

Date : 2024-05-13

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24D29-PTH01

Customer Identification : Cypress - Spain - CL0114R

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

Date : 2024-05-08

PHYSICOCHEMICAL DATA

Refractive index : 1.4718 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2024-04-29

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
3-Methylfuran	tr	Furan
Toluene	0.01	Simple phenolic
Cyclofenchene	0.02	Monoterpene
Bornylene	0.06	Monoterpene
Tricyclene	0.18	Monoterpene
α -Thujene	0.48	Monoterpene
α -Pinene	49.40	Monoterpene
α -Fenchene	0.70	Monoterpene
Camphene	0.31	Monoterpene
Thuja-2,4(10)-diene	0.03	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.08	Monoterpene
β -Pinene	1.09	Monoterpene
Sabinene	0.79	Monoterpene
Pseudolimonene isomer	0.01	Monoterpene
Myrcene	2.20	Monoterpene
2-Carene	0.01	Monoterpene
α -Phellandrene	0.10	Monoterpene
Pseudolimonene	0.01	Monoterpene
Menthatriene isomer I	0.02	Monoterpene
Δ^3 -Carene	23.59	Monoterpene
α -Terpinene	0.46	Monoterpene
<i>meta</i> -Cymene	0.04	Monoterpene
<i>para</i> -Cymene	0.29	Monoterpene
β -Phellandrene	0.31	Monoterpene
1,8-Cineole	0.02	Monoterpenic ether
Limonene	2.49	Monoterpene
Sylvestrene	0.17	Monoterpene
(Z)- β -Ocimene	tr	Monoterpene
(E)- β -Ocimene	0.05	Monoterpene
Unknown	0.05	Monoterpene
γ -Terpinene	0.78	Monoterpene
<i>cis</i> -Sabinene hydrate	tr	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
<i>cis</i> -Linalool oxide (fur.)	0.02	Monoterpenic alcohol
<i>meta</i> -Cymenene	0.02	Monoterpene
Isoterpinolene	0.12	Monoterpene
Terpinolene	3.09	Monoterpene
<i>para</i> -Cymenene	0.13	Monoterpene
α -Pinene oxide	0.02	Monoterpenic ether
Perillene	0.01	Monoterpenic ether

Linalool	0.36	Monoterpenic alcohol
endo-Fenchol	0.02	Monoterpenic alcohol
<i>cis-para</i> -Menth-2-en-1-ol	0.02	Monoterpenic alcohol
<i>cis-para</i> -Mentha-2,8-dien-1-ol	0.02	Monoterpenic alcohol
<i>trans</i> -Pinocarveol	0.04	Monoterpenic alcohol
Camphor	0.06	Monoterpenic ketone
<i>trans-para</i> -Menth-2-en-1-ol	0.02	Monoterpenic alcohol
Epoxyterpinolene	0.04	Monoterpenic ether
Camphene hydrate	0.02	Monoterpenic alcohol
Karahanaenone	0.24	Monoterpenic ketone
Borneol	0.05	Monoterpenic alcohol
α -Phellandren-8-ol	0.03	Monoterpenic alcohol
Umbellulone	0.06	Monoterpenic ketone
Terpinen-4-ol	1.01	Monoterpenic alcohol
Unknown	0.03	Oxygenated monoterpene
<i>meta</i> -Cymen-8-ol	0.03	Monoterpenic alcohol
<i>para</i> -Cymen-8-ol	0.04	Monoterpenic alcohol
Unknown	0.05	Oxygenated monoterpene
α -Terpineol	0.38	Monoterpenic alcohol
Myrtenal	0.01	Monoterpenic aldehyde
Verbenone	0.05	Monoterpenic ketone
Unknown	0.03	Unknown
<i>trans</i> -Carveol	0.01	Monoterpenic alcohol
<i>cis</i> -Carveol	0.01	Monoterpenic alcohol
Unknown	0.04	Oxygenated monoterpene
Carvacrol methyl ether	0.03	Monoterpenic ether
Car-3-en-2-one	0.01	Monoterpenic ketone
Linalyl acetate	0.04	Monoterpenic ester
(<i>trans</i> ?) -Linalool oxide acetate (fur.)?	0.05	Monoterpenic ester
Unknown	0.02	Oxygenated monoterpene
Bornyl acetate	0.11	Monoterpenic ester
Unknown	0.22	Monoterpenic ester
Terpinen-4-yl acetate	0.02	Monoterpenic ester
Thymol	0.03	Monoterpenic alcohol
Unknown	0.01	Unknown
Unknown	0.31	Monoterpenic ester
α -Cubebene	0.13	Sesquiterpene
α -Terpinyl acetate	2.18	Monoterpenic ester
α -Ylangene	0.02	Sesquiterpene
α -Copaene	0.07	Sesquiterpene
2-epi- α -Funebrene	0.02	Sesquiterpene
β -Bourbonene	0.02	Sesquiterpene
β -Cubebene	0.03	Sesquiterpene
β -Elemene	0.03	Sesquiterpene
α -Cedrene	0.91	Sesquiterpene

