

Date : January 21, 2022

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 22A14-PTH02

Customer identification : Cypress Organic - France - CB9105214R

Type : Essential oil

Source : *Cupressus sempervirens*

Customer : Plant Therapy

ANALYSIS

Method: PC-MAT-014  - Analysis of the composition of an essential oil or other volatile liquid by FAST GC-FID (in French); identifications validated by GC-MS.

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

Analysis date : January 17, 2022

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid

Refractive index: 1.4715 ± 0.0003 (20 °C; method PC-MAT-016)

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
Bornylene	0.04	Monoterpene
Tricyclene	0.19	Monoterpene
α -Thujene	0.39	Monoterpene
α -Pinene	56.16	Monoterpene
Camphene	0.25	Monoterpene
α -Fenchene	0.49	Monoterpene
Thuja-2,4(10)-diene	0.03	Monoterpene
meta-Cymene	0.08	Monoterpene
β -Pinene	0.86	Monoterpene
Sabinene	0.60	Monoterpene
Pseudolimonene isomer	0.01	Monoterpene
Myrcene	1.56	Monoterpene
2-Carene	0.04	Monoterpene
Pseudolimonene	0.02	Monoterpene
α -Phellandrene	0.09	Monoterpene
Δ^3 -Carene	21.16	Monoterpene
α -Terpinene	0.20	Monoterpene
1,4-Cineole	0.04	Monoterpenic ether
ortho-Cymene	0.05	Monoterpene
para-Cymene	0.48	Monoterpene
Sylvestrene	0.09	Monoterpene
β -Phellandrene	0.49	Monoterpene
Limonene	1.94	Monoterpene
(Z)- β -Ocimene	0.01	Monoterpene
(E)- β -Ocimene	0.02	Monoterpene
Unknown	0.02	Monoterpene
γ -Terpinene	0.33	Monoterpene
cis-Sabinene hydrate	0.01	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
cis-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
meta-Cymenene	0.01	Monoterpene
Terpinolene isomer	0.03	Monoterpene
Isoterpinolene	0.06	Monoterpene
para-Cymenene	0.08	Monoterpene
Terpinolene	2.33	Monoterpene
α -Pinene oxide	0.07	Monoterpenic ether
Unknown	0.01	Unknown
Unknown	0.03	Oxygenated monoterpene
Linalool	0.32	Monoterpenic alcohol
para-Mentha-1,3,8-triene	0.01	Monoterpene
endo-Fenchol	0.03	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.02	Monoterpenic alcohol

4-Hydroxy-4-methylcyclohex-2-enone	0.04	Aliphatic alcohol
<i>trans</i> -Pinocarveol	0.05	Monoterpenic alcohol
Camphor	0.06	Monoterpenic ketone
<i>trans</i> -para-Menth-2-en-1-ol	0.02	Monoterpenic alcohol
Camphene hydrate	0.01	Monoterpenic alcohol
Epoxyterpinolene	0.14	Monoterpenic ether
meta-Mentha-4,6-dien-8-ol	0.02	Monoterpenic alcohol
Karahanaenone	0.16	Monoterpenic ketone
Borneol	0.04	Monoterpenic alcohol
α -Phellandren-8-ol	0.02	Monoterpenic alcohol
Umbellulone	0.08	Monoterpenic ketone
Terpinen-4-ol	1.02	Monoterpenic alcohol
meta-Cymen-8-ol	0.02	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
para-Cymen-8-ol	0.16	Monoterpenic alcohol
α -Terpineol	0.30	Monoterpenic alcohol
Myrtenal	0.01	Monoterpenic aldehyde
Myrtenol	0.03	Monoterpenic alcohol
Verbenone	0.14	Monoterpenic ketone
Unknown	0.01	Unknown
<i>trans</i> -Carveol	0.01	Monoterpenic alcohol
Unknown	0.09	Oxygenated monoterpene
Carvacrol methyl ether	0.08	Monoterpenic ether
Car-3-en-2-one	0.04	Monoterpenic ketone
(<i>cis</i> ?) <i>-</i> Linalool oxide acetate (fur.)?	0.01	Monoterpenic ester
Linalyl acetate	0.01	Monoterpenic ester
(<i>trans</i> ?) <i>-</i> Linalool oxide acetate (fur.)?	0.03	Monoterpenic ester
Unknown	0.04	Oxygenated monoterpene
Bornyl acetate	0.09	Monoterpenic ester
Cuminol	0.01	Monoterpenic alcohol
Unknown	0.18	Monoterpenic ester
Terpinen-4-yl acetate	0.05	Monoterpenic ester
Thymol	0.09	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Unknown	0.05	Unknown
Unknown	0.20	Monoterpenic ester
Unknown	0.01	Unknown
α -Terpinyl acetate	2.07	Monoterpenic ester
α -Cubebene	0.11	Sesquiterpene
α -Ylangene	0.02	Sesquiterpene
α -Copaene	0.05	Sesquiterpene
2-epi- α -Funebrene	0.05	Sesquiterpene
α -Duprezianene	0.02	Sesquiterpene
β -Cubebene	0.02	Sesquiterpene
β -Elemene	0.05	Sesquiterpene
Sesquithujene	0.17	Sesquiterpene
α -Cedrene	0.17	Sesquiterpene
β -Funebrene	0.04	Sesquiterpene
β -Cedrene	0.04	Sesquiterpene
β -Caryophyllene	0.26	Sesquiterpene
<i>cis</i> -Thujopsene	0.02	Sesquiterpene
β -Copaene	0.09	Sesquiterpene

