Date : September 03, 2020

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 20H24-BKB04
Customer identification : Allspice - Jamaica - PD2005
Type : Essential oil
Source : *Pimenta dioica*
Customer : Be Kind Botanicals, Inc.

Analysis

Method: PC-MAT-014 ISO - Analysis of the composition of an essential oil or other volatile liquid by FAST GC-FID (in French); identifications validated by GC-MS.
Analyst : Fanny Charlier, B. Sc., chimiste à l'entraînement
Analysis date : August 26, 2020

Checked and approved by :

Alexis St-Gelais, M. Sc., 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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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PHYSICOCHEMICAL DATA

Physical aspect: Light yellow liquid
Refractive index: 1.5322 ± 0.0003 (20 °C; method PC-MAT-016)

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
Toluene	tr	Simple phenolic
α-Thujene	0.02	Monoterpene
α-Pinene	0.22	Monoterpene
Camphene	tr	Monoterpene
β-Pinene	0.13	Monoterpene
Sabinene	0.12	Monoterpene
Myrcene	1.81	Monoterpene
α-Phellandrene	0.80	Monoterpene
Δ3-Carene	0.17	Monoterpene
α-Terpinene	0.03	Monoterpene
para-Cymene	0.27	Monoterpene
1,8-Cineole	1.38	Monoterpenic ether
β-Phellandrene	0.03	Monoterpene
Limonene	0.69	Monoterpene
(*Z*)-β-Ocimene	0.01	Monoterpene
(*E*)-β-Ocimene	0.06	Monoterpene
γ-Terpinene	0.04	Monoterpene
Terpinolene	0.28	Monoterpene
para-Cymenene	0.01	Monoterpene
Linalool	0.38	Monoterpenic alcohol
Terpinen-4-ol	0.32	Monoterpenic alcohol
para-Cymen-8-ol	0.01	Monoterpenic alcohol
α-Terpineol	0.05	Monoterpenic alcohol
Methylchavicol	0.03	Phenylpropanoid
Chavicol	0.01	Phenylpropanoid
Eugenol	74.66	Phenylpropanoid
α-Copaene	0.47	Sesquiterpene
β-Elemene	0.40	Sesquiterpene
α-Gurjunene	0.02	Sesquiterpene
Methyleugenol	6.71	Phenylpropanoid
β-Caryophyllene	6.17	Sesquiterpene
β-Copaene	0.03	Sesquiterpene
Aromadendrene	0.01	Sesquiterpene
trans-α-Bergamotene	0.01	Sesquiterpene
α-Humulene	1.07	Sesquiterpene
allo-Aromadendrene	0.03	Sesquiterpene
Selina-4,11-diene	0.03	Sesquiterpene
γ-Muurolene	0.02	Sesquiterpene
α-Amorphene	0.01	Sesquiterpene
α-Selinene	0.02	Sesquiterpene
Viridiflorene	0.01	Sesquiterpene
α-Muurolene	0.01	Sesquiterpene
γ-Cadinene	0.11	Sesquiterpene
trans-Calamenene	0.06	Sesquiterpene
δ-Cadinene	0.64	Sesquiterpene

trans-Cadina-1,4-diene	0.02	Sesquiterpene
α-Cadinene	0.01	Sesquiterpene
α-Calacorene	0.02	Sesquiterpene
Unknown	0.02	Unknown
Unknown	0.05	Oxygenated sesquiterpene
Caryophyllene oxide	0.15	Sesquiterpenic ether
Caryophyllene oxide isomer	0.05	Sesquiterpenic ether
Globulol	0.01	Sesquiterpenic alcohol
Cubeban-11-ol	0.01	Sesquiterpenic alcohol
Methoxyeugenol	0.03	Phenylpropanoid
Unknown	0.02	Oxygenated sesquiterpene
α-Cadinol	0.01	Sesquiterpenic alcohol
Consolidated total	**97.76%**	

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.

