

Date : 2023-10-05

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 23I29-PTH02

Customer Identification : Eucalyptus Radiata - S Africa - E40108R

Type : Essential Oil

Source : *Eucalyptus radiata*

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 : 2023-10-02

PHYSICOCHEMICAL DATA

Refractive index : 1.464 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2023-09-29

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
2-Methyl-3-buten-2-ol	tr	Aliphatic alcohol
Isoamyl alcohol	tr	Aliphatic alcohol
2-Methylbutanol	tr	Aliphatic alcohol
Toluene	tr	Simple phenolic
(2E)-Hexenal	0.01	Aliphatic aldehyde
(3Z)-Hexenol	0.01	Aliphatic alcohol
2-Methylbutyl acetate	0.01	Aliphatic ester
α -Thujene	0.22	Monoterpene
α -Pinene	1.82	Monoterpene
α -Fenchene	0.01	Monoterpene
Camphene	0.02	Monoterpene
Thuja-2,4(10)-diene	tr	Monoterpene
β -Pinene	0.58	Monoterpene
Sabinene	1.11	Monoterpene
Unknown	0.01	Unknown
<i>trans-para</i> -Menthane	tr	Monoterpene
6-Methyl-5-hepten-2-one	0.02	Aliphatic ketone
<i>trans</i> -Dehydroxylinalool oxide	0.01	Monoterpenic ether
Myrcene	0.88	Monoterpene
α -Phellandrene	0.42	Monoterpene
Pseudolimonene	0.02	Monoterpene
α -Terpinene	0.24	Monoterpene
1,8-Cineole	69.80	Monoterpenic ether
Limonene	4.94	Monoterpene
<i>para</i> -Cymene	0.45	Monoterpene
(Z)- β -Ocimene	0.02	Monoterpene
(E)- β -Ocimene	0.22	Monoterpene
γ -Terpinene	0.50	Monoterpene
<i>cis</i> -Sabinene hydrate	0.03	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (fur.)	0.02	Monoterpenic alcohol
Terpinolene	0.15	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	0.02	Monoterpenic alcohol
<i>trans</i> -Sabinene hydrate	0.02	Monoterpenic alcohol
Linalool	0.40	Monoterpenic alcohol
<i>cis-para</i> -Menth-2-en-1-ol	0.15	Monoterpenic alcohol
<i>trans</i> -Pinocarveol	0.01	Monoterpenic alcohol
<i>trans-para</i> -Menth-2-en-1-ol	0.10	Monoterpenic alcohol
Isopulegol	0.03	Monoterpenic alcohol
Citronellal	0.05	Monoterpenic aldehyde
δ -Terpineol	0.19	Monoterpenic alcohol

α -Phellandren-8-ol	0.01	Monoterpenic alcohol
Isopinocampnone	0.01	Monoterpenic ketone
Terpinen-4-ol	1.64	Monoterpenic alcohol
Cryptone	0.02	Normonoterpenic ketone
α -Terpineol	10.03	Monoterpenic alcohol
<i>cis</i> -Piperitol	0.05	Monoterpenic alcohol
<i>trans</i> -Piperitol	0.07	Monoterpenic alcohol
<i>exo</i> -2-Hydroxycineole	0.02	Monoterpenic alcohol
Nerol	0.07	Monoterpenic alcohol
Citronellol	0.05	Monoterpenic alcohol
Neral	0.62	Monoterpenic aldehyde
Piperitone	0.25	Monoterpenic ketone
Geraniol	0.76	Monoterpenic alcohol
Geranial	0.90	Monoterpenic aldehyde
Unknown	0.02	Oxygenated monoterpene
Unknown	0.02	Monoterpenic alcohol
Unknown	0.02	Unknown
<i>exo</i> -2-Hydroxycineole acetate	0.01	Monoterpenic ester
α -Terpinyl acetate	1.60	Monoterpenic ester
Isoledene	0.01	Sesquiterpene
Methyl (<i>E</i>)-cinnamate	0.10	Phenylpropanoid ester
Geranyl acetate	0.03	Monoterpenic ester
Unknown	0.02	Sesquiterpene
Unknown	0.02	Unknown
β -Caryophyllene	0.07	Sesquiterpene
Aromadendrene	0.01	Sesquiterpene
α -Humulene	0.01	Sesquiterpene
allo-Aromadendrene	0.02	Sesquiterpene
Viridiflorene	0.02	Sesquiterpene
Bicyclogermacrene	0.10	Sesquiterpene
α -Elemol	0.03	Sesquiterpenic alcohol
Spathulenol	0.03	Sesquiterpenic alcohol
Globulol	0.03	Sesquiterpenic alcohol
Viridiflorol	0.02	Sesquiterpenic alcohol
Cubeban-11-ol	0.01	Sesquiterpenic alcohol
Ledol	0.02	Sesquiterpenic alcohol
γ -Eudesmol	0.03	Sesquiterpenic alcohol
Isospathulenol	0.03	Sesquiterpenic alcohol
β -Eudesmol	0.03	Sesquiterpenic alcohol
α -Eudesmol	0.03	Sesquiterpenic alcohol
Consolidated total	99.39	

