

GC/MS BATCH NUMBER: EG0102

ESSENTIAL OIL: EUCALYPTUS DIVES
BOTANICAL NAME: EUCALYPTUS DIVES
ORIGIN: AUSTRALIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF EUCALYPTUS DIVES OIL	%
PIPERITONE	51.6
p-CYMENE	7.2
TERPINEN-4-ol	4.9
1,8-CINEOLE + β -PHELLANDRENE	2.9
α -THUJENE	2.7
TERPINOLENE	1.7
MYRCENE	1.4
α -TERPINEOL	1.4
LINALOOL	1.0

Comments from Robert Tisserand: Beautiful fruity-minty odor quality, with hints of Eucalyptus and Tea Tree. Constituents are in expected amounts.

Date : October 18, 2018

CERTIFICATE OF ANALYSIS – GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 18J11-PTH4-1-CC

Customer identification : Eucalyptus Dives - Australia - EG010285R

Type : Essential oil

Source : *Eucalyptus dives*

Customer : Plant Therapy

ANALYSIS

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

Analyst : Lindsay Girard, B. Sc.

Analysis date : October 12, 2018

Checked and approved by :

Alexis St-Gelais, M. Sc., chimiste 2013-174

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This report is digitally signed, it is only considered valid if the digital signature is intact.

PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid

Refractive index: 1.4803 ± 0.0003 (20 °C)

CONCLUSION

No adulterant, contaminant or diluent has been detected using this method.

ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
Toluene	0.02	0.02	Simple phenolic
Isoamyl acetate	0.01	0.01	Aliphatic ester
α -Thujene	2.66	2.68	Monoterpene
α -Pinene	0.39	0.33	Monoterpene
Camphene	0.02		Monoterpene
Sabinene	0.22*	0.17	Monoterpene
β -Pinene	[0.22]*	0.05	Monoterpene
Myrcene	1.41	1.40	Monoterpene
α -Phellandrene	16.11	15.99	Monoterpene
α -Terpinene	0.99	0.87	Monoterpene
para-Cymene	7.24	7.58	Monoterpene
Limonene	3.76*	0.46	Monoterpene
1,8-Cineole	[3.76]*	2.86*	Monoterpenic ether
β -Phellandrene	[3.76]*	[2.86]*	Monoterpene
(Z)- β -Ocimene	0.07	0.05	Monoterpene
(E)- β -Ocimene	0.31	0.31	Monoterpene
γ -Terpinene	0.58	0.59	Monoterpene
cis-Linalool oxide (fur.)	0.01	0.02	Monoterpenic alcohol
para-Cymenene	1.71*	0.04	Monoterpene
Terpinolene	[1.71]*	1.67	Monoterpene
Methyl benzoate	0.03	0.01	Phenolic ester
trans-Sabinene hydrate	0.01	0.01	Monoterpenic alcohol
Linalool	1.03	1.04	Monoterpenic alcohol
para-Mentha-1,3,8-triene	0.03	0.01	Monoterpene
cis-para-Menth-2-en-1-ol	0.77	0.79	Monoterpenic alcohol
Cosmene?	0.01		Monoterpene
trans-para-Menth-2-en-1-ol	0.56	0.61*	Monoterpenic alcohol
Unknown	0.06	0.02	Oxygenated monoterpene
iso-Isopulegol	0.02	0.02	Monoterpenic alcohol
Unknown	0.05	0.04	Oxygenated monoterpene
Unknown	0.08	0.06	Oxygenated monoterpene
Terpinen-4-ol	5.03*	4.87*	Monoterpenic alcohol
Unknown	[5.03]*		Unknown
α -Terpineol	1.58*	1.29*	Monoterpenic alcohol
cis-Piperitol	[1.58]*	0.18	Monoterpenic alcohol
α -Phellandrene epoxide	0.18	0.17	Monoterpenic ether
trans-Piperitol	0.32	0.33	Monoterpenic alcohol
Citronellol	0.02	0.02	Monoterpenic alcohol
Neral	0.05	0.05	Monoterpenic aldehyde
Benzylacetone	0.08	0.08	Simple phenolic
Piperitone	51.60	51.17	Monoterpenic ketone
Geraniol	0.21	0.14	Monoterpenic alcohol
Thymol	0.05	0.14*	Monoterpenic alcohol
Unknown	0.04	0.18*	Unknown
Unknown	0.07	[0.14]*	Unknown
α -Terpinyl acetate	0.13	0.11	Monoterpenic ester
Methyl (E)-cinnamate	0.05	0.04	Phenylpropanoid ester
β -Elemene	0.01	0.01	Sesquiterpene

