

Date : November 27, 2018

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 18K20-PTH10-1-CC

Customer identification : Allspice - Jamaica - A1010386R

Type : Essential oil

Source : *Pimenta dioica*

Customer : Plant Therapy

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 : Lindsay Girard, B. Sc.

Analysis date : November 23, 2018

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Light yellow

Refractive index: 1.5313 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.

ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
α -Thujene	0.09	0.08	Monoterpene
α -Pinene	0.17	0.17	Monoterpene
β -Pinene	0.01	0.01	Monoterpene
Myrcene	0.12	0.12	Monoterpene
α -Phellandrene	0.46	0.45	Monoterpene
Δ^3 -Carene	0.04	0.04	Monoterpene
α -Terpinene	0.09	0.10	Monoterpene
para-Cymene	0.41	0.41	Monoterpene
Limonene	0.47*	0.11	Monoterpene
1,8-Cineole	[0.47]*	0.38*	Monoterpenic ether
β -Phellandrene	[0.47]*	[0.38]*	Monoterpene
(Z)- β -Ocimene	0.02	0.02	Monoterpene
(E)- β -Ocimene	0.40	0.39	Monoterpene
γ -Terpinene	0.22	0.21	Monoterpene
Terpinolene	0.52*	0.47	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	[0.52]*	0.02	Monoterpenic alcohol
para-Cymenene	[0.52]*	0.04	Monoterpene
Linalool	0.06	0.07	Monoterpenic alcohol
Terpinen-4-ol	0.21	0.21	Monoterpenic alcohol
para-Cymen-8-ol	0.03	0.03	Monoterpenic alcohol
α -Terpineol	0.13	0.16	Monoterpenic alcohol
Methylchavicol	0.02	0.03	Phenylpropanoid
Geraniol	0.01	0.01	Monoterpenic alcohol
Chavicol	0.05	0.08	Phenylpropanoid
Dihydroeugenol	77.84*	0.13	Phenylpropanoid
Eugenol	[77.84]*	78.11	Phenylpropanoid
α -Copaene	0.03	0.05	Sesquiterpene
β -Elemene	0.33	5.87*	Sesquiterpene
Methyleugenol	4.02*	3.83	Phenylpropanoid
α -Gurjunene	[4.02]*	0.20	Sesquiterpene
β -Caryophyllene	5.49	[5.87]*	Sesquiterpene
β -Copaene	0.04	0.02	Sesquiterpene
Aromadendrene	0.02	0.01	Sesquiterpene
<i>trans</i> - α -Bergamotene	0.10	[5.87]*	Sesquiterpene
α -Humulene	1.42	1.44	Sesquiterpene
allo-Aromadendrene	0.39	0.39	Sesquiterpene
Selina-4,11-diene	0.33	0.33	Sesquiterpene
γ -Muurolene	0.09*	0.14	Sesquiterpene
α -Amorphene	[0.09]*	0.11	Sesquiterpene
β -Selinene	0.75	0.79	Sesquiterpene
α -Selinene	1.22*	0.97	Sesquiterpene
Viridiflorene	[1.22]*	0.27	Sesquiterpene
α -Muurolene	0.11	0.12	Sesquiterpene
γ -Cadinene	0.11	0.15	Sesquiterpene
δ -Cadinene	0.44*	0.40*	Sesquiterpene
<i>trans</i> -Calamenene	[0.44]*	0.03	Sesquiterpene
Zonarene	[0.44]*	[0.40]*	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.02	0.02	Sesquiterpene

