

Date : 2024-08-29

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24H16-PTH06

Customer Identification : Organic Cypress - Spain - CB9109R

Type : Essential Oil

Source : *Cupressus sempervirens*

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

Date : 2024-08-29

PHYSICOCHEMICAL DATA

Refractive index : 1.4718 ± 0.0003 (20 °C)

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

Analyst : Cassandra Baker

Date : 2024-08-19

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
Toluene	0.01	Simple phenolic
Unknown	tr	Alkene
Cyclofenchene	0.01	Monoterpene
Santene	tr	Normonoterpene
Bornylene	0.05	Monoterpene
Tricyclene	0.19	Monoterpene
α -Thujene	0.65	Monoterpene
α -Pinene	52.10	Monoterpene
Camphene	0.28	Monoterpene
α -Fenchene	0.62	Monoterpene
Thuja-2,4(10)-diene	0.04	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.10	Monoterpene
β -Pinene	0.97	Monoterpene
Sabinene	0.85	Monoterpene
Pseudolimonene isomer	0.01	Monoterpene
Myrcene	2.32	Monoterpene
2-Carene	0.02	Monoterpene
α -Phellandrene	0.14	Monoterpene
Δ^3 -Carene	20.89	Monoterpene
1,4-Cineole	0.01	Monoterpenic ether
α -Terpinene	0.44	Monoterpene
<i>meta</i> -Cymene	0.04	Monoterpene
<i>para</i> -Cymene	0.36	Monoterpene
Sylvestrene	0.16	Monoterpene
Limonene	2.33	Monoterpene
β -Phellandrene	0.55	Monoterpene
(<i>Z</i>)- β -Ocimene	0.01	Monoterpene
(<i>E</i>)- β -Ocimene	0.03	Monoterpene
Unknown	0.04	Monoterpene
γ -Terpinene	0.80	Monoterpene
<i>cis</i> -Sabinene hydrate	0.01	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
<i>cis</i> -Linalool oxide (fur.)	0.01	Monoterpenic alcohol
<i>meta</i> -Cymenene	0.01	Monoterpene
Isoterpinolene	0.11	Monoterpene
Terpinolene	3.16	Monoterpene
α -Pinene oxide	0.02	Monoterpenic ether
<i>trans</i> -Sabinene hydrate	0.01	Monoterpenic alcohol
Linalool	0.30	Monoterpenic alcohol
endo-Fenchol	0.03	Monoterpenic alcohol

<i>cis-para</i> -Menth-2-en-1-ol	0.03	Monoterpenic alcohol
4-Hydroxy-4-methylcyclohex-2-enone	0.02	Aliphatic alcohol
<i>trans</i> -Pinocarveol	0.04	Monoterpenic alcohol
Camphor	0.04	Monoterpenic ketone
<i>trans-para</i> -Menth-2-en-1-ol	0.02	Monoterpenic alcohol
Camphene hydrate	0.02	Monoterpenic alcohol
Epoxyterpinolene	0.03	Monoterpenic ether
<i>meta</i> -Mentha-4,6-dien-8-ol	0.02	Monoterpenic alcohol
Karahanaenone	0.19	Monoterpenic ketone
Borneol	0.04	Monoterpenic alcohol
α -Phellandren-8-ol	0.02	Monoterpenic alcohol
Umbellulone	0.11	Monoterpenic ketone
Terpinen-4-ol	1.17	Monoterpenic alcohol
<i>meta</i> -Cymen-8-ol	0.02	Monoterpenic alcohol
<i>para</i> -Cymen-8-ol	0.05	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Myrtenal	0.02	Monoterpenic aldehyde
α -Terpineol	0.34	Monoterpenic alcohol
Myrtenol	0.02	Monoterpenic alcohol
Unknown	0.04	Oxygenated monoterpene
Verbenone	0.02	Monoterpenic ketone
<i>trans</i> -Carveol	0.02	Monoterpenic alcohol
<i>cis</i> -Carveol	0.01	Monoterpenic alcohol
Unknown	0.03	Oxygenated monoterpene
Carvacrol methyl ether	0.03	Monoterpenic ether
Car-3-en-2-one	0.02	Monoterpenic ketone
Linalyl acetate	0.07	Monoterpenic ester
(<i>trans</i> ?)-Linalool oxide acetate (fur.)?	0.04	Monoterpenic ester
Unknown	0.02	Oxygenated monoterpene
Bornyl acetate	0.09	Monoterpenic ester
Unknown	0.30	Monoterpenic ester
Terpinen-4-yl acetate	0.02	Monoterpenic ester
Unknown	0.02	Oxygenated monoterpene
Unknown	0.01	Unknown
Unknown	0.30	Monoterpenic ester
α -Terpinyl acetate	2.02	Monoterpenic ester
α -Cubebene	0.15	Sesquiterpene
α -Ylangene	0.03	Sesquiterpene
α -Copaene	0.07	Sesquiterpene
2-epi- α -Funebrene	0.01	Sesquiterpene
β -Bourbonene	0.03	Sesquiterpene
β -Cubebene	0.03	Sesquiterpene
α -Cedrene	0.60	Sesquiterpene
β -Caryophyllene	0.40	Sesquiterpene
β -Cedrene	0.16	Sesquiterpene

