

Date : September 10, 2021

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

**Internal code** : 21H27-PTH02

**Customer identification** : Allspice - Jamaica - A10106208

**Type** : Essential oil

**Source** : *Pimenta dioica*

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

**Analysis date** : September 07, 2021

Checked and approved by :

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

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*PHYSICOCHEMICAL DATA*

**Physical aspect:** Light orange liquid

**Refractive index:**  $1.5310 \pm 0.0003$  (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
$\alpha$ -Thujene	0.02	Monoterpene
$\alpha$ -Pinene	0.36	Monoterpene
Camphene	0.01	Monoterpene
$\beta$ -Pinene	0.09	Monoterpene
Sabinene	0.01	Monoterpene
Octen-3-ol	0.05	Aliphatic alcohol
Octan-3-one	0.05	Aliphatic ketone
Myrcene	1.55	Monoterpene
Pseudolimonene	0.03	Monoterpene
$\alpha$ -Phellandrene	0.44	Monoterpene
$\Delta^3$ -Carene	0.02	Monoterpene
$\alpha$ -Terpinene	0.03	Monoterpene
para-Cymene	0.79	Monoterpene
Limonene	0.36	Monoterpene
1,8-Cineole	2.13	Monoterpenic ether
(Z)- $\beta$ -Ocimene	0.14	Monoterpene
(E)- $\beta$ -Ocimene	0.28	Monoterpene
$\gamma$ -Terpinene	0.25	Monoterpene
Terpinolene	0.53	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	0.01	Monoterpenic alcohol
para-Cymenene	0.01	Monoterpene
Linalool	0.25	Monoterpenic alcohol
Ethyl benzoate	0.01	Phenolic ester
Terpinen-4-ol	0.26	Monoterpenic alcohol
para-Cymen-8-ol	0.02	Monoterpenic alcohol
$\alpha$ -Terpineol	0.53	Monoterpenic alcohol
Methylchavicol	0.02	Phenylpropanoid
Geraniol	0.01	Monoterpenic alcohol
Chavicol	0.56	Phenylpropanoid
$\alpha$ -Terpinyl acetate	0.03	Monoterpenic ester
Eugenol	71.72	Phenylpropanoid
Dihydroeugenol	0.03	Phenylpropanoid
$\alpha$ -Copaene	0.07	Sesquiterpene
$\beta$ -Elemene	0.02	Sesquiterpene
$\alpha$ -Gurjunene	0.02	Sesquiterpene
Methyleugenol	7.30	Phenylpropanoid
$\beta$ -Caryophyllene	7.48	Sesquiterpene
$\beta$ -Copaene	0.01	Sesquiterpene
Aromadendrene	0.01	Sesquiterpene
$\alpha$ -Humulene	2.28	Sesquiterpene
allo-Aromadendrene	0.03	Sesquiterpene
Selina-4,11-diene	0.02	Sesquiterpene
$\gamma$ -Murolene	0.01	Sesquiterpene
$\alpha$ -Amorphene	0.01	Sesquiterpene
$\beta$ -Selinene	0.05	Sesquiterpene

α-Selinene	tr	Sesquiterpene
Viridiflorene	0.01	Sesquiterpene
α-Muurolene	0.02	Sesquiterpene
γ-Cadinene	0.05	Sesquiterpene
<i>trans</i> -Calamenene	0.01	Sesquiterpene
δ-Cadinene	0.56	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.01	Sesquiterpene
α-Cadinene	tr	Sesquiterpene
α-Calacorene	0.01	Sesquiterpene
Unknown	0.01	Unknown
Unknown	0.01	Oxygenated sesquiterpene
Caryophyllene oxide	0.06	Sesquiterpenic ether
Caryophyllene oxide isomer	0.02	Sesquiterpenic ether
Globulol	0.02	Sesquiterpenic alcohol
Viridiflorol	0.02	Sesquiterpenic alcohol
Methoxyeugenol	0.02	Phenylpropanoid
Eudesm-5-en-11-ol	0.01	Sesquiterpenic alcohol
Unknown	tr	Oxygenated sesquiterpene
Caryophylladienol II	0.01	Sesquiterpenic alcohol
τ-Cadinol	0.01	Sesquiterpenic alcohol
α-Muurolol	0.01	Sesquiterpenic alcohol
α-Cadinol	tr	Sesquiterpenic alcohol
Selin-11-en-4α-ol	0.01	Sesquiterpenic alcohol
( <i>E</i> )-Coniferyl alcohol	0.02	Phenylpropanoid
Unknown	0.05	Unknown
meta-Camphorene	0.05	Diterpene
para-Camphorene	0.02	Diterpene
Unknown	0.08	Lignan
Unknown	0.03	Lignan
<b>Consolidated total</b>	<b>99.01%</b>	