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

Note: no correction factor was applied

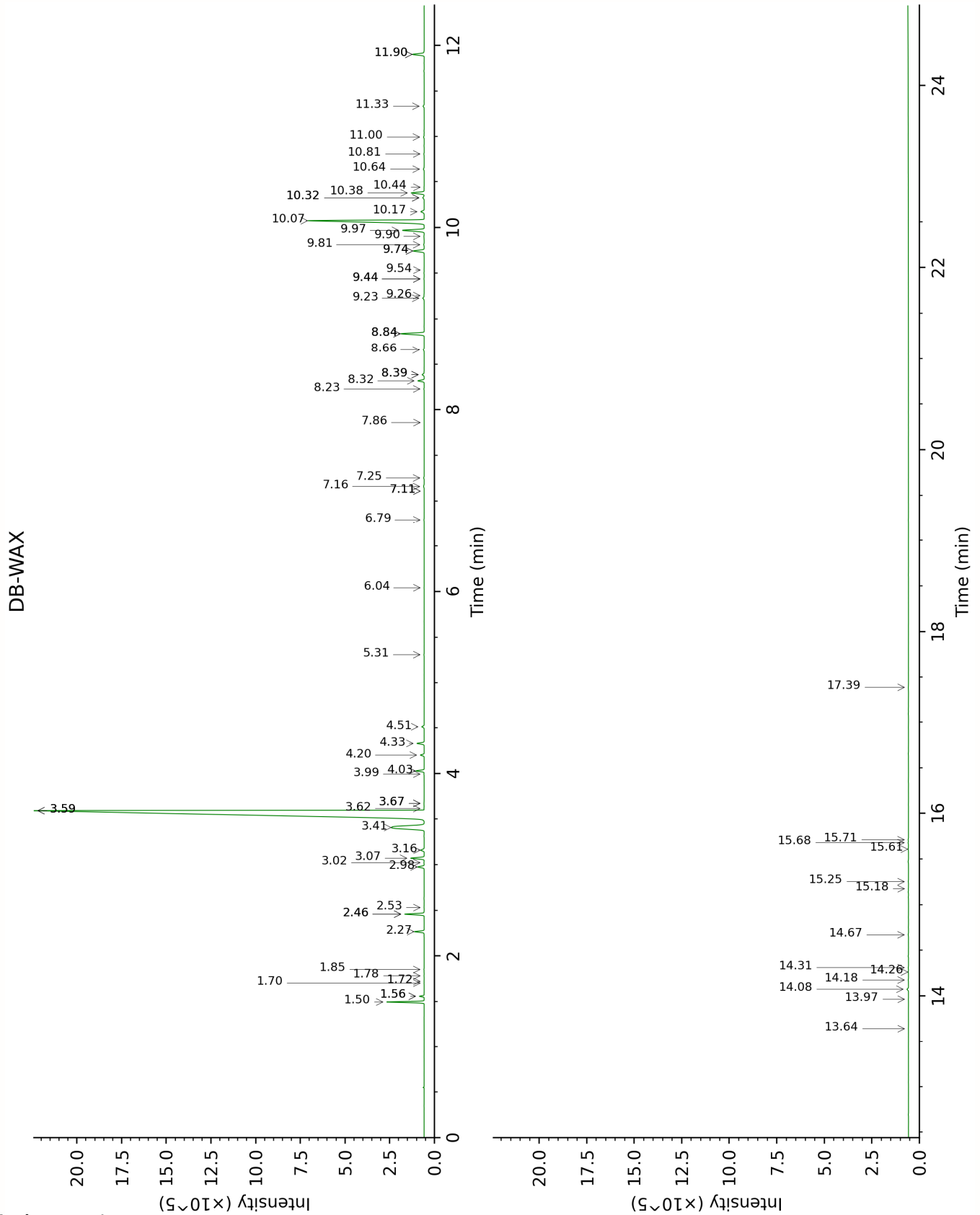
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm is set to prioritize data from the most standard DB-5 column, and smallest values so as to avoid