<i>cis</i> -Thujopsene	0.05	Sesquiterpene
β -Copaene	0.02	Sesquiterpene
<i>cis</i> -Muuroala-3,5-diene	0.07	Sesquiterpene
<i>trans</i> -Muuroala-3,5-diene	0.02	Sesquiterpene
α -Humulene	0.24	Sesquiterpene
<i>cis</i> -Cadina-1(6),4-diene	0.03	Sesquiterpene
<i>cis</i> -Muuroala-4(15),5-diene	0.18	Sesquiterpene
Unknown	0.02	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.05	Sesquiterpene
α -Amorphene	0.28	Sesquiterpene
Germacrene D	0.51	Sesquiterpene
<i>trans</i> -Muuroala-4(15),5-diene	0.04	Sesquiterpene
β -Alaskene	0.11	Sesquiterpene
α -Muurolene	0.23	Sesquiterpene
Epizonarene	0.02	Sesquiterpene
δ -Amorphene	0.04	Sesquiterpene
γ -Cadinene	0.15	Sesquiterpene
α -Alaskene	0.13	Sesquiterpene
<i>trans</i> -Calamenene	0.05	Sesquiterpene
δ -Cadinene	0.54	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.06	Sesquiterpene
α -Cadinene	0.04	Sesquiterpene
α -Calacorene	0.04	Sesquiterpene
Salviadienol?	0.07	Sesquiterpenic alcohol
Caryophyllene oxide	0.03	Sesquiterpenic ether
allo-Cedrol	0.04	Sesquiterpenic alcohol
α -Cedrol	1.37	Sesquiterpenic alcohol
Widdrol	0.02	Sesquiterpenic alcohol
epi-Cedrol	0.02	Sesquiterpenic alcohol
1,10-diepi-Cubenol	0.02	Sesquiterpenic alcohol
1-epi-Cubenol	0.04	Sesquiterpenic alcohol
α -Acorenol	0.01	Sesquiterpenic alcohol
τ -Cadinol	0.01	Sesquiterpenic alcohol
τ -Muurolol	0.02	Sesquiterpenic alcohol
α -Muurolol	0.02	Sesquiterpenic alcohol
α -Cadinol	0.03	Sesquiterpenic alcohol
Unknown	0.04	Unknown
Manoyl oxide	0.08	Diterpenic ether
7,13-Abietadiene	0.01	Diterpene
Unknown	0.01	Unknown
Isopimaradiene	0.02	Diterpene
Consolidated total	99.25	