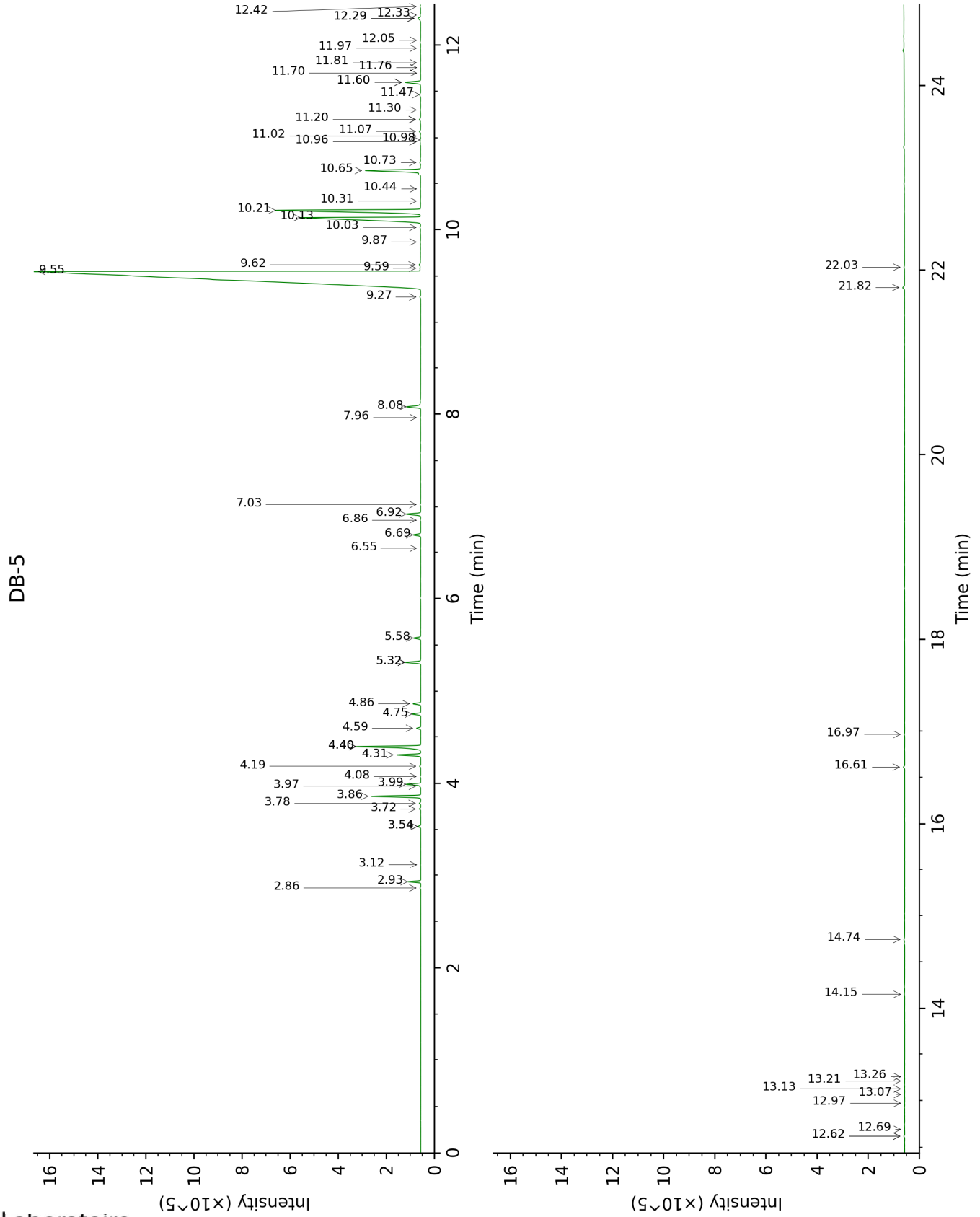
tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

