

Date : 2025-03-25

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25C11-PTH02

Customer Identification : Yuzu - Spain - Y40106R

Type : Essential Oil

Source : *Citrus junos*

Customer : Plant Therapy

Checked and approved by:

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

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GAS CHROMATOGRAPHIC ANALYSIS

Method : PC-MAT-014 - Analysis of the composition of an essential oil or other volatile liquide by FAST GC-FID

✖ISO

Results : See analysis summary (next page)

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

Date : 2025-03-17

PHYSICOCHEMICAL DATA

Refractive index : 1.4757 ± 0.0003 (20 °C)

Method : PC-MAT-016 - Measure of the refractive index of a liquid.

Analyst : Cindy Caron B. Sc.

Date : 2025-03-12

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
α -Thujene	0.34	Monoterpene
α -Pinene	1.35	Monoterpene
α -Fenchene	tr	Monoterpene
Camphene	0.01	Monoterpene
β -Pinene	0.66	Monoterpene
Sabinene	0.13	Monoterpene
Myrcene	1.87	Monoterpene
Octanal	tr	Aliphatic aldehyde
Pseudolimonene	0.02	Monoterpene
α -Phellandrene	0.46	Monoterpene
Δ^3 -Carene	0.01	Monoterpene
α -Terpinene	0.21	Monoterpene
<i>para</i> -Cymene	0.38	Monoterpene
β -Phellandrene	2.94	Monoterpene
Limonene	77.46	Monoterpene
(<i>Z</i>)- β -Ocimene	0.01	Monoterpene
(<i>E</i>)- β -Ocimene	0.17	Monoterpene
γ -Terpinene	7.90	Monoterpene
<i>cis</i> -Sabinene hydrate	0.01	Monoterpenic alcohol
<i>para</i> -Cymenene	0.03	Monoterpene
Terpinolene	0.40	Monoterpene
Linalool	0.69	Monoterpenic alcohol
<i>trans-para</i> -Mentha-2,8-dien-1-ol	0.01	Monoterpenic alcohol
Terpinen-4-ol	0.11	Monoterpenic alcohol
α -Terpineol	0.05	Monoterpenic alcohol
Unknown	0.01	Unknown
Decanal	0.02	Aliphatic aldehyde
Thymol methyl ether	0.05	Monoterpenic ether
Carvone	0.01	Monoterpenic ketone
Ascaridole glycol isomer I	0.01	Monoterpenic alcohol
Geraniol	0.02	Monoterpenic alcohol
Geranial	0.01	Monoterpenic aldehyde
Thymol	0.08	Monoterpenic alcohol
Carvacrol	0.01	Monoterpenic alcohol
δ -Elemene	0.12	Sesquiterpene
α -Cubebene	0.02	Sesquiterpene
α -Copaene	0.04	Sesquiterpene
β -Cubebene	0.01	Sesquiterpene
β -Elemene	0.06	Sesquiterpene
Sesquithujene	0.02	Sesquiterpene

β -Caryophyllene	0.21	Sesquiterpene
γ -Elemene	0.02	Sesquiterpene
α -Humulene	0.05	Sesquiterpene
allo-Aromadendrene	0.02	Sesquiterpene
(E)- β -Farnesene	0.56	Sesquiterpene
γ -Muurolene	0.02	Sesquiterpene
Germacrene D	0.16	Sesquiterpene
β -Selinene	0.02	Sesquiterpene
Viridiflorene	0.03	Sesquiterpene
Bicyclogermacrene	0.89	Sesquiterpene
α -Muurolene	0.03	Sesquiterpene
γ -Cadinene	0.02	Sesquiterpene
Cubebol	0.01	Sesquiterpenic alcohol
δ -Cadinene	0.10	Sesquiterpene
β -Sesquiphellandrene	0.04	Sesquiterpene
Germacrene B	0.16	Sesquiterpene
Spathulenol	0.02	Sesquiterpenic alcohol
Globulol	0.01	Sesquiterpenic alcohol
Viridiflorol	0.02	Sesquiterpenic alcohol
Alismol	0.01	Sesquiterpenic alcohol
Isospathulenol	0.01	Sesquiterpenic alcohol
τ -Cadinol	0.01	Sesquiterpenic alcohol
τ -Muurolol	0.04	Sesquiterpenic alcohol
β -Eudesmol	0.02	Sesquiterpenic alcohol
α -Cadinol	0.10	Sesquiterpenic alcohol
Palmitic acid	0.07	Aliphatic acid
Linoleic acid	0.09	Aliphatic acid
Oleic acid	0.05	Aliphatic acid
cis-Vaccenic acid?	0.07	Aliphatic acid
Stearic acid	0.02	Aliphatic acid
Auraptene	0.68	Coumarin
α -Tocopherol	0.02	Tocopherol
γ -Sitosterol?	0.07	Sterol
Consolidated total	99.34	

