Date : February 19, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21B05-ZAA01
Customer identification : Bois de Rose - EAP264767 - PE32720B
Type : Essential oil
Source : *Aniba rosaeodora*
Customer : ZAYAT AROMA

Analysis

Method: PC-MAT-014 ISO - 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 : February 18, 2021

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Clear liquid
Refractive index: 1.4642 ± 0.0003 (20 °C; method PC-MAT-016)

CONCLUSION

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

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Analysis summary – Consolidated contents

New readers of similar reports are encouraged to read table footnotes at least once.

Identification	%	Class
α-Pinene	0.17	Monoterpene
Camphene	0.01	Monoterpene
Benzaldehyde	0.19	Simple phenolic
Geranic oxide	0.05	Monoterpenic ether
β-Pinene	0.10	Monoterpene
6-Methyl-5-hepten-2-one	0.32	Aliphatic ketone
trans-Dehydroxylinalool oxide	0.02	Monoterpenic ether
Myrcene	0.04	Monoterpene
6-Methyl-5-hepten-2-ol	0.05	Aliphatic alcohol
cis-Dehydroxylinalool oxide	0.02	Monoterpenic ether
α-Terpinene	0.02	Monoterpene
para-Cymene	0.05	Monoterpene
Limonene	0.47	Monoterpene
1,8-Cineole	1.04	Monoterpenic ether
Benzyl alcohol	0.03	Simple phenolic
(*Z*)-β-Ocimene	0.03	Monoterpene
(*E*)-β-Ocimene	0.04	Monoterpene
γ-Terpinene	0.02	Monoterpene
cis-Linalool oxide (fur.)	1.54	Monoterpenic alcohol
trans-Linalool oxide (fur.)	1.43	Monoterpenic alcohol
Terpinolene	0.06	Monoterpene
Linalool	82.16	Monoterpenic alcohol
Hotrienol	0.12	Monoterpenic alcohol
(*Z*)-Ocimenol	0.03	Monoterpenic alcohol
Borneol	0.01	Monoterpenic alcohol
(*E*)-Ocimenol	0.03	Monoterpenic alcohol
cis-Linalool oxide (pyr.)	0.14	Monoterpenic alcohol
trans-Linalool oxide (pyr.)	0.19	Monoterpenic alcohol
Terpinen-4-ol	0.15	Monoterpenic alcohol
α-Terpineol	1.69	Monoterpenic alcohol
Nerol	0.07	Monoterpenic alcohol
Neral	0.03	Monoterpenic aldehyde
Geraniol	0.30	Monoterpenic alcohol
Geranial	0.05	Monoterpenic aldehyde
Methyl geranate	0.01	Monoterpenic ester
α-Cubebene	0.02	Sesquiterpene
Cyclosativene II	0.03	Sesquiterpene
α-Copaene	1.91	Sesquiterpene
β-Elemene	0.30	Sesquiterpene
α-Gurjunene	0.37	Sesquiterpene
β-Caryophyllene	0.13	Sesquiterpene
β-Copaene	0.03	Sesquiterpene
trans-α-Bergamotene	0.07	Sesquiterpene
α-Humulene	0.06	Sesquiterpene
allo-Aromadendrene	0.11	Sesquiterpene