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

Note: no correction factor was applied

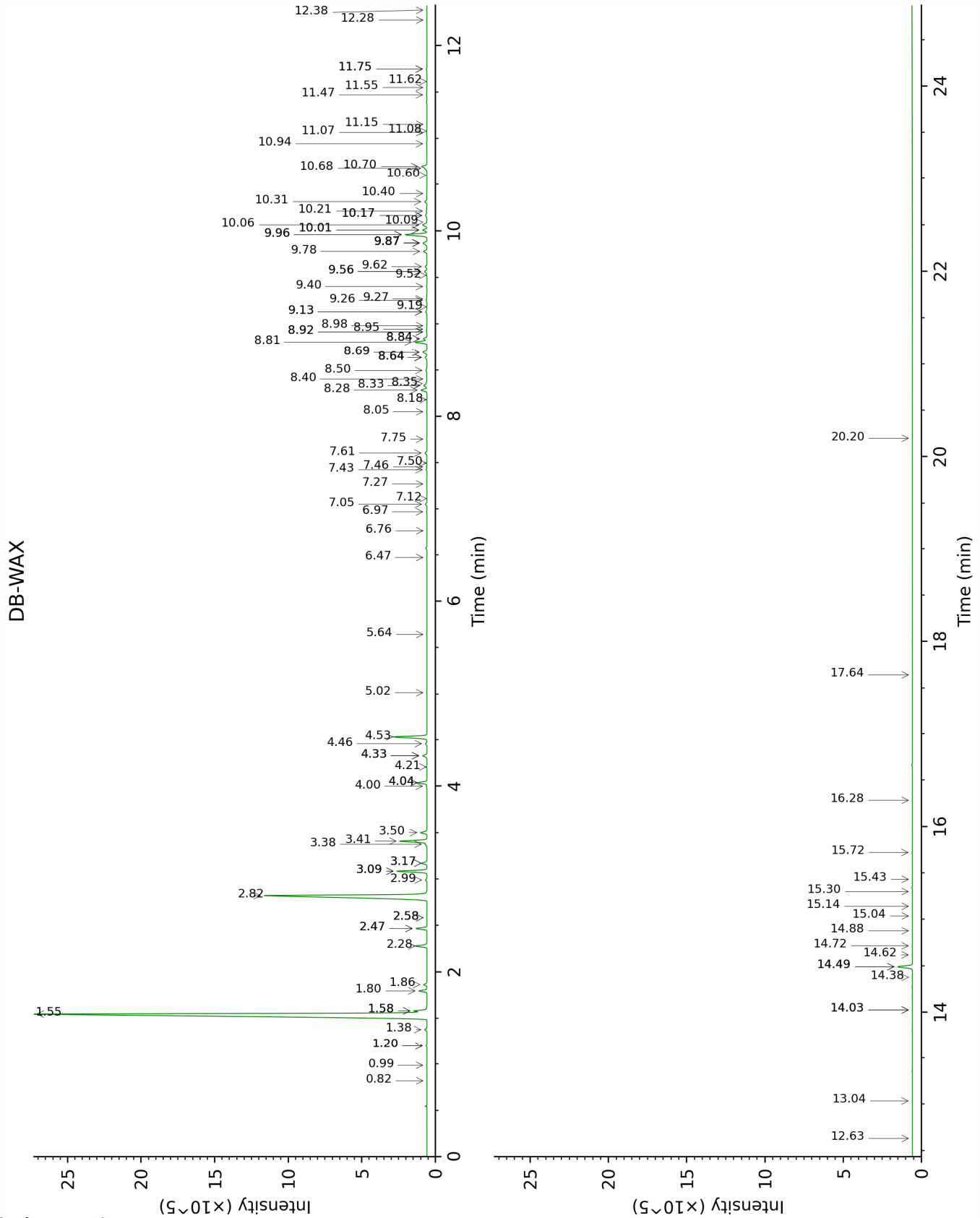
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies

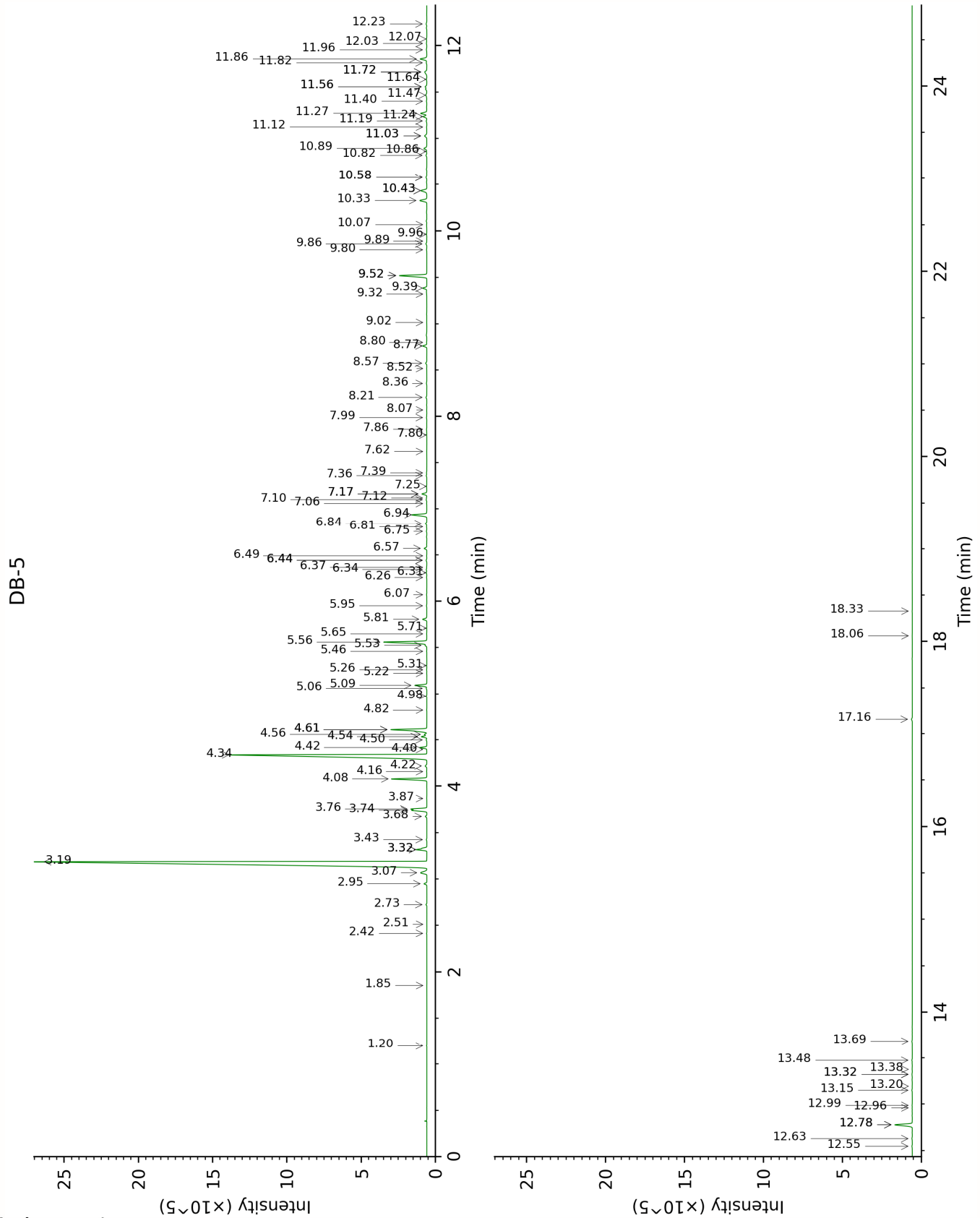
between columns, the algorithm is set to prioritize data from the most standard DB-5 column, and smallest values so as to avoid overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report 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.