<i>cis</i> -Muuro-la-3,5-diene	0.01	Sesquiterpene
<i>trans</i> -Muuro-la-3,5-diene	0.01	Sesquiterpene
α -Humulene	0.16	Sesquiterpene
<i>cis</i> -Muuro-la-4(15),5-diene	0.12	Sesquiterpene
<i>cis</i> -Cadina-1(6),4-diene	0.03	Sesquiterpene
Unknown	0.02	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.02	Sesquiterpene
γ -Muuro-lene	0.07	Sesquiterpene
Germacrene D	0.24	Sesquiterpene
<i>trans</i> -Muuro-la-4(15),5-diene	0.02	Sesquiterpene
β -Alaskene	0.07	Sesquiterpene
Epizonarene	0.07	Sesquiterpene
α -Muuro-lene	0.10	Sesquiterpene
δ -Amorphene	0.01	Sesquiterpene
γ -Cadinene	0.05	Sesquiterpene
α -Alaskene	0.03	Sesquiterpene
<i>trans</i> -Calamenene	0.05	Sesquiterpene
δ -Cadinene	0.32	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.03	Sesquiterpene
α -Cadinene	0.03	Sesquiterpene
α -Calacorene	0.04	Sesquiterpene
Salviadienol?	0.05	Sesquiterpenic alcohol
Caryophyllene oxide	0.07	Sesquiterpenic ether
Caryophyllene oxide isomer	0.02	Sesquiterpenic ether
allo-Cedrol	0.04	Sesquiterpenic alcohol
α -Cedrol	1.30	Sesquiterpenic alcohol
Widdrol	0.01	Sesquiterpenic alcohol
epi-Cedrol	0.01	Sesquiterpenic alcohol
Torilenol	0.04	Oxygenated sesquiterpene
10-epi-Cubenol	0.01	Sesquiterpenic alcohol
α -Acorenol	0.02	Sesquiterpenic alcohol
1-epi-Cubenol	0.02	Sesquiterpenic alcohol
Unknown	0.10	Unknown
τ -Muuro-lol	0.02	Sesquiterpenic alcohol
τ -Cadinol	0.03	Sesquiterpenic alcohol
α -Muuro-lol	0.03	Sesquiterpenic alcohol
α -Cadinol	0.03	Sesquiterpenic alcohol
Unknown	0.02	Unknown
Eudesma-4(15),7-dien-1 β -ol	0.01	Sesquiterpenic alcohol
Phenylethyl octanoate	0.01	Phenolic ester
Isopimaradiene	0.03	Diterpene
Manoyl oxide	0.09	Diterpenic ether
7,13-Abietadiene	0.01	Diterpene
Unknown	0.01	Unknown
Consolidated total	98.69%	