4,5-diepi-Aristolochene	0.02	Sesquiterpene
Selina-4,11-diene	0.28	Sesquiterpene
γ-Muurolene	0.08	Sesquiterpene
β-Selinene	1.20	Sesquiterpene
α-Selinene	1.03	Sesquiterpene
α-Muurolene	0.02	Sesquiterpene
Unknown	0.16	Sesquiterpene
δ-Guaiene	0.05	Sesquiterpene
γ-Cadinene	0.29	Sesquiterpene
δ-Cadinene	0.53	Sesquiterpene
trans-Calamenene	0.06	Sesquiterpene
trans-Cadina-1,4-diene	0.02	Sesquiterpene
α-Cadinene	0.05	Sesquiterpene
α-Calacorene	0.04	Sesquiterpene
Isocaryophyllene epoxide B	0.01	Sesquiterpenic ether
Unknown	0.03	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Palustrol	0.04	Sesquiterpenic alcohol
(*E*)-Nerolidol	0.15	Sesquiterpenic alcohol
Spathulenol	0.05	Sesquiterpenic alcohol
Caryophyllene oxide	0.09	Sesquiterpenic ether
Ledol	0.09	Sesquiterpenic alcohol
Humulene epoxide II	0.04	Sesquiterpenic ether
Unknown	0.05	Oxygenated sesquiterpene
Unknown	0.01	Oxygenated sesquiterpene
10-epi-Cubenol	0.02	Sesquiterpenic alcohol
1-epi-Cubenol	0.05	Sesquiterpenic alcohol
Caryophylladienol I	0.01	Sesquiterpenic alcohol
τ-Cadinol	0.11	Sesquiterpenic alcohol
α-Muurolol	0.03	Sesquiterpenic alcohol
Neointermedeol	0.09	Sesquiterpenic alcohol
α-Cadinol	0.05	Sesquiterpenic alcohol
Unknown	0.06	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Unknown	0.05	Oxygenated sesquiterpene
Cyperol	0.01	Sesquiterpenic alcohol
Unknown	0.04	Oxygenated sesquiterpene
Unknown	0.10	Lignan
Unknown	0.10	Oxygenated sesquiterpene
Unknown	0.14	Oxygenated sesquiterpene
Unknown	0.02	Oxygenated sesquiterpene
Benzyl benzoate	0.34	Phenolic ester
Consolidated total	**99.45%**	

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.