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

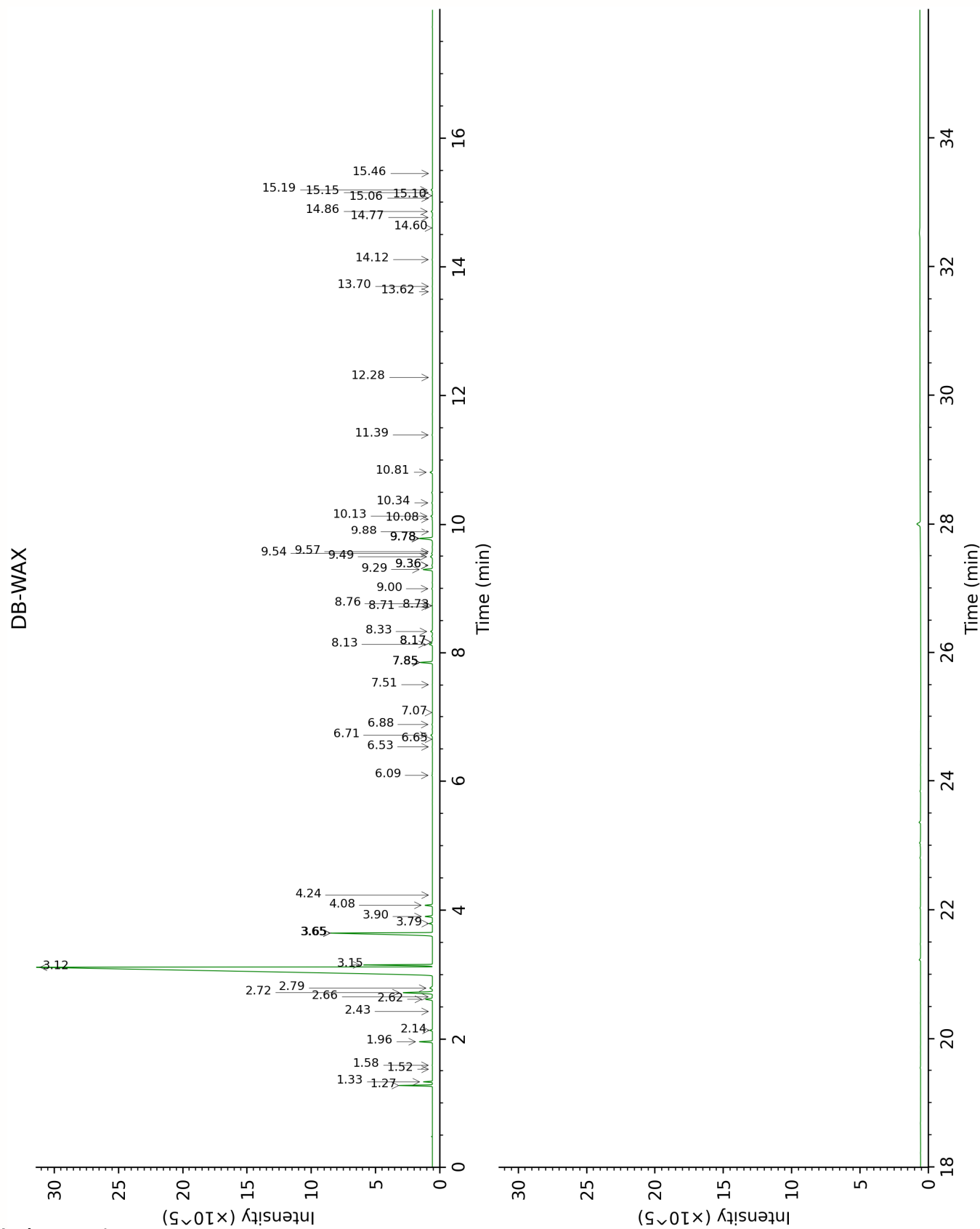
Note: no correction factor was applied

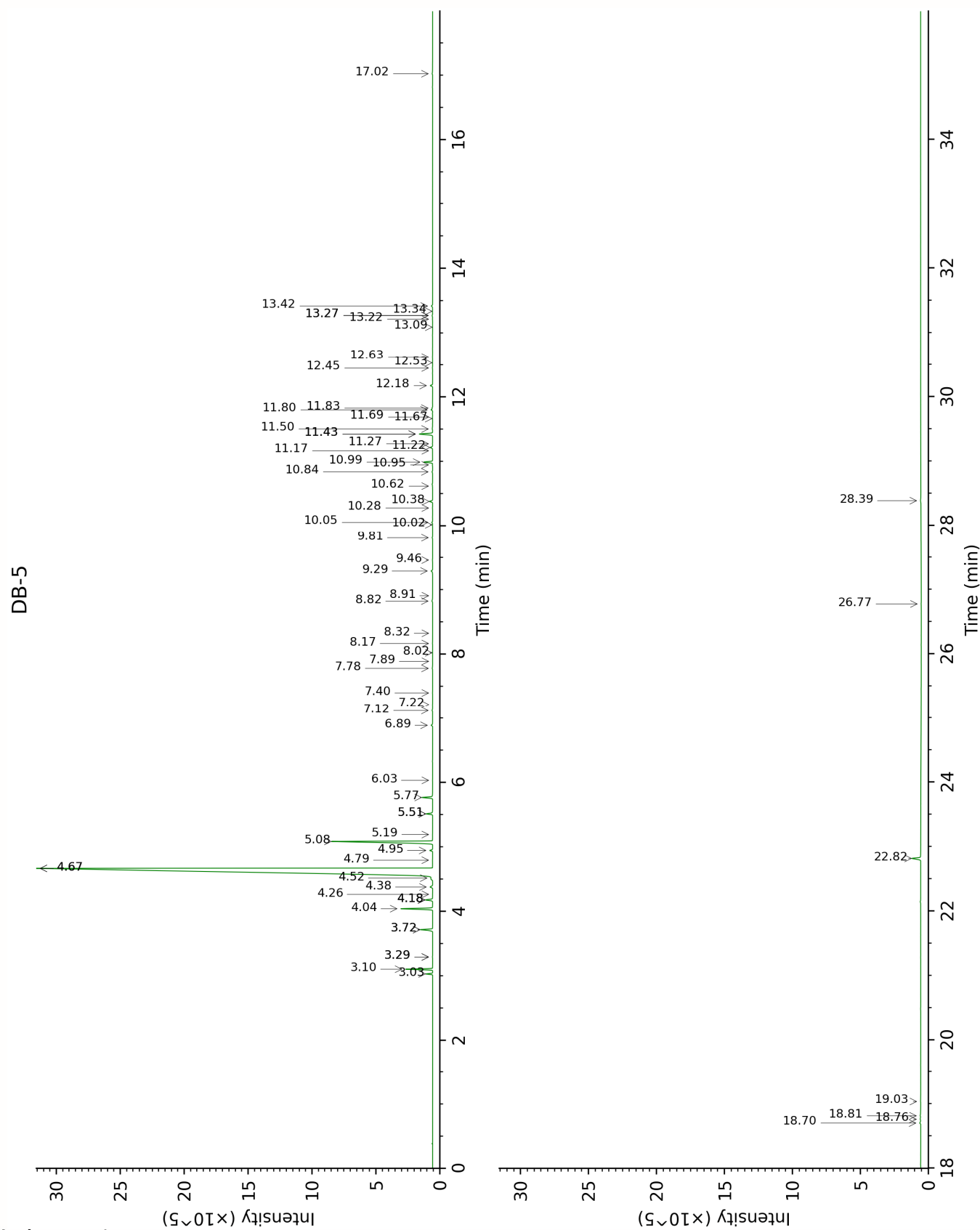
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

Bracketed value ([xx]): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

This page was intentionally left blank. The following pages present the complete data of the analysis.