β-Caryophyllene	0.39	Sesquiterpene
β-Cedrene	0.19	Sesquiterpene
β-Copaene	0.06	Sesquiterpene
cis-Muurolo-3,5-diene	0.05	Sesquiterpene
trans-Muurolo-3,5-diene	0.02	Sesquiterpene
α-Humulene	0.21	Sesquiterpene
cis-Muurolo-4(15),5-diene	0.12	Sesquiterpene
cis-Cadina-1(6),4-diene	0.05	Sesquiterpene
Unknown	0.02	Sesquiterpene
trans-Cadina-1(6),4-diene	0.05	Sesquiterpene
α-Amorphene	0.26	Sesquiterpene
Germacrene D	0.55	Sesquiterpene
trans-Muurolo-4(15),5-diene	0.03	Sesquiterpene
Epizonarene	0.11	Sesquiterpene
α-Muuroloene	0.13	Sesquiterpene
δ-Amorphene	0.04	Sesquiterpene
α-Alaskene	0.04	Sesquiterpene
γ-Cadinene	0.22	Sesquiterpene
trans-Calamenene	0.03	Sesquiterpene
Zonarene	0.05	Sesquiterpene
δ-Cadinene	0.42	Sesquiterpene
trans-Cadina-1,4-diene	0.05	Sesquiterpene
α-Cadinene	0.03	Sesquiterpene
α-Calacorene	0.02	Sesquiterpene
Salviadienol?	0.03	Sesquiterpenic alcohol
Caryophyllene oxide	0.02	Sesquiterpenic ether
allo-Cedrol	0.03	Sesquiterpenic alcohol
α-Cedrol	1.39	Sesquiterpenic alcohol
Widdrol	0.02	Sesquiterpenic alcohol
epi-Cedrol	0.02	Sesquiterpenic alcohol
1-epi-Cubenol	0.03	Sesquiterpenic alcohol
allo-Aromadendrene epoxide?	0.03	Sesquiterpenic ether
τ-Muurolol	0.02	Sesquiterpenic alcohol
τ-Cadinol	0.01	Sesquiterpenic alcohol
α-Muurolol	0.01	Sesquiterpenic alcohol
α-Cadinol	0.03	Sesquiterpenic alcohol
Unknown	0.03	Unknown
β-Turmerone	0.01	Sesquiterpenic ketone
Manoyl oxide	0.04	Diterpenic ether
Unknown	0.01	Unknown
Isopimaradiene	0.02	Diterpene
Consolidated total	99.03	