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

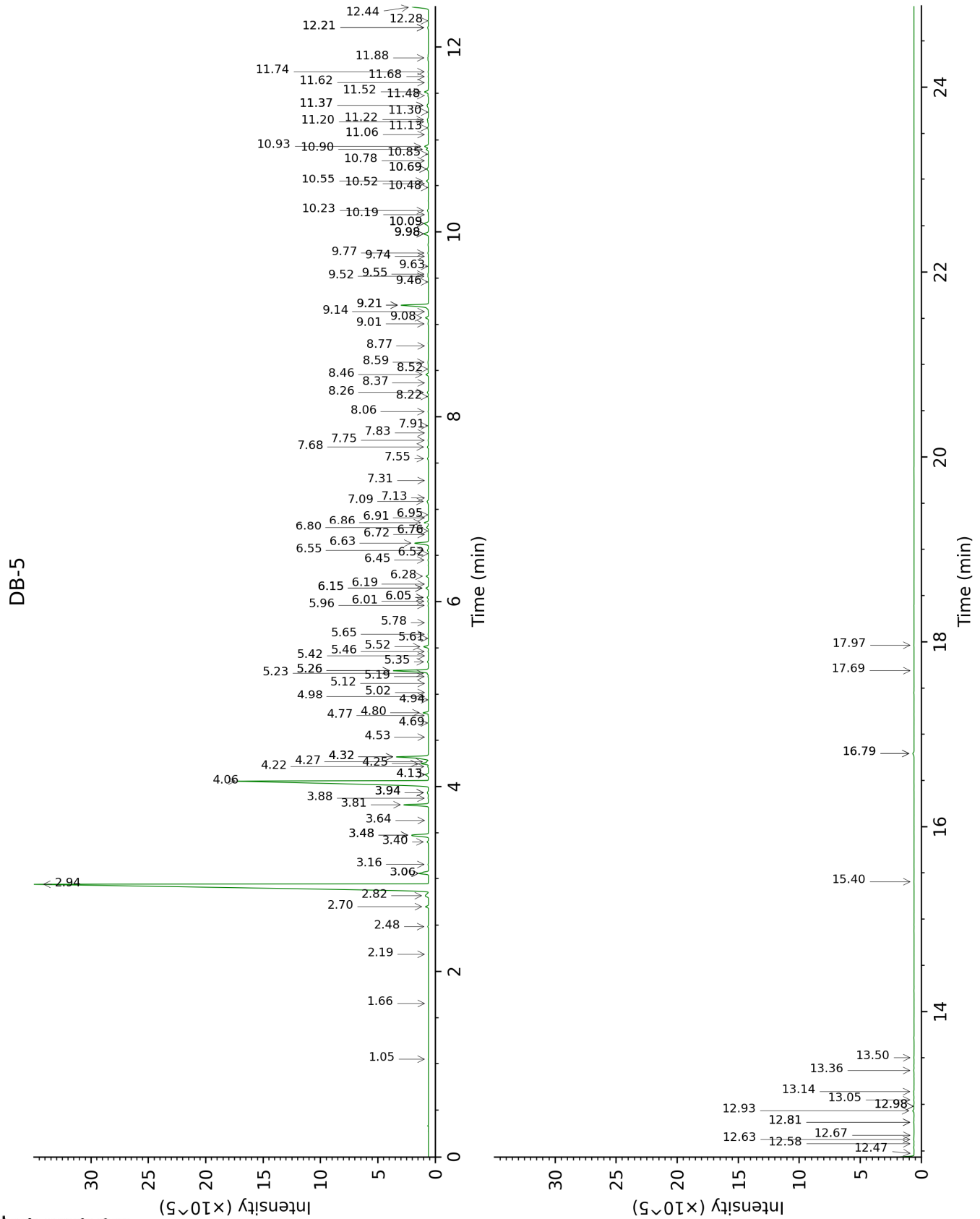
Note: no correction factor was applied

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

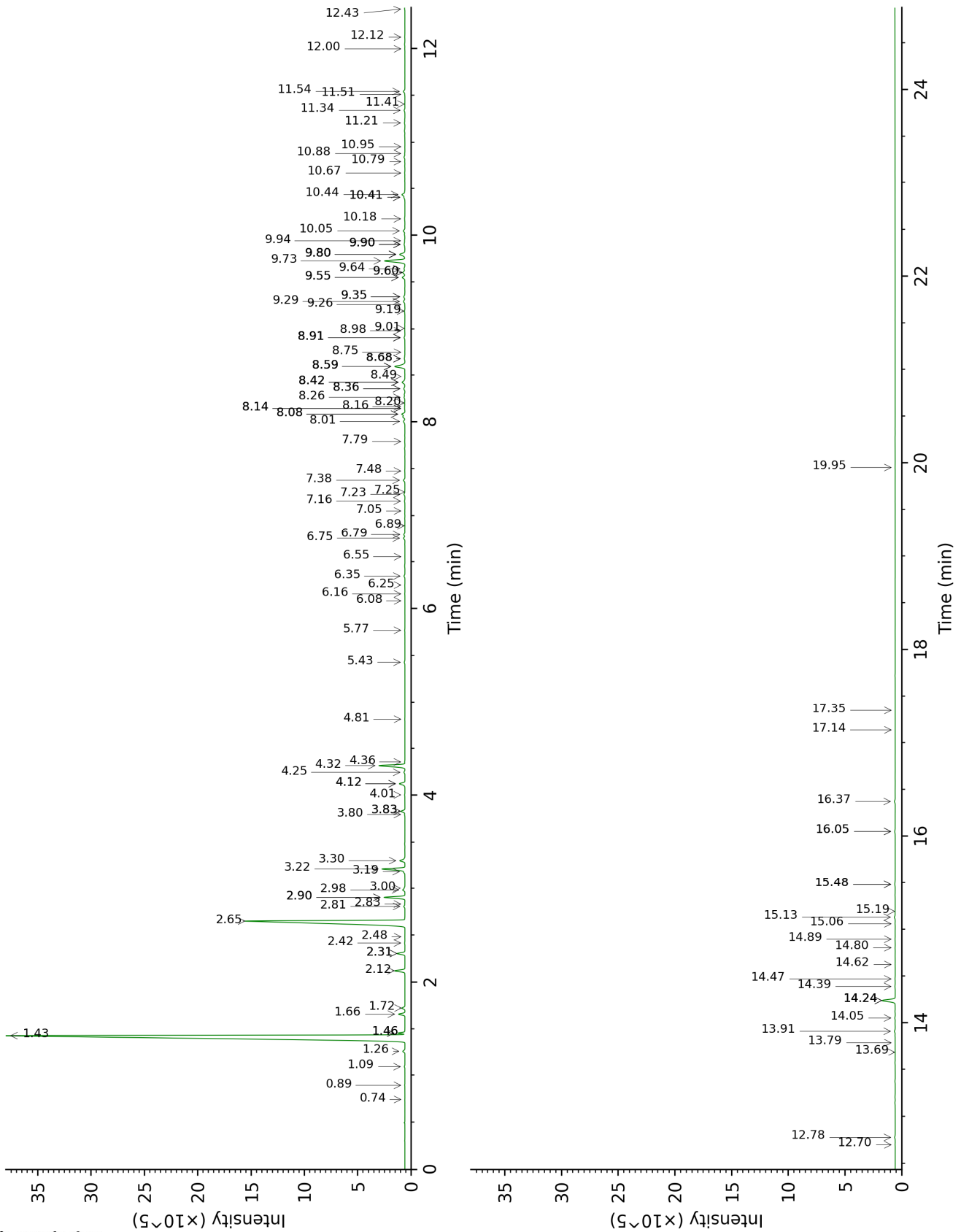
overestimating individual content. This process is semi-automatic. Advanced users are invited to consult the "Full analysis data" table after the chromatograms in this report to access the full untreated data and perform their own calculations if needed.

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.