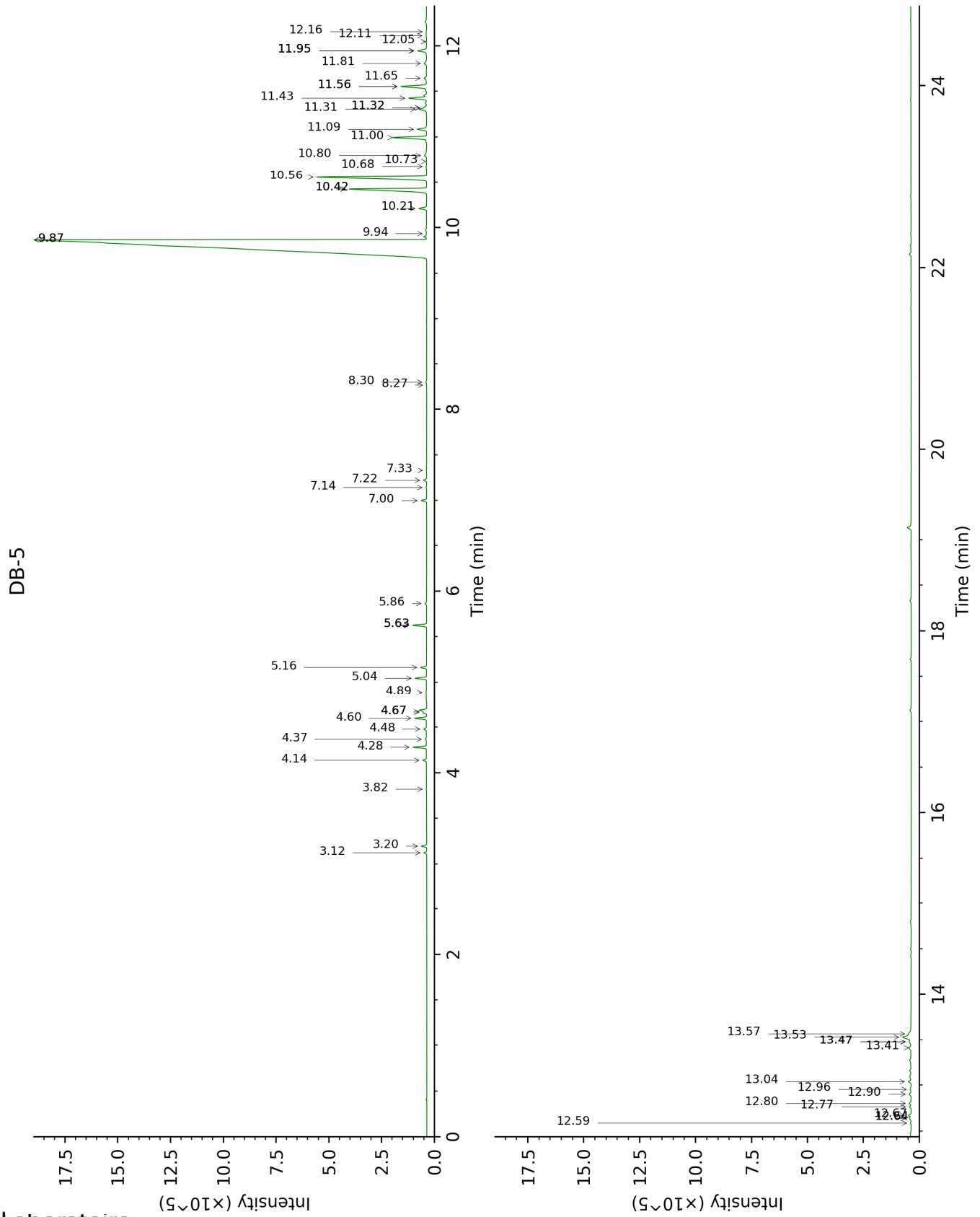
α -Cadinene	0.03	0.03	Sesquiterpene
α -Calacorene	0.03	0.03	Sesquiterpene
Spathulenol	0.02	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.08*	0.07	Sesquiterpenic ether
Caryophyllene oxide isomer	[0.08]*	0.02	Sesquiterpenic ether
Globulol	0.12	0.11	Sesquiterpenic alcohol
Viridiflorol	0.07	0.08	Sesquiterpenic alcohol
Cubeban-11-ol	0.08	0.09	Sesquiterpenic alcohol
Eudesm-5-en-11-ol	0.09	0.06	Sesquiterpenic alcohol
Methoxyeugenol	0.06	0.04	Phenylpropanoid
Unknown	0.11	0.11	Oxygenated sesquiterpene
τ -Cadinol	0.14	0.18	Sesquiterpenic alcohol
α -Muurolol	0.13*	0.04	Sesquiterpenic alcohol
τ -Muurolol	[0.13]*	0.08	Sesquiterpenic alcohol
Selin-11-en-4 α -ol	0.54	0.28	Sesquiterpenic alcohol
α -Cadinol	0.13	0.11	Sesquiterpenic alcohol
Total identified	97.80%	98.23%	

