

GC/MS
CYPRESS - 181050187
OCTOBER 2018

Type : Essential oil

Source : Cupressus sempervirens

Customer : Jade Bloom

ANALYSIS

Method: PC-PA-014-17J19 - Analysis of the composition of an essential oil, or other volatile liquid, by FAST GC-FID; identifications validated by GC-MS.

Physical aspect: Faintly yellow liquid

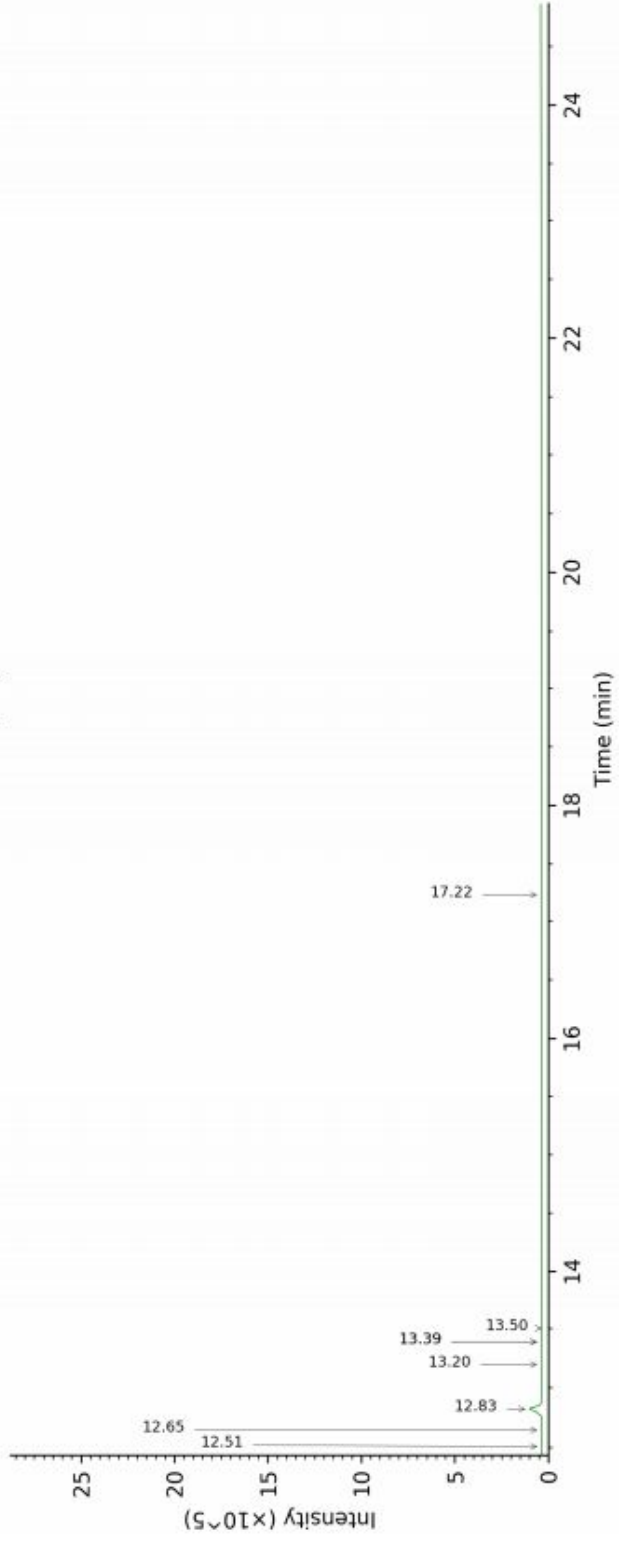
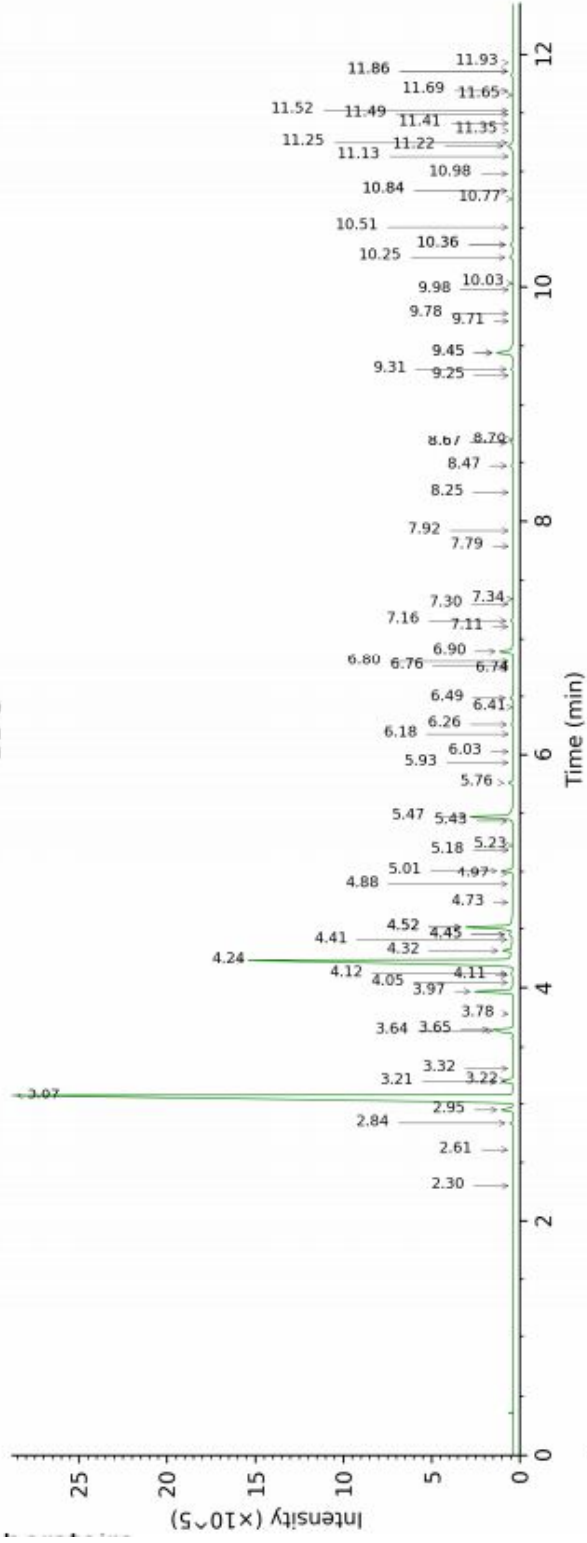
Refractive index: 1.4695 ± 0.0003 (20 °C)