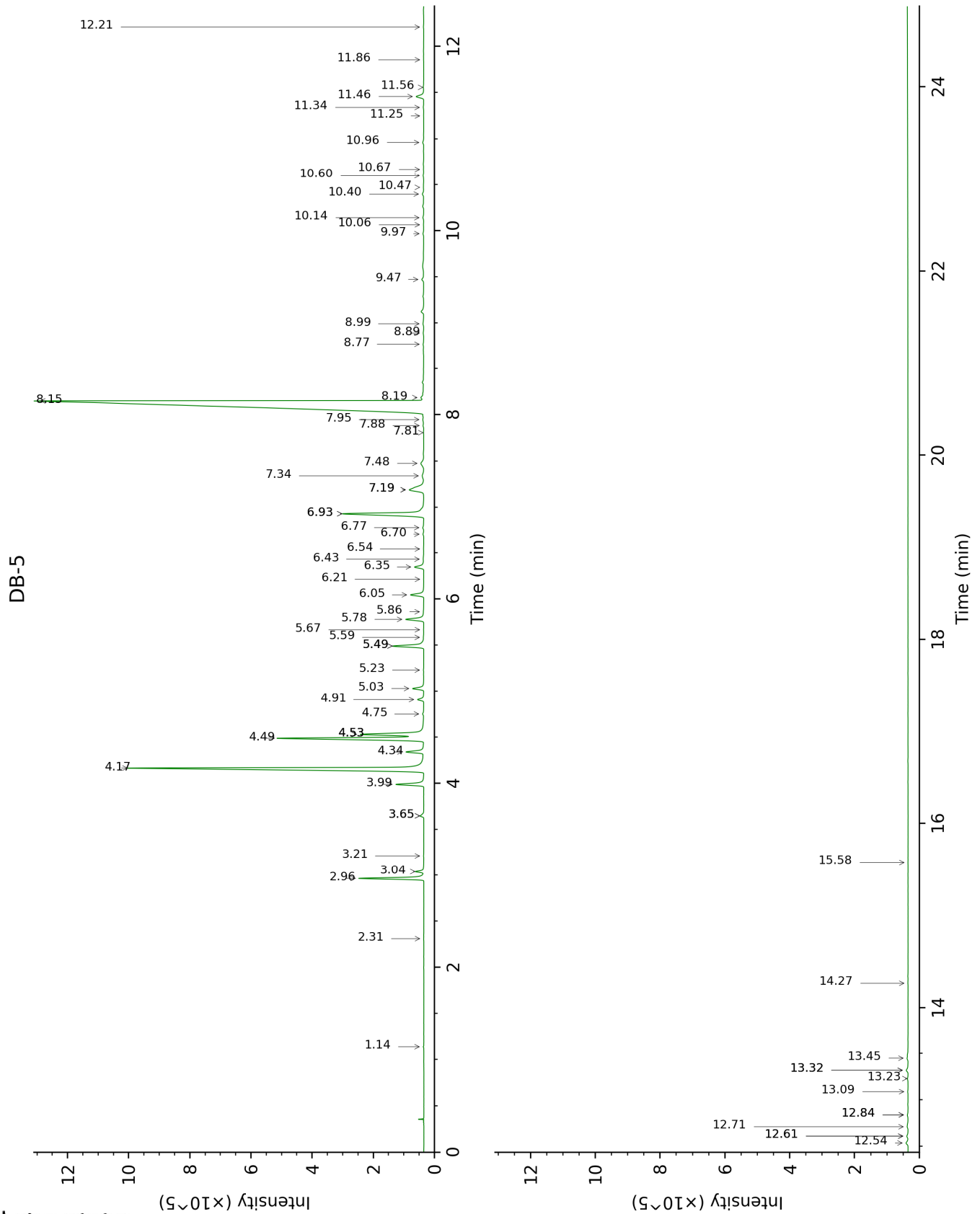
(Z)-Jasmone	0.06	0.05	Jasmonate
β-Caryophyllene	0.09	0.07	Sesquiterpene
(trans?)-6-Hydroxypiperitone	0.02	0.06*	Monoterpenic alcohol
(cis?)-6-Hydroxypiperitone	0.04		Monoterpenic alcohol
Aromadendrene	0.01	[4.87]*	Sesquiterpene
allo-Aromadendrene	0.06	[0.61]*	Sesquiterpene
Germacrene D	0.01	[1.29]*	Sesquiterpene
Unknown	0.03		Unknown
Bicyclogermacrene	0.50	0.49	Sesquiterpene
Aromadendra-1(10),4(15)-diene	0.03		Sesquiterpene
δ-Cadinene	0.01	0.01	Sesquiterpene
α-Elemol	0.02	0.03	Sesquiterpenic alcohol
Spathulenol	0.13	[0.18]*	Sesquiterpenic alcohol
Globulol	0.09*	0.09	Sesquiterpenic alcohol
Unknown	[0.09]*		Oxygenated sesquiterpene
Viridiflorol	0.08	0.06	Sesquiterpenic alcohol
Ledol	0.05*	0.16	Sesquiterpenic alcohol
Eudesm-5-en-11-ol	[0.05]*	0.02	Sesquiterpenic alcohol
Rosifoliol	0.02	0.02	Sesquiterpenic alcohol
γ-Eudesmol	0.03	0.04	Sesquiterpenic alcohol
Isospathulenol	0.13*	0.11	Sesquiterpenic alcohol
τ-Cadinol	[0.13]*	0.06	Sesquiterpenic alcohol
α-Eudesmol	0.06	0.06	Sesquiterpenic alcohol
Aromadendrane-4,10-diol	0.01	[0.06]*	Sesquiterpenic alcohol
α-Phellandrene dimer IV	0.01	0.04	Diterpene
Total identified	98.75%	97.71%	