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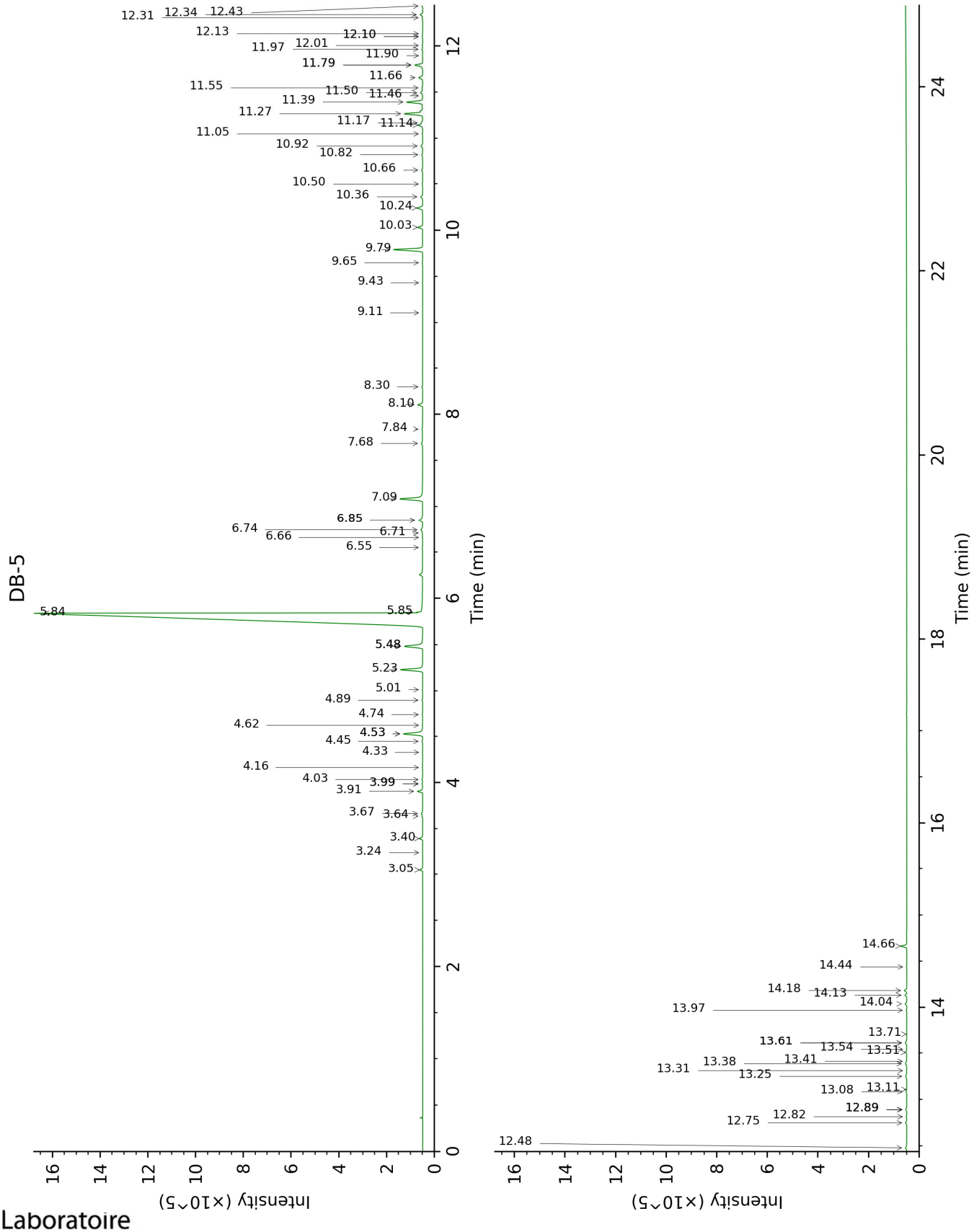
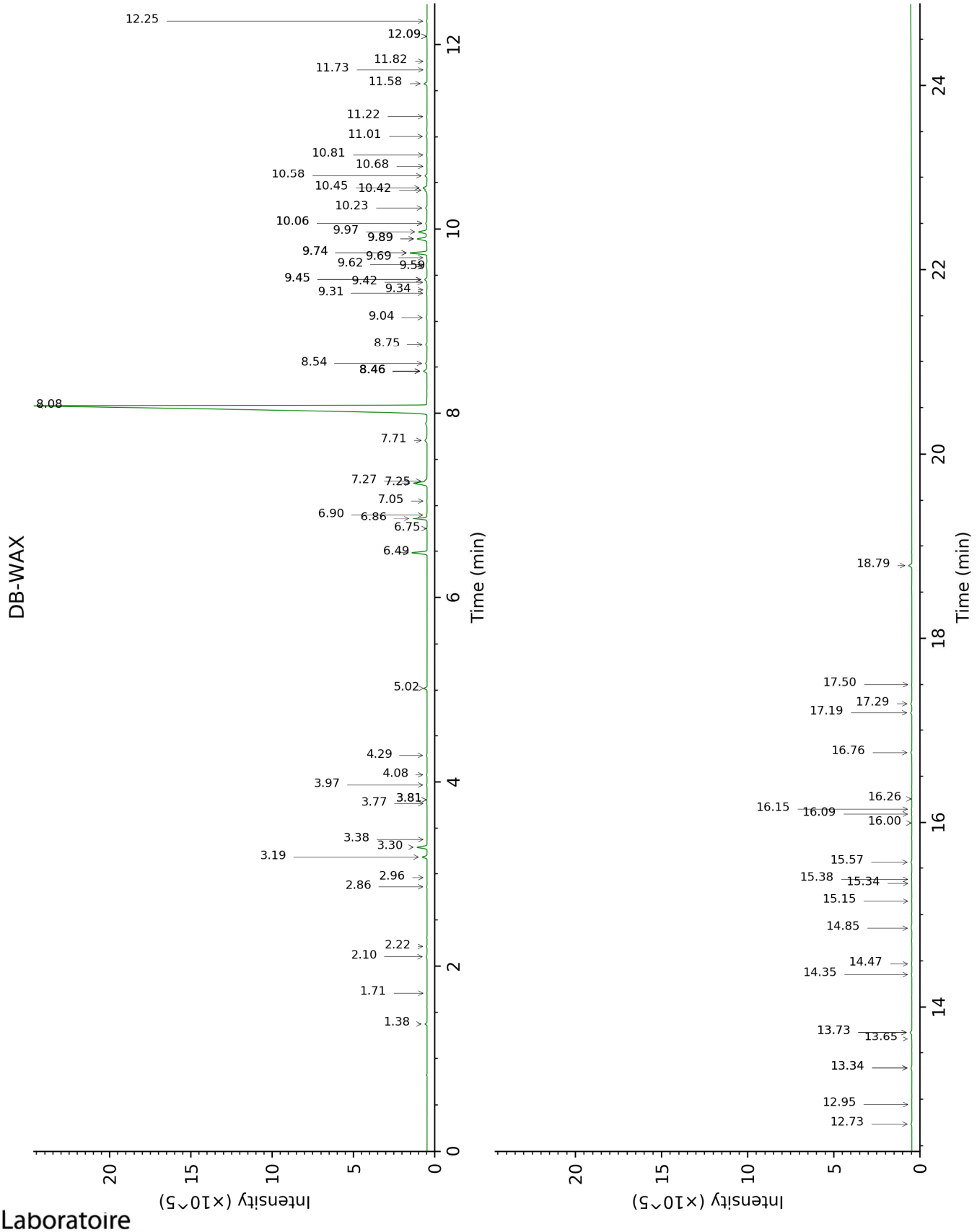