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

Note: no correction factor was applied

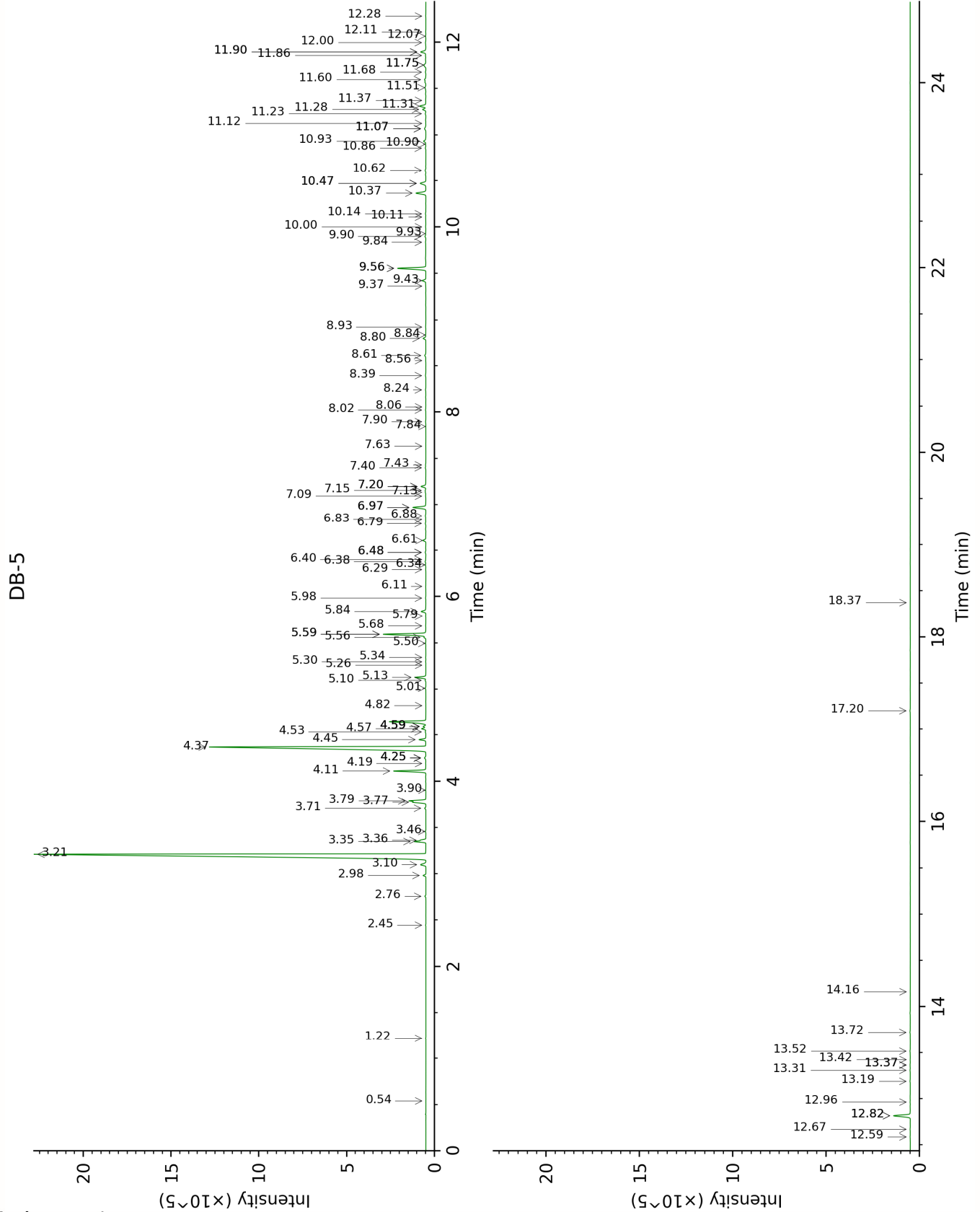
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies

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.