FULL ANALYSIS DATA

α-Thujene	Column DB-WAX			Column DB-5		
	1.33	1000.9	0.34	3.03	926.7	0.34
α-Pinene	1.27	991.0	1.35	3.10	931.6	1.35
α-Fenchene	1.52	1021.1	tr	3.29*	944.2	[0.02]
Camphene	1.58	1027.4	0.01	3.29*	944.2	[0.02]
β-Pinene	1.96	1065.8	0.66	3.72*	972.3	[0.79]
Sabinene	2.14	1083.9	0.13	3.72*	972.3	[0.79]
Myrcene	2.72	1134.8	1.89	4.04	993.9	1.87
Octanal	4.24	1253.2	tr	4.18*	1003.0	[0.47]
Pseudolimonene	2.66	1129.6	0.02	4.18*	1003.0	[0.47]
α-Phellandrene	2.62	1126.6	0.46	4.18*	1003.0	[0.47]
Δ3-Carene	2.43	1111.4	0.01	4.26	1008.5	0.01
α-Terpinene	2.79	1140.4	0.21	4.38	1015.7	0.21
para-Cymene	3.90	1228.2	0.38	4.52*†	1024.4	[0.23]
β-Phellandrene	3.15	1169.4	2.94	4.67*†	1033.8	[80.69]
Limonene	3.12	1166.5	77.46	4.67*†	1033.8	[80.69]
(Z)-β-Ocimene	3.65*	1208.9	[7.91]	4.79	1041.8	0.01
(E)-β-Ocimene	3.79	1220.1	0.18	4.94	1051.3	0.17
γ-Terpinene	3.65*	1208.9	[7.91]	5.08	1060.0	7.90
cis-Sabinene hydrate	6.65	1428.3	0.01	5.19	1066.7	0.01
para-Cymenene	6.09	1386.9	0.03	5.51*	1086.9	[0.42]
Terpinolene	4.08	1241.3	0.40	5.51*	1086.9	[0.42]
Linalool	7.85*	1518.9	[0.72]	5.77	1102.9	0.69
trans-para-Mentha-2,8-dien-1-ol	8.72	1586.3	0.01	6.03	1119.8	0.01
Terpinen-4-ol	8.33	1556.5	0.12	6.89	1174.4	0.11
α-Terpineol	9.54	1653.3	0.06	7.12	1189.2	0.05
Unknown MISC XXXII [m/z 121, 79 (61), 93 (55), 94 (40), 91 (39), 84 (37)...]	7.85*	1518.9	[0.72]	7.22	1195.6	0.01
Decanal	7.07	1459.3	0.01	7.40	1207.2	0.02
Thymol methyl ether	8.17*	1543.5	[0.06]	7.78	1232.8	0.05
Carvone	9.78*	1672.3	[0.93]	7.89	1240.1	0.01
Ascaridole glycol isomer I				8.02	1249.1	0.01
Geraniol	11.39	1809.2	0.03	8.17	1258.7	0.02
Geranial	9.88	1680.9	0.01	8.32	1269.3	0.01
Thymol	14.86	2134.7	0.08	8.82	1302.7	0.08
Carvacrol	15.06	2155.4	0.01	8.91	1308.5	0.01
δ-Elementene	6.71	1433.0	0.11	9.29	1335.6	0.12
α-Cubebene	6.53	1419.4	0.02	9.46	1347.6	0.02

α -Copaene	6.88	1445.4	0.03	9.81	1372.1	0.04
β -Cubebene	7.51	1492.6	0.01	10.02	1386.9	0.01
β -Elemene	8.17*	1543.5	[0.06]	10.06	1389.6	0.06
Sesquithujene	7.85*	1518.9	[0.72]	10.28	1405.3	0.02
β -Caryophyllene	8.13	1540.9	0.21	10.38	1413.0	0.21
γ -Elemene	8.76	1590.1	0.02	10.62	1430.7	0.02
α -Humulene	9.00	1608.6	0.05	10.84	1447.2	0.05
allo-Aromadendrene	8.73	1587.7	0.01	10.95	1455.2	0.02
(E)- β -Farnesene	9.29	1632.9	0.58	10.99	1458.5	0.56
γ -Murolene	9.36*	1638.1	[0.04]	11.17	1471.6	0.02
Germacrene D	9.49	1649.1	0.16	11.22	1475.4	0.16
β -Selinene	9.57	1655.5	0.02	11.27	1479.6	0.02
Viridiflorene	9.36*	1638.1	[0.04]	11.43*	1490.9	[0.96]
Bicyclogermacrene	9.78*	1672.3	[0.93]	11.43*	1490.9	[0.96]
α -Murolene	9.78*	1672.3	[0.93]	11.50	1496.7	0.03
γ -Cadinene	10.08	1697.5	0.03	11.67	1509.0	0.02
Cubebol	12.28	1888.9	0.01	11.69	1510.8	0.01
δ -Cadinene	10.13	1701.5	0.11	11.80	1519.7	0.10
β -Sesquiphellandrene	10.34	1718.9	0.05	11.83	1521.8	0.04
Germacrene B	10.81	1759.5	0.17	12.18	1549.2	0.16
Spathulenol	14.12	2061.3	0.03	12.45	1570.7	0.02
Globulol	13.62	2013.3	0.02	12.53	1577.1	0.01
Viridiflorol	13.70	2021.3	0.02	12.63	1584.6	0.02
Alismol	15.46	2195.0	0.01	13.09	1621.9	0.01
Isospathulenol	15.15	2164.1	0.02	13.22	1632.1	0.01
τ -Cadinol	14.60	2109.0	0.01	13.27*	1636.8	[0.05]
τ -Murolol	14.76	2125.3	0.04	13.27*	1636.8	[0.05]
β -Eudesmol	15.10	2159.2	0.01	13.34	1642.2	0.02
α -Cadinol	15.19	2168.3	0.09	13.42	1648.9	0.10
Palmitic acid				17.02	1969.4	0.07
Linoleic acid				18.70	2135.3	0.09
Oleic acid				18.76	2141.4	0.05
cis-Vaccenic acid?				18.81	2147.0	0.07
Stearic acid				19.03	2170.0	0.02
Auraptene				22.82	2598.7	0.68
α -Tocopherol				26.77	3116.5	0.02
γ -Sitosterol?				28.39	3272.2	0.07
Total reported		98.30%			99.50%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, only the first one is 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