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



DB-WAX



FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Toluene	1.05	757	0.01	1.46*†	1001	[56.46]
Unknown [m/z 109, 67 (32), 81 (14), 41 (12), 124 (10)]	1.66	831	tr	0.74	880	tr
Cyclofenchene	2.19	877	0.01	0.89	913	0.01
Bornylene	2.48	903	0.04	1.09	945	0.04
Tricyclene	2.70	918	0.19	1.26	972	0.19
α-Thujene	2.82	926	0.39	1.46*†	1001	[56.46]
α-Pinene	2.94	934	56.16	1.43†	998	56.46
Camphene	3.06*	942	0.75	1.72	1027	0.25
α-Fenchene	3.06*	942	[0.75]	1.66	1021	0.49
Thuja-2,4(10)-diene	3.16	950	0.03	2.31*	1085	0.64
meta-Cymene	3.40	966	0.08	2.90*	1134	1.64
β-Pinene	3.48*	971	1.46	2.12	1066	0.86
Sabinene	3.48*	971	[1.46]	2.31*	1085	[0.64]
Pseudolimonene isomer	3.64	982	0.01	2.48	1101	0.01
Myrcene	3.80	993	1.56	2.90*	1134	[1.64]
2-Carene	3.88	998	0.04	2.42	1096	0.02
Pseudolimonene	3.94*	1002	0.12	2.83	1129	0.02
α-Phellandrene	3.94*	1002	[0.12]	2.81	1126	0.09
Δ3-Carene	4.06	1010	21.16	2.65	1114	21.16
α-Terpinene	4.13*	1014	0.24	2.98	1140	0.20
1,4-Cineole	4.13*	1014	[0.24]	3.00	1142	0.04
ortho-Cymene	4.22	1020	0.05	4.12*	1229	0.52
para-Cymene	4.25	1022	0.48	4.12*	1229	[0.52]
Sylvestrene	4.27	1023	0.09	3.19	1157	0.09
β-Phellandrene	4.32*	1027	2.39	3.30	1166	0.49
Limonene	4.32*	1027	[2.39]	3.22	1159	1.94
(Z)-β-Ocimene	4.53	1040	0.01	3.83*	1207	0.34
(E)-β-Ocimene	4.69	1050	0.02	4.01	1220	0.03
Unknown [m/z 93, 91 (54), 92 (31), 77 (29), 79 (17), 43 (13), 41 (10), 136 (9)]	4.77	1055	0.02	3.80	1204	0.03
γ-Terpinene	4.80	1057	0.33	3.83*	1207	[0.34]
cis-Sabinene hydrate	4.94	1066	0.01	6.89	1427	0.01
Unknown [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	4.98	1068	0.01	4.81	1280	0.01
cis-Linalool oxide (fur.)	5.02	1071	0.01	6.56	1402	0.01

meta-Cymenene	5.12	1077	0.01	6.25	1380	0.02
Terpinolene isomer	5.19	1082	0.03	4.36	1246	0.02
Isoterpinolene	5.23	1084	0.06	4.25	1238	0.09
para-Cymenene	5.26*	1086	2.43	6.35	1387	0.08
Terpinolene	5.26*	1086	[2.43]	4.32	1243	2.33
α-Pinene oxide	5.35	1092	0.07	5.43	1320	0.07
Unknown [m/z 109, 43 (65), 95 (54), 119 (50), 91 (47)... 149 (8)...]	5.42	1096	0.01	6.08	1368	0.02
Unknown [m/z 95, 150 (45), 110 (35), 107 (23), 109 (21)]	5.46	1099	0.03	5.77	1345	0.02
Linalool	5.52	1102	0.32	8.08*†	1516	0.49
para-Mentha-1,3,8-triene	5.61	1108	0.01	6.16	1373	0.02
endo-Fenchol	5.65	1111	0.03	8.42*	1542	0.34
cis-para-Menth-2-en-1-ol	5.78	1119	0.02	8.14*†	1521	0.06
4-Hydroxy-4-methylcyclohex-2-enone	5.96	1131	0.04	14.05	2027	0.04
trans-Pinocarveol	6.01	1134	0.05	9.19	1602	0.05
Camphor	6.05*	1136	0.11	7.23†	1452	0.11
trans-para-Menth-2-en-1-ol	6.05*	1136	[0.11]	8.98	1586	0.02
Camphene hydrate	6.15*	1143	0.19	8.49	1547	0.01
Epoxyterpinolene	6.15*	1143	[0.19]	6.75	1416	0.14
meta-Mentha-4,6-dien-8-ol	6.19	1146	0.02	9.34*	1615	0.14
Karahanaenone	6.28	1151	0.16	7.38	1463	0.15
Borneol	6.45	1162	0.04	9.80*	1651	0.60
α-Phellandren-8-ol	6.52	1167	0.02	10.18	1682	0.05
Umbellulone	6.55	1169	0.08	8.91*	1580	0.09
Terpinen-4-ol	6.63	1174	1.02	8.59*	1556	1.13
meta-Cymen-8-ol	6.72	1180	0.02	11.51	1795	0.01
Unknown [m/z 93, 59 (85), 81 (36), 92 (35), 43 (34), 121 (20), 136 (16)...]	6.76	1183	0.02	9.80*	1651	[0.60]
para-Cymen-8-ol	6.80	1185	0.16	11.54	1798	0.15
α-Terpineol	6.86	1189	0.30	9.80*	1651	[0.60]
Myrtenal	6.91	1192	0.01	8.68*	1562	0.08
Myrtenol	6.94	1194	0.03	10.88	1741	0.02
Verbenone	7.09	1204	0.14	9.64	1639	0.10
Unknown [m/z 95, 93 (32), 121	7.13	1206	0.01	10.95	1747	0.01