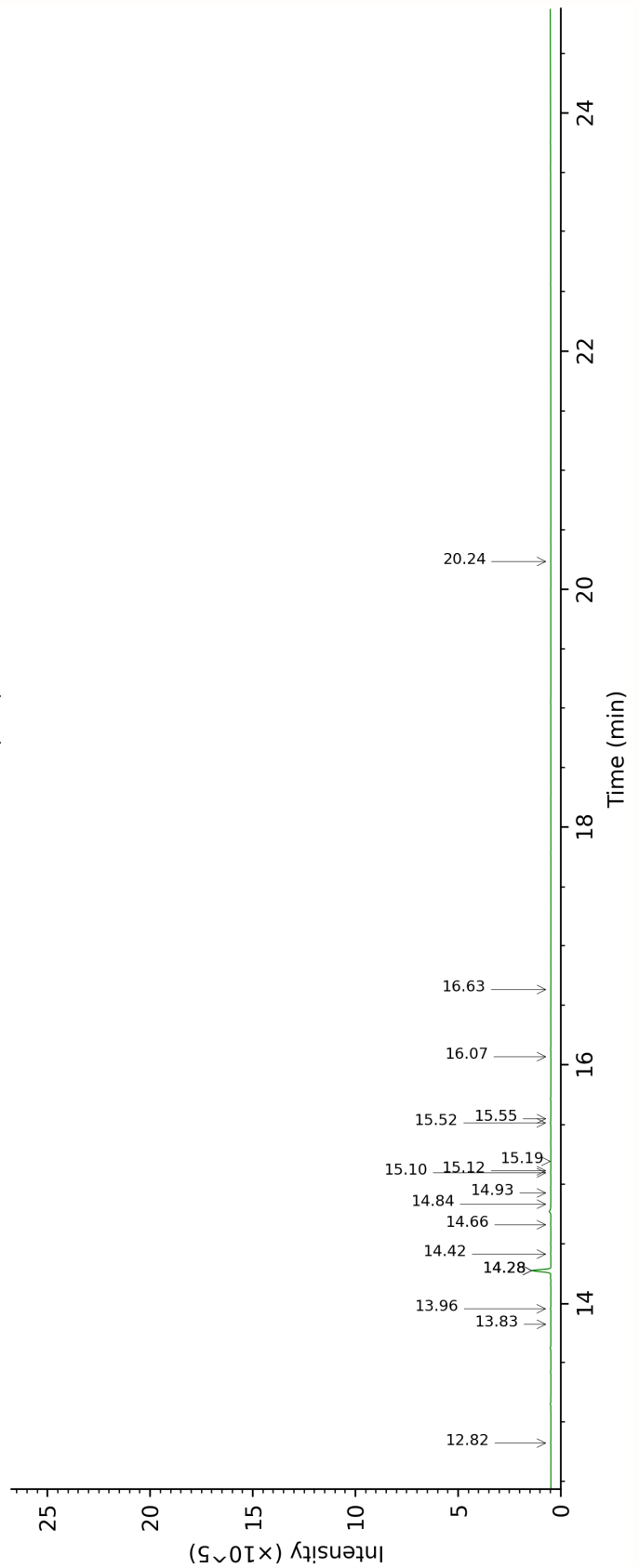
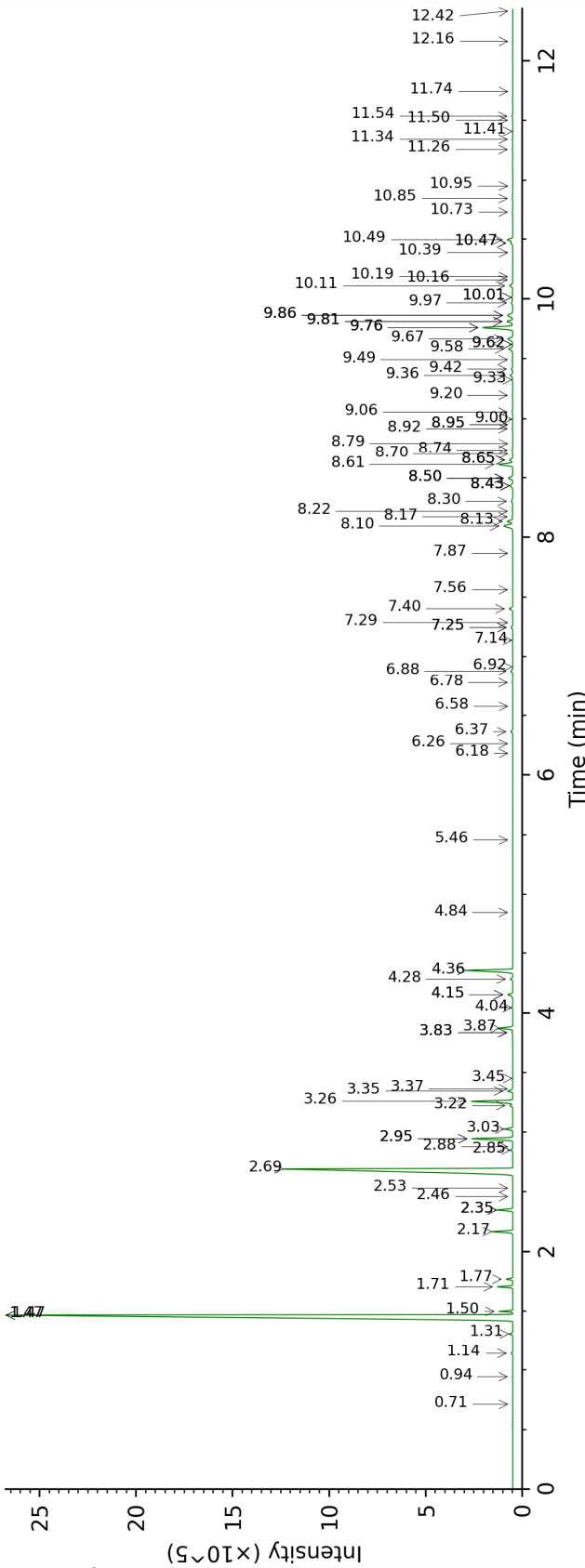
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