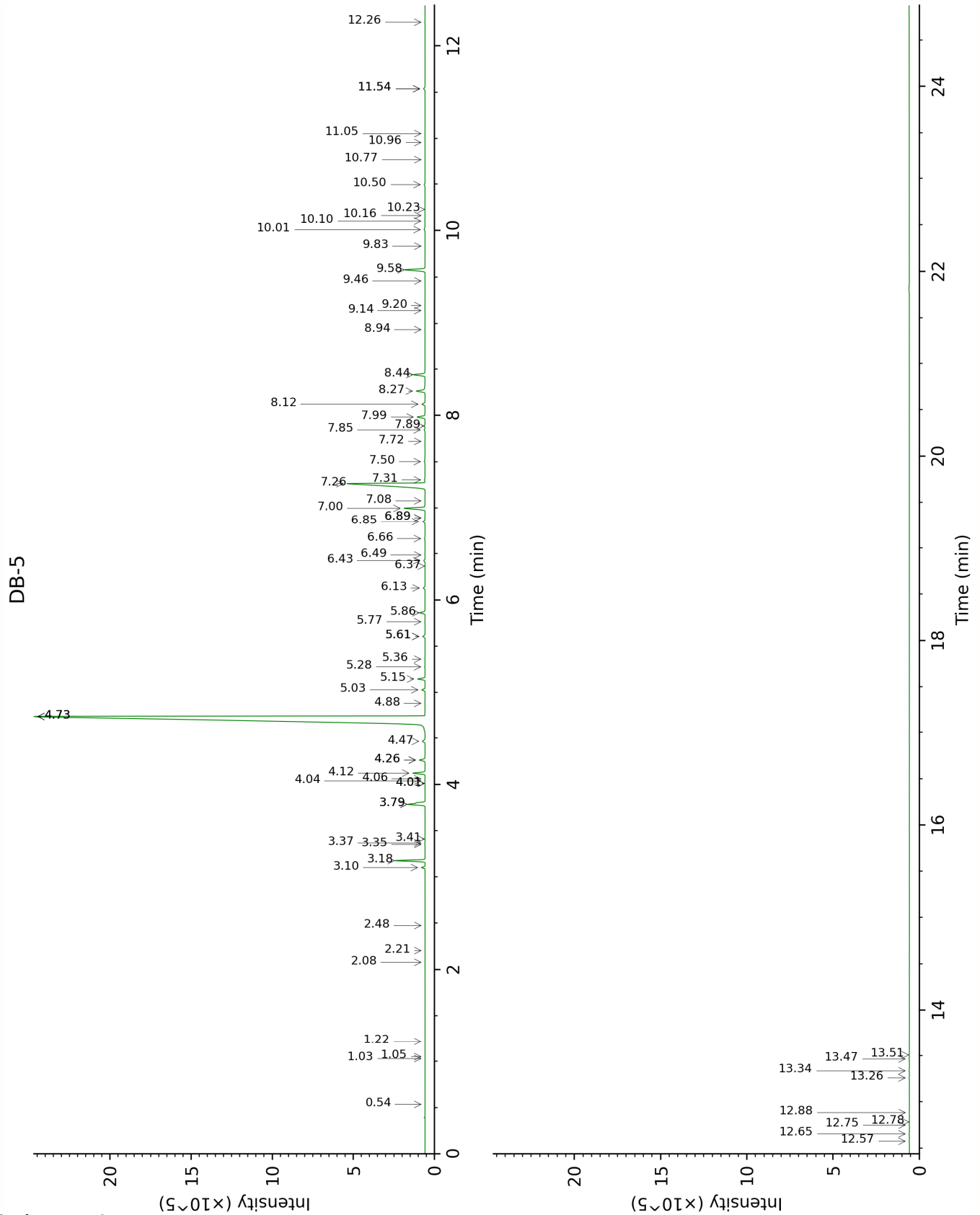
overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report to access the full untreated data and perform their own calculations if needed.