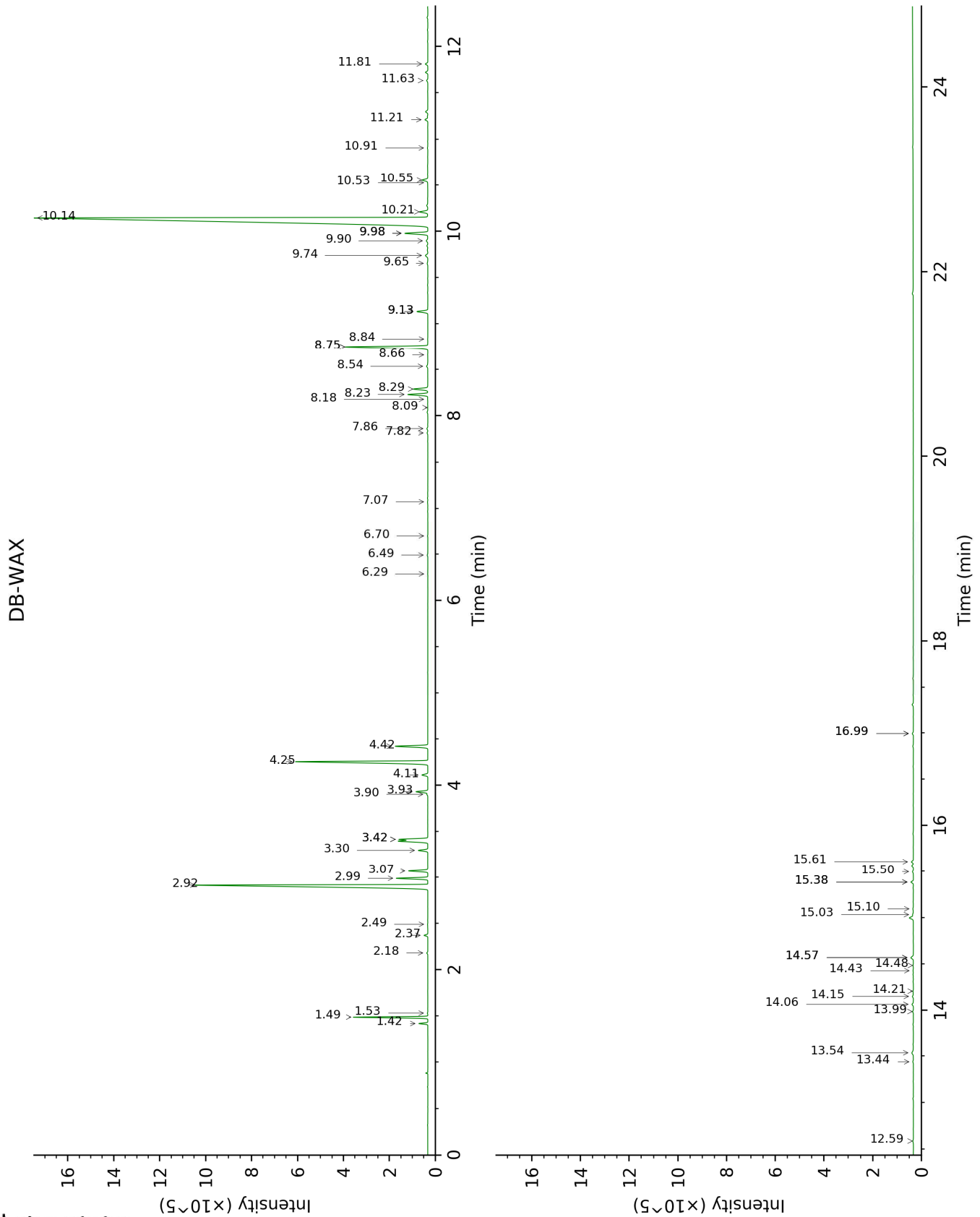
*: Two or more compounds are coeluting on this column