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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DB-WAX



FULL ANALYSIS DATA

3-Methylfuran	Column DB-5			Column DB-WAX		
	0.54	607.3	tr	0.71	858.2	tr
Toluene	1.22	759.5	0.01	1.47*	1000.0	[48.90]
Cyclofenchene	2.45	878.8	0.02	0.94	922.1	0.02
Bornylene	2.76	904.4	0.06	1.14	951.4	0.06
Tricyclene	2.98	919.6	0.18	1.31	976.5	0.18
α -Thujene	3.10	927.3	0.48	1.50	1004.7	0.50
α -Pinene	3.21	934.7	49.40	1.47*	1000.0	[48.90]
α -Fenchene	3.35*†	943.7	[0.81]	1.71	1025.9	0.70
Camphene	3.36*†	944.6	[0.22]	1.77	1031.9	0.31
Thuja-2,4(10)-diene	3.46	950.9	0.03	2.35*	1086.0	[0.82]
3,7,7-Trimethylcyclohepta-1,3,5-triene	3.71	967.4	0.08	2.95*	1135.4	[2.28]
β -Pinene	3.77*†	971.7	[0.80]	2.17	1069.1	1.09
Sabinene	3.79*†	972.7	[1.08]	2.35*	1086.0	[0.82]
Pseudolimonene isomer	3.90	980.2	0.01	2.53	1103.2	tr
Myrcene	4.11	993.9	2.20	2.95*	1135.4	[2.28]
2-Carene	4.19	999.2	0.01	2.46	1096.6	0.01
α -Phellandrene	4.25*	1003.1	[0.12]	2.85	1128.2	0.10
Pseudolimonene	4.25*	1003.1	[0.12]	2.88	1130.3	0.01
Menthatriene isomer I	4.25*	1003.1	[0.12]	3.45	1173.5	0.02
Δ 3-Carene	4.37	1010.7	23.59	2.69	1116.3	23.35
α -Terpinene	4.45	1015.7	0.46	3.03	1141.5	0.44
<i>meta</i> -Cymene	4.53	1020.9	0.04	4.15*	1225.3	[0.35]
<i>para</i> -Cymene	4.57	1023.1	0.29	4.15*	1225.3	[0.35]
β -Phellandrene	4.59*†	1024.6	[0.18]	3.35	1165.5	0.31
1,8-Cineole	4.59*†	1024.6	[0.18]	3.36	1166.9	0.02
Limonene	4.59*†	1024.6	[0.18]	3.26	1159.0	2.49
Sylvestrene	4.59*†	1024.6	[0.18]	3.22	1156.3	0.17
(Z)- β -Ocimene	4.82	1038.7	tr	3.84*	1202.4	[0.07]
(E)- β -Ocimene	5.01	1050.9	0.05	4.04	1217.5	0.05
Unknown CUSE I [m/z 93, 91 (54), 92 (31), 77 (29), 79 (17), 43 (13), 41 (10), 136 (9)]	5.10	1056.2	0.05	3.84*	1202.4	[0.07]
γ -Terpinene	5.13	1058.2	0.78	3.87	1205.3	0.78
<i>cis</i> -Sabinene hydrate	5.26	1066.5	tr	6.92	1425.5	0.01
Unknown PIMA I [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33),	5.30	1068.7	0.02	4.84	1274.1	0.02

