

Date : 2024-04-18

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24D04-PTH04

Customer Identification : Cypress - Greece - CL0113R

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 : 2024-04-10

PHYSICOCHEMICAL DATA

Refractive index : 1.4705 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2024-04-05

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	tr	Simple phenolic
Cyclofenchene	0.01	Monoterpene
Santene	0.03	Normoterpene
Bornylene	0.04	Monoterpene
Hashishene	0.02	Monoterpene
Tricyclene	0.15	Monoterpene
α -Thujene	0.48	Monoterpene
α -Pinene	55.98	Monoterpene
Camphene	0.47	Monoterpene
α -Fenchene	0.38	Monoterpene
Thuja-2,4(10)-diene	0.03	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.06	Monoterpene
β -Pinene	2.39	Monoterpene
Sabinene	0.58	Monoterpene
Pseudolimonene isomer	0.01	Monoterpene
Myrcene	1.24	Monoterpene
2-Carene	0.01	Monoterpene
Menthatriene isomer I	0.01	Monoterpene
Pseudolimonene	0.02	Monoterpene
α -Phellandrene	0.08	Monoterpene
Δ^3 -Carene	21.74	Monoterpene
1,4-Cineole	0.07	Monoterpenic ether
α -Terpinene	0.26	Monoterpene
<i>meta</i> -Cymene	0.03	Monoterpene
<i>para</i> -Cymene	0.23	Monoterpene
Sylvestrene	0.09	Monoterpene
Limonene	4.07	Monoterpene
1,8-Cineole	0.02	Monoterpenic ether
β -Phellandrene	0.22	Monoterpene
(Z)- β -Ocimene	0.01	Monoterpene
(E)- β -Ocimene	0.02	Monoterpene
Unknown	0.02	Monoterpene
γ -Terpinene	0.40	Monoterpene
<i>cis</i> -Sabinene hydrate	0.01	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
<i>cis</i> -Linalool oxide (fur.)	tr	Monoterpenic alcohol
<i>meta</i> -Cymenene	0.01	Monoterpene
Isoterpinolene	0.07	Monoterpene
<i>para</i> -Cymenene	0.05	Monoterpene
Terpinolene	1.33	Monoterpene

α -Pinene oxide	0.03	Monoterpenic ether
Unknown	0.01	Oxygenated monoterpene
Linalool	0.38	Monoterpenic alcohol
endo-Fenchol	0.02	Monoterpenic alcohol
<i>cis-para</i> -Menth-2-en-1-ol	0.02	Monoterpenic alcohol
4-Hydroxy-4-methylcyclohex-2-enone	0.02	Aliphatic alcohol
<i>trans</i> -Pinocarveol	0.03	Monoterpenic alcohol
Camphor	0.03	Monoterpenic ketone
<i>trans-para</i> -Menth-2-en-1-ol	0.01	Monoterpenic alcohol
Epoxyterpinolene	0.05	Monoterpenic ether
<i>meta</i> -Mentha-4,6-dien-8-ol	0.01	Monoterpenic alcohol
Karahanaenone	0.12	Monoterpenic ketone
Borneol	0.04	Monoterpenic alcohol
α -Phellandren-8-ol	0.01	Monoterpenic alcohol
Umbellulone	0.05	Monoterpenic ketone
Terpinen-4-ol	1.47	Monoterpenic alcohol
<i>meta</i> -Cymen-8-ol	0.01	Monoterpenic alcohol
<i>para</i> -Cymen-8-ol	0.03	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
α -Terpineol	0.32	Monoterpenic alcohol
Myrtenal	0.01	Monoterpenic aldehyde
Myrtenol	0.02	Monoterpenic alcohol
Unknown	0.03	Oxygenated monoterpene
Verbenone	0.03	Monoterpenic ketone
Unknown	0.01	Unknown
<i>trans</i> -Carveol	0.01	Monoterpenic alcohol
<i>cis</i> -Carveol	0.01	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Carvacrol methyl ether	0.02	Monoterpenic ether
Car-3-en-2-one	0.01	Monoterpenic ketone
Linalyl acetate	0.02	Monoterpenic ester
(<i>trans</i> ?) - Linalool oxide acetate (fur.)?	0.03	Monoterpenic ester
Bornyl acetate	0.35	Monoterpenic ester
Unknown	0.16	Monoterpenic ester
Terpinen-4-yl acetate	0.01	Monoterpenic ester
Thymol	0.02	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Unknown	0.01	Unknown
Unknown	0.19	Monoterpenic ester
α -Cubebene	0.10	Sesquiterpene
α -Terpinyl acetate	1.11	Monoterpenic ester
α -Ylangene	0.01	Sesquiterpene
α -Copaene	0.03	Sesquiterpene
2-epi- α -Funebrene	tr	Sesquiterpene
β -Bourbonene	0.01	Sesquiterpene