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

2-Methyl-3-buten-2-ol	Column DB-WAX			Column DB-5		
	1.70	1014.2	tr	0.54	606.4	tr
Isoamyl alcohol	3.67*	1179.4	[0.02]	1.03	733.3	tr
2-Methylbutanol	3.67*	1179.4	[0.02]	1.05	736.3	tr
Toluene	1.56*	1000.6	[0.21]	1.22	759.1	tr
(2E)-Hexenal	3.62	1175.1	0.02	2.08	848.2	0.01
(3Z)-Hexenol	6.04	1351.3	0.01	2.21	858.6	0.01
2-Methylbutyl acetate	2.53	1092.1	0.01	2.48	880.7	0.01
α-Thujene	1.56*	1000.6	[0.21]	3.10	926.7	0.22
α-Pinene	1.50	992.5	1.81	3.18	931.6	1.82
α-Fenchene	1.78	1021.7	0.01	3.35*†	943.1	[0.01]
Camphene	1.85	1028.2	0.02	3.37*†	944.1	[0.02]
Thuja-2,4(10)-diene	2.46*	1085.4	[1.12]	3.41	946.9	tr
β-Pinene	2.27	1067.3	0.58	3.79*	971.5	[1.69]
Sabinene	2.46*	1085.4	[1.12]	3.79*	971.5	[1.69]
Unknown CASA XI [m/z 67, 68 (95), 43 (73), 94 (65), 79 (54), 41 (50)...]				4.01*	986.3	[0.01]
<i>trans-para</i> -Menthane	1.72	1016.0	tr	4.01*	986.3	[0.01]
6-Methyl-5-hepten-2-one	5.31	1299.4	0.02	4.04	988.1	0.02
<i>trans</i> -Dehydroxylinalool oxide	3.59*	1173.4	[69.81]	4.06	989.6	0.01
Myrcene	3.07	1134.0	0.88	4.12	993.6	0.88
α-Phellandrene	2.98	1126.8	0.42	4.26*	1002.9	[0.43]
Pseudolimonene	3.02	1130.4	0.02	4.26*	1002.9	[0.43]
α-Terpinene	3.16	1140.7	0.25	4.47	1015.7	0.24
1,8-Cineole	3.59*	1173.4	[69.81]	4.73*	1032.4	[75.62]
Limonene	3.41	1159.5	4.94	4.73*	1032.4	[75.62]
<i>para</i> -Cymene	4.33	1226.9	0.45	4.73*	1032.4	[75.62]
(Z)-β-Ocimene	3.99	1203.2	0.02	4.88	1041.2	0.02
(E)-β-Ocimene	4.20	1217.9	0.23	5.03	1050.8	0.22
γ-Terpinene	4.03	1205.7	0.51	5.15	1058.1	0.50
<i>cis</i> -Sabinene hydrate	7.16	1431.5	0.06	5.28	1066.3	0.03
<i>cis</i> -Linalool oxide (fur.)	6.79	1404.6	0.02	5.36	1071.5	0.02
Terpinolene	4.51	1239.8	0.15	5.61*	1086.8	[0.18]
<i>trans</i> -Linalool	7.11*	1427.9	[0.01]	5.61*	1086.8	[0.18]