Compound	Min. %	Max. %	Observed %	Complies?
Manoyl oxide	tr		0.04	Yes
Isopimaradiene	tr		0.03	Yes
Karahanaenone	tr		0.25	Yes
Germacrene D	0.5	3.0	0.5	Yes
α-Cedrol	0.8	7.0	1.3	Yes
α-Terpinyl acetate	1	4	2	Yes
Terpinen-4-ol	0.2	2.0	1.1	Yes
Limonene	1.8	5.0	3.0	Yes
Δ ³ -Carene	12	25	23	Yes
Myrcene	1.0	3.5	2.4	Yes
β-Pinene	0.5	3.0	1.1	Yes
α-Pinene	40	65	52	Yes
Refractive index	1.4680	1.4780	1.4695	Yes

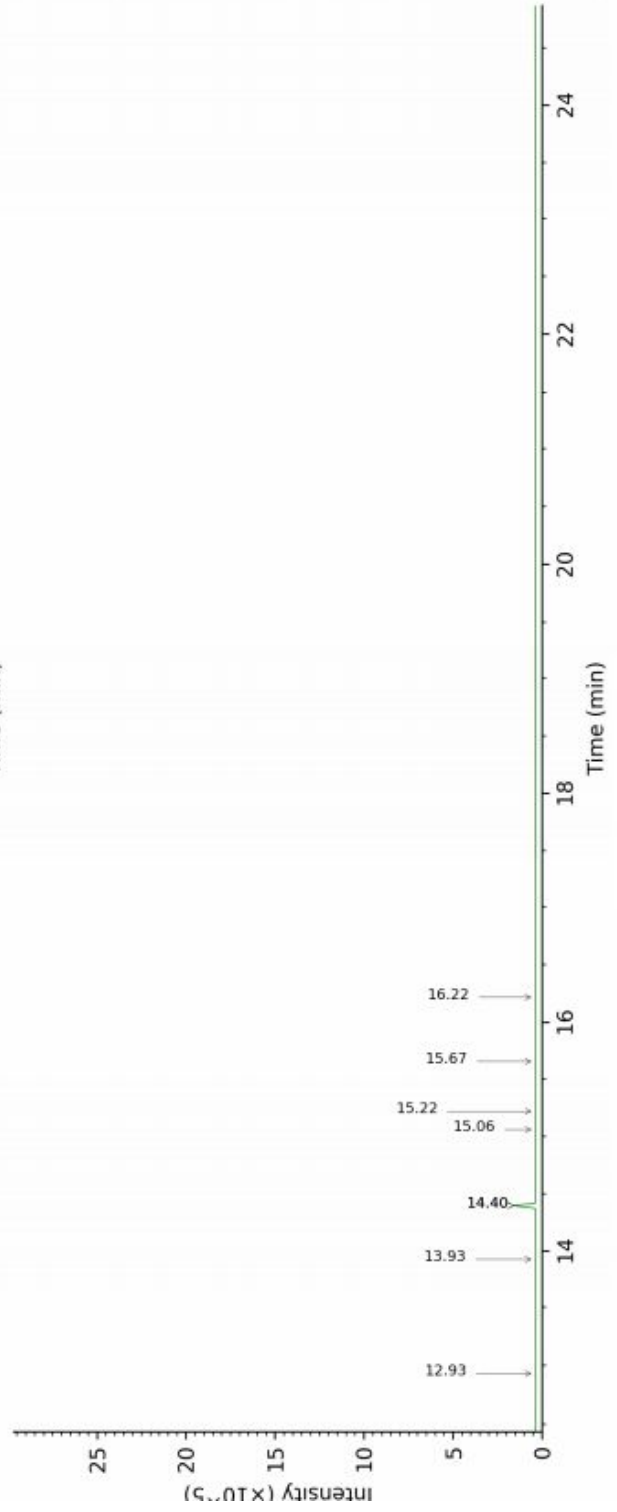
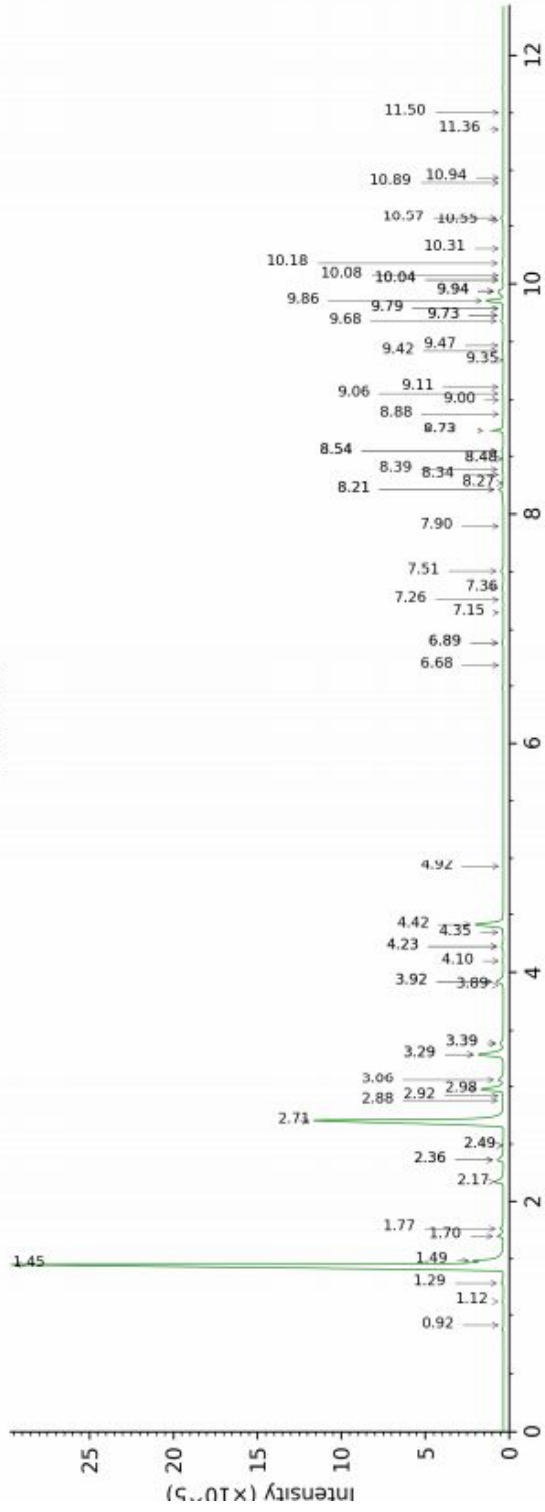
Identification	DB-5 (%)	DB-WAX (%)	Classe
Cyclofenchene	0.02	0.02	Monoterpene
Bornylene	0.06	0.05	Monoterpene
Tricyclene	0.19	0.19	Monoterpene
α -Thujene	0.86	[52.01]	Monoterpene
α -Pinene	51.66	52.01	Monoterpene
α -Fenchene	0.92	0.50	Monoterpene
Camphene	[0.92]	0.30	Monoterpene
Thuja-2,4(10)-diene	0.05	0.72*	Monoterpene
Sabinene	1.79	[0.72]*	Monoterpene
β -Pinene	[1.79]	1.06	Monoterpene
Pseudolimonene isomer	0.02	0.05*	Monoterpene
Myrcene	2.37	2.50	Monoterpene
2-Carene	0.06	[0.05]*	Monoterpene
Pseudolimonene	0.08	0.05	Monoterpene
α -Phellandrene	0.14	0.14	Monoterpene
Δ 3-Carene	23.35	23.92	Monoterpene
α -Terpinene	0.87	0.61	Monoterpene
ortho-Cymene	0.10	0.23*	Simple phenolic
para-Cymene	0.37*	[0.23]*	Monoterpene
