Date : September 17, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21I02-PTH01
Customer identification : Organic Basil Linalool - Egypt - B20103215R
Type : Essential oil
Source : *Ocimum basilicum* ct. Linalool
Customer : Plant Therapy

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 : Pamela Lavoie, M.Sc., Chimiste
Analysis date : September 15, 2021

Checked and approved by :

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

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Méthode certifiée ISO 17025:2017 Certified method

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PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid
Refractive index: 1.4760 ± 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
Isovaleral	0.02	Aliphatic aldehyde
2-Methylbutyral	0.01	Aliphatic aldehyde
2-Ethylfuran	0.01	Furan
Isoamyl alcohol	tr	Aliphatic alcohol
(2*E*)-Hexenal	0.01	Aliphatic aldehyde
(3*Z*)-Hexenol	0.02	Aliphatic alcohol
Hexanol	0.01	Aliphatic alcohol
Hashishene	0.01	Monoterpene
Tricyclene	tr	Monoterpene
α-Thujene	0.04	Monoterpene
α-Pinene	0.52	Monoterpene
Camphene	0.11	Monoterpene
Thuja-2,4(10)-diene	0.01	Monoterpene
Benzaldehyde	0.02	Simple phenolic
β-Pinene	0.96	Monoterpene
Sabinene	0.49	Monoterpene
Octen-3-ol	0.05	Aliphatic alcohol
Octan-3-one	0.04	Aliphatic ketone
Myrcene	1.02	Monoterpene
Pseudolimonene	0.01	Monoterpene
α-Phellandrene	0.02	Monoterpene
Octanal	0.01	Aliphatic aldehyde
Δ3-Carene	0.01	Monoterpene
(3*Z*)-Hexenyl acetate	0.04	Aliphatic ester
α-Terpinene	0.07	Monoterpene
ortho-Cymene	0.01	Monoterpene
para-Cymene	0.12	Monoterpene
Limonene	0.41	Monoterpene
1,8-Cineole	8.84	Monoterpenic ether
(*Z*)-β-Ocimene	0.08	Monoterpene
(*E*)-β-Ocimene	0.81	Monoterpene
γ-Terpinene	0.10	Monoterpene
cis-Sabinene hydrate	0.15	Monoterpenic alcohol
cis-Linalool oxide (fur.)	0.04	Monoterpenic alcohol
Octanol	0.02	Aliphatic alcohol
Terpinolene	0.17	Monoterpene
trans-Linalool oxide (fur.)	0.05	Monoterpenic alcohol
6,7-Epoxymyrcene	0.04	Monoterpenic ether
trans-Sabinene hydrate	0.01	Monoterpenic alcohol
Linalool	47.97	Monoterpenic alcohol
Phenylethyl alcohol	0.02	Simple phenolic
Hotrienol	0.04	Monoterpenic alcohol
Octen-3-yl acetate	0.07	Aliphatic ester
cis-para-Menth-2-en-1-ol	0.02	Monoterpenic alcohol
Limona ketone	0.02	Normonoterpenic ketone

