Date : December 11, 2018

Certificate of Analysis – GC Profiling

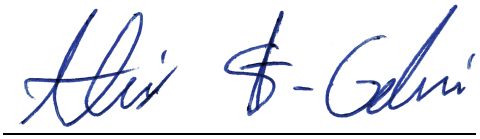
Sample identification

Internal code : 18L10-PTH02-1-CC
Customer identification : Peru Balsam - El Salvador - PN0101811R
Type : Resin
Source : *Myroxylon balsamum*
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 : Sylvain Mercier, M. Sc., Chimiste
Analysis date : December 10, 2018

Checked and approved by :



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

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PHYSICOCHEMICAL DATA

Physical aspect: Orange viscous liquid
Refractive index: 1.5695 ± 0.0003 (20 °C)

CONCLUSION

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

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ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
Acetic acid	tr		Aliphatic acid
Toluene	0.02	0.02	Simple phenolic
Styrene	0.02	0.02	Simple phenolic
Benzaldehyde	0.06	0.06	Simple phenolic
6-Methyl-5-hepten-2-one	tr		Aliphatic ketone
Myrcene	0.01	tr	Monoterpene
para-Cymene	0.01	tr	Monoterpene
1,8-Cineole	0.01*	tr	Monoterpenic ether
Limonene	[0.01]*	0.01	Monoterpene
Benzyl alcohol	0.82	0.86	Simple phenolic
Acetophenone	0.02	0.01	Simple phenolic
Benzyl formate	0.01	0.02	Phenolic ester
ortho-Guaiacol	0.07	0.07	Simple phenolic
Methyl benzoate	0.02	0.02	Phenolic ester
Benzyl acetate	0.01	0.01*	Phenolic ester
Ethyl benzoate	0.02	0.02	Phenolic ester
Terpinen-4-ol	0.02	0.01	Monoterpenic alcohol
4-Ethylguaiacol	0.03	0.03	Norphenylpropanoid
4-Vinylguaiacol	0.15	0.15	Simple phenolic
Unknown	0.01		Unknown
Hydrocinnamic acid	0.03	78.80*	Phenylpropanoid
Eugenol	0.02	0.02	Phenylpropanoid
Cyclosativene I	tr	tr	Sesquiterpene
α-Copaene	tr	tr	Sesquiterpene
Methyl (*E*)-cinnamate	0.16	1.18*	Phenylpropanoid ester
Vanillin	0.24	0.24	Simple phenolic
Coumarin	0.02	0.02	Coumarin
(*E*)-Cinnamic acid	4.48*	4.41	Phenylpropanoid
γ-Muurolene	[4.48]*	tr	Sesquiterpene
Ethyl (*E*)-cinnamate	[4.48]*	0.02	Phenylpropanoid ester
(*E*)-β-Farnesene	[4.48]*	0.12	Sesquiterpene
Geranylacetone	[4.48]*	tr	Monoterpenic ketone
(*E*)-Isoeugenol	[4.48]*	0.04*	Phenylpropanoid
Methyl (*Z*)-isoeugenol	[4.48]	0.01	Phenylpropanoid
α-Selinene	0.01	0.01	Sesquiterpene
α-Muurolene	0.02	[0.01]*	Sesquiterpene
Unknown	0.01		Unknown
(3*E*,6*E*)-α-Farnesene	0.09	0.06	Sesquiterpene
β-Bisabolene	[0.09]	0.04	Sesquiterpene
Guaiacylacetone	0.22	0.22	Phenylpropanoid
(*E*)-γ-Bisabolene	0.01	tr	Sesquiterpene
(*E*)-α-Bisabolene	0.02	0.02	Sesquiterpene
Unknown	0.04	0.03	Unknown
(*E*)-Nerolidol	1.12	[1.18]*	Sesquiterpenic alcohol
Unknown	0.03	0.03	Unknown
Butyrovanillone?	0.02		Phenylbutanoid
τ-Cadinol	0.01	tr	Sesquiterpenic alcohol
α-Cadinol	tr	tr	Sesquiterpenic alcohol

(2*E*,6*Z*)-Farnesol	0.02	[0.04]*	Sesquiterpenic alcohol
Benzyl benzoate	78.32	[78.80]*	Phenolic ester
Benzyl hydrocinnamate	0.12	0.14	Phenylpropanoid ester
Unknown	0.03		Unknown
Benzyl (*Z*)-cinnamate	0.31		Phenylpropanoid ester
Benzyl (*E*)-cinnamate	8.32	8.36	Phenylpropanoid ester
Benzyl (*E*)-ferulate?	0.11		Phenylpropanoid ester
Benzyl α-linolenate	0.02		Phenolic ester
1,2,2α,3,3,4,6,7,8,8α-Decahydro-2α,7,8-trimethylacenaphthylene		tr	Sesquiterpene
Total identified	**94.97%**	**95.04%**	