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

Note: no correction factor was applied

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FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Toluene	1.14	757	0.02	1.53	1005	0.02
Isoamyl acetate	2.31	876	0.01	2.49	1096	0.01
α -Thujene	2.96	925	2.66	1.49	1001	2.68
α -Pinene	3.04	930	0.39	1.42	992	0.33
Camphene	3.21	941	0.02			
Sabinene	3.65*	969	0.22	2.37	1085	0.17
β -Pinene	3.65*	969	[0.22]	2.18	1067	0.05
Myrcene	3.99	992	1.41	2.99	1135	1.40
α -Phellandrene	4.16	1003	16.11	2.92	1129	15.99
α -Terpinene	4.34	1014	0.99	3.07	1141	0.87
para-Cymene	4.49	1023	7.24	4.25	1232	7.58
Limonene	4.53*	1026	3.76	3.30	1159	0.46
1,8-Cineole	4.53*	1026	[3.76]	3.42*†	1168	2.86
β -Phellandrene	4.53*	1026	[3.76]	3.42*†	1168	[2.86]
(Z)- β -Ocimene	4.75	1039	0.07	3.90	1206	0.05
(E)- β -Ocimene	4.91	1049	0.31	4.11	1221	0.31
γ -Terpinene	5.03	1057	0.58	3.93	1208	0.59
cis-Linalool oxide (fur.)	5.23	1069	0.01	6.70	1405	0.02
para-Cymenene	5.49*	1085	1.71	6.49	1390	0.04
Terpinolene	5.49*	1085	[1.71]	4.42	1244	1.67
Methyl benzoate	5.59	1091	0.03	8.84	1566	0.01
trans-Sabinene hydrate	5.67	1096	0.01	8.09	1508	0.01
Linalool	5.78	1103	1.03	8.23	1519	1.04
para-Mentha-1,3,8-triene	5.86	1108	0.03	6.29	1376	0.01
cis-para-Menth-2-en-1-ol	6.05	1120	0.77	8.29	1524	0.79
Cosmene?	6.21	1130	0.01			
trans-para-Menth-2-en-1-ol	6.35	1138	0.56	9.13*	1588	0.61
Unknown [m/z 95, 43 (74), 109 (72), 82 (62), 110 (50)... 152 (14)]	6.43	1144	0.06	7.07	1433	0.02
iso-Isopulegol	6.54	1151	0.02	8.18	1515	0.02
Unknown [m/z 95, 110 (38), 81 (21), 79 (16)... 152 (7)]	6.70	1161	0.05	7.82	1488	0.04
Unknown [m/z 95, 110 (43), 81 (28), 41 (15)... 152 (8)]	6.77	1165	0.08	7.86	1491	0.06
Terpinen-4-ol	6.93*	1175	5.03	8.75*	1559	4.87
Unknown [m/z 69, 68 (65), 110 (51), 67 (39), 41 (27), 83 (26)...]	6.93*	1175	[5.03]			