77 (26), 91 (20), 152 (18)]						
<i>cis</i> -Linalool oxide (fur.)	5.34	1071.7	0.02	6.58	1400.4	0.02
<i>meta</i> -Cymenene	5.50	1081.2	0.02	6.26	1377.6	0.03
Isoterpinolene	5.56	1085.3	0.12	4.28	1234.5	0.16
Terpinolene	5.59*	1087.4	[3.25]	4.36	1239.7	3.09
<i>para</i> -Cymenene	5.59*	1087.4	[3.25]	6.36	1384.9	0.13
α -Pinene oxide	5.68	1093.0	0.02	5.46	1318.8	0.02
Perillene	5.79	1099.7	0.01	6.18	1371.7	tr
Linalool	5.84	1102.7	0.36	8.14	1517.6	0.41
endo-Fenchol	5.98	1111.9	0.02	8.43*	1541.0	[0.28]
<i>cis-para</i> -Menth-2-en-1-ol	6.11	1120.0	0.02	8.17	1520.6	0.05
<i>cis-para</i> -Mentha-2,8-dien-1-ol	6.29	1131.6	0.02	9.49	1624.8	0.03
<i>trans</i> -Pinocarveol	6.34	1134.8	0.04	9.20	1600.9	0.05
Camphor	6.38	1137.0	0.06	7.25*	1450.4	[0.12]
<i>trans-para</i> -Menth-2-en-1-ol	6.40	1138.5	0.02	9.00	1585.2	0.02
Epoxyterpinolene	6.48*	1143.4	[0.06]	6.78	1415.1	0.04
Camphene hydrate	6.48*	1143.4	[0.06]	8.50*	1546.0	[0.36]
Karahanaenone	6.61	1151.6	0.24	7.40	1462.2	0.24
Borneol	6.79	1163.4	0.05	9.81*	1651.0	[0.43]
α -Phellandren-8-ol	6.83	1166.2	0.03	10.16	1679.5	0.03
Umbellulone	6.88	1169.0	0.06	8.92	1579.0	0.05
Terpinen-4-ol	6.97*	1174.8	[1.10]	8.61	1555.0	1.01
Unknown MISC XIV [m/z 43, 137 (89), 109 (69), 91 (49), 152 (45), 67 (31), 119 (29)]	6.97*	1174.8	[1.10]	10.19	1681.7	0.03
<i>meta</i> -Cymen-8-ol	7.09	1182.6	0.03	11.50	1793.2	0.03
<i>para</i> -Cymen-8-ol	7.13	1185.3	0.04	11.54	1796.1	0.06
Unknown JUVI II [m/z 93, 59 (85), 81 (36), 92 (35), 43 (34), 121 (20), 136 (16)...]	7.15	1186.6	0.05	9.76*	1646.8	[2.26]
α -Terpineol	7.20*	1189.3	[0.40]	9.81*	1651.0	[0.43]
Myrtenal	7.20*	1189.3	[0.40]	8.70	1562.1	0.01
Verbenone	7.40	1202.2	0.05	9.62*	1635.3	[0.04]
Unknown PIMA 7 [m/z 95, 93 (32), 121 (24), 79 (22), 91 (21), 105 (16)... 154 (2)]	7.43	1204.2	0.03	10.95	1746.0	0.02
<i>trans</i> -Carveol	7.63	1217.6	0.01	11.41	1785.2	0.02