Camphor	0.53	Monoterpenic ketone
(*E*)-Myroxide	0.26	Monoterpenic ether
Isomenthone	0.03	Monoterpenic ketone
Borneol	0.14	Monoterpenic alcohol
δ-Terpineol	0.16	Monoterpenic alcohol
Terpinen-4-ol	0.54	Monoterpenic alcohol
para-Cymen-8-ol	0.02	Monoterpenic alcohol
α-Terpineol	0.88	Monoterpenic alcohol
Methylchavicol	0.92	Phenylpropanoid
(3*E*,5*E*)-2,6-Dimethylocta-3,5,7-trien-2-ol	0.04	Monoterpenic alcohol
Octyl acetate	0.25	Aliphatic ester
Nerol	0.02	Monoterpenic alcohol
Citronellol	0.18	Monoterpenic alcohol
Geraniol	0.21	Monoterpenic alcohol
Chavicol	0.03	Phenylpropanoid
Geranial	0.03	Monoterpenic aldehyde
Bornyl acetate	1.09	Monoterpenic ester
Lavandulyl acetate	0.01	Monoterpenic ester
trans-Pinocarvyl acetate	0.03	Monoterpenic ester
Geranyl formate	0.03	Monoterpenic ester
δ-Elemene isomer	0.03	Sesquiterpene
α-Cubebene	0.09	Sesquiterpene
Eugenol	5.42	Phenylpropanoid
Neryl acetate	0.02	Monoterpenic ester
α-Copaene	0.19	Sesquiterpene
β-Bourbonene	0.26	Sesquiterpene
1,5-diepi-β-Bourbonene	0.02	Sesquiterpene
cis-β-Elemene	0.10	Sesquiterpene
β-Cubebene	0.16	Sesquiterpene
β-Elemene	1.75	Sesquiterpene
Unknown	0.08	Unknown
α-Cedrene	0.05	Sesquiterpene
Methyleugenol	0.09	Phenylpropanoid
α-Gurjunene	0.01	Sesquiterpene
β-Caryophyllene	0.39	Sesquiterpene
β-Copaene	0.19	Sesquiterpene
α-Guaiene	5.84*	Sesquiterpene
trans-α-Bergamotene	[5.84]*	Sesquiterpene
cis-β-Bergamotene?	0.18	Sesquiterpene
trans-Muurola-3,5-diene	0.04	Sesquiterpene
α-Humulene	0.78	Sesquiterpene
allo-Aromadendrene	0.14	Sesquiterpene
cis-Muurola-4(15),5-diene	0.50	Sesquiterpene
(*E*)-β-Farnesene	0.14	Sesquiterpene
Germacrene D	3.26	Sesquiterpene
β-Selinene	0.39	Sesquiterpene
Bicyclogermacrene	1.01	Sesquiterpene
Germacrene A	0.17	Sesquiterpene
(*Z*)-α-Bisabolene	1.33	Sesquiterpene
δ-Guaiene	1.22	Sesquiterpene
β-Bisabolene	0.11	Sesquiterpene
γ-Cadinene	1.97	Sesquiterpene

trans-Calamenene	0.20	Sesquiterpene
δ-Cadinene	0.13	Sesquiterpene
Zonarene	0.20	Sesquiterpene
β-Sesquiphellandrene	0.10	Sesquiterpene
α-Cadinene	0.07	Sesquiterpene
Maaliol	0.16	Sesquiterpenic alcohol
(*E*)-Nerolidol	0.13	Sesquiterpenic alcohol
Spathulenol	0.15	Sesquiterpenic alcohol
Caryophyllene oxide	0.01	Sesquiterpenic ether
Globulol	0.03	Sesquiterpenic alcohol
Viridiflorol	0.12	Sesquiterpenic alcohol
10-epi-Cubenol	0.41	Sesquiterpenic alcohol
10-epi-γ-Eudesmol	0.07	Sesquiterpenic alcohol
τ-Cadinol	2.22	Sesquiterpenic alcohol
α-Eudesmol	0.07	Sesquiterpenic alcohol
α-Cadinol	0.09	Sesquiterpenic alcohol
α-Bisabolol	0.04	Sesquiterpenic alcohol
Mint sulfide?	0.02	Sesquiterpenic sulfide
Phytone	0.02	Terpenic ketone
Consolidated total	**98.10%**	

*: Individual compounds concentration could not be found due to overlapping coelutions on columns considered
[xx]: Duplicate percentage due to coelutions, not taken into account in the consolidated total
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.