β-Cubebene	0.01	Sesquiterpene
β-Elemene	0.01	Sesquiterpene
α-Cedrene	0.30	Sesquiterpene
β-Caryophyllene	0.15	Sesquiterpene
β-Cedrene	0.09	Sesquiterpene
cis-Thujopsene	0.01	Sesquiterpene
β-Copaene	0.02	Sesquiterpene
cis-Muuro-la-3,5-diene	0.03	Sesquiterpene
trans-Muuro-la-3,5-diene	0.01	Sesquiterpene
α-Humulene	0.13	Sesquiterpene
cis-Cadina-1(6),4-diene	0.02	Sesquiterpene
cis-Muuro-la-4(15),5-diene	0.09	Sesquiterpene
Unknown	0.01	Sesquiterpene
trans-Cadina-1(6),4-diene	0.02	Sesquiterpene
α-Amorphene	0.14	Sesquiterpene
Germacrene D	0.54	Sesquiterpene
trans-Muuro-la-4(15),5-diene	0.02	Sesquiterpene
β-Alaskene	0.06	Sesquiterpene
Epizonarene	0.05	Sesquiterpene
α-Muuro-lene	0.07	Sesquiterpene
δ-Amorphene	0.02	Sesquiterpene
α-Alaskene	0.05	Sesquiterpene
γ-Cadinene	0.09	Sesquiterpene
δ-Cadinene	0.26	Sesquiterpene
trans-Cadina-1,4-diene	0.03	Sesquiterpene
α-Cadinene	0.02	Sesquiterpene
α-Calacorene	0.01	Sesquiterpene
Salviadienol?	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.02	Sesquiterpenic ether
allo-Cedrol	0.02	Sesquiterpenic alcohol
Widdrol	0.01	Sesquiterpenic alcohol
α-Cedrol	1.34	Sesquiterpenic alcohol
epi-Cedrol	0.01	Sesquiterpenic alcohol
Torilenol	0.01	Oxygenated sesquiterpene
1,10-diepi-Cubenol	0.02	Sesquiterpenic alcohol
α-Acorenol	0.02	Sesquiterpenic alcohol
1-epi-Cubenol	0.01	Sesquiterpenic alcohol
allo-Aromadendrene epoxide?	0.03	Sesquiterpenic ether
τ-Cadinol	0.01	Sesquiterpenic alcohol
τ-Muuro-lol	0.02	Sesquiterpenic alcohol
α-Muuro-lol	0.01	Sesquiterpenic alcohol
α-Cadinol	0.02	Sesquiterpenic alcohol
Unknown	0.03	Unknown
Eudesma-4(15),7-dien-1β-ol	0.01	Sesquiterpenic alcohol
Manoyl oxide	0.03	Diterpenic ether

7,13-Abietadiene	0.01	Diterpene
Unknown	0.01	Unknown
Isopimaradiene	tr	Diterpene
Consolidated total	99.51	