<i>cis</i> -Carveol	7.84	1231.9	0.01	11.74	1813.8	0.01
Unknown CIAU II [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	7.90	1235.3	0.04	11.34	1779.5	0.04
Carvacrol methyl ether	8.02	1243.7	0.03	8.65*	1558.0	[0.24]
Car-3-en-2-one	8.06	1246.0	0.01	10.39	1698.1	0.02
Linalyl acetate	8.24	1258.3	0.04	8.22	1524.2	0.03
(<i>trans</i> ?) <i>-</i> Linalool oxide acetate (fur.)?	8.39	1268.6	0.05	8.74	1564.9	0.06
Unknown CIAU V [m/z 95, 67 (45), 41 (42), 110 (42), 43 (41), 59 (36)]	8.56	1279.5	0.02	12.42	1874.5	0.02
Bornyl acetate	8.61	1283.1	0.11	8.30	1530.8	0.14
Unknown CUSE III [m/z 121, 93 (97), 43 (81), 136 (48), 107 (47), 108 (44)...]	8.80	1296.0	0.22	8.65*	1558.0	[0.24]
Terpinen-4-yl acetate	8.84	1298.4	0.02	8.79	1569.2	0.02
Thymol	8.92	1304.1	0.03	15.12	2129.0	0.01
Unknown CUSE V [m/z 93, 92 (34), 43 (31), 91 (27)...]	9.36	1335.0	0.01			
Unknown CUSE VI [m/z 93, 43 (50), 121 (50), 136 (35)...]	9.42	1339.3	0.31	9.58	1632.2	0.36
α -Cubebene	9.56*	1348.6	[2.32]	6.88	1422.7	0.13
α -Terpinyl acetate	9.56*	1348.6	[2.32]	9.76*	1646.8	[2.26]
α -Ylangene	9.84	1368.3	0.02	7.14	1442.3	0.02
α -Copaene	9.90	1372.8	0.07	7.25*	1450.4	[0.12]
2- <i>epi</i> - α -Funebrene	9.93	1374.8	0.02	7.29	1453.5	0.01
β -Bourbonene	10.00	1380.0	0.02	7.56	1474.2	0.03
β -Cubebene	10.11	1387.4	0.03	7.87	1497.1	0.02
β -Elemene	10.14	1389.9	0.03	8.50*	1546.0	[0.36]
α -Cedrene	10.36	1405.6	0.91	8.10	1514.5	0.87
β -Caryophyllene	10.47*	1413.4	[0.58]	8.50*	1546.0	[0.36]
β -Cedrene	10.47*	1413.4	[0.58]	8.43*	1541.0	[0.28]
β -Copaene	10.62	1424.2	0.06	8.43*	1541.0	[0.28]
<i>cis</i> -Muurolo-3,5- diene	10.86	1442.2	0.05	8.95*	1581.7	[0.03]
<i>trans</i> -Muurolo-3,5- diene	10.90	1445.4	0.02	8.95*	1581.7	[0.03]
α -Humulene	10.93	1447.7	0.21	9.36	1614.0	0.20