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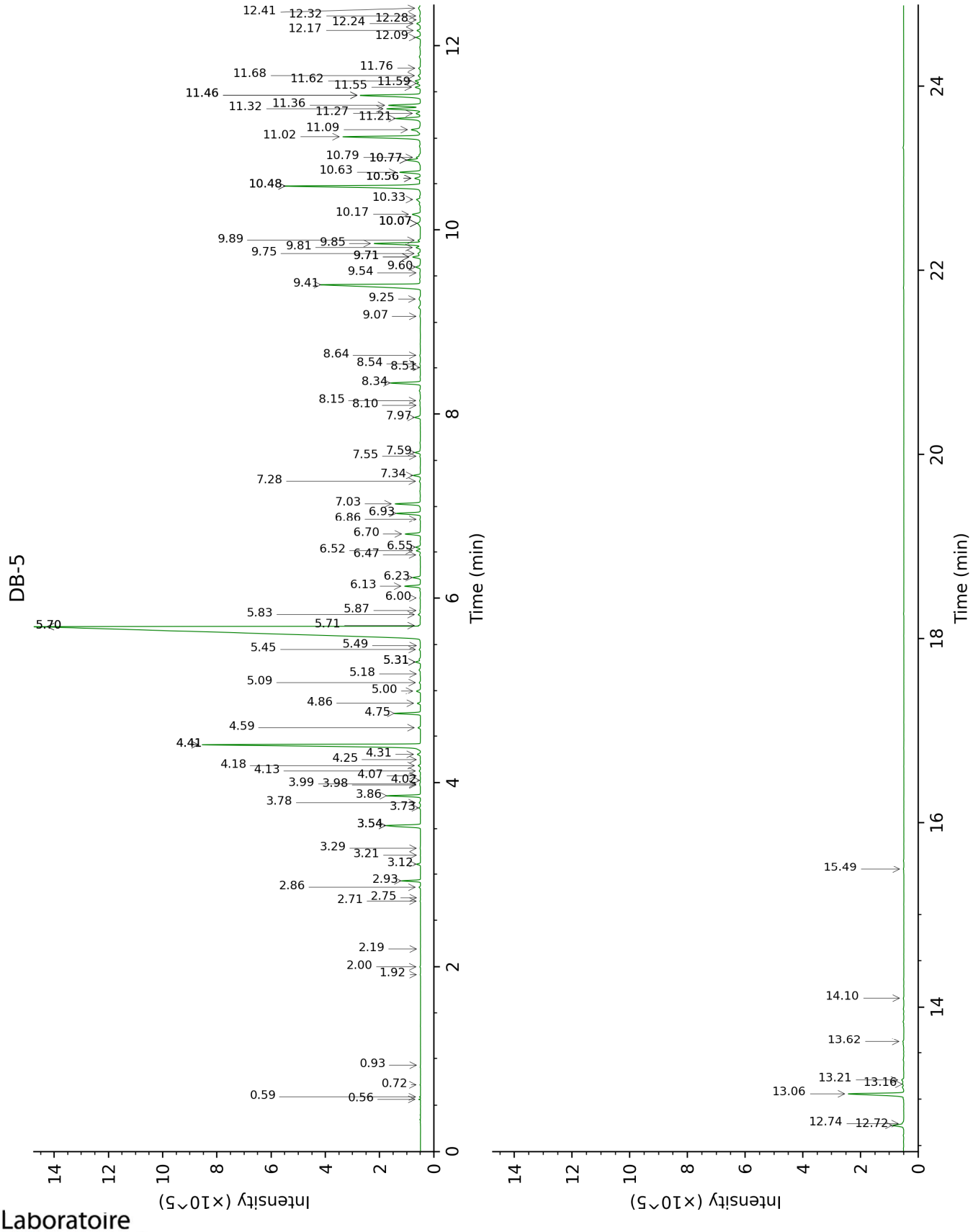
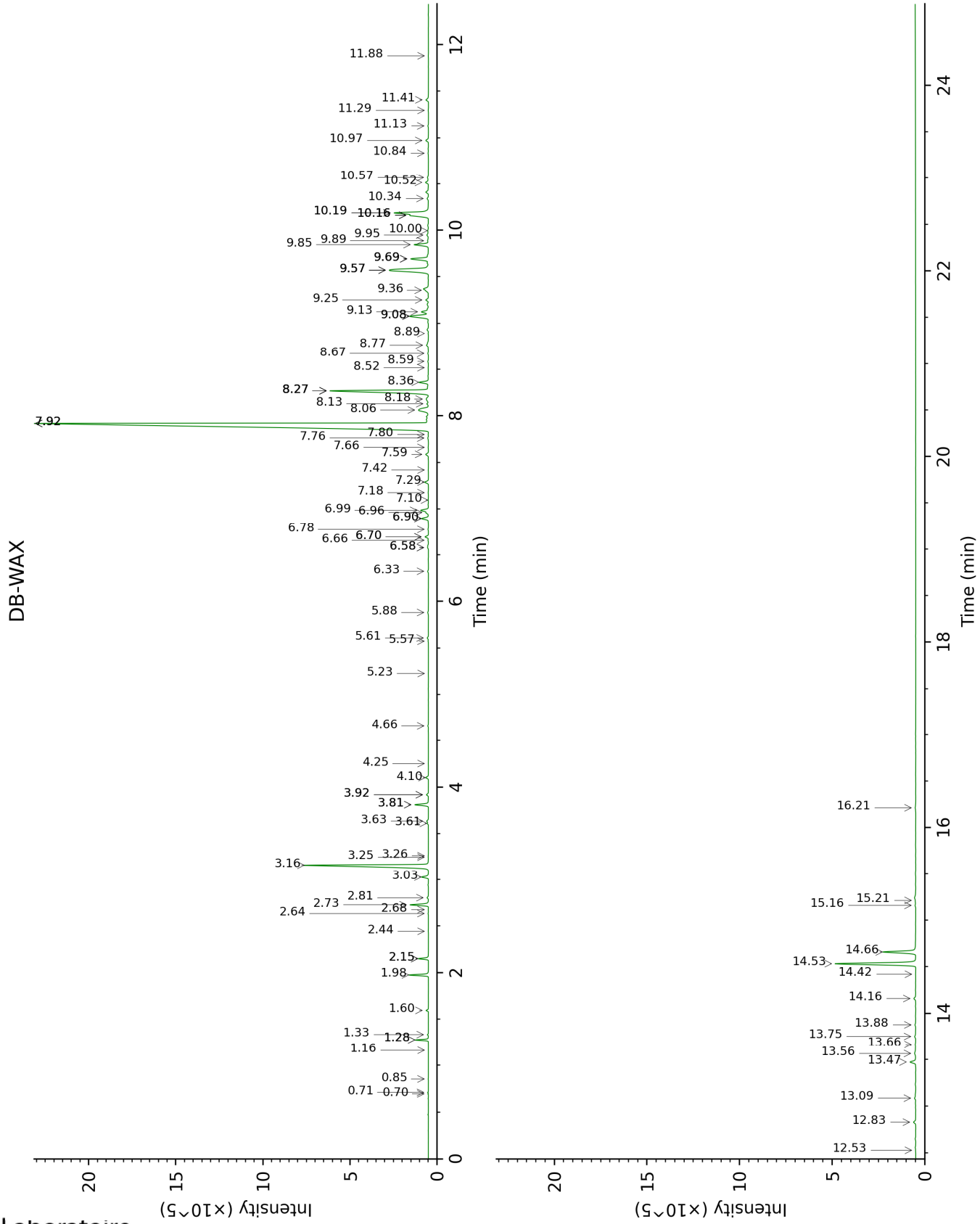