α-Terpineol	7.19*	1192	1.58	9.98*	1656	1.29
cis-Piperitol	7.19*	1192	[1.58]	9.74	1637	0.18
α-Phellandrene epoxide	7.34	1201	0.18	11.21	1758	0.17
trans-Piperitol	7.48	1210	0.32	10.55	1703	0.33
Citronellol	7.81	1232	0.02	10.91	1732	0.02
Neral	7.88	1237	0.05	9.65	1630	0.05
Benzylacetone	7.95	1241	0.08	11.63	1794	0.08
Piperitone	8.15	1255	51.60	10.14	1669	51.17
Geraniol	8.19	1257	0.21	11.81	1810	0.14
Thymol	8.77	1296	0.05	15.38*	2142	0.14
Unknown [m/z 43, 111 (84), 109 (71), 126 (70)...]	8.89	1306	0.04	14.57*	2062	0.18
Unknown [m/z 111, 126 (93), 43 (90), 71 (60)...]	8.99	1313	0.07	15.38*	2142	[0.14]
α-Terpinyl acetate	9.47	1346	0.13	9.90	1650	0.11
Methyl (E)-cinnamate	9.97	1380	0.05	13.99	2006	0.04
β-Elemene	10.06	1387	0.01	8.66	1552	0.01
(Z)-Jasmone	10.14	1392	0.06	12.59	1878	0.05
β-Caryophyllene	10.40	1410	0.09	8.54	1542	0.07
(trans?)-6-Hydroxypiperitone	10.47	1416	0.02	16.99*	2307	0.06
(cis?)-6-Hydroxypiperitone	10.60	1425	0.04			
Aromadendrene	10.67	1430	0.01	8.75*	1559	[4.87]
allo-Aromadendrene	10.96	1452	0.06	9.13*	1588	[0.61]
Germacrene D	11.25	1473	0.01	9.98*	1656	[1.29]
Unknown [m/z 98, 108 (84), 43 (62), 161 (38), 41 (28), 91 (26)...]	11.34	1480	0.03			
Bicyclogermacrene	11.46	1488	0.50	10.21	1675	0.49
Aromadendra-1(10),4(15)-diene	11.56	1496	0.03			
δ-Cadinene	11.86	1518	0.01	10.52	1700	0.01
α-Elemol	12.21	1546	0.02	14.21	2027	0.03
Spathulenol	12.54	1571	0.13	14.57*	2062	[0.18]
Globulol	12.61*	1577	0.09	14.06	2014	0.09
Unknown [m/z 109, 43 (95), 81 (81), 93 (76), 69 (75), 95 (74), 107 (71)... 204 (22), 220 (6)]	12.61*	1577	[0.09]			
Viridiflorol	12.71	1584	0.08	14.15	2022	0.06
Ledol	12.84*	1594	0.05	13.54	1964	0.16
Eudesm-5-en-11-ol	12.84*	1594	[0.05]	14.48	2054	0.02
Rosifoliol	13.09	1614	0.02	14.43	2048	0.02

γ -Eudesmol	13.23	1626	0.03	15.10	2113	0.04
Isospathulenol	13.32*	1633	0.13	15.61	2164	0.11
τ -Cadinol	13.32*	1633	[0.13]	15.03	2107	0.06
α -Eudesmol	13.45	1644	0.06	15.50	2153	0.06
Aromadendrane-4,10-diol	14.27	1711	0.01	16.99*	2307	[0.06]
α -Phellandrene dimer IV	15.58	1825	0.01	13.44	1955	0.04
Total identified		98.75%			97.71%	
Total reported		99.07%			97.84%	

*: 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