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

Note: no correction factor was applied

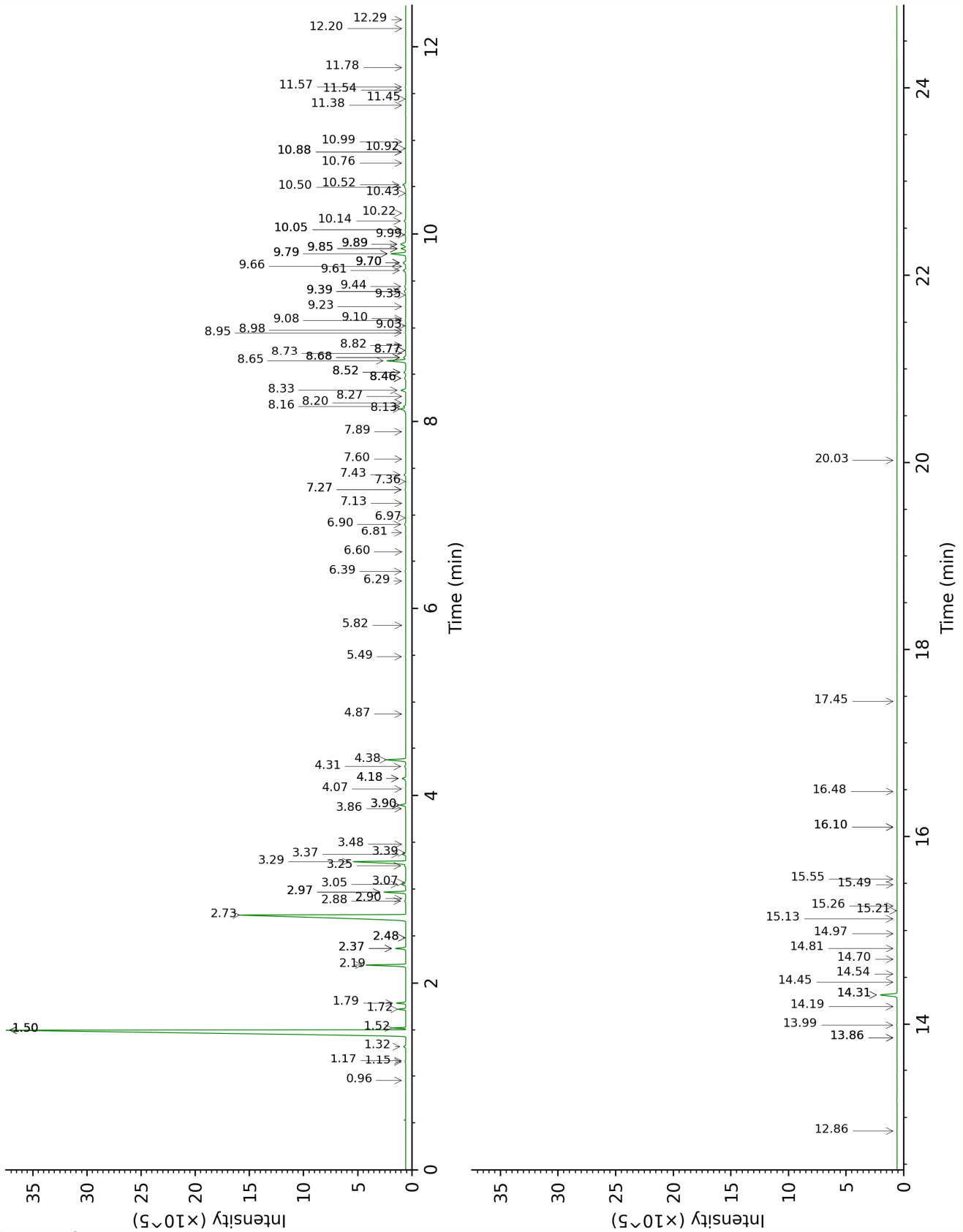
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