DB-5
Time (min)
Intensity (×10^5)
12.41
12.32
12.24
12.28
12.17
12.09
11.76
11.68
11.62
11.55
11.59
11.46
11.32
11.36
11.27
11.21
11.09
11.02
10.79
10.77
10.63
10.56
10.48
10.33
10.17
10.07
9.89
9.75
9.81
9.85
9.71
9.54
9.60
9.41
9.25
9.07
8.64
8.54
8.51
8.34
8.15
8.10
7.97
7.55
7.59
7.34
7.28
7.03
6.86
6.93
6.70
6.52
6.47
6.55
6.23
6.13
6.00
5.83
5.87
5.70
5.71
5.45
5.49
5.31
5.18
5.09
5.00
4.86
4.75
4.59
4.41
4.25
4.31
4.18
4.13
4.07
4.02
3.99
3.98
3.86
3.78
3.73
3.54
3.29
3.21
3.12
2.93
2.86
2.71
2.75
2.19
2.00
1.92
0.93
0.72
0.59
0.56
15.49
14.10
13.62
13.21
13.16
13.06
12.74
12.72


DB-WAX
Time (min)
Intensity (×10^5)
11.88
11.41
11.29
11.13
10.97
10.84
10.57
10.52
10.34
10.19
10.16
10.00
9.95
9.89
9.85
9.69
9.57
9.36
9.25
9.13
9.08
8.89
8.77
8.67
8.59
8.52
8.36
8.27
8.18
8.13
8.06
7.92
7.80
7.76
7.66
7.59
7.42
7.29
7.18
7.10
6.99
6.96
6.90
6.78
6.70
6.66
6.58
6.33
5.88
5.61
5.57
5.23
4.66
4.25
4.10
3.92
3.81
3.63
3.61
3.25
3.26
3.16
3.03
2.81
2.73
2.68
2.64
2.44
2.15
1.98
1.60
1.33
1.28
1.16
0.85
0.71
0.70
16.21
15.21
15.16
14.66
14.53
14.42
14.16
13.88
13.75
13.66
13.56
13.47
13.09
12.83
12.53