(24), 79 (22), 91 (21), 105 (16)... 154 (2)]						
<i>trans</i> -Carveol	7.31	1219	0.01	11.41	1786	0.01
Unknown [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	7.55	1234	0.09	11.34	1780	0.08
Carvacrol methyl ether	7.68	1243	0.08	8.59*	1556	[1.13]
Car-3-en-2-one	7.75	1248	0.04	10.41*	1701	0.09
(<i>cis</i> ?) <i>-</i> Linalool oxide acetate (fur.)?	7.83	1253	0.01	8.16†	1522	[0.06]
Linalyl acetate	7.90	1258	0.01	8.20	1525	0.03
(<i>trans</i> ?) <i>-</i> Linalool oxide acetate (fur.)?	8.06	1268	0.03	8.68*	1562	[0.08]
Unknown [m/z 95, 67 (45), 41 (42), 110 (42), 43 (41), 59 (36)]	8.22	1279	0.04	12.43	1876	0.04
Bornyl acetate	8.26	1282	0.09	8.26	1530	0.09
Cuminol	8.37	1289	0.01	14.24*	2045	1.32
Unknown [m/z 121, 93 (97), 43 (81), 136 (48), 107 (47), 108 (44)...]	8.46	1295	0.18	8.59*	1556	[1.13]
Terpinen-4-yl acetate	8.52	1299	0.05	8.75	1568	0.02
Thymol	8.59	1304	0.09	15.13	2132	0.09
Unknown [m/z 150, 107 (98), 91 (79), 108 (61)]	8.77	1317	0.01	12.00	1838	0.02
Unknown [m/z 93, 92 (34), 43 (31), 91 (27)...]	9.01	1334	0.05			
Unknown [m/z 93, 43 (50), 121 (50), 136 (35)...]	9.08	1339	0.20	9.55*	1631	0.28
Unknown [m/z 133, 105 (45), 91 (38), 119 (36)... 150 (3)]	9.14	1343	0.01			
α -Terpinyl acetate	9.21*	1348	2.17	9.73	1646	2.07
α -Cubebene	9.21*	1348	[2.17]	6.79	1419	0.11
α -Ylangene	9.46	1366	0.02	7.05	1438	0.01
α -Copaene	9.52	1370	0.05	7.16	1446	0.04
2-epi- α -Funebrene	9.55	1372	0.05	7.25†	1454	[0.11]
α -Duprezianene	9.63	1378	0.02	7.48	1470	0.02