DB-5
Time (min)
Intensity (×10^5)
12.31
12.34
12.43
12.13
12.10
11.97
12.01
11.90
11.79
11.66
11.55
11.50
11.46
11.39
11.27
11.17
11.14
11.05
10.92
10.82
10.66
10.50
10.36
10.24
10.03
9.79
9.65
9.43
9.11
8.30
8.10
7.84
7.68
7.09
6.85
6.74
6.71
6.66
6.55
5.84
5.85
5.48
5.23
5.01
4.89
4.74
4.62
4.53
4.45
4.33
4.16
4.03
3.99
3.91
3.67
3.64
3.40
3.24
3.05
14.66
14.44
14.18
14.13
14.04
13.97
13.71
13.61
13.54
13.51
13.41
13.38
13.31
13.25
13.11
13.08
12.89
12.82
12.75
12.48


DB-WAX
Intensity (×10^5)
Time (min)
12.25
12.09
11.82
11.73
11.58
11.22
11.01
10.81
10.68
10.58
10.45
10.42
10.23
10.06
9.97
9.89
9.74
9.69
9.62
9.59
9.45
9.42
9.34
9.31
9.04
8.75
8.54
8.46
8.08
7.71
7.27
7.25
7.05
6.90
6.86
6.75
6.49
5.02
4.29
4.08
3.97
3.81
3.77
3.38
3.30
3.19
2.96
2.86
2.22
2.10
1.71
1.38
18.79
17.50
17.29
17.19
16.76
16.26
16.15
16.09
16.00
15.57
15.38
15.34
15.15
14.85
14.47
14.35
13.73
13.65
13.34
12.95
12.73