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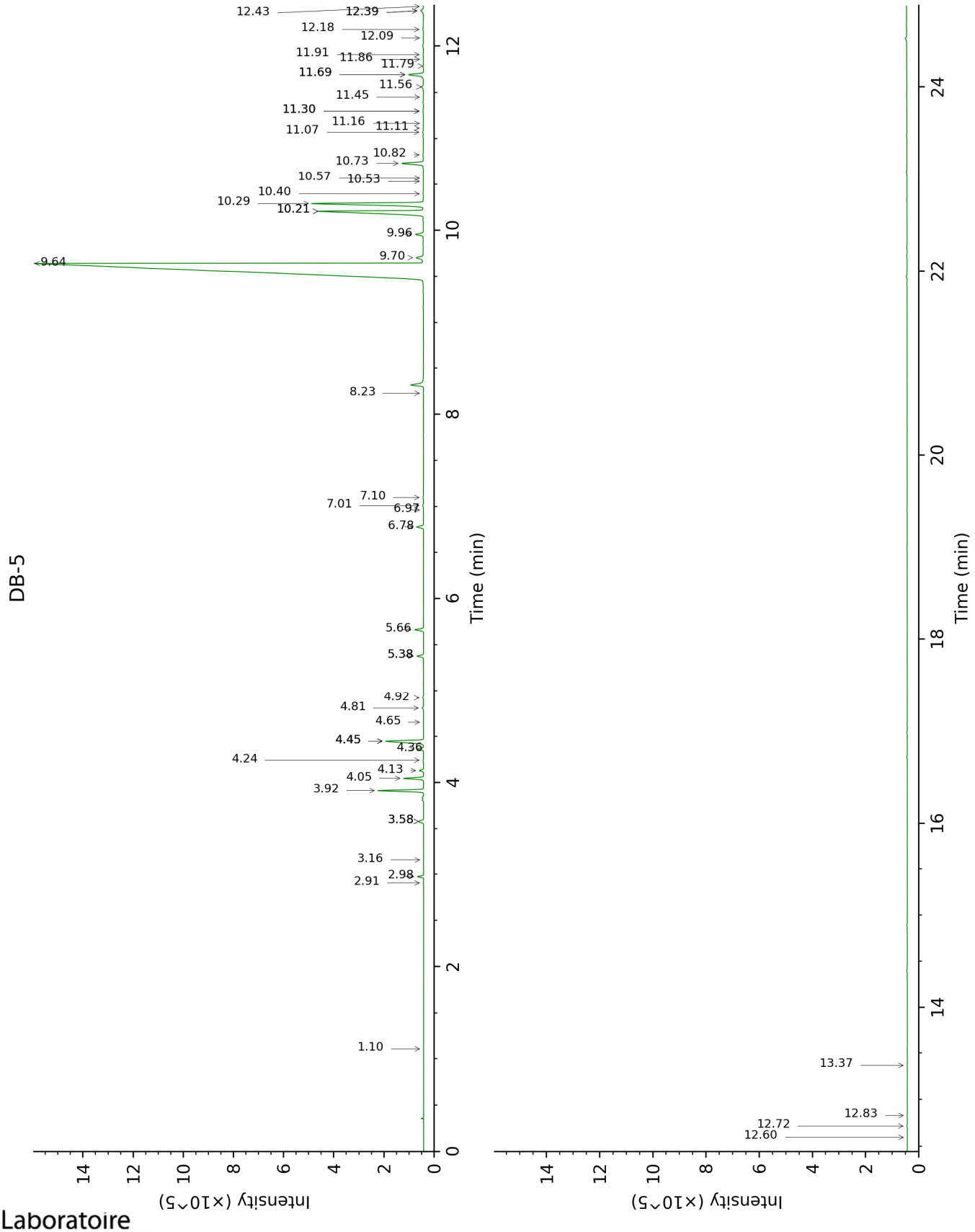
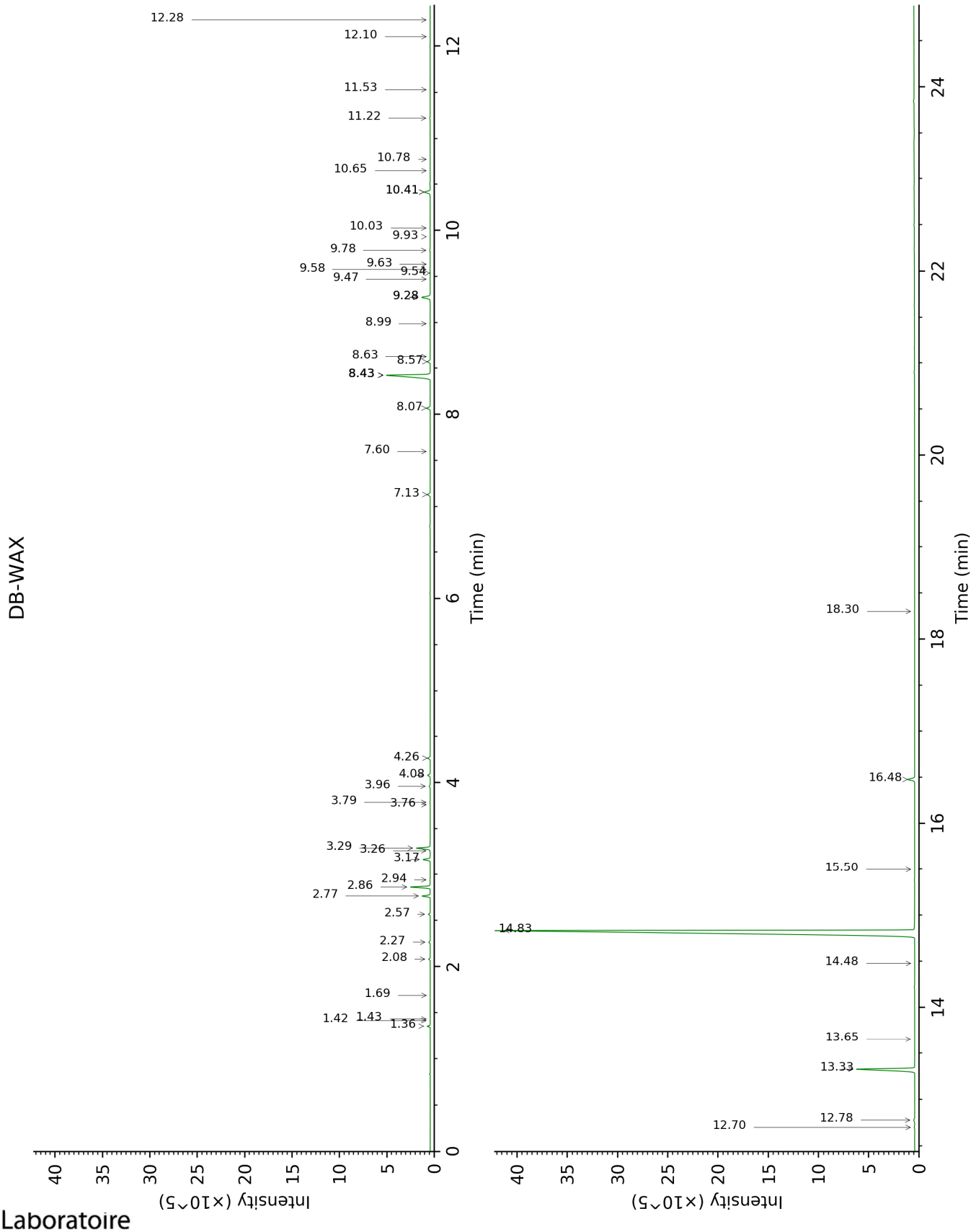