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FULL ANALYSIS DATA

Toluene	Column DB-WAX			Column DB-5		
	1.58*†	1000.6	[0.92]	1.20	758.4	0.01
Unknown BOCA I [m/z 109, 67 (32), 81 (14), 41 (12), 124 (10)]	0.82	878.9	tr	1.85	831.1	tr
Cyclofenchene	0.99	913.3	0.02	2.42	877.6	0.01
Santene	1.20*	945.7	[0.05]	2.51	885.7	tr
Bornylene	1.20*	945.7	[0.05]	2.73	903.2	0.05
Tricyclene	1.38	973.1	0.18	2.95	918.1	0.19
α-Thujene	1.58*†	1000.6	[0.92]	3.07	925.9	0.65
α-Pinene	1.55*†	997.3	[51.74]	3.19	933.8	52.10
Camphene	1.86	1027.6	0.28	3.32*	942.4	[0.90]
α-Fenchene	1.80	1021.1	0.62	3.32*	942.4	[0.90]
Thuja-2,4(10)-diene 3,7,7-	2.47*	1085.1	[0.89]	3.43	949.5	0.04
Trimethylcyclohepta- 1,3,5-triene	3.09*	1134.2	[2.42]	3.68	966.0	0.10
β-Pinene	2.28	1067.2	0.97	3.74*†	970.4	[0.93]
Sabinene	2.47*	1085.1	[0.89]	3.76*†	971.3	[0.89]
Pseudolimonene isomer	2.58*	1095.9	[0.02]	3.87	978.7	0.01
Myrcene	3.09*	1134.2	[2.42]	4.08	992.7	2.32
2-Carene	2.58*	1095.9	[0.02]	4.16	997.8	0.02
α-Phellandrene	2.99	1126.9	0.13	4.22	1001.8	0.14
Δ ³ -Carene	2.82	1114.1	20.85	4.34	1009.4	20.89
1,4-Cineole	3.17*	1140.7	[0.45]	4.40	1013.1	0.01
α-Terpinene	3.17*	1140.7	[0.45]	4.42	1014.3	0.44
meta-Cymene	4.33*	1227.0	[0.41]	4.50	1019.5	0.04
para-Cymene	4.33*	1227.0	[0.41]	4.54	1021.7	0.36
Sylvestrene	3.38	1156.3	0.14	4.56	1023.2	0.16
Limonene	3.41	1158.9	2.33	4.61*	1026.4	[2.83]
β-Phellandrene	3.50	1165.9	0.55	4.61*	1026.4	[2.83]
(Z)-β-Ocimene	4.04*	1206.2	[0.81]	4.82	1039.6	0.01
(E)-β-Ocimene	4.21	1218.3	0.04	4.98	1049.2	0.03
Unknown CUSE I [m/z 93, 91 (54), 92 (31), 77 (29), 79 (17), 43 (13), 41 (10), 136 (9)]	4.00	1203.4	0.05	5.06	1054.7	0.04
γ-Terpinene	4.04*	1206.2	[0.81]	5.10	1056.7	0.80
cis-Sabinene hydrate	7.12	1426.7	0.01	5.22	1064.8	0.01
Unknown PIMA I [m/z 79, 93 (60), 43	5.02	1276.0	0.02	5.26	1067.2	0.02

(40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]						
<i>cis</i> -Linalool oxide (fur.)	6.76	1400.6	0.01	5.31	1070.0	0.01
<i>meta</i> -Cymenene	6.47	1379.9	0.02	5.46	1079.6	0.01
Isoterpinolene	4.46	1236.2	0.14	5.53	1083.7	0.11
Terpinolene	4.53	1241.4	3.03	5.56	1085.9	3.16
α -Pinene oxide	5.64	1320.8	0.02	5.65	1091.4	0.02
<i>trans</i> -Sabinene hydrate	8.18	1505.7	0.01	5.71	1095.2	0.01
Linalool	8.33	1517.3	0.33	5.81	1101.3	0.30
endo-Fenchol	8.64*	1540.7	[0.21]	5.95	1110.5	0.03
<i>cis-para</i> -Menth-2-en- 1-ol	8.40	1522.9	0.02	6.07	1118.1	0.03
4-Hydroxy-4- methylcyclohex-2- enone	14.38	2032.5	0.03	6.26	1129.9	0.02
<i>trans</i> -Pinocarveol	9.40	1600.2	0.05	6.31	1133.2	0.04
Camphor	7.46	1451.9	0.04	6.34	1135.3	0.04
<i>trans-para</i> -Menth-2- en-1-ol	9.19	1583.0	0.02	6.37	1136.8	0.02
Camphene hydrate	8.69*	1545.1	[0.42]	6.44*	1141.7	[0.06]
Epoxyterpinolene	6.97	1416.2	0.03	6.44*	1141.7	[0.06]
<i>meta</i> -Mentha-4,6- dien-8-ol	9.56*	1613.1	[0.23]	6.49	1144.8	0.02
Karahanaenone	7.61	1462.8	0.19	6.57	1149.9	0.19
Borneol	10.01*	1648.9	[0.38]	6.76	1161.6	0.04
α -Phellandren-8-ol	10.40	1680.5	0.02	6.81	1164.9	0.02
Umbellulone	9.13*	1578.8	[0.14]	6.84	1167.2	0.11
Terpinen-4-ol	8.81	1553.9	1.09	6.94	1173.4	1.17
<i>meta</i> -Cymen-8-ol	11.75*	1793.7	[0.06]	7.06	1181.1	0.02
<i>para</i> -Cymen-8-ol	11.75*	1793.7	[0.06]	7.10	1183.8	0.05
Unknown JUVI II [m/z 93, 59 (85), 81 (36), 92 (35), 43 (34), 121 (20), 136 (16)...]	9.96*	1645.0	[2.07]	7.12	1185.0	0.02
Myrtenal	8.92*	1562.3	[0.04]	7.16*	1187.8	[0.36]
α -Terpineol	10.01*	1648.9	[0.38]	7.16*	1187.8	[0.36]
Myrtenol	11.15	1743.3	0.01	7.25	1193.0	0.02
Unknown PINI IV [m/z 109, 91 (100), 81 (88), 94 (75), 119 (74), 96 (73), 41 (63)... 150 (2)]	11.07	1735.9	0.05	7.36	1200.3	0.04

