Date : June 06, 2022

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 22E30-PTH02
Customer identification : Allspice - A10107R
Type : Essential oil
Source : *Pimenta dioica*
Customer : Plant Therapy

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 : Sylvain Mercier, M. Sc., Chimiste 2014-005
Analysis date : June 02, 2022

Checked and 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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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PHYSICOCHEMICAL DATA

Physical aspect: Light brown liquid
Refractive index: 1.5326 ± 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
α-Thujene	0.02	Monoterpene
α-Pinene	0.19	Monoterpene
Camphene	0.01	Monoterpene
β-Pinene	0.14	Monoterpene
Sabinene	0.10	Monoterpene
Octen-3-ol	0.06	Aliphatic alcohol
Octan-3-one	0.07	Aliphatic ketone
Myrcene	1.66	Monoterpene
α-Phellandrene	0.65	Monoterpene
Δ3-Carene	0.15	Monoterpene
α-Terpinene	0.02	Monoterpene
para-Cymene	0.34	Monoterpene
Limonene	0.74	Monoterpene
1,8-Cineole	1.45	Monoterpenic ether
(*Z*)-β-Ocimene	0.01	Monoterpene
(*E*)-β-Ocimene	0.04	Monoterpene
γ-Terpinene	0.04	Monoterpene
trans-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
para-Cymenene	0.01	Monoterpene
Terpinolene	0.24	Monoterpene
Linalool	0.35	Monoterpenic alcohol
Ethyl benzoate	0.01	Phenolic ester
Terpinen-4-ol	0.32	Monoterpenic alcohol
para-Cymen-8-ol	0.02	Monoterpenic alcohol
α-Terpineol	0.04	Monoterpenic alcohol
Methylchavicol	0.03	Phenylpropanoid
Chavicol	0.78	Phenylpropanoid
Chavicyl acetate	0.02	Phenylpropanoid ester
Eugenol	75.27	Phenylpropanoid
Dihydroeugenol	0.13	Phenylpropanoid
α-Copaene	0.31	Sesquiterpene
β-Elemene	0.34	Sesquiterpene
α-Gurjunene	0.01	Sesquiterpene
Methyleugenol	6.79	Phenylpropanoid
β-Caryophyllene	6.15	Sesquiterpene
β-Copaene	0.02	Sesquiterpene
α-Humulene	1.06	Sesquiterpene
allo-Aromadendrene	0.02	Sesquiterpene
Selina-4,11-diene	0.03	Sesquiterpene
γ-Muurolene	0.04	Sesquiterpene
β-Selinene	0.02	Sesquiterpene
α-Selinene	0.02	Sesquiterpene
Viridiflorene	0.01	Sesquiterpene
α-Muurolene	0.04	Sesquiterpene
γ-Cadinene	0.04	Sesquiterpene

(3*E*,6*E*)-α-Farnesene	0.04	Sesquiterpene
trans-Calamenene	0.03	Sesquiterpene
δ-Cadinene	0.73	Sesquiterpene
trans-Cadina-1,4-diene	0.01	Sesquiterpene
α-Calacorene	0.02	Sesquiterpene
Unknown	0.05	Unknown
Unknown	0.01	Oxygenated sesquiterpene
Caryophyllene oxide	0.08	Sesquiterpenic ether
Caryophyllene oxide isomer	0.01	Sesquiterpenic ether
Methoxyeugenol	0.03	Phenylpropanoid
Caryophylladienol II	0.01	Sesquiterpenic alcohol
τ-Cadinol	0.03	Sesquiterpenic alcohol
α-Muurolol	0.01	Sesquiterpenic alcohol
α-Cadinol	0.01	Sesquiterpenic alcohol
Selin-11-en-4α-ol	0.02	Sesquiterpenic alcohol
(*E*)-Coniferyl alcohol	0.03	Phenylpropanoid
(*E*)-Coniferaldehyde	0.03	Phenylpropanoid
para-Camphorene	0.03	Diterpene
Unknown	0.01	Unknown
Unknown	0.11	Lignan
Unknown	0.03	Lignan
Consolidated total	**99.18%**	