oxide (fur.)						
<i>trans</i> -Sabinene hydrate	8.23	1510.5	0.03	5.77	1096.7	0.02
Linalool	8.32	1517.4	0.40	5.86	1102.7	0.40
<i>cis-para</i> -Menth-2-en-1-ol	8.39*	1522.5	[0.15]	6.13	1119.7	0.15
<i>trans</i> -Pinocarveol	9.44*	1603.6	[0.02]	6.37	1134.8	0.01
<i>trans-para</i> -Menth-2-en-1-ol	9.23	1587.0	0.11	6.43	1138.5	0.10
Isopulegol	8.39*	1522.5	[0.15]	6.49	1142.4	0.03
Citronellal	7.25	1438.4	0.04	6.66	1153.7	0.05
δ-Terpineol	9.74*	1628.1	[0.79]	6.85	1165.6	0.19
α-Phellandren-8-ol	10.44	1683.8	0.01	6.89*	1168.3	[0.03]
Isopinocampone	7.86	1482.9	0.01	6.89*	1168.3	[0.03]
Terpinen-4-ol	8.84*	1557.3	[1.62]	7.00	1175.0	1.64
Cryptone	9.44*	1603.6	[0.02]	7.08	1180.1	0.02
α-Terpineol	10.07	1654.5	10.02	7.26	1191.9	10.03
<i>cis</i> -Piperitol	9.81	1633.5	0.04	7.31	1194.5	0.05
<i>trans</i> -Piperitol	10.64	1700.7	0.07	7.50	1207.2	0.07
<i>exo</i> -2-Hydroxycineole	11.90*	1806.9	[0.85]	7.72	1221.8	0.02
Nerol	11.33	1758.5	0.09	7.85	1230.1	0.07
Citronellol	11.00	1730.2	0.05	7.89	1232.9	0.05
Neral	9.74*	1628.1	[0.79]	7.98	1239.4	0.62
Piperitone	10.17	1662.4	0.26	8.12	1248.6	0.25
Geraniol	11.90*	1806.9	[0.85]	8.26	1258.0	0.76
Geranial	10.38	1678.9	0.90	8.44	1269.9	0.90
Unknown RODA I [m/z 59, 94 (99), 79 (68), 43 (32), 97 (17)... 137 (8)...]				8.94	1302.8	0.02
Unknown MEAL I [m/z 97, 112 (92), 83 (62), 43 (44), 41 (25)... 170? (4)]	15.25	2116.9	0.02	9.14	1317.1	0.02
Unknown PRME VII [m/z 69, 41 (58), 114 (29), 43 (25), 83 (24), 123 (20)...]				9.20	1320.9	0.02
<i>exo</i> -2-Hydroxycineole acetate	10.32*	1674.6	[0.12]	9.46	1339.5	0.01
α-Terpinyl acetate	9.97	1646.1	1.59	9.58	1348.0	1.60
Isoledene	7.11*	1427.9	[0.01]	9.83	1365.9	0.01
Methyl (E)-	14.08	2003.1	0.11	10.01	1378.4	0.10

cinnamate						
Geranyl acetate	10.81	1714.7	0.03	10.10	1384.9	0.03
Unknown EUGL IV [m/z 93, 122 (98), 161 (98), 107 (86), 95 (46), 105 (72)... 204 (34)]				10.16	1389.1	0.02
Unknown CALU VIII [m/z 71, 100 (92), 111 (79), 69 (46), 109 (45)...]	17.39	2337.6	0.03	10.23	1393.7	0.02
β-Caryophyllene	8.66	1543.6	0.07	10.50	1412.9	0.07
Aromadendrene	8.84*	1557.3	[1.62]	10.77	1433.5	0.01
α-Humulene	9.54	1611.3	0.01	10.96	1447.2	0.01
allo- Aromadendrene	9.26	1589.2	0.02	11.05	1454.4	0.02
Viridiflorene	9.90	1640.9	0.02	11.54*	1490.4	[0.13]
Bicyclogermacrene	10.32*	1674.6	[0.12]	11.54*	1490.4	[0.13]
α-Elemol	14.31	2025.7	0.02	12.26	1545.9	0.03
Spathulenol	14.67	2060.0	0.03	12.58	1570.8	0.03
Globulol	14.18	2012.7	0.02	12.66	1577.1	0.03
Viridiflorol	14.26	2021.1	0.02	12.75	1584.6	0.02
Cubeban-11-ol	13.97	1992.6	0.01	12.78	1587.2	0.01
Ledol	13.64	1962.8	0.01	12.88	1595.1	0.02
γ-Eudesmol	15.18	2109.2	0.02	13.26	1625.6	0.03
Isospathulenol	15.71	2162.7	0.03	13.34	1631.9	0.03
β-Eudesmol	15.68	2159.5	0.03	13.47	1642.5	0.03
α-Eudesmol	15.61	2152.4	0.03	13.51	1646.1	0.03
Total reported		99.32%			99.81%	

*: 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