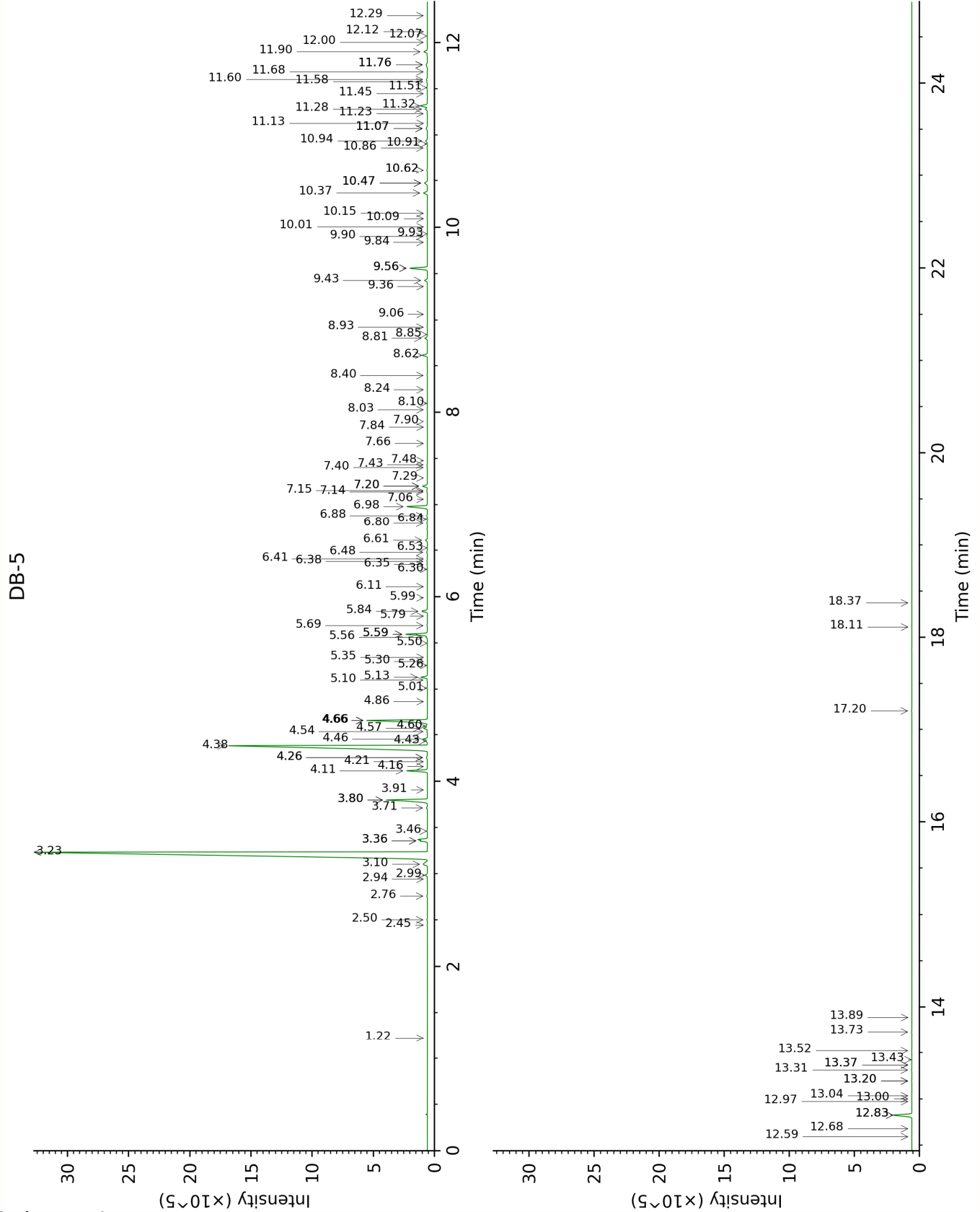
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

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.