Sylvestrene	[0.37]*	3.08*	Monoterpene
1,8-Cineole	3.47*	0.43*	Monoterpenic ether
β -Phellandrene	[3.47]*	[0.43]*	Monoterpene
Limonene	[3.47]*	[3.08]*	Monoterpene
(Z)- β -Ocimene	0.05	0.88*	Monoterpene
(E)- β -Ocimene	0.10	0.04	Monoterpene
Unknown	0.03	0.03	Monoterpene
γ -Terpinene	0.81	[0.88]*	Monoterpene
Unknown	0.01	0.01	Oxygenated monoterpene
cis-Linalool oxide (fur.)	0.01	0.01	Monoterpenic alcohol
Isoterpinolene	0.07	0.10	Monoterpene
Terpinolene	3.28	3.36	Monoterpene
Linalool	0.33	0.41*	Monoterpenic alcohol
endo-Fenchol	0.02	0.10*	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.02	0.05	Monoterpenic alcohol
trans-Pinocarveol	0.01	0.02	Monoterpenic alcohol
Camphor	0.13	0.16	Monoterpenic ketone
Epoxyterpinolene	0.02	0.13*	Monoterpenic ether
Karahanaenone	0.25	0.25	Monoterpenic ketone
Borneol	0.04	0.81*	Monoterpenic alcohol
α -Phellandren-8-ol	0.05	0.02	Monoterpenic alcohol
Umbellulone	0.02	0.02	Monoterpenic ketone
Terpinen-4-ol	1.08	1.40*	Monoterpenic alcohol
Unknown	0.04		Oxygenated monoterpene
α -Terpineol	0.18	[0.81]*	Monoterpenic alcohol
Unknown	0.03	0.01	Oxygenated monoterpene
Verbenone	0.01	0.08*	Monoterpenic ketone
Unknown	0.01	0.02	Oxygenated monoterpene
Carvacrol methyl ether	0.02	[1.40]*	Monoterpenic ether