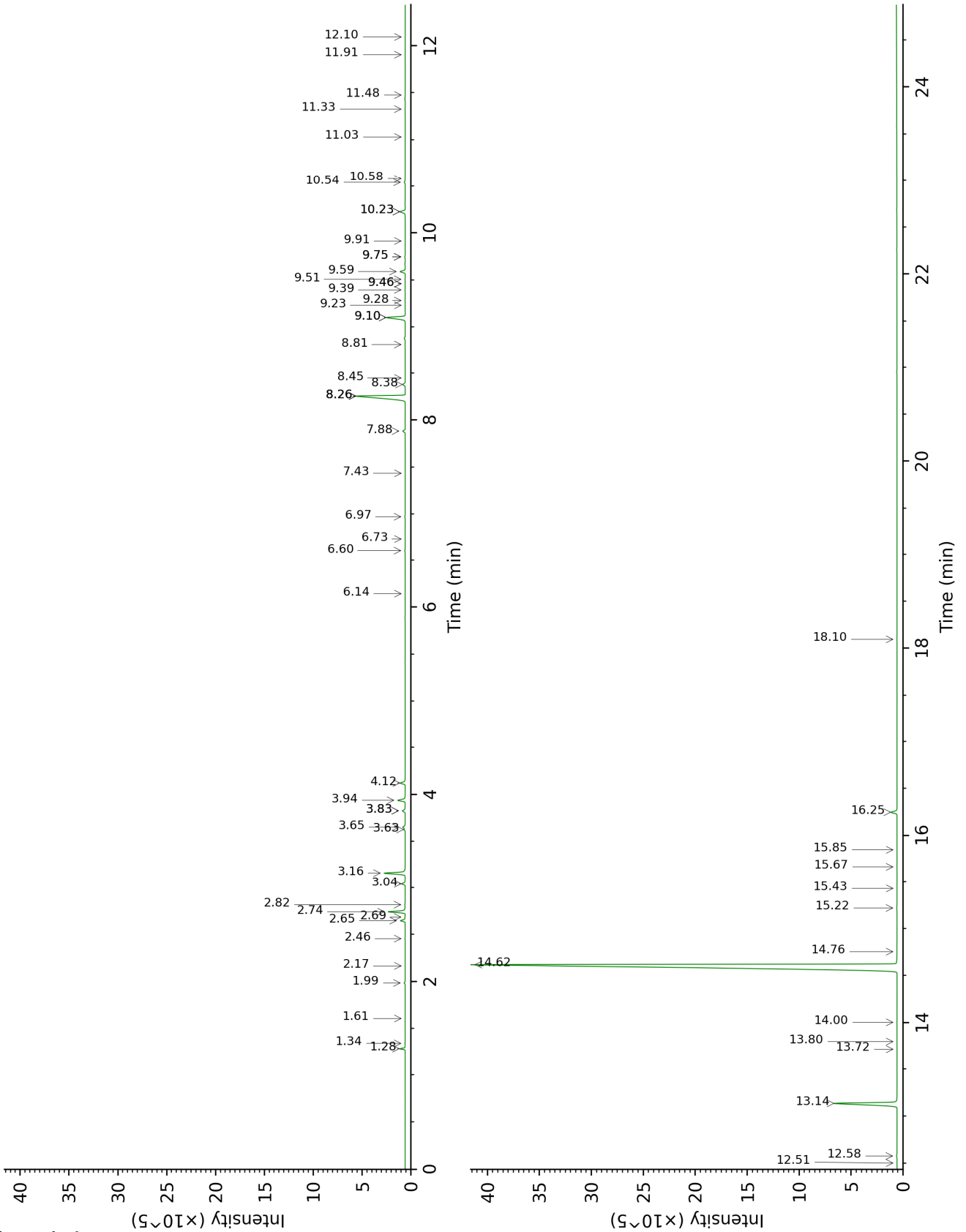
**About "consolidated" data:** The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm 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.