<i>cis</i> -Muurolo-4(15),5-diene	11.07*	1457.8	[0.16]	9.42	1618.4	0.12
<i>cis</i> -Cadina-1(6),4-diene	11.07*	1457.8	[0.16]	9.06	1590.0	0.05
Unknown DACA II [m/z 161, 91 (57), 120 (46), 105 (42), 133 (25), 119 (22), 41 (21), 204 (21)]	11.12	1462.1	0.02	9.62*	1635.3	[0.04]
<i>trans</i> -Cadina-1(6),4-diene	11.23	1469.9	0.05	9.33	1611.1	0.05
α -Amorphene	11.28	1473.3	0.26	9.67	1639.1	0.47
Germacrene D	11.31	1476.0	0.55	9.86*	1655.2	[0.53]
<i>trans</i> -Muurolo-4(15),5-diene	11.37	1480.6	0.03	9.86*	1655.2	[0.53]
Epizonarene	11.51	1490.8	0.11	9.97	1663.8	0.17
α -Muurolole	11.60	1497.2	0.13	10.11	1675.4	0.25
δ -Amorphene	11.68	1503.3	0.04	10.01*	1667.5	[0.09]
α -Alaskene	11.75*	1509.1	[0.26]	10.01*	1667.5	[0.09]
γ -Cadinene	11.75*	1509.1	[0.26]	10.47*	1704.6	[0.16]
<i>trans</i> -Calamenene	11.86	1517.2	0.03	11.26	1772.2	0.04
Zonarene	11.90*	1520.2	[0.47]	10.47*	1704.6	[0.16]
δ -Cadinene	11.90*	1520.2	[0.47]	10.50	1707.0	0.42
<i>trans</i> -Cadina-1,4-diene	12.00	1528.1	0.05	10.73	1727.2	0.04
α -Cadinene	12.07	1533.6	0.03	10.85	1737.0	0.07
α -Calacorene	12.11	1537.2	0.02	12.16	1851.4	0.02
Salviadienol?	12.28	1550.6	0.03	14.42	2060.7	0.02
Caryophyllene oxide	12.59	1574.5	0.02	12.82	1910.4	0.03
allo-Cedrol	12.67	1581.0	0.03	14.28*	2047.3	[1.39]
α -Cedrol	12.82*	1592.5	[1.41]	14.28*	2047.3	[1.39]
Widdrol	12.82*	1592.5	[1.41]	14.66	2084.5	0.02
epi-Cedrol	12.96	1604.1	0.02	14.84	2101.3	0.02
1-epi-Cubenol	13.19	1622.5	0.03	13.83	2004.0	0.02
allo-Aromadendrene epoxide?	13.31	1632.3	0.03	13.96	2016.2	0.03
τ -Muurolol	13.36*	1637.0	[0.03]	15.10	2127.2	0.02
τ -Cadinol	13.36*	1637.0	[0.03]	14.93	2110.4	0.01
α -Muurolol	13.42	1641.9	0.01	15.19	2137.0	0.01
α -Cadinol	13.52	1649.4	0.03	15.52	2169.5	0.04
Unknown CUSE VIII [m/z 85, 57 (59), 79 (26), 67 (18), 41 (16), 80 (15), 81 (10), 77 (8), 238 (7)]	13.72	1666.7	0.03			

β -Turmerone	14.16	1703.0	0.01	15.55	2173.0	0.01
Manoyl oxide	17.20	1976.8	0.04	16.63	2284.9	0.02
Unknown PISY I [m/z 191, 81 (47), 95 (41), 69 (39), 109 (32), 93 (32)...]	18.37	2092.1	0.01	20.24	2693.1	0.01
Isopimaradiene				16.07	2226.0	0.02
Total reported		99.11%			98.50%	

*: 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