Linalyl acetate	0.02	0.01	Monoterpenic ester
Bornyl acetate	0.17	0.18	Monoterpenic ester
Unknown	0.15*	[1.40]*	Monoterpenic ester
Cuminol	[0.15]*	1.58*	Monoterpenic alcohol
Terpinen-4-yl acetate	0.03	0.02	Monoterpenic ester
Unknown	0.02		Unknown
Unknown	0.20	0.23	Monoterpenic ester
α -Cubebene	1.67*	[0.13]*	Sesquiterpene
α -Terpinyl acetate	[1.67]*	1.53	Monoterpenic ester
α -Ylangene	0.01	0.01	Sesquiterpene
α -Copaene	0.05	0.05	Sesquiterpene
β -Cubebene	0.01	0.01	Sesquiterpene
β -Elemene	0.04	0.22*	Sesquiterpene
α -Cedrene	0.35	[0.41]*	Sesquiterpene
β -Caryophyllene	0.29*	[0.22]*	Sesquiterpene
β -Cedrene	[0.29]*	[0.10]*	Sesquiterpene
β -Copaene	0.15	[0.22]*	Sesquiterpene
<i>cis</i> -Muurolo-3,5-diene	0.05	0.08	Sesquiterpene
α -Humulene	0.12*	0.11	Sesquiterpene
<i>trans</i> -Muurolo-3,5-diene	[0.12]*	0.05	Sesquiterpene
<i>cis</i> -Muurolo-4(15),5-diene	0.10	0.10	Sesquiterpene
Unknown	0.02	0.17*	Sesquiterpene
α -Amorphene	0.56	[0.17]*	Sesquiterpene
Germacrene D	[0.56]	[0.81]*	Sesquiterpene
<i>trans</i> -Muurolo-4(15),5-diene	0.01	0.09*	Sesquiterpene
β -Alaskene	0.05	[0.08]*	Sesquiterpene
Epizonarene	0.04	[0.09]*	Sesquiterpene
α -Muurolene	0.09	0.14	Sesquiterpene
α -Alaskene	0.04	0.04	Sesquiterpene
γ -Cadinene	0.08	0.24	Sesquiterpene
<i>trans</i> -Calamenene	0.07*	0.02	Sesquiterpene
δ -Cadinene	[0.07]*	0.06	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.01	0.01	Sesquiterpene
Caryophyllene oxide	0.01	0.01	Sesquiterpenic ether
allo-Cedrol	0.01	[1.58]*	Sesquiterpenic alcohol
α -Cedrol	1.31	[1.58]*	Sesquiterpenic alcohol
1- <i>epi</i> -Cubenol	0.02	0.01	Sesquiterpenic alcohol
τ -Muurolol	0.02*	0.01	Sesquiterpenic alcohol
τ -Cadinol	[0.02]*	0.01	Sesquiterpenic alcohol
α -Cadinol	0.01	0.02	Sesquiterpenic alcohol
Manoyl oxide	0.04		Diterpenic ether
Isopimaradiene		0.03	Diterpene
Total identified	98.45%	98.51%	

