Date : August 28, 2020

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 20H21-PTH04
Customer identification : Basil Linalool - 43831 - B10107201R
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 : Fanny Charlier, B. Sc., chimiste à l'entraînement
Analysis date : August 24, 2020

Checked and approved by :

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

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PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid
Refractive index: 1.4759 ± 0.0003 (20 °C; method PC-MAT-016)

NF T 75-244:1992 - OIL OF BASIL, LINALOOL TYPE

Compound	Min. %	Max. %	Observed %	Complies?
Eugenol	2	15	5	Yes
Methylchavicol	tr	30.0	1.1	Yes
Terpinen-4-ol	tr	4.00	0.52	Yes
Linalool	45.0	62.0	48.6	Yes
Camphor	0.2	1.5	0.5	Yes
(E)-β-Ocimene	0.2	2.0	0.6	Yes
1,8-Cineole	2.0	8.0	9.0	No
Refractive index	1.4750	1.4950	1.4759	Yes

CONCLUSION

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

Analysis summary – Consolidated contents

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

Identification	%	Class
Ethanol	0.02	Aliphatic alcohol
Isovaleral	0.01	Aliphatic aldehyde
2-Methylbutyral	0.01	Aliphatic aldehyde
2-Ethylfuran	tr	Furan
Isoamyl alcohol	0.01	Aliphatic alcohol
2-Methylbutanol	tr	Aliphatic alcohol
(3*Z*)-Hexenol	0.03	Aliphatic alcohol
Hexanol	tr	Aliphatic alcohol
Hashishene	0.01	Monoterpene
α-Thujene	0.04	Monoterpene
α-Pinene	0.51	Monoterpene
Camphene	0.09	Monoterpene
α-Fenchene	0.01	Monoterpene
Thuja-2,4(10)-diene	0.02	Monoterpene
β-Pinene	0.97	Monoterpene
Sabinene	0.46	Monoterpene
Octen-3-ol	0.05	Aliphatic alcohol
Octan-3-one	0.05	Aliphatic ketone
Myrcene	1.04	Monoterpene
α-