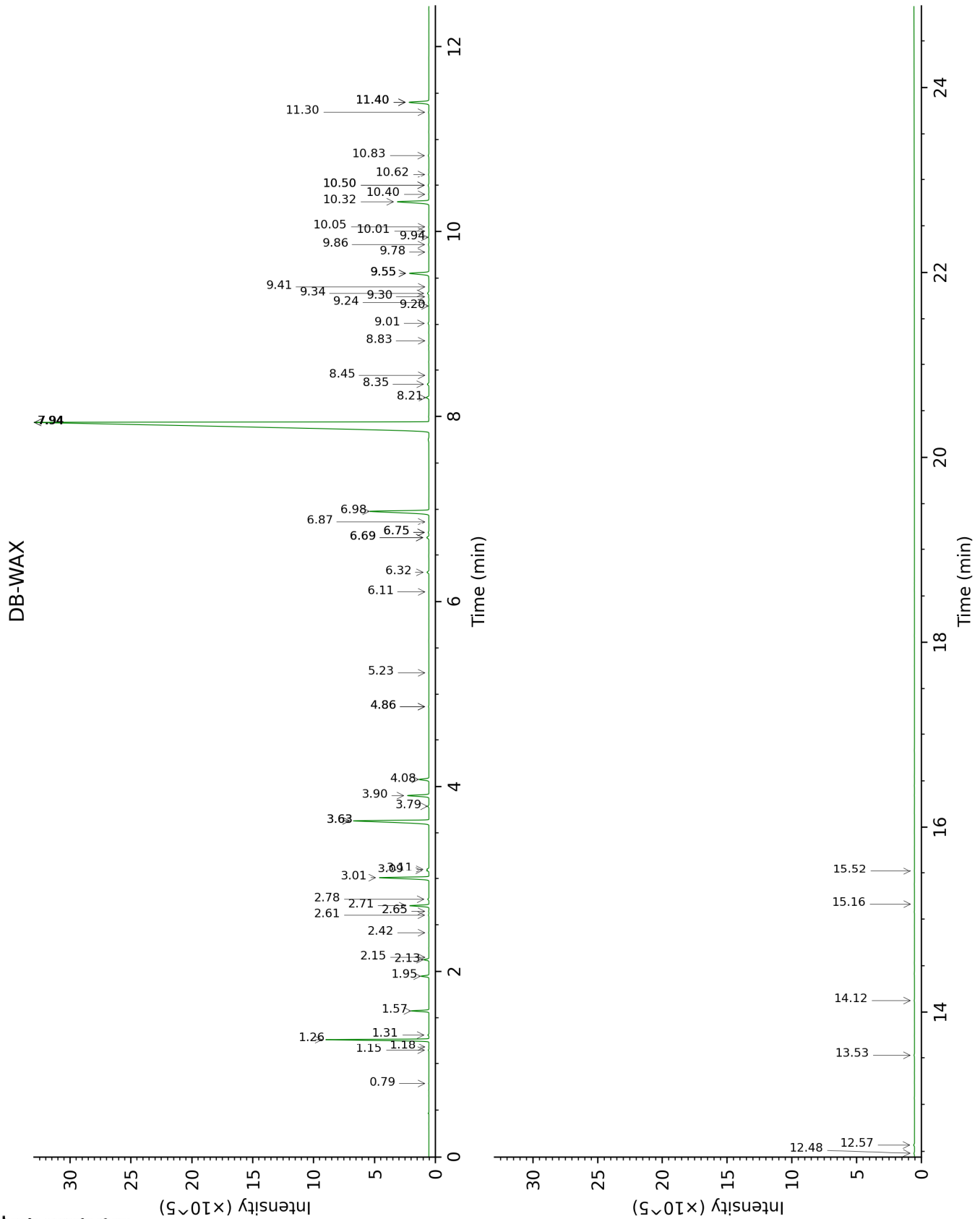
Note: no correction factor was applied

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	%
Ethanol	0.38	499	tr	0.79	906	0.01
Methyl 2-methylbutyrate	1.35	774	0.01	1.18	975	tr
Hexanol	2.42	873	0.01	5.23	1324	0.01
Tricyclene	3.02	918	0.03	1.14	969	0.02
α -Thujene	3.13	926	0.04	1.32	998	0.04
α -Pinene	3.22	931	4.98	1.26	990	4.98
Camphene	3.40	943	0.88	1.58	1024	0.86
Thuja-2,4(10)-diene	3.50	950	tr	2.15	1085	tr
β -Pinene	3.83*	971	0.67	1.95	1063	0.41
Sabinene	3.83*	971	[0.67]	2.13	1082	0.26
6-Methyl-5-hepten-2-one	4.06	987	0.02	4.86*	1302	0.02
Myrcene	4.15	992	1.04	2.71	1132	1.04
6-Methyl-5-hepten-2-ol	4.21	996	0.04	6.75*†	1434	[0.20]
α -Phellandrene	4.29*	1001	0.04	2.61	1124	0.02
Pseudolimonene	4.29*	1001	[0.04]	2.65	1128	0.02
Δ^3 -Carene	4.38	1007	0.02	2.42	1109	0.01
α -Terpinene	4.49	1014	0.07	2.78	1138	0.07
para-Cymene	4.61	1022	1.30	3.90	1228	1.30
Limonene	4.69*	1027	3.41	3.01	1157	3.16
1,8-Cineole	4.69*	1027	[3.41]	3.11	1165	0.11
β -Phellandrene	4.69*	1027	[3.41]	3.09	1164	0.15
(Z)- β -Ocimene	4.90	1040	0.04	3.63*	1208	6.05
(E)- β -Ocimene	5.06	1050	0.06	3.79	1220	0.06
γ -Terpinene	5.19	1058	6.00	3.63*	1208	[6.05]
cis-Sabinene hydrate	5.31	1065	0.06	6.69*†	1430	0.20
cis-Linalool oxide (fur.)	5.40	1071	0.13	6.32	1402	0.12
para-Cymenene	5.64*	1086	0.70	6.10	1387	0.01
Terpinolene	5.64*	1086	[0.70]	4.08	1242	0.60
trans-Linalool oxide (fur.)	5.64*	1086	[0.70]	6.69*†	1430	[0.20]
2-Hexylfuran	5.74	1092	0.01	4.86*	1302	[0.02]
Linalool	6.04	1111	68.90	7.94*	1524	68.73
Camphor	6.48	1139	4.93	6.98	1452	4.86
Isopulegol	6.56	1144	0.03	7.94*	1524	[68.73]
Citronellal	6.71	1154	0.01	6.75*†	1434	[0.20]
Borneol	6.86	1163	0.18	9.55*	1651	1.41