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Isovaleral	0.56	641	0.02	0.71	888	0.02
2-Methylbutyral	0.59	651	0.01	0.70	881	0.01
2-Ethylfuran	0.72	700	0.01	0.86	920	0.01
Isoamyl alcohol	0.93	734	tr	3.26	1178	0.01
(2*E*)-Hexenal	1.92	850	0.01	3.25	1177	0.01
(3*Z*)-Hexenol	2.00	857	0.02	5.57	1347	0.02
Hexanol	2.19	874	0.01	5.23	1321	0.01
Hashishene	2.71	915	0.01	1.28*	992	0.53
Tricyclene	2.75	918	tr	1.16	972	tr
α-Thujene	2.86	925	0.04	1.34	1002	0.04
α-Pinene	2.93	930	0.52	1.28*	992	[0.53]
Camphene	3.12	943	0.11	1.60	1028	0.11
Thuja-2,4(10)-diene	3.22	949	0.01	2.15*	1085	0.50
Benzaldehyde	3.29	954	0.02	7.10	1460	0.02
β-Pinene	3.54*	971	1.46	1.98	1067	0.96
Sabinene	3.54*	971	[1.46]	2.15*	1085	[0.50]
Octen-3-ol	3.73	984	0.05	6.58*†	1421	0.09
Octan-3-one	3.78	988	0.04	3.81*	1222	0.82
Myrcene	3.86	993	1.02	2.73	1135	1.01
Pseudolimonene	3.98†	1001	0.04	2.68	1131	0.01
α-Phellandrene	3.99†	1001	[0.04]	2.64	1127	0.02
Octanal	4.02	1004	0.01	4.25	1255	0.01
Δ3-Carene	4.07	1007	0.01	2.44	1112	0.01
(3*Z*)-Hexenyl acetate	4.13	1010	0.04	4.66	1286	0.04
α-Terpinene	4.18	1014	0.07	2.81	1141	0.08
ortho-Cymene	4.25	1018	0.01	3.92*	1230	0.13
para-Cymene	4.31	1022	0.12	3.92*	1230	[0.13]
Limonene	4.41*	1028	9.19	3.03	1159	0.41
1,8-Cineole	4.41*	1028	[9.19]	3.16	1170	8.84
(*Z*)-β-Ocimene	4.59	1040	0.08	3.61	1207	0.07
(*E*)-β-Ocimene	4.75	1050	0.81	3.81*	1222	[0.82]
γ-Terpinene	4.86	1057	0.10	3.64	1208	0.11
cis-Sabinene hydrate	5.00	1065	0.15	6.70*	1429	0.21
cis-Linalool oxide (fur.)	5.09	1071	0.04	6.32	1402	0.05
Octanol	5.18	1077	0.02	7.92*	1522	48.03
Terpinolene	5.31*†	1085	0.22	4.10	1244	0.17
trans-Linalool oxide (fur.)	5.31*†	1085	[0.22]	6.70*	1429	[0.21]
6,7-Epoxymyrcene	5.45	1094	0.04	5.88	1369	0.06
trans-Sabinene hydrate	5.49	1097	0.01	7.80	1513	0.01
Linalool	5.70*†	1110	48.03	7.92*	1522	[48.03]
Phenylethyl alcohol	5.70*†	1110	[48.03]	11.88	1852	0.02
Hotrienol	5.71†	1110	[48.03]	8.59	1575	0.04
Octen-3-yl acetate	5.82	1118	0.07	5.61	1349	0.07