DB-WAX





FULL ANALYSIS DATA

Toluene	Column DB-WAX			Column DB-5		
	1.50*	1001.0	[55.81]	1.22	759.2	tr
Cyclofenchene	0.96	919.7	0.02	2.45	878.3	0.01
Santene	1.17	951.3	0.03	2.50	883.0	0.03
Bornylene	1.15	949.2	0.03	2.76	903.9	0.04
Hashishene	1.50*	1001.0	[55.81]	2.94	916.3	0.02
Tricyclene	1.32	974.7	0.14	2.99	919.1	0.15
α-Thujene	1.52	1004.5	0.48	3.10	926.9	0.48
α-Pinene	1.50*	1001.0	[55.81]	3.23	935.4	55.98
Camphene	1.79	1030.1	0.47	3.36*†	943.5	[0.39]
α-Fenchene	1.72	1024.0	0.38	3.36*†	943.5	[0.39]
Thuja-2,4(10)-diene	2.37*	1084.9	[0.58]	3.46	950.4	0.03
3,7,7-Trimethylcyclohepta-1,3,5-triene	2.97*	1134.4	[1.32]	3.71	966.9	0.06
β-Pinene	2.19	1068.3	2.39	3.80*	972.5	[2.96]
Sabinene	2.37*	1084.9	[0.58]	3.80*	972.5	[2.96]
Pseudolimonene isomer	2.48*	1095.7	[0.01]	3.91	979.7	0.01
Myrcene	2.97*	1134.4	[1.32]	4.11	993.3	1.24
2-Carene	2.48*	1095.7	[0.01]	4.16	996.3	0.01
Menthatriene isomer I	3.48	1173.1	0.01	4.21*†	999.8	[0.03]
Pseudolimonene	2.90	1129.2	0.02	4.26*†	1002.7	[0.09]
α-Phellandrene	2.88	1127.2	0.08	4.26*†	1002.7	[0.09]
Δ ³ -Carene	2.73	1115.9	21.69	4.38	1010.8	21.74
1,4-Cineole	3.07	1142.2	0.06	4.43	1013.9	0.07
α-Terpinene	3.05	1140.6	0.26	4.46	1015.3	0.26
meta-Cymene	4.18*	1224.9	[0.27]	4.54	1020.4	0.03
para-Cymene	4.18*	1224.9	[0.27]	4.57	1022.6	0.23
Sylvestrene	3.25	1155.7	0.08	4.60	1024.1	0.09
Limonene	3.29	1159.0	4.07	4.66*	1027.9	[4.29]
1,8-Cineole	3.39	1166.2	0.02	4.66*	1027.9	[4.29]
β-Phellandrene	3.37	1165.0	0.22	4.66*	1027.9	[4.29]
(Z)-β-Ocimene	3.86	1201.9	0.03	4.86	1040.6	0.01
(E)-β-Ocimene	4.07	1217.0	0.02	5.01	1050.2	0.02
Unknown CUSE I [m/z 93, 91 (54), 92 (31), 77 (29), 79 (17), 43 (13), 41 (10), 136 (9)]	3.90*	1204.8	[0.40]	5.10	1055.7	0.02
γ-Terpinene	3.90*	1204.8	[0.40]	5.13	1057.5	0.40
cis-Sabinene hydrate	6.97	1426.3	0.01	5.26	1065.5	0.01
Unknown PIMA I	4.87	1273.9	0.01	5.30	1068.2	0.01

[m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]						
<i>cis</i> -Linalool oxide (fur.)	6.60	1398.8	0.01	5.35	1071.0	tr
<i>meta</i> -Cymenene	6.29	1376.3	0.01	5.50	1080.6	0.01
Isoterpinolene	4.31	1234.1	0.08	5.56	1084.6	0.07
<i>para</i> -Cymenene	6.39	1383.7	0.05	5.60*	1086.6	[1.38]
Terpinolene	4.38	1239.1	1.33	5.60*	1086.6	[1.38]
α -Pinene oxide	5.49	1318.2	0.03	5.69	1092.4	0.03
Unknown CEDE I [m/z 95, 150 (45), 110 (35), 107 (23), 109 (21)]	5.82	1342.3	0.01	5.79	1098.9	0.01
Linalool	8.13*†	1513.6	[0.50]	5.84	1102.2	0.38
endo-Fenchol	8.46*	1539.4	[0.11]	5.99	1111.3	0.02
<i>cis-para</i> -Menth-2-en-1-ol	8.20	1518.8	0.03	6.11	1119.0	0.02
4-Hydroxy-4-methylcyclohex-2-enone	14.19	2031.3	0.02	6.30	1130.9	0.02
<i>trans</i> -Pinocarveol	9.23	1600.0	0.03	6.35	1134.2	0.03
Camphor	7.27*	1448.8	[0.07]	6.38	1136.4	0.03
<i>trans-para</i> -Menth-2-en-1-ol	9.03	1583.8	0.01	6.41	1138.1	0.01
Epoxyterpinolene	6.81	1413.9	0.02	6.48	1142.7	0.05
<i>meta</i> -Mentha-4,6-dien-8-ol	9.39*	1612.8	[0.13]	6.53	1145.7	0.01
Karahanaenone	7.43	1460.7	0.13	6.61	1151.0	0.12
Borneol	9.84*	1650.4	[0.36]	6.80	1162.8	0.04
α -Phellandren-8-ol	10.22	1681.5	0.01	6.84	1165.7	0.01
Umbellulone	8.95	1577.9	0.05	6.88	1168.3	0.05
Terpinen-4-ol	8.65	1554.1	1.43	6.98	1174.6	1.47
<i>meta</i> -Cymen-8-ol	11.54	1784.7	0.02	7.06	1179.7	0.01
<i>para</i> -Cymen-8-ol	11.57	1787.6	0.04	7.14	1184.7	0.03
Unknown JUVI II [m/z 93, 59 (85), 81 (36), 92 (35), 43 (34), 121 (20), 136 (16)...]	9.79*	1645.9	[1.16]	7.15	1185.6	0.02
α -Terpineol	9.84*	1650.4	[0.36]	7.20*	1188.7	[0.33]
Myrtenal	8.76*	1563.3	[0.03]	7.20*	1188.7	[0.33]
Myrtenol	10.92	1740.6	0.02	7.29	1194.4	0.02
Unknown PINI IV [m/z 109, 91 (100), 81	10.88*	1737.3	[0.04]	7.40	1201.5	0.03