DB-5



DB-WAX



Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Cyclofenchene	2.30	875	0.02	0.92	916	0.02
Bornylene	2.61	900	0.06	1.12	946	0.05
Tricyclene	2.84	916	0.19	1.29	972	0.19
α -Thujene	2.95	924	0.86	1.49†	1001	[52.01]
α -Pinene	3.07	932	51.66	1.45†	996	52.01
α -Fenchene	3.21†	940	0.92	1.70	1021	0.50
Camphene	3.22†	941	[0.92]	1.77	1027	0.30
Thuja-2,4(10)-diene	3.32	948	0.05	2.36*	1084	0.72
Sabinene	3.64†	969	1.79	2.36*	1084	[0.72]
β -Pinene	3.65†	969	[1.79]	2.17	1066	1.06
Pseudolimonene isomer	3.78	978	0.02	2.49*	1096	0.05
Myrcene	3.97	990	2.37	2.98	1134	2.50
2-Carene	4.05	995	0.06	2.49*	1096	[0.05]
Pseudolimonene	4.11	999	0.08	2.92	1129	0.05
α -Phellandrene	4.12	1000	0.14	2.88	1126	0.14
Δ^3 -Carene	4.24	1008	23.35	2.71	1113	23.92
α -Terpinene	4.32	1012	0.87	3.06	1140	0.61
ortho-Cymene	4.41	1018	0.10	4.23*	1230	0.23
para-Cymene	4.45*	1021	0.37	4.23*	1230	[0.23]
Sylvestrene	4.45*	1021	[0.37]	3.29*	1159	3.08
1,8-Cineole	4.52*	1025	3.47	3.39*	1166	0.43
β -Phellandrene	4.52*	1025	[3.47]	3.39*	1166	[0.43]
Limonene	4.52*	1025	[3.47]	3.29*	1159	[3.08]
(Z)- β -Ocimene	4.73	1038	0.05	3.92*	1208	0.88
(E)- β -Ocimene	4.88	1047	0.10	4.10	1221	0.04
Unknown [m/z 93, 91 (54), 92 (31), 77 (29), 79 (17), 43 (13), 41 (10), 136 (9)]	4.97	1053	0.03	3.89	1205	0.03
γ -Terpinene	5.01	1055	0.81	3.92*	1208	[0.88]
Unknown [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	5.18	1066	0.01	4.92	1282	0.01
<i>cis</i> -Linalool oxide (fur.)	5.23	1069	0.01	6.68	1404	0.01
Isoterpinolene	5.43	1081	0.07	4.35	1239	0.10
Terpinolene	5.47	1084	3.28	4.42	1244	3.36
Linalool	5.76	1102	0.33	8.21*	1518	0.41
endo-Fenchol	5.93	1112	0.02	8.48*	1538	0.10
<i>cis</i> -para-Menth-2-en-1-ol	6.03	1118	0.02	8.27	1522	0.05
<i>trans</i> -Pinocarveol	6.18	1128	0.01	9.34	1605	0.02
Camphor	6.26	1133	0.13	7.36	1454	0.16