*: Two or more compounds are coeluting on this column

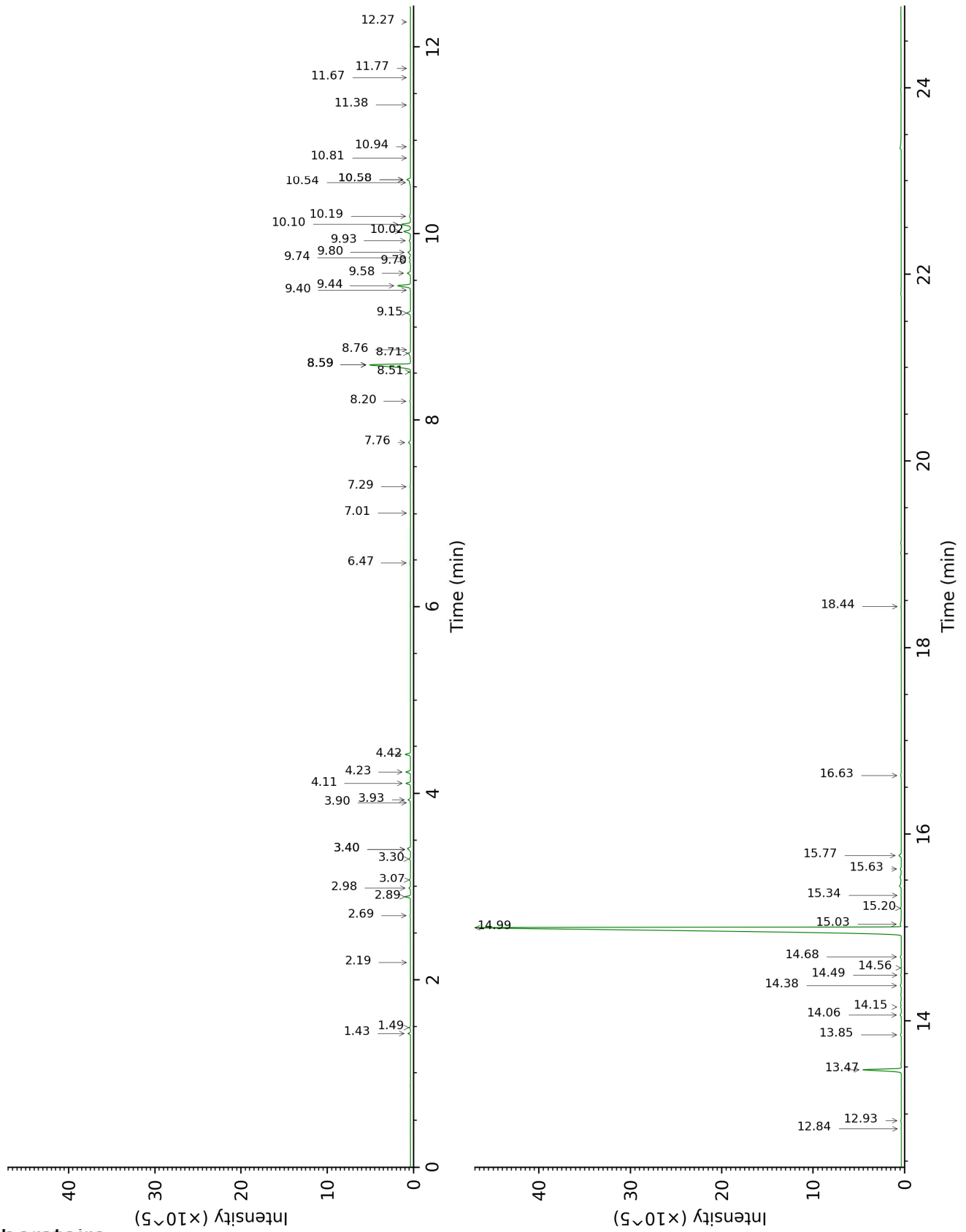
[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