(88), 94 (75), 119 (74), 96 (73), 41 (63)... 150 (2)]						
Verbenone	9.66	1634.8	0.02	7.43	1203.5	0.03
Unknown PIMA 7 [m/z 95, 93 (32), 121 (24), 79 (22), 91 (21), 105 (16)... 154 (2)]	10.99	1746.7	0.01	7.48	1206.4	0.01
<i>trans</i> -Carveol	11.44	1776.5	0.01	7.66	1218.7	0.01
<i>cis</i> -Carveol	11.78	1805.8	0.01	7.84	1230.5	0.01
Unknown CIAU II [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	11.38	1770.6	0.02	7.90	1234.6	0.02
Carvacrol methyl ether	8.68*	1556.7	[0.17]	8.03	1243.1	0.02
Car-3-en-2-one	10.43	1699.0	0.01	8.10	1247.8	0.01
Linalyl acetate	8.27	1524.2	0.03	8.24	1257.5	0.02
(<i>trans</i> ?) -Linalool oxide acetate (fur.)?	8.76*	1563.3	[0.03]	8.40	1267.8	0.03
Bornyl acetate	8.33	1529.3	0.39	8.62	1282.4	0.35
Unknown CUSE III [m/z 121, 93 (97), 43 (81), 136 (48), 107 (47), 108 (44)...]	8.68*	1556.7	[0.17]	8.81	1295.2	0.16
Terpinen-4-yl acetate	8.82	1567.6	0.01	8.85	1297.9	0.01
Thymol	15.21	2132.3	0.01	8.93	1303.1	0.02
Unknown CUSE IV [m/z 150, 107 (98), 91 (79), 108 (61)]	12.20	1843.8	0.01	9.06	1312.8	0.01
Unknown CUSE V [m/z 93, 92 (34), 43 (31), 91 (27)...]				9.36	1333.8	0.01
Unknown CUSE VI [m/z 93, 43 (50), 121 (50), 136 (35)...]	9.61	1631.2	0.24	9.43	1338.4	0.19
α -Cubebene	6.90	1421.0	0.10	9.56*	1347.7	[1.21]
α -Terpinyl acetate	9.79*	1645.9	[1.16]	9.56*	1347.7	[1.21]
α -Ylangene	7.13	1437.9	0.01	9.84	1367.3	0.01
α -Copaene	7.27*	1448.8	[0.07]	9.90	1371.9	0.03
2-epi- α -Funebrene	7.36	1455.3	tr	9.93	1373.8	tr
β -Bourbonene	7.60	1473.2	0.01	10.00	1379.1	0.01
β -Cubebene	7.89	1495.1	0.02	10.09	1385.2	0.01
β -Elemene	8.52*	1544.4	[0.17]	10.15	1389.3	0.01
α -Cedrene	8.16*†	1515.8	[0.17]	10.37	1404.8	0.30