DB-WAX



FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
α-Thujene	2.86	926	0.02	1.34	999	0.03
α-Pinene	2.93	930	0.36	1.28	990	0.36
Camphene	3.12	943	0.01	1.61	1026	0.01
β-Pinene	3.54*	971	0.10	1.98	1064	0.09
Sabinene	3.54*	971	[0.10]	2.17	1083	0.01
Octen-3-ol	3.72	984	0.05	6.60	1418	0.05
Octan-3-one	3.78	988	0.05	3.83*	1218	0.33
Myrcene	3.86	993	1.55	2.74	1132	1.53
Pseudolimonene	3.97†	1000	0.49	2.69	1128	0.03
α-Phellandrene	3.99†	1002	[0.49]	2.65	1125	0.44
Δ <sup>3</sup> -Carene	4.08	1007	0.02	2.46	1109	0.02
α-Terpinene	4.19	1014	0.03	2.82	1138	0.05
para-Cymene	4.31	1022	0.79	3.94	1227	0.79
Limonene	4.40*	1028	2.49	3.04	1156	0.36
1,8-Cineole	4.40*	1028	[2.49]	3.16	1166	2.13
(Z)-β-Ocimene	4.60	1040	0.14	3.63	1204	0.11
(E)-β-Ocimene	4.75	1050	0.28	3.83*	1218	[0.33]
γ-Terpinene	4.86	1057	0.25	3.65	1206	0.28
Terpinolene	5.32*	1086	0.54	4.12	1241	0.53
trans-Linalool oxide (fur.)	5.32*	1086	[0.54]	6.73	1427	0.01
para-Cymenene	5.32*	1086	[0.54]	6.14	1384	0.01
Linalool	5.58	1102	0.25	7.88	1514	0.25
Ethyl benzoate	6.55	1165	0.01	9.10*	1609	2.28
Terpinen-4-ol	6.69	1174	0.26	8.38	1553	0.27
para-Cymen-8-ol	6.86	1184	0.02	11.33	1794	0.02
α-Terpineol	6.92	1189	0.53	9.59	1649	0.53
Methylchavicol	7.03	1195	0.02	9.23	1620	0.01
Geraniol	7.96	1258	0.01	11.48	1808	0.01
Chavicol	8.08	1266	0.56	16.25	2264	0.64
α-Terpinyl acetate	9.27	1348	0.03	9.51	1642	0.03
Eugenol	9.55	1368	71.72	14.62	2099	71.96
Dihydroeugenol	9.59	1370	0.03	14.00	2039	0.02
α-Copaene	9.62	1373	0.07	6.97	1445	0.05
β-Elemene	9.87	1390	0.02	8.26*	1543	7.40
α-Gurjunene	10.03	1402	0.02	7.43	1480	0.01
Methyleugenol	10.13	1409	7.30	13.14	1958	7.32
β-Caryophyllene	10.21	1415	7.48	8.26*	1543	[7.40]
β-Copaene	10.31	1422	0.01	8.26*	1543	[7.40]
Aromadendrene	10.44	1432	0.01	8.45	1558	0.01
α-Humulene	10.65	1448	2.28	9.10*	1609	[2.28]
allo- Aromadendrene	10.73	1454	0.03	8.81	1586	0.03
Selina-4,11-diene	10.96	1471	0.02	9.28	1624	0.02
γ-Murolene	10.98	1472	0.01	9.46*	1639	0.02
α-Amorphene	11.02	1476	0.01	9.40	1633	0.03
β-Selinene	11.07	1479	0.05	9.75*	1662	0.05
α-Selinene	11.20*	1489	0.06	9.75*	1662	[0.05]



Viridiflorene	11.20*	1489	[0.06]	9.46*	1639	[0.02]
α-Muurolene	11.30	1496	0.02	9.92	1676	0.01
γ-Cadinene	11.47	1509	0.05	10.23*	1701	0.62
<i>trans</i> -Calamenene	11.60*	1520	0.61	11.03	1769	0.01
δ-Cadinene	11.60*	1520	[0.61]	10.23*	1701	[0.62]
<i>trans</i> -Cadina-1,4-diene	11.70	1527	0.01	10.54	1728	0.10
α-Cadinene	11.76	1532	tr	10.58	1731	0.02
α-Calacorene	11.81	1536	0.01	11.91	1846	0.01
Unknown [m/z 180, 93 (77), 55 (67), 125 (66), 208 (62), 65 (43)...]	11.97	1548	0.01			
Unknown [m/z 138, 96 (100), 95 (85), 109 (74), 110 (60), 105 (57)... 220 (10)]	12.05	1555	0.01	12.10	1863	tr
Caryophyllene oxide	12.29*	1574	0.13	12.58	1906	0.06
Caryophyllene oxide isomer	12.29*	1574	[0.13]	12.50	1899	0.02
Globulol	12.33	1577	0.02	13.72	2012	0.01
Viridiflorol	12.42	1584	0.02	13.80	2020	0.02
Methoxyeugenol	12.62*	1600	0.03	18.10	2465	0.02
Eudesm-5-en-11-ol	12.62*	1600	[0.03]			
Unknown [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61), 71 (59), 207 (56)... 222 (3)]	12.69	1606	tr			
Caryophylladienol II	12.97	1629	0.01	15.85	2223	0.01
τ-Cadinol	13.07	1637	0.01	14.76	2113	0.04
α-Muurolol	13.13	1642	0.01			
α-Cadinol	13.21	1649	tr			
Selin-11-en-4α-ol	13.26	1652	0.01	15.43	2180	0.01
( <i>E</i> )-Coniferyl alcohol	14.15	1728	0.02			
Unknown [m/z 151, 194 (67), 138 (47), 91 (35), 77 (27), 55 (21)...]	14.74	1779	0.05			
meta-Camphorene	16.61	1950	0.05	15.22	2159	0.07
para-Camphorene	16.97	1984	0.02	15.67	2204	0.02
Unknown [m/z 326, 148 (67), 147 (41), 117 (30), 91 (22)...]	21.82	2503	0.08			

Unknown [m/z 326, 150 (54), 161 (42), 202 (41), 201 (28)]	22.03	2529	0.03	
<b>Total identified</b>		<b>99.00%</b>		<b>99.14%</b>
<b>Total reported</b>		<b>99.17%</b>		<b>99.14%</b>

\*: 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