Epoxyterpinolene	6.41	1142	0.02	6.89*	1419	0.13
Karahanaenone	6.49	1147	0.25	7.51	1465	0.25
Borneol	6.74	1163	0.04	9.94*	1653	0.81
α -Phellandren-8-ol	6.76	1165	0.05	10.31	1682	0.02
Umbellulone	6.80	1167	0.02	9.00	1578	0.02
Terpinen-4-ol	6.90	1173	1.08	8.73*	1558	1.40
Unknown [m/z 93, 59 (85), 81 (36), 92 (35), 43 (34), 121 (20), 136 (16)...]	7.11	1186	0.04			
α -Terpineol	7.16	1190	0.18	9.94*	1653	[0.81]
Unknown [m/z 109, 91 (100), 81 (88), 94 (75), 119 (74), 96 (73), 41 (63)... 150 (2)]	7.30	1199	0.03	10.94	1735	0.01
Verbenone	7.34	1201	0.01	9.79*	1641	0.08
Unknown [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	7.79	1231	0.01	11.50	1783	0.02
Carvacrol methyl ether	7.92	1240	0.02	8.73*	1558	[1.40]
Linalyl acetate	8.25	1261	0.02	8.34	1528	0.01
Bornyl acetate	8.47	1276	0.17	8.39	1531	0.18
Unknown [m/z 121, 93 (97), 43 (81), 136 (48), 107 (47), 108 (44)...]	8.67*	1289	0.15	8.73*	1558	[1.40]
Cuminol	8.67*	1289	[0.15]	14.40*	2046	1.58
Terpinen-4-yl acetate	8.70	1291	0.03	8.88	1569	0.02
Unknown [m/z 93, 92 (34), 43 (31), 91 (27)...]	9.25	1331	0.02			
Unknown [m/z 93, 43 (50), 121 (50), 136 (35)...]	9.31	1334	0.20	9.68	1632	0.23
α -Cubebene	9.44*†	1344	1.67	6.89*	1419	[0.13]
α -Terpinyl acetate	9.44*†	1344	[1.67]	9.86	1646	1.53
α -Ylangene	9.71	1363	0.01	7.15	1439	0.01
α -Copaene	9.78	1367	0.05	7.26	1447	0.05
β -Cubebene	9.98	1381	0.01	7.90	1494	0.01
β -Elemene	10.03	1385	0.04	8.54*	1543	0.22
α -Cedrene	10.25	1400	0.35	8.21*	1518	[0.41]
β -Caryophyllene	10.36*	1408	0.29	8.54*	1543	[0.22]
β -Cedrene	10.36*	1408	[0.29]	8.48*	1538	[0.10]
β -Copaene	10.51	1419	0.15	8.54*	1543	[0.22]
<i>cis</i> -Muurolo-3,5-	10.77	1437	0.05	9.11	1587	0.08

diene						
α -Humulene	10.84*	1442	0.12	9.42	1611	0.11
<i>trans</i> -Muuro-la-3,5-diene	10.84*	1442	[0.12]	9.06	1582	0.05
<i>cis</i> -Muuro-la-4(15),5-diene	10.98	1453	0.10	9.47	1615	0.10
Unknown [m/z 161, 91 (57), 120 (46), 105 (42), 133 (25), 119 (22), 41 (21), 204 (21)]	11.13	1464	0.02	9.73*	1636	0.17
α -Amorphene	11.22†	1470	0.56	9.73*	1636	[0.17]
Germacrene D	11.25†	1472	[0.56]	9.94*	1653	[0.81]
<i>trans</i> -Muuro-la-4(15),5-diene	11.35	1480	0.01	10.04*	1661	0.09
β -Alaskene	11.41	1485	0.05	9.79*	1641	[0.08]
Epizonarene	11.49	1490	0.04	10.04*	1661	[0.09]
α -Muuro-lene	11.52	1493	0.09	10.18	1672	0.14
α -Alaskene	11.65	1502	0.04	10.08	1664	0.04
γ -Cadinene	11.69	1505	0.08	10.57	1704	0.24
<i>trans</i> -Calamenene	11.86*	1518	0.07	11.36	1770	0.02
δ -Cadinene	11.86*	1518	[0.07]	10.55	1702	0.06
<i>trans</i> -Cadina-1,4-diene	11.93	1524	0.01	10.89	1731	0.01
Caryophyllene oxide	12.51	1569	0.01	12.93	1909	0.01
allo-Cedrol	12.65	1580	0.01	14.40*	2046	[1.58]
α -Cedrol	12.83	1593	1.31	14.40*	2046	[1.58]
1- <i>epi</i> -Cubenol	13.20	1623	0.02	13.93	2001	0.01
τ -Muuro-lol	13.39*	1639	0.02	15.22	2125	0.01
τ -Cadinol	13.39*	1639	[0.02]	15.06	2110	0.01
α -Cadinol	13.50	1648	0.01	15.67	2170	0.02
Manoyl oxide	17.22	1977	0.04			
Isopimaradiene				16.22	2226	0.03
Total identified		98.45%			98.51%	
Total reported		98.82%			98.82%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

Note: no correction factor was applied

R.T.: Retention time (minutes)

R.I.: Retention index

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