β -Caryophyllene	8.52*	1544.4	[0.17]	10.48*	1412.6	[0.24]
β -Cedrene	8.46*	1539.4	[0.11]	10.48*	1412.6	[0.24]
<i>cis</i> -Thujopsene	8.73	1560.7	0.01	10.62*	1423.4	[0.03]
β -Copaene	8.46*	1539.4	[0.11]	10.62*	1423.4	[0.03]
<i>cis</i> -Muurolo-3,5-diene	9.08	1588.3	0.03	10.86	1441.3	0.03
<i>trans</i> -Muurolo-3,5-diene	8.98	1580.2	0.01	10.91	1444.6	0.01
α -Humulene	9.39*	1612.8	[0.13]	10.94	1447.0	0.13
<i>cis</i> -Cadina-1(6),4-diene	9.10	1589.9	0.02	11.07*	1457.0	[0.11]
<i>cis</i> -Muurolo-4(15),5-diene	9.44	1617.2	0.09	11.07*	1457.0	[0.11]
Unknown DACA II [m/z 161, 91 (57), 120 (46), 105 (42), 133 (25), 119 (22), 41 (21), 204 (21)]	9.70*	1638.0	[0.24]	11.13	1461.1	0.01
<i>trans</i> -Cadina-1(6),4-diene	9.35	1609.7	0.03	11.23	1468.9	0.02
α -Amorphene	9.70*	1638.0	[0.24]	11.28	1472.5	0.14
Germacrene D	9.89*	1654.2	[0.54]	11.32	1475.2	0.54
<i>trans</i> -Muurolo-4(15),5-diene	9.89*	1654.2	[0.54]	11.45	1485.0	0.02
β -Alaskene	9.70*	1638.0	[0.24]	11.51	1489.8	0.06
Epizonarene	9.99	1662.6	0.10	11.58	1494.6	0.05
α -Muurolole	10.14	1674.6	0.12	11.60	1496.3	0.07
δ -Amorphene	10.05*	1667.0	[0.05]	11.68	1502.5	0.02
α -Alaskene	10.05*	1667.0	[0.05]	11.76*	1508.3	[0.13]
γ -Cadinene	10.50	1704.3	0.09	11.76*	1508.3	[0.13]
δ -Cadinene	10.52	1706.5	0.25	11.90	1519.4	0.26
<i>trans</i> -Cadina-1,4-diene	10.76	1727.0	0.02	12.00	1527.3	0.03
α -Cadinene	10.88*	1737.3	[0.04]	12.07	1532.7	0.02
α -Calacorene	12.29	1852.3	0.01	12.12	1536.4	0.01
Salviadienol?	14.45	2056.8	0.02	12.29	1550.0	0.02
Caryophyllene oxide	12.86	1904.0	0.02	12.59	1573.7	0.02
allo-Cedrol	14.32*	2043.5	[1.35]	12.68	1580.4	0.02
Widdrol	14.70	2080.8	0.01	12.83*	1591.9	[1.35]
α -Cedrol	14.32*	2043.5	[1.35]	12.83*	1591.9	[1.35]
epi-Cedrol	14.81	2092.0	0.02	12.97	1603.5	0.01
Torilenol	15.49	2160.5	0.01	13.00	1605.8	0.01
1,10-diepi-Cubenol	13.86*	1998.9	[0.02]	13.04	1608.5	0.02
α -Acorenol	14.54	2065.3	0.02	13.20*	1621.7	[0.02]
1-epi-Cubenol	13.86*	1998.9	[0.02]	13.20*	1621.7	[0.02]

allo-Aromadendrene epoxide?	13.99	2011.8	0.04	13.31	1631.4	0.03
τ-Cadinol	14.97	2107.4	0.01	13.37*	1636.0	[0.03]
τ-Muurolol	15.13	2123.6	0.02	13.37*	1636.0	[0.03]
α-Muurolol	15.26	2137.4	0.01	13.43	1640.7	0.01
α-Cadinol	15.55	2166.7	0.03	13.52	1648.8	0.02
Unknown CUSE VIII [m/z 85, 57 (59), 79 (26), 67 (18), 41 (16), 80 (15), 81 (10), 77 (8), 238 (7)]				13.73	1666.0	0.03
Eudesma-4(15),7-dien-1β-ol	16.10*	2223.6	[0.02]	13.89	1679.0	0.01
Manoyl oxide	16.48	2263.5	0.01	17.20	1975.4	0.03
7,13-Abietadiene	17.45	2367.3	0.01	18.11	2064.7	0.01
Unknown PISY I [m/z 191, 81 (47), 95 (41), 69 (39), 109 (32), 93 (32)...]	20.03	2661.3	0.01	18.37	2090.6	0.01
Isopimaradiene	16.10*	2223.6	[0.02]			
Total reported		99.28%			99.49%	

*: 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