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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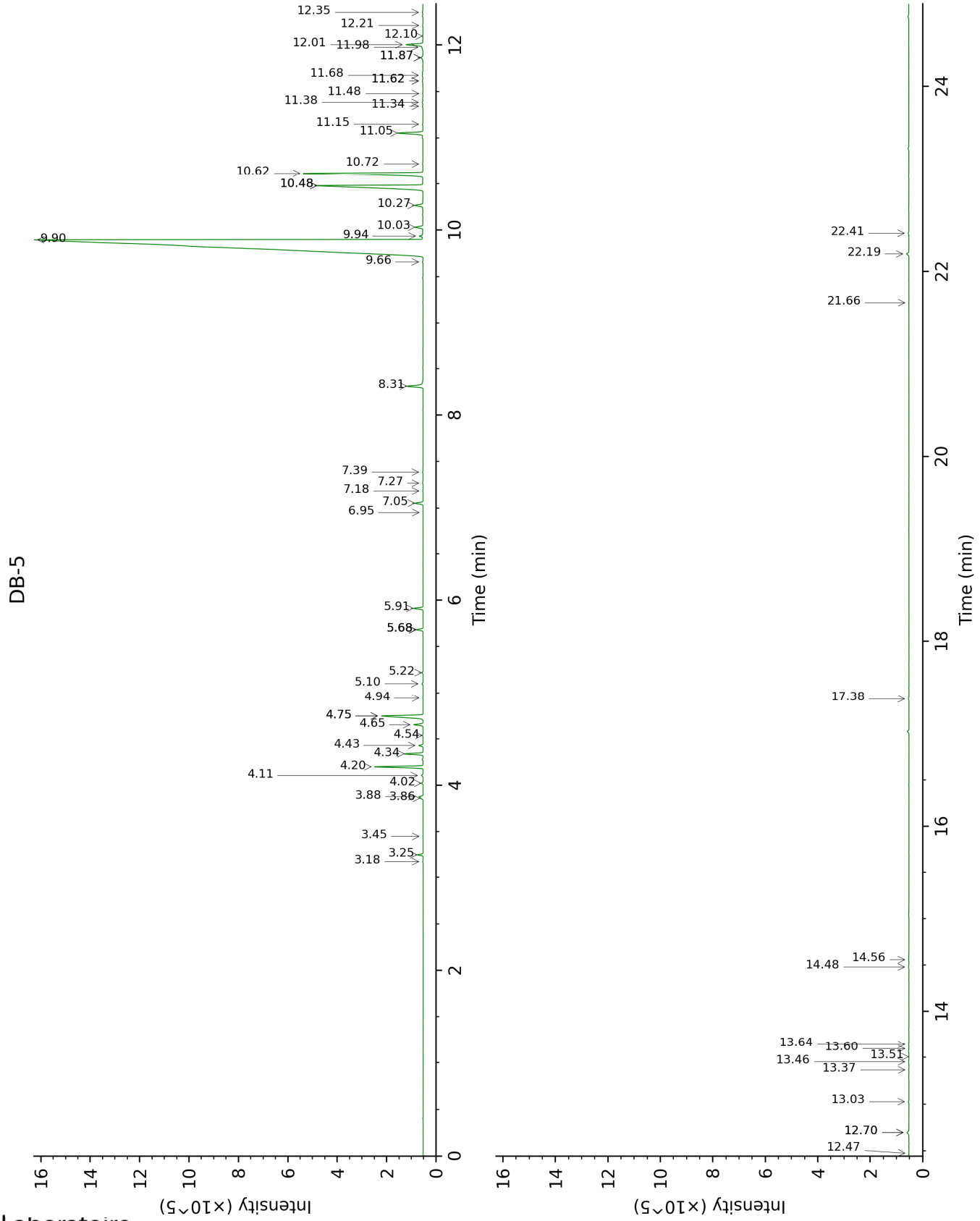
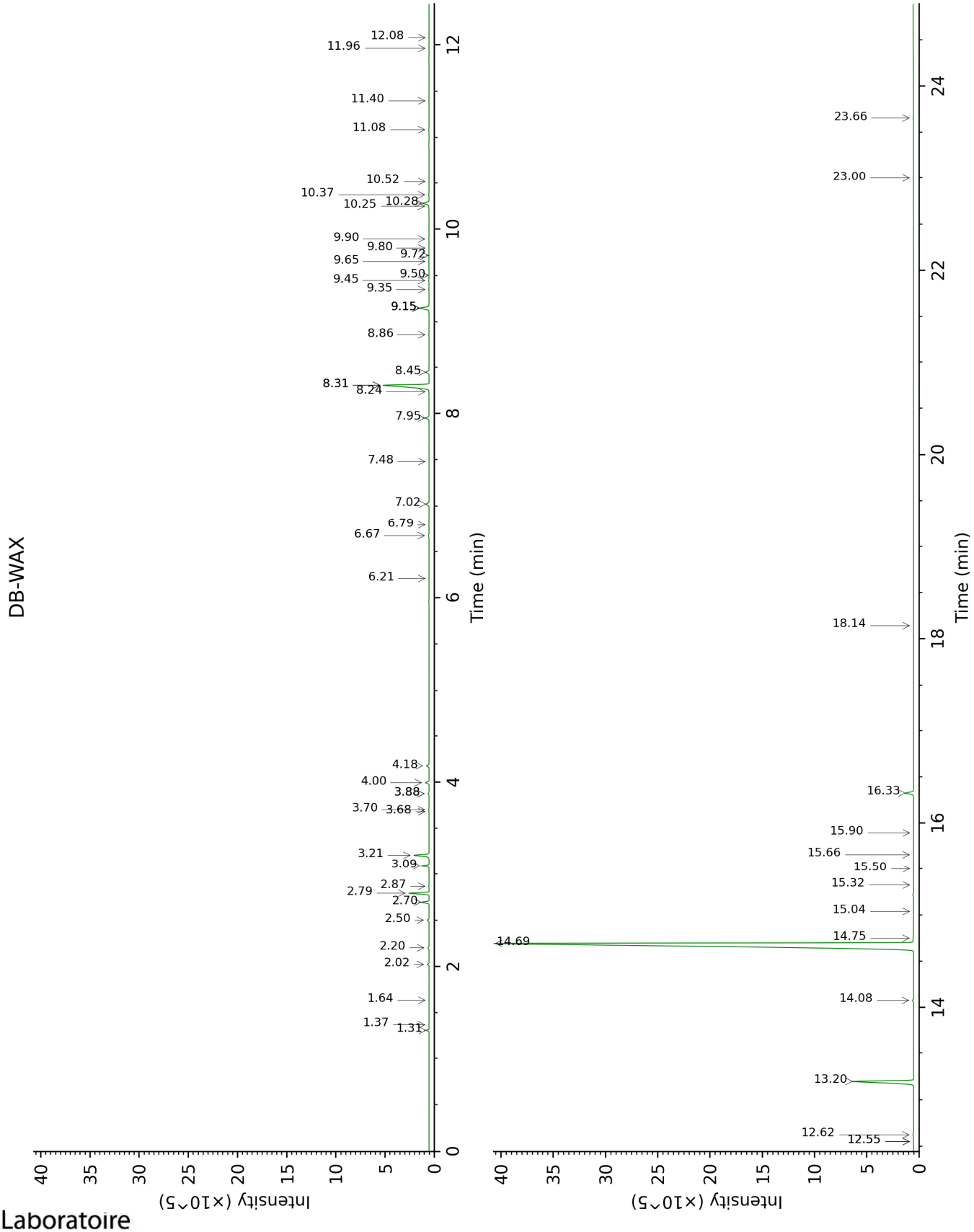