Verbenone	9.87*	1637.8	[0.46]	7.39	1202.2	0.02
<i>trans</i> -Carveol	11.62	1782.2	0.01	7.62	1217.6	0.02
<i>cis</i> -Carveol				7.80	1229.5	0.01
Unknown CIAU II [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	11.55	1776.7	0.03	7.86	1233.5	0.03
Carvacrol methyl ether	8.84*	1556.6	[0.33]	7.99	1242.0	0.03
Car-3-en-2-one	10.60	1696.7	0.01	8.07	1247.4	0.02
Linalyl acetate	8.35	1519.0	0.07	8.20	1256.5	0.07
(<i>trans</i> ?)-Linalool oxide acetate (fur.)?	8.95	1564.7	0.03	8.36	1266.5	0.04
Unknown CIAU V [m/z 95, 67 (45), 41 (42), 110 (42), 43 (41), 59 (36)]	12.63	1871.2	0.02	8.52	1277.3	0.02
Bornyl acetate	8.50	1530.0	0.15	8.57	1281.1	0.09
Unknown CUSE III [m/z 121, 93 (97), 43 (81), 136 (48), 107 (47), 108 (44)...]	8.84*	1556.6	[0.33]	8.77	1294.0	0.30
Terpinen-4-yl acetate	8.98	1567.5	0.02	8.80	1296.5	0.02
Unknown CUSE IV [m/z 150, 107 (98), 91 (79), 108 (61)]	12.28	1840.0	0.02	9.02	1311.3	0.02
Unknown CUSE V [m/z 93, 92 (34), 43 (31), 91 (27)...]				9.32	1332.7	0.01
Unknown CUSE VI [m/z 93, 43 (50), 121 (50), 136 (35)...]	9.78	1630.5	0.34	9.39	1337.3	0.30
α -Terpinyl acetate	9.96*	1645.0	[2.07]	9.52*	1346.7	[2.17]
α -Cubebene	7.05	1422.1	0.15	9.52*	1346.7	[2.17]
α -Ylangene	7.27	1438.2	0.02	9.80	1366.2	0.03
α -Copaene	7.43	1449.6	0.07	9.86	1370.6	0.07
2- <i>epi</i> - α -Funebrene	7.50	1454.9	0.01	9.89	1372.7	0.01
β -Bourbonene	7.76	1473.8	0.03	9.96	1377.9	0.03
β -Cubebene	8.05	1495.7	0.03	10.07†	1385.1	0.02
α -Cedrene	8.28	1513.6	0.57	10.33	1403.5	0.60
β -Caryophyllene	8.69*	1545.1	[0.42]	10.43*	1411.4	[0.56]
β -Cedrene	8.64*	1540.7	[0.21]	10.43*	1411.4	[0.56]
<i>cis</i> -Thujopsene	8.92*	1562.3	[0.04]	10.58*	1422.1	[0.07]
β -Copaene	8.64*	1540.7	[0.21]	10.58*	1422.1	[0.07]
<i>cis</i> -Muurolo-3,5-	9.26	1588.4	0.07	10.82	1440.1	0.07