*: Two or more compounds are coeluting on this column
[xx]: Duplicate percentage due to coelutions, not taken account in the identified total
tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

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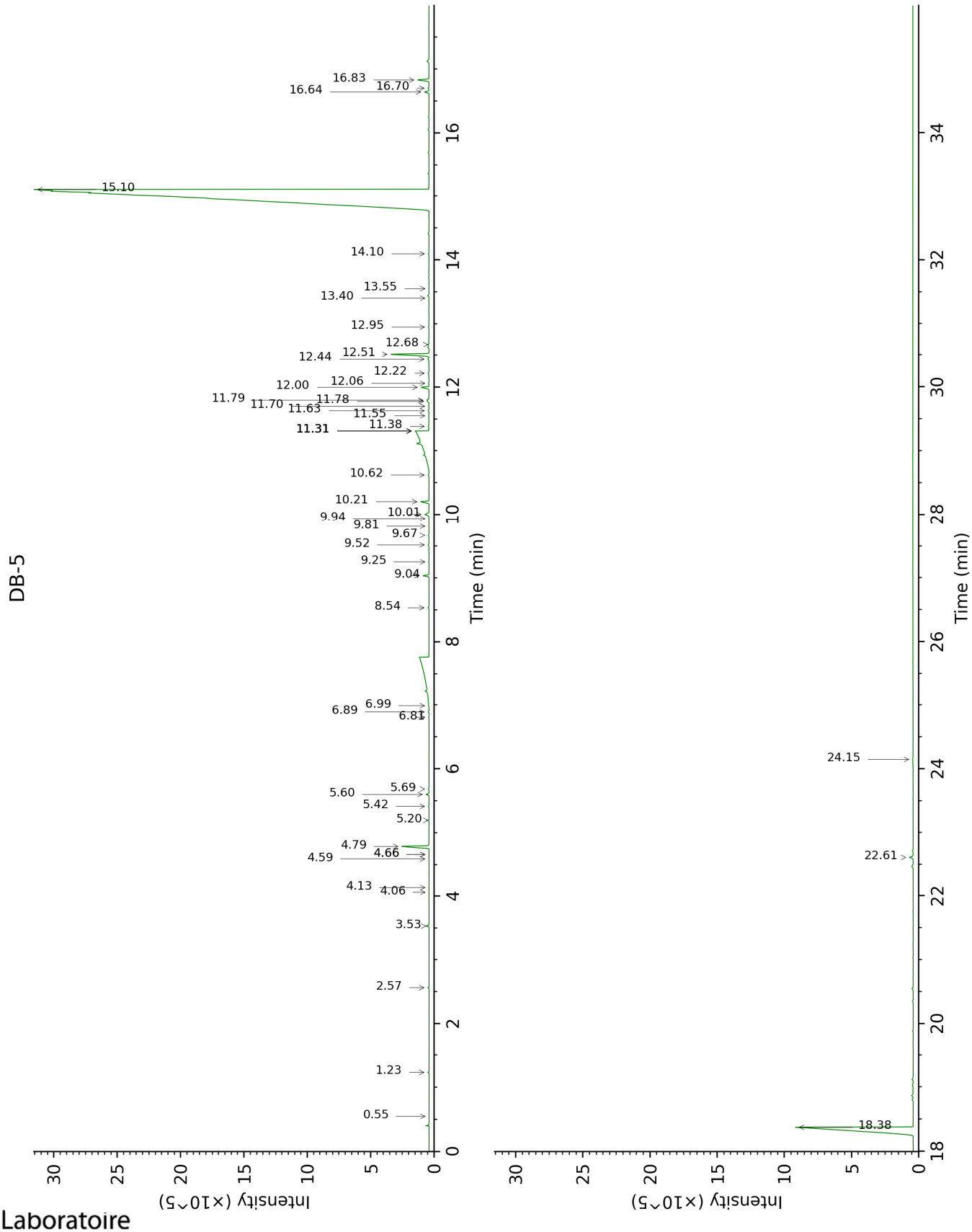
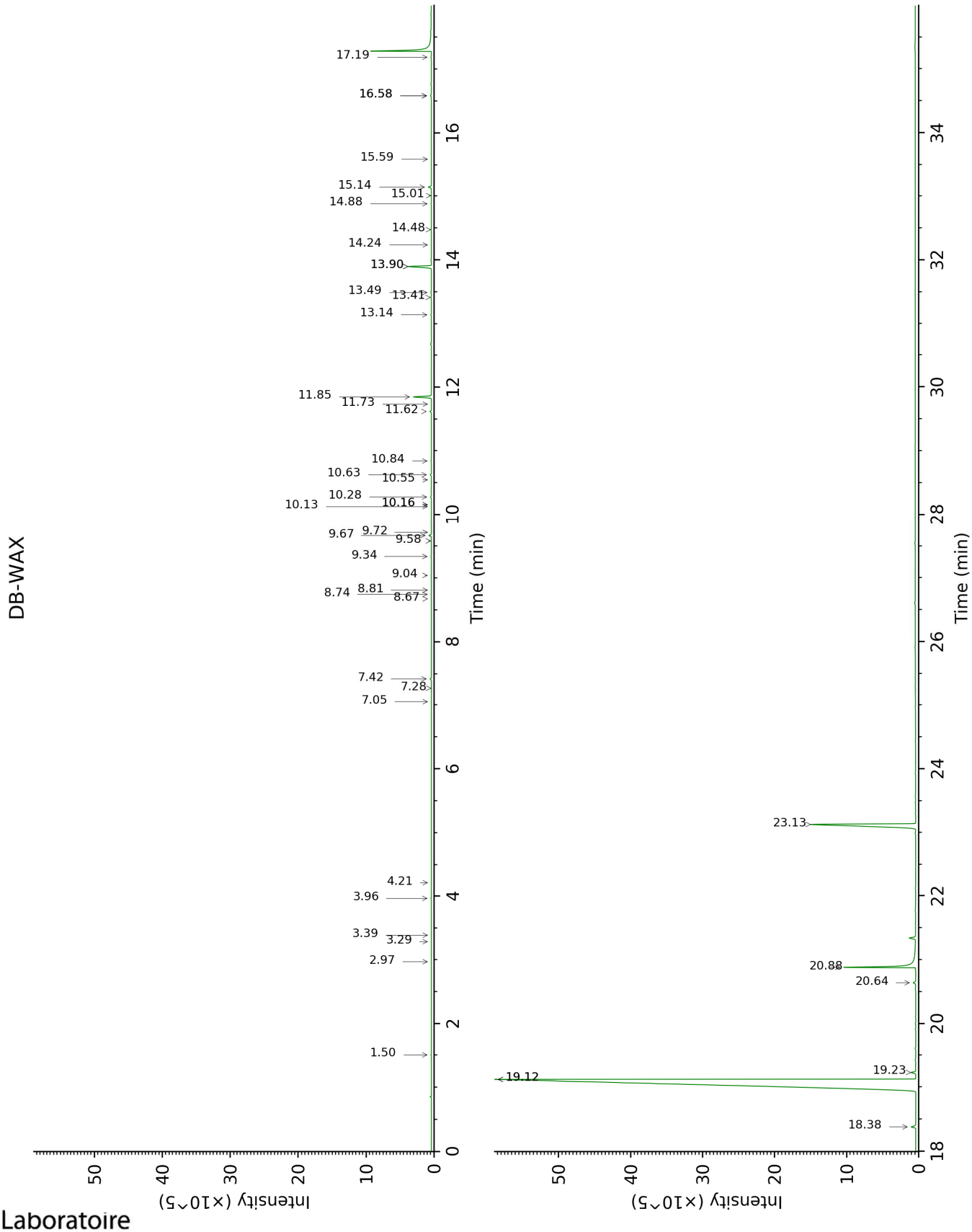