DB-5
Time (min)
Intensity (×10^5)
12.35
12.21
12.10
12.01
11.98
11.87
11.68
11.62
11.48
11.38
11.34
11.15
11.05
10.72
10.62
10.48
10.27
10.03
9.94
9.90
9.66
8.31
7.39
7.27
7.18
7.05
6.95
5.91
5.68
5.22
5.10
4.94
4.75
4.65
4.54
4.43
4.34
4.20
4.11
4.02
3.88
3.86
3.45
3.25
3.18
22.41
22.19
21.66
17.38
14.56
14.48
13.64
13.60
13.51
13.46
13.37
13.03
12.70
12.47


DB-WAX
Intensity (×10^5)
Time (min)
12.08
11.96
11.40
11.08
10.52
10.37
10.25
10.28
9.90
9.80
9.72
9.65
9.50
9.45
9.35
9.15
8.86
8.45
8.31
8.24
7.95
7.48
7.02
6.79
6.67
6.21
4.18
4.00
3.88
3.70
3.68
3.21
3.09
2.87
2.79
2.70
2.50
2.20
2.02
1.64
1.37
1.31
23.66
23.00
18.14
16.33
15.90
15.66
15.50
15.32
15.04
14.75
14.69
14.08
13.20
12.62
12.55

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
α-Thujene	3.18	925	0.02	1.37	1001	0.02
α-Pinene	3.25	930	0.19	1.31	991	0.18
Camphene	3.45	943	0.01	1.64	1027	0.01
β-Pinene	3.86†	970	0.23	2.02	1066	0.14
Sabinene	3.88†	971	[0.23]	2.20	1084	0.10
Octen-3-ol	4.02	981	0.06	6.67	1421	0.08
Octan-3-one	4.11	986	0.07	3.88*	1219	0.10
Myrcene	4.20	992	1.66	2.79	1134	1.67
α-Phellandrene	4.34	1002	0.65	2.70	1126	0.65
Δ3-Carene	4.43	1007	0.15	2.50	1111	0.15
α-Terpinene	4.54	1014	0.02	2.87	1140	0.03
para-Cymene	4.65	1021	0.34	4.00	1228	0.34
Limonene	4.75*	1027	2.19	3.09	1158	0.74
1,8-Cineole	4.75*	1027	[2.19]	3.21	1167	1.45
(*Z*)-β-Ocimene	4.94	1040	0.01	3.68	1204	0.01
(*E*)-β-Ocimene	5.10	1049	0.04	3.88*	1219	[0.10]
γ-Terpinene	5.22	1057	0.04	3.70	1206	0.05
trans-Linalool oxide (fur.)	5.68*	1086	0.25	6.79	1430	0.01
para-Cymenene	5.68*	1086	[0.25]	6.21	1387	0.01
Terpinolene	5.68*	1086	[0.25]	4.18	1241	0.24
Linalool	5.91	1101	0.35	7.95	1517	0.35
Ethyl benzoate	6.95	1168	0.01	9.15*	1611	1.07
Terpinen-4-ol	7.05	1174	0.32	8.45	1556	0.31
para-Cymen-8-ol	7.18	1183	0.02	11.40	1799	0.02
α-Terpineol	7.27	1188	0.04	9.65	1652	0.07
Methylchavicol	7.39	1196	0.03	9.15*	1611	[1.07]
Chavicol	8.31	1258	0.78	16.33	2272	0.86
Chavicyl acetate	9.66	1347	0.02	12.55*	1902	0.04
Eugenol	9.90	1364	75.27	14.69	2104	75.31
Dihydroeugenol	9.94	1367	0.13	14.08	2045	0.12
α-Copaene	10.03	1374	0.31	7.02	1447	0.31
β-Elemene	10.27	1390	0.34	8.31*	1545	6.44
α-Gurjunene	10.48*	1406	6.79	7.48	1481	0.01
Methyleugenol	10.48*	1406	[6.79]	13.20	1962	6.79
β-Caryophyllene	10.62	1416	6.15	8.31*	1545	[6.44]
β-Copaene	10.72	1423	0.02	8.24	1540	0.01
α-Humulene	11.05	1448	1.06	9.15*	1611	[1.07]
allo-Aromadendrene	11.15	1455	0.02	8.86	1588	0.02
Selina-4,11-diene	11.34	1470	0.03	9.35	1627	0.02
γ-Muurolene	11.38	1473	0.04	9.45	1635	0.04
β-Selinene	11.48	1480	0.02	9.72	1658	0.02
α-Selinene	11.62*	1490	0.05	9.80	1664	0.02
Viridiflorene	11.62*	1490	[0.05]	9.50	1640	0.01
α-Muurolene	11.68	1495	0.04	9.90	1672	0.03
γ-Cadinene	11.87*	1509	0.11	10.25	1701	0.04

(3*E*,6*E*)-α-Farnesene	11.87*	1509	[0.11]	10.37	1711	0.04
trans-Calamenene	11.98	1518	0.03	11.08	1772	0.05
δ-Cadinene	12.01	1520	0.73	10.28	1704	0.73
trans-Cadina-1,4-diene	12.10	1527	0.01	10.52	1724	0.01
α-Calacorene	12.21	1536	0.02	11.96	1849	0.02
Unknown [m/z 180, 93 (77), 55 (67), 125 (66), 208 (62), 65 (43)...]	12.35	1547	0.05			
Unknown [m/z 138, 96 (100), 95 (85), 109 (74), 110 (60), 105 (57)... 220 (10)]	12.47	1557	0.01	12.08	1860	0.01
Caryophyllene oxide	12.70*	1574	0.11	12.62	1908	0.08
Caryophyllene oxide isomer	12.70*	1574	[0.11]	12.55*	1902	[0.04]
Methoxyeugenol	13.03	1600	0.03	18.14	2470	0.02
Caryophylladienol II	13.37	1628	0.01	15.90	2227	0.02
τ-Cadinol	13.46	1636	0.03	14.75	2110	0.04
α-Muurolol	13.51	1640	0.01	15.04	2139	0.02
α-Cadinol	13.60	1647	0.01	15.32	2168	0.01
Selin-11-en-4α-ol	13.64	1651	0.02	15.50	2186	0.01
(*E*)-Coniferyl alcohol	14.48	1721	0.03	23.66	3166	0.03
(*E*)-Coniferaldehyde	14.56	1728	0.03	23.00	3075	0.02
para-Camphorene	17.38	1984	0.03	15.66	2202	0.03
Unknown [m/z 151, 93 (44), 153 (29), 92 (21), 179 (18)... 314? (10)]	21.66	2438	0.01			
Unknown [m/z 326, 148 (67), 147 (41), 117 (30), 91 (22)...]	22.19	2500	0.11			
Unknown [m/z 326, 150 (54), 161 (42), 202 (41), 201 (28)]	22.41	2526	0.03			
Total identified		**99.01%**			**99.04%**	
Total reported		**99.21%**			**99.05%**	

*: 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

Note: no correction factor was applied
R.T.: Retention time (minutes)

R.I.: Retention index

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