diene						
<i>trans</i> -Muurolo-3,5-diene	9.13*	1578.8	[0.14]	10.86	1443.2	0.02
α -Humulene	9.56*	1613.1	[0.23]	10.89	1445.6	0.24
<i>cis</i> -Cadina-1(6),4-diene	9.27	1589.6	0.03	11.03*	1455.7	[0.22]
<i>cis</i> -Muurolo-4(15),5-diene	9.62	1617.4	0.18	11.03*	1455.7	[0.22]
Unknown DACA II [m/z 161, 91 (57), 120 (46), 105 (42), 133 (25), 119 (22), 41 (21), 204 (21)]	9.87*	1637.8	[0.46]	11.12	1462.7	0.02
<i>trans</i> -Cadina-1(6),4-diene	9.52	1609.9	0.05	11.19	1467.7	0.05
α -Amorphene	9.87*	1637.8	[0.46]	11.24	1471.1	0.28
Germacrene D	10.06	1653.4	0.47	11.27	1473.7	0.51
<i>trans</i> -Muurolo-4(15),5-diene	10.09	1655.6	0.03	11.40	1483.4	0.04
β -Alaskene	9.87*	1637.8	[0.46]	11.47	1488.2	0.11
α -Muurolole	10.31	1673.4	0.23	11.56*†	1495.0	[0.14]
Epizonarene	10.17*	1661.5	[0.19]	11.56*†	1495.0	[0.14]
δ -Amorphene	10.21	1665.3	0.07	11.64	1500.9	0.04
γ -Cadinene	10.68	1703.5	0.15	11.72*	1507.1	[0.27]
α -Alaskene	10.17*	1661.5	[0.19]	11.72*	1507.1	[0.27]
<i>trans</i> -Calamenene	11.47	1770.1	0.05	11.82	1514.9	0.05
δ -Cadinene	10.70	1705.0	0.52	11.86	1518.1	0.54
<i>trans</i> -Cadina-1,4-diene	10.94	1725.6	0.05	11.96	1525.8	0.06
α -Cadinene	11.08	1737.2	0.02	12.02	1531.2	0.04
α -Calacorene	12.38	1849.5	0.02	12.07	1535.0	0.04
Salviadienol?	14.62	2055.6	0.03	12.24	1547.6	0.07
Caryophyllene oxide	13.04	1907.6	0.03	12.55	1572.1	0.03
allo-Cedrol	14.49*	2043.4	[1.38]	12.63	1578.6	0.04
α -Cedrol	14.49*	2043.4	[1.38]	12.78*	1590.3	[1.38]
Widdrol	14.88	2080.4	0.02	12.78*	1590.3	[1.38]
epi-Cedrol	15.04	2096.1	0.01	12.96	1604.7	0.02
1,10-diepi-Cubenol	14.02*	1998.8	[0.03]	12.99	1606.9	0.02
1-epi-Cubenol	14.02*	1998.8	[0.03]	13.15	1620.4	0.04
α -Acorenol	14.72	2065.0	0.03	13.20	1623.9	0.01
τ -Cadinol	15.14	2106.5	0.01	13.32*	1634.5	[0.04]
τ -Muurolol	15.30	2122.3	0.02	13.32*	1634.5	[0.04]
α -Muurolol	15.43	2135.4	0.01	13.38	1639.0	0.02
α -Cadinol	15.72	2164.1	0.05	13.48	1647.1	0.03
Unknown CUSE VIII				13.69	1664.4	0.04

[m/z 85, 57 (59), 79 (26), 67 (18), 41 (16), 80 (15), 81 (10), 77 (8), 238 (7)]						
Manoyl oxide				17.16	1973.9	0.08
7,13-Abietadiene	17.64	2364.9	0.01	18.06	2062.6	0.01
Unknown PISY I [m/z 191, 81 (47), 95 (41), 69 (39), 109 (32), 93 (32)...]	20.20	2657.1	0.01	18.33	2089.0	0.01
Isopimaradiene	16.28	2221.4	0.02			
Total reported		98.72%			99.20%	

*: 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