β-Cubebene	9.74	1386	0.02	7.79	1494	0.02
β-Elemene	9.77	1388	0.05	8.42*	1542	[0.34]
Sesquithujene	9.98*	1403	0.39	8.08*†	1516	[0.49]
α-Cedrene	9.98*	1403	[0.39]	8.01	1510	0.17
β-Funebrene	9.98*	1403	[0.39]	8.14*†	1521	[0.06]
β-Cedrene	10.09*	1411	0.40	8.36*	1537	0.13
β-Caryophyllene	10.09*	1411	[0.40]	8.42*	1542	[0.34]
cis-Thujopsene	10.19	1418	0.02	8.68*	1562	[0.08]
β-Copaene	10.23	1421	0.09	8.36*	1537	[0.13]
cis-Muurolo-3,5-diene	10.48	1440	0.01	8.91*	1580	[0.09]
trans-Muurolo-3,5-diene	10.52	1443	0.01	8.91*	1580	[0.09]
α-Humulene	10.55	1445	0.16	9.29	1611	0.16
cis-Muurolo-4(15),5-diene	10.69*	1455	0.15	9.34*	1615	[0.14]
cis-Cadina-1(6),4-diene	10.69*	1455	[0.15]	9.01	1588	0.03
Unknown [m/z 161, 91 (57), 120 (46), 105 (42), 133 (25), 119 (22), 41 (21), 204 (21)]	10.78	1462	0.02	9.60*	1636	0.23
trans-Cadina-1(6),4-diene	10.85	1467	0.02	9.26	1608	0.02
γ-Muurolole	10.90†	1471	0.47	9.55*	1631	[0.28]
Germacrene D	10.93†	1474	[0.47]	9.80*	1651	[0.60]
trans-Muurolo-4(15),5-diene	11.06	1483	0.02	9.90*	1660	0.12
β-Alaskene	11.13	1489	0.07	9.60*	1636	[0.23]
Epizonarene	11.20	1493	0.07	9.90*	1660	[0.12]
α-Muurolole	11.22	1495	0.10	10.05	1672	0.17
δ-Amorphene	11.30	1501	0.01	9.94	1663	0.05
γ-Cadinene	11.37*	1507	0.18	10.41*	1701	[0.09]
α-Alaskene	11.37*	1507	[0.18]	9.90*	1660	[0.12]
trans-Calamenene	11.48	1515	0.05	11.21	1769	0.05
δ-Cadinene	11.52	1518	0.32	10.44	1704	0.34
trans-Cadina-1,4-diene	11.62	1526	0.03	10.67	1724	0.02
α-Cadinene	11.68	1531	0.03	10.79	1734	0.02
α-Calacorene	11.74	1535	0.04	12.12	1849	0.02
Salviadienol?	11.88	1547	0.05	14.39	2059	0.04
Caryophyllene oxide	12.21*	1573	0.09	12.78	1908	0.07
Caryophyllene oxide isomer	12.21*	1573	[0.09]	12.70	1900	0.02
allo-Cedrol	12.28	1578	0.04	14.24*	2045	[1.32]
α-Cedrol	12.44	1590	1.30	14.24*	2045	[1.32]
Widdrol	12.47	1594	0.01	14.62	2082	0.02
epi-Cedrol	12.58	1602	0.01	14.80	2099	0.02
Torilenol	12.63	1606	0.04	15.48*	2167	0.07

10-epi-Cubenol	12.67	1609	0.01	13.69	1992	0.01
α-Acorenol	12.81*	1621	0.03	14.47	2067	0.02
1-epi-Cubenol	12.81*	1621	[0.03]	13.79	2001	0.02
Unknown [m/z 43, 93 (89), 91 (88), 79 (87), 123 (76), 81 (75)...]	12.93	1631	0.10	13.91	2013	0.09
τ-Muurolol	12.98*	1635	0.03	15.06	2125	0.02
τ-Cadinol	12.98*	1635	[0.03]	14.90	2108	0.03
α-Muurolol	13.05	1641	0.03	15.19	2138	0.02
α-Cadinol	13.14	1648	0.03	15.48*	2167	[0.07]
Unknown [m/z 85, 57 (59), 79 (26), 67 (18), 41 (16), 80 (15), 81 (10), 77 (8), 238 (7)]	13.36	1667	0.02			
Eudesma-4(15),7- dien-1β-ol	13.50	1678	0.01	16.05*	2225	0.06
Phenylethyl octanoate	15.40	1844	0.01	17.14	2340	0.01
Isopimaradiene	16.79*	1973	0.12	16.05*	2225	[0.06]
Manoyl oxide	16.79*	1973	[0.12]	16.37	2258	0.09
7,13-Abietadiene	17.69	2062	0.01	17.35	2362	0.01
Unknown [m/z 191, 81 (47), 95 (41), 69 (39), 109 (32), 93 (32)...]	17.97	2089	0.01	19.95	2660	0.01
Total identified		98.24%			98.23%	
Total reported		99.09%			98.56%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not 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