cis-para-Menth-2-en-1-ol	5.87	1121	0.02	7.92*	1522	[48.03]
Limona ketone	6.00	1130	0.02	7.66	1502	0.02
Camphor	6.13	1138	0.53	6.99†	1451	[0.69]
(*E*)-Myroxide	6.23	1144	0.26	6.90*	1445	0.46
Isomenthone	6.47	1160	0.03	6.78	1436	0.03
Borneol	6.52	1162	0.14	9.57*	1654	4.25
δ-Terpineol	6.55	1165	0.16	9.25	1628	0.17
Terpinen-4-ol	6.70	1174	0.54	8.36	1557	0.61
para-Cymen-8-ol	6.86	1185	0.02	11.30	1800	0.02
α-Terpineol	6.93	1189	0.88	9.57*	1654	[4.25]
Methylchavicol	7.03	1196	0.92	9.08*	1614	1.61
(3*E*,5*E*)-2,6-Dimethylocta-3,5,7-trien-2-ol	7.28	1212	0.04	11.13	1785	0.04
Octyl acetate	7.34	1216	0.25	6.90*	1445	[0.46]
Nerol	7.55	1230	0.02	10.84	1760	0.03
Citronellol	7.59	1232	0.18	10.52	1733	0.20
Geraniol	7.97	1258	0.21	11.41	1810	0.19
Chavicol	8.10	1267	0.03	16.22	2272	0.07
Geranial	8.15	1270	0.03	9.89	1680	0.07
Bornyl acetate	8.34	1283	1.09	8.06	1534	1.21
Lavandulyl acetate	8.51	1294	0.01	8.52	1569	0.02
trans-Pinocarvyl acetate	8.54	1297	0.03	8.89	1599	0.01
Geranyl formate	8.64	1303	0.03	9.69*†	1664	1.43
δ-Elemene isomer	9.07	1333	0.03	6.66	1427	0.03
α-Cubebene	9.25	1346	0.09	6.58*†	1421	[0.09]
Eugenol	9.41	1358	5.42	14.53	2100	5.51
Neryl acetate	9.54	1367	0.02	10.00	1689	0.05
α-Copaene	9.60	1371	0.19	6.96†	1450	0.69
β-Bourbonene	9.71*	1379	0.30	7.29	1474	0.26
1,5-diepi-β-Bourbonene	9.71*	1379	[0.30]	7.18	1466	0.02
cis-β-Elemene	9.75	1381	0.10	8.13	1539	0.09
β-Cubebene	9.81	1386	0.16	7.59	1497	0.20
β-Elemene	9.85	1389	1.75	8.27*	1550	7.56
Unknown [m/z 161, 105 (83), 119 (69), 81 (34), 91 (29), 93 (28)...204]	9.89	1392	0.08			
α-Cedrene	10.07*†	1404	0.17	7.76	1510	0.05
Methyleugenol	10.07*†	1404	[0.17]	13.09	1962	0.09
α-Gurjunene	10.07*†	1404	[0.17]	7.42	1484	0.01
β-Caryophyllene	10.17	1412	0.39	8.27*	1550	[7.56]
β-Copaene	10.33	1424	0.19	8.18	1543	0.25
α-Guaiene	10.48*	1435	5.84	8.27*	1550	[7.56]
trans-α-Bergamotene	10.48*	1435	[5.84]	8.27*	1550	[7.56]
cis-β-Bergamotene?	10.56*	1441	0.22			
trans-Muurola-3,5-diene	10.56*	1441	[0.22]	8.67	1582	0.04

α-Humulene	10.63	1446	0.78	9.08*	1614	[1.61]
allo-Aromadendrene	10.76*†	1456	0.77	8.77	1589	0.14
cis-Muurola-4(15),5-diene	10.76*†	1456	[0.77]	9.13	1618	0.50
(*E*)-β-Farnesene	10.79†	1458	[0.77]	9.36	1637	0.14
Germacrene D	11.02	1475	3.26	9.57*	1654	[4.25]
β-Selinene	11.09	1481	0.39	9.69*†	1664	[1.43]
Bicyclogermacrene	11.22	1490	1.01	9.85	1677	0.97
Germacrene A	11.27	1494	0.17	10.19*†	1705	[3.80]
(*Z*)-α-Bisabolene	11.32	1498	1.33	10.16*†	1703	3.80
δ-Guaiene	11.36	1500	1.22	9.69*†	1664	[1.43]
β-Bisabolene	11.46*	1509	2.54	9.95	1685	0.11
γ-Cadinene	11.46*	1509	[2.54]	10.19*†	1705	[3.80]
trans-Calamenene	11.55	1516	0.20	10.97	1772	0.20
δ-Cadinene	11.59	1519	0.13	10.16*†	1703	[3.80]
Zonarene	11.62	1521	0.20	10.16*†	1703	[3.80]
β-Sesquiphellandrene	11.68	1525	0.10	10.34	1718	0.08
α-Cadinene	11.76	1532	0.07	10.57	1737	0.08
Maaliol	12.09	1558	0.16	12.83	1938	0.17
(*E*)-Nerolidol	12.17	1564	0.13	13.56	2006	0.17
Spathulenol	12.24	1570	0.15	14.16	2064	0.15
Caryophyllene oxide	12.28	1573	0.01	12.53	1910	0.01
Globulol	12.32	1576	0.03	13.66	2016	0.05
Viridiflorol	12.41	1583	0.12	13.75	2025	0.09
10-epi-Cubenol	12.72†	1608	0.50	13.47	1998	0.41
10-epi-γ-Eudesmol	12.74†	1609	[0.50]	13.88	2037	0.07
τ-Cadinol	13.06	1636	2.22	14.66	2113	2.20
α-Eudesmol	13.16	1644	0.07			
α-Cadinol	13.21	1648	0.09	15.21	2169	0.03
α-Bisabolol	13.62	1682	0.04	15.16	2163	0.05
Mint sulfide?	14.10	1722	0.02			
Phytone	15.49	1846	0.02	14.42	2090	0.02
Total identified		**98.45%**			**97.35%**	
Total reported		**98.53%**			**97.35%**	

*: 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