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
α-Pinene	3.05	930	0.17	1.38	995	0.16
Camphene	3.24	943	0.01	1.71	1030	0.01
Benzaldehyde	3.40	953	0.19	7.27	1460	0.20
Geranic oxide	3.64	969	0.05	2.22	1079	0.06
β-Pinene	3.67	970	0.10	2.10	1068	0.10
6-Methyl-5-hepten-2-one	3.91	986	0.32	5.02	1300	0.31
trans-Dehydroxylinalool oxide	3.99*	992	0.05	3.38	1175	0.02
Myrcene	3.99*	992	[0.05]	2.86	1134	0.04
6-Methyl-5-hepten-2-ol	4.03	995	0.05	6.90	1433	0.05
cis-Dehydroxylinalool oxide	4.16	1003	0.02	3.77†	1206	0.06
α-Terpinene	4.33	1013	0.02	2.96	1142	0.02
para-Cymene	4.45	1021	0.05	4.08	1229	0.05
Limonene	4.53*	1026	1.49	3.19	1160	0.47
1,8-Cineole	4.53*	1026	[1.49]	3.30	1169	1.04
Benzyl alcohol	4.62	1032	0.03	11.73	1821	0.02
(*Z*)-β-Ocimene	4.74	1039	0.03	3.81*†	1209	[0.06]
(*E*)-β-Ocimene	4.89	1049	0.04	3.97	1221	0.05
γ-Terpinene	5.01	1056	0.02	3.81*†	1209	[0.06]
cis-Linalool oxide (fur.)	5.23	1070	1.54	6.49	1402	1.53
trans-Linalool oxide (fur.)	5.48*	1086	1.52	6.86	1430	1.43
Terpinolene	5.48*	1086	[1.52]	4.29	1245	0.06
Linalool	5.84†	1109	82.35	8.08	1522	82.16
Hotrienol	5.85†	1110	[82.35]	8.75	1574	0.12
(*Z*)-Ocimenol	6.55	1155	0.03	9.34	1621	0.02
Borneol	6.66	1162	0.01	9.74*	1653	1.73
(*E*)-Ocimenol	6.71	1165	0.03	9.62	1643	0.09
cis-Linalool oxide (pyr.)	6.74	1168	0.14	10.23	1693	0.13
trans-Linalool oxide (pyr.)	6.85*	1174	0.32	10.58	1722	0.19
Terpinen-4-ol	6.85*	1174	[0.32]	8.54	1557	0.15
α-Terpineol	7.09	1190	1.69	9.74*	1653	[1.73]
Nerol	7.68	1230	0.07	11.01	1759	0.08
Neral	7.84	1241	0.03	9.45*	1630	0.31
Geraniol	8.10	1259	0.30	11.58	1808	0.31
Geranial	8.30	1273	0.05	10.06*	1680	0.18
Methyl geranate	9.11	1324	0.01	9.69	1649	0.03
α-Cubebene	9.43	1347	0.02	6.75	1421	0.04
Cyclosativene II	9.65	1362	0.03	7.05	1444	0.03
α-Copaene	9.79	1372	1.91	7.25	1458	1.77

β-Elemene	10.03	1389	0.30	8.46*	1551	0.45
α-Gurjunene	10.24	1404	0.37	7.71	1493	0.33
β-Caryophyllene	10.36	1413	0.13	8.46*	1551	[0.45]
β-Copaene	10.50	1423	0.03	8.46*	1551	[0.45]
trans-α-Bergamotene	10.66	1435	0.07	8.46*	1551	[0.45]
α-Humulene	10.82	1447	0.06	9.31	1618	0.07
allo-Aromadendrene	10.92	1454	0.11	9.04	1597	0.10
4,5-diepi-Aristolochene	11.05	1464	0.02	9.42	1627	0.03
Selina-4,11-diene	11.14†	1471	0.38	9.45*	1630	[0.31]
γ-Muurolene	11.17†	1473	[0.38]	9.59	1641	0.08
β-Selinene	11.27	1480	1.20	9.89*	1666	1.24
α-Selinene	11.40	1489	1.03	9.97	1672	1.06
α-Muurolene	11.46	1494	0.02	10.06*	1680	[0.18]
Unknown [m/z 105, 91 (85), 93 (75), 119 (74), 107 (68), 145 (62), 202 (59)]	11.50	1497	0.16			
δ-Guaiene	11.55	1501	0.05	9.89*	1666	[1.24]
γ-Cadinene	11.66	1509	0.29	10.42	1709	0.22
δ-Cadinene	11.79*	1520	0.54	10.44	1711	0.53
trans-Calamenene	11.79*	1520	[0.54]	11.22	1778	0.06
trans-Cadina-1,4-diene	11.90	1528	0.02	10.68	1732	0.02
α-Cadinene	11.97	1534	0.05	10.81	1742	0.04
α-Calacorene	12.01	1537	0.04	12.09*	1854	0.04
Isocaryophyllene epoxide B	12.10*	1544	0.03	12.09*	1854	[0.04]
Unknown [m/z 83, 82 (46), 43 (34), 95 (29), 81 (26)... 220 (8)]	12.10*	1544	[0.03]			
Unknown [m/z 107, 43 (92), 93 (91), 79 (87), 91 (73), 41 (63), 121 (62)... 205 (20), 220 (4)]	12.13	1547	0.02	11.82	1830	0.02
Palustrol	12.31	1560	0.04	12.25	1868	0.04
(*E*)-Nerolidol	12.34	1563	0.15	13.73*	2004	0.21
Spathulenol	12.43	1570	0.05	14.35	2064	0.05
Caryophyllene oxide	12.48	1574	0.09	12.74	1911	0.09
Ledol	12.75	1595	0.09	13.34*	1967	0.11
Humulene epoxide II	12.82	1600	0.04	13.34*	1967	[0.11]
Unknown [m/z 43, 81 (97), 135 (71), 95 (62), 204 (61),	12.89*	1606	0.09	14.47	2075	0.05