Note: no correction factor was applied

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DB-WAX



FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
α -Thujene	3.12	925	0.09	1.49	1001	0.08
α -Pinene	3.20	930	0.17	1.43	992	0.17
β -Pinene	3.82	970	0.01	2.19	1066	0.01
Myrcene	4.14	991	0.12	2.98	1134	0.12
α -Phellandrene	4.28	1001	0.46	2.89	1126	0.45
Δ^3 -Carene	4.37	1006	0.04	2.69	1111	0.04
α -Terpinene	4.48	1013	0.09	3.07	1140	0.10
para-Cymene	4.60	1021	0.41	4.23	1230	0.41
Limonene	4.67*†	1025	0.47	3.30	1159	0.11
1,8-Cineole	4.67*†	1025	[0.47]	3.40*†	1167	0.38
β -Phellandrene	4.67*†	1025	[0.47]	3.40*†	1167	[0.38]
(Z)- β -Ocimene	4.89	1039	0.02	3.90	1206	0.02
(E)- β -Ocimene	5.04	1049	0.40	4.11	1221	0.39
γ -Terpinene	5.16	1056	0.22	3.93	1208	0.21
Terpinolene	5.63*	1086	0.52	4.42	1244	0.47
<i>trans</i> -Linalool oxide (fur.)	5.63*	1086	[0.52]	7.01	1428	0.02
para-Cymenene	5.63*	1086	[0.52]	6.47	1389	0.04
Linalool	5.86	1101	0.06	8.20	1518	0.07
Terpinen-4-ol	7.00	1174	0.21	8.71	1557	0.21
para-Cymen-8-ol	7.14	1184	0.03	11.67	1799	0.03
α -Terpineol	7.22	1189	0.13	9.92	1653	0.16
Methylchavicol	7.33	1196	0.02	9.40	1610	0.03
Geraniol	8.27	1259	0.01	11.77	1808	0.01
Chavicol	8.30	1262	0.05	16.63	2271	0.08
Dihydroeugenol	9.87*†	1366	77.84	14.38	2046	0.13
Eugenol	9.87*†	1366	[77.84]	14.99	2106	78.11
α -Copaene	9.94	1370	0.03	7.29	1449	0.05
β -Elemene	10.21	1390	0.33	8.59*	1548	5.87
Methyleugenol	10.42*	1405	4.02	13.47	1960	3.83
α -Gurjunene	10.42*	1405	[4.02]	7.76	1484	0.20
β -Caryophyllene	10.56	1415	5.49	8.59*	1548	[5.87]
β -Copaene	10.68	1424	0.04	8.51	1542	0.02
Aromadendrene	10.73	1429	0.02	8.76	1561	0.01
<i>trans</i> - α -Bergamotene	10.80	1434	0.10	8.59*	1548	[5.87]
α -Humulene	11.00	1448	1.42	9.44	1614	1.44
allo-Aromadendrene	11.09	1455	0.39	9.15	1591	0.39
Selina-4,11-diene	11.31	1472	0.33	9.58	1625	0.33
γ -Muuroleone	11.32*	1473	0.09	9.74	1638	0.14
α -Amorphene	11.32*	1473	[0.09]	9.70	1635	0.11
β -Selinene	11.43	1481	0.75	10.02	1661	0.79
α -Selinene	11.56*	1490	1.22	10.10	1667	0.97
Viridiflorene	11.56*	1490	[1.22]	9.80	1643	0.27
α -Muuroleone	11.65	1497	0.11	10.18	1674	0.12
γ -Cadinene	11.81	1510	0.11	10.54	1703	0.15

δ-Cadinene	11.95*	1521	0.44	10.58*	1706	0.40
<i>trans</i> -Calamenene	11.95*	1521	[0.44]	11.38	1774	0.03
Zonarene	11.95*	1521	[0.44]	10.58*	1706	[0.40]
<i>trans</i> -Cadina-1,4-diene	12.05	1529	0.02	10.82	1726	0.02
α-Cadinene	12.11	1534	0.03	10.94	1736	0.03
α-Calacorene	12.16	1537	0.03	12.27	1851	0.03
Spathulenol	12.59	1572	0.02	14.56	2064	0.02
Caryophyllene oxide	12.64*	1576	0.08	12.93	1911	0.07
Caryophyllene oxide isomer	12.64*	1576	[0.08]	12.84	1903	0.02
Globulol	12.67	1578	0.12	14.06	2016	0.11
Viridiflorol	12.76	1586	0.07	14.15	2024	0.08
Cubeban-11-ol	12.80	1588	0.08	13.85	1995	0.09
Eudesm-5-en-11-ol	12.90	1596	0.09	14.49	2056	0.06
Methoxyeugenol	12.96	1600	0.06	18.44	2469	0.04
Unknown [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61), 71 (59), 207 (56)... 222 (3)]	13.04	1607	0.11	14.68	2075	0.11
τ-Cadinol	13.41	1638	0.14	15.03	2109	0.18
α-Muurolol	13.47*	1643	0.13	15.34	2140	0.04
τ-Muurolol	13.47*	1643	[0.13]	15.20	2126	0.08
Selin-11-en-4α-ol	13.53	1648	0.54	15.77	2183	0.28
α-Cadinol	13.57	1651	0.13	15.63	2169	0.11
Total identified		97.80%			98.23%	
Total reported		97.91%			98.34%	

*: 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

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