DB-5
Intensity (×10^5)
Time (min)
16.83
16.70
16.64
15.10
14.10
13.55
13.40
12.95
12.68
12.51
12.44
12.22
12.06
12.00
11.79
11.70
11.63
11.78
11.55
11.38
11.31
10.62
10.21
10.01
9.94
9.81
9.67
9.52
9.25
9.04
8.54
6.99
6.89
6.81
5.69
5.60
5.42
5.20
4.79
4.66
4.59
4.13
4.06
3.53
2.57
1.23
0.55
24.15
22.61
18.38


DB-WAX
17.19
16.58
15.59
15.14
15.01
14.88
14.48
14.24
13.90
13.49
13.41
13.14
11.85
11.73
11.62
10.84
10.63
10.55
10.28
10.13
10.16
9.67
9.72
9.58
9.34
9.04
8.74
8.81
8.67
7.42
7.28
7.05
4.21
3.96
3.39
3.29
2.97
1.50
23.13
20.88
20.64
19.12
19.23
18.38
Time (min)
Intensity (×10^5)

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Acetic acid	0.55	608	tr			
Toluene	1.23	756	0.02	1.50	1002	0.02
Styrene	2.57	884	0.02	3.96	1210	0.02
Benzaldehyde	3.53	951	0.06	7.42	1459	0.06
6-Methyl-5-hepten-2-one	4.06	986	tr			
Myrcene	4.13	991	0.01	2.97	1133	tr
para-Cymene	4.59	1020	0.01	4.21	1229	tr
1,8-Cineole	4.66*	1025	0.01	3.39	1166	tr
Limonene	4.66*	1025	[0.01]	3.29	1158	0.01
Benzyl alcohol	4.79	1033	0.82	11.85	1814	0.86
Acetophenone	5.20	1058	0.02	9.04	1582	0.01
Benzyl formate	5.42	1072	0.01	9.58	1625	0.02
ortho-Guaiacol	5.60	1084	0.07	11.62	1794	0.07
Methyl benzoate	5.69	1089	0.02	8.74	1559	0.02
Benzyl acetate	6.81	1162	0.01	10.16*	1672	0.01
Ethyl benzoate	6.89	1167	0.02	9.34	1606	0.02
Terpinen-4-ol	6.99	1174	0.02	8.67	1554	0.01
4-Ethylguaiacol	8.54	1278	0.03	13.42	1955	0.03
4-Vinylguaiacol	9.04	1306	0.15	15.14	2120	0.15
Unknown [m/z 105, 77 (59), 122 (29), 51 (18), 106 (8), 50 (8)...]	9.25	1322	0.01			
Hydrocinnamic acid	9.52	1341	0.03	19.12*	2547	78.80
Eugenol	9.67	1352	0.02	14.88	2094	0.02
Cyclosativene I	9.81	1362	tr	7.05	1432	tr
α-Copaene	9.94	1371	tr	7.28	1448	tr
Methyl (*E*)-cinnamate	10.00	1375	0.16	13.90*	2000	1.18
Vanillin	10.21	1390	0.24	18.38	2462	0.24
Coumarin	10.62	1420	0.02	17.19	2331	0.02
(*E*)-Cinnamic acid	11.31*†	1472	4.48	20.88	2758	4.41
γ-Muurolene	11.31*†	1472	[4.48]	9.72	1636	tr
Ethyl (*E*)-cinnamate	11.31*†	1472	[4.48]	14.48	2055	0.02
(*E*)-β-Farnesene	11.31*†	1472	[4.48]	9.67	1632	0.12
Geranylacetone	11.31*†	1472	[4.48]	11.73	1804	tr
(*E*)-Isoeugenol	11.31*†	1472	[4.48]	16.58*	2267	0.04
Methyl (*Z*)-isoeugenol	11.38†	1478	[4.48]	14.24	2032	0.01
α-Selinene	11.55	1490	0.01	10.13	1669	0.01
α-Muurolene	11.63	1496	0.02	10.16*	1672	[0.01]
Unknown [m/z 151, 166 (47), 77 (35), 147 (35), 105 (25), 148 (24)...]	11.70	1501	0.01			
(3*E*,6*E*)-α-Farnesene	11.78†	1507	0.09	10.63	1710	0.06
β-Bisabolene	11.80†	1509	[0.09]	10.28	1682	0.04
Guaiacylacetone	12.00	1525	0.22	19.23	2559	0.22
(*E*)-γ-Bisabolene	12.06	1530	0.01	10.55	1704	tr
(*E*)-α-Bisabolene	12.22	1542	0.02	10.84	1729	0.02
Unknown [m/z 109, 69	12.44	1560	0.04	13.14	1930	0.03

(74), 43 (55), 41 (30), 93 (28), 55 (23)...]						
(*E*)-Nerolidol	12.51	1566	1.12	13.90*	2000	[1.18]
Unknown [m/z 109, 69 (75), 43 (55), 41 (29), 93 (28), 55 (26), 71 (22)...]	12.68	1578	0.03	13.49	1962	0.03
Butyrovanillone?	12.95	1600	0.02			
τ-Cadinol	13.40	1638	0.01	15.01	2107	tr
α-Cadinol	13.55	1650	tr	15.59	2165	tr
(2*E*,6*Z*)-Farnesol	14.10	1695	0.02	16.58*	2267	[0.04]
Benzyl benzoate	15.10	1783	78.32	19.12*	2547	[78.80]
Benzyl hydrocinnamate	16.64	1922	0.12	20.64	2728	0.14
Unknown [m/z 91, 107 (51), 180 (40), 105 (32), 77 (29), 57 (26)...]	16.70	1928	0.03			
Benzyl (*Z*)-cinnamate	16.83	1940	0.31			
Benzyl (*E*)-cinnamate	18.38	2091	8.32	23.13	3051	8.36
Benzyl (*E*)-ferulate?	22.61	2558	0.11			
Benzyl α-linolenate	24.15	2749	0.02			
1,2,2α,3,3,4,6,7,8,8α-Decahydro-2α,7,8-trimethylacenaphthylene				8.81	1564	tr
Total identified		**94.97%**			**95.04%**	
Total reported		**95.08%**			**95.09%**	

*: 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
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