71 (59), 207 (56)... 222 (3)]						
Unknown [m/z 162, 119 (73), 79 (69), 107 (60), 43 (51), 159 (40)...]	12.89*	1606	[0.09]			
10-epi-Cubenol	12.89*	1606	[0.09]	13.65	1997	0.02
1-epi-Cubenol	13.08	1622	0.05	13.73*	2004	[0.21]
Caryophylladienol I	13.11	1624	0.01	16.00	2229	0.01
τ-Cadinol	13.25	1636	0.11	14.85	2113	0.06
α-Muurolol	13.31	1641	0.03	15.15	2142	0.03
Neointermedeol	13.38	1647	0.09	15.57	2186	0.10
α-Cadinol	13.41	1649	0.05	15.38	2166	0.04
Unknown [m/z 43, 93 (86), 79 (85), 107 (66), 91 (59), 105 (59), 119 (57)... 205 (23), 220 (3)]	13.51	1657	0.06			
Unknown [m/z 93, 205 (65), 79 (52), 43 (51), 107 (51), 91 (50)... 220 (8)]	13.54	1660	0.02	16.09	2239	0.04
Unknown [m/z 93, 43 (82), 119 (62), 162 (51), 91 (50), 147 (42)... 220 (2)]	13.61*	1665	0.13	12.94	1931	0.02
Unknown [m/z 205, 93 (93), 43 (58), 79 (510, 91 (48), 119 (45)... 220 (3)]	13.61*	1665	[0.13]	16.15	2245	0.05
Cyperol	13.71	1674	0.01	16.26	2256	0.02
Unknown [m/z 124, 97 (91), 67 (78), 137 (77), 107 (66), 136 (59), 177 (57), 81 (55)... 220 (20)...]	13.97	1695	0.04	15.34	2162	0.02
Unknown [m/z 133, 93 (97), 131 (85), 145 (83), 107 (69)...220]	14.04	1701	0.10	16.76	2309	0.10
Unknown [m/z 93, 81 (90), 107 (83), 95 (75), 91 (71), 71 (70), 121 (68), 105 (68)... 220 (47)]	14.13	1709	0.10	17.19	2356	0.13
Unknown [m/z 159, 93 (87), 105 (84), 91 (81), 107	14.18	1713	0.14	17.29	2366	0.13

(71), 131 (69), 79 (65), 119 (63), 145 (62), 41 (61), 220 (61)]						
Unknown [m/z 177, 123 (74), 159 (55), 91 (72), 43 (41), 93 (40)... 220 (17)]	14.44	1735	0.02	17.50	2389	0.02
Benzyl benzoate	14.66	1754	0.34	18.79	2535	0.34
Total identified		**98.84%**			**98.46%**	
Total reported		**99.52%**			**99.05%**	

*: 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

Note: no correction factor was applied
R.T.: Retention time (minutes)
R.I.: Retention index