cis-Linalool oxide (pyr.)	6.94	1168	0.02	10.05	1692	0.01
Terpinen-4-ol	7.03*	1174	0.12	8.35	1556	0.11
Nonanol	7.03*	1174	[0.12]	9.24	1626	0.02
trans-Linalool oxide (pyr.)	7.11	1179	0.01	10.40	1722	0.02

para-Cymen-8-ol	7.20	1185	0.02	11.30	1797	0.02
α-Terpineol	7.27*	1189	1.27	9.55*	1651	[1.41]
Myrtenal	7.27*	1189	[1.27]	8.45	1563	0.01
Myrtenol	7.34*	1194	0.08	10.62	1740	0.02
Hodiendiol (2,6-dimethylocta-3,7-diene-2,6-diol)	7.34*	1194	[0.08]	12.57	1911	0.06
Verbenone	7.46	1202	0.03	9.41	1640	0.01
Octyl acetate	7.66	1214	0.01	6.87	1443	0.01
Nerol	7.88	1229	0.03	10.83	1758	0.04
Citronellol	7.92	1232	0.05	10.50*	1730	0.06
Neral	8.01	1238	0.02	9.30	1631	0.02
Geraniol	8.31	1258	1.33	11.40*	1807	1.41
(2E)-Decenal	8.37	1262	0.01	8.83	1593	0.01
Geranial	8.47	1268	0.03	9.86	1676	0.03
Decanol	8.61	1278	0.02	10.50*	1730	[0.06]
Safrole	8.69	1283	0.04	11.40*	1807	[1.41]
Myrtenyl acetate	9.25	1322	0.09	9.34	1634	0.10
Citronellyl acetate	9.72	1354	0.01	9.20	1623	tr
Neryl acetate	9.86	1365	0.03	9.94	1683	0.02
trans-Myrtenyl acetate	10.06	1379	0.02	10.01	1688	0.01
Geranyl acetate	10.15	1385	2.27	10.32	1715	2.27
β-Caryophyllene	10.53	1412	0.17	8.21	1544	0.19
α-Humulene	10.99	1446	0.06	9.01	1608	0.05
(2E)-Dodecenal	11.24	1464	0.01	11.40*	1807	[1.41]
Germacrene D	11.37	1474	0.03	9.55*	1651	[1.41]
Bicyclogermacrene	11.57	1490	0.03	9.78	1670	0.01
(E)-Nerolidol	12.52	1563	0.03	13.53	2000	0.03
Spathulenol	12.61	1570	0.02	14.12	2057	0.03
Caryophyllene oxide	12.65	1573	0.05	12.48	1903	0.04
Tetradecanal	13.12	1611	0.01			
meta-Camphorene	16.98	1948	0.02	15.16	2160	0.01
para-Camphorene	17.33	1982	0.01	15.52	2197	0.02
Total identified		99.58%			99.19%	
Total reported		99.58%			99.19%	

*: 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