DB-5
12.43
12.39
12.18
12.09
11.91
11.86
11.79
11.69
11.56
11.45
11.30
11.16
11.11
11.07
10.82
10.73
10.57
10.53
10.40
10.29
10.21
9.96
9.70
9.64
8.23
7.10
7.01
6.97
6.78
5.66
5.38
4.92
4.81
4.65
4.45
4.36
4.24
4.13
4.05
3.92
3.58
3.16
2.91
2.98
1.10
13.37
12.83
12.72
12.60
Time (min)
Intensity (×10^5)


DB-WAX
12.28
12.10
11.53
11.22
10.78
10.65
10.41
10.03
9.93
9.78
9.63
9.58
9.54
9.47
9.28
8.99
8.63
8.57
8.43
8.07
7.60
7.13
4.26
4.08
3.96
3.79
3.76
3.29
3.26
3.17
2.94
2.86
2.77
2.57
2.27
2.08
1.69
1.42
1.43
1.36
Time (min)
Intensity (×10^5)
18.30
16.48
15.50
14.83
14.48
13.65
13.33
12.78
12.70
Time (min)
Intensity (×10^5)

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Toluene	1.10	757	tr	1.43	1002	tr
α-Thujene	2.91	924	0.02	1.42	1000	0.01
α-Pinene	2.98	929	0.22	1.36	992	0.21
Camphene	3.16	942	tr	1.69	1027	0.01
β-Pinene	3.58*	969	0.26	2.08	1066	0.13
Sabinene	3.58*	969	[0.26]	2.27	1084	0.12
Myrcene	3.92	992	1.81	2.86	1134	1.76
α-Phellandrene	4.05	1000	0.80	2.77	1126	0.73
Δ3-Carene	4.13	1006	0.17	2.57	1110	0.16
α-Terpinene	4.24	1013	0.03	2.94	1140	0.03
para-Cymene	4.36	1020	0.27	4.08	1226	0.27
1,8-Cineole	4.45*	1026	2.13	3.29	1167	1.38
β-Phellandrene	4.45*	1026	[2.13]	3.26	1165	0.03
Limonene	4.45*	1026	[2.13]	3.17	1157	0.69
(*Z*)-β-Ocimene	4.65	1039	0.01	3.76	1203	0.01
(*E*)-β-Ocimene	4.81	1048	0.06	3.96	1218	0.12
γ-Terpinene	4.92	1055	0.04	3.79	1205	0.04
Terpinolene	5.38*	1084	0.28	4.26	1240	0.28
para-Cymenene	5.38*	1084	[0.28]			
Linalool	5.66	1102	0.38	8.07	1517	0.38
Terpinen-4-ol	6.78	1173	0.32	8.57	1556	0.31
para-Cymen-8-ol	6.97	1185	0.01	11.53	1799	0.02
α-Terpineol	7.01	1188	0.05	9.78	1652	0.06
Methylchavicol	7.10	1194	0.03	9.28*	1611	1.08
Chavicol	8.23	1268	0.01	16.48	2270	0.82
Eugenol	9.64	1365	74.66	14.83	2104	74.66
α-Copaene	9.70	1369	0.47	7.13	1446	0.34
β-Elemene	9.96	1387	0.40	8.42*	1544	6.43
α-Gurjunene	10.21*	1405	6.74	7.60	1481	0.02
Methyleugenol	10.21*	1405	[6.74]	13.33	1960	6.71
β-Caryophyllene	10.29	1411	6.17	8.42*	1544	[6.43]
β-Copaene	10.40	1419	0.03	8.42*	1544	[6.43]
Aromadendrene	10.53	1429	0.01	8.63	1560	0.01
trans-α-Bergamotene	10.57	1432	0.01	8.42*	1544	[6.43]
α-Humulene	10.73	1444	1.07	9.28*	1611	[1.08]
allo-Aromadendrene	10.82	1451	0.03	8.99	1588	0.02
Selina-4,11-diene	11.07	1469	0.03	9.47	1627	0.02
γ-Muurolene	11.11	1472	0.02	9.54	1632	0.01
α-Amorphene	11.16	1476	0.01	9.58	1636	0.04
α-Selinene	11.30*	1486	0.03	9.93	1664	0.02
Viridiflorene	11.30*	1486	[0.03]	9.63	1640	0.01
α-Muurolene	11.45	1497	0.01	10.02	1672	0.03
γ-Cadinene	11.56	1506	0.11	10.41*	1704	0.76
trans-Calamenene	11.69*	1516	0.79	11.22	1772	0.06

δ-Cadinene	11.69*	1516	[0.79]	10.41*	1704	[0.76]
trans-Cadina-1,4-diene	11.79	1524	0.02	10.65	1724	0.01
α-Cadinene	11.86	1529	0.01	10.78	1735	0.01
α-Calacorene	11.91	1533	0.02	12.10	1849	0.01
Unknown [m/z 180, 93 (77), 55 (67), 125 (66), 208 (62), 65 (43)...]	12.09	1548	0.02			
Unknown [m/z 138, 96 (100), 95 (85), 109 (74), 110 (60), 105 (57)... 220 (10)]	12.18	1555	0.05	12.28	1865	0.02
Caryophyllene oxide	12.39*	1571	0.18	12.78	1910	0.15
Caryophyllene oxide isomer	12.39*	1571	[0.18]	12.70	1903	0.05
Globulol	12.43	1574	0.01			
Cubeban-11-ol	12.60	1587	0.01	13.65	1990	0.01
Methoxyeugenol	12.72	1597	0.03	18.30	2468	0.02
Unknown [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61), 71 (59), 207 (56)... 222 (3)]	12.83	1606	0.02	14.48	2069	0.01
α-Cadinol	13.37	1651	0.01	15.50	2170	0.01
Total identified		**97.79%**			**98.10%**	
Total reported		**97.88%**			**98.14%**	

*: Two or more compounds are coeluting on this column
[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
R.T.: Retention time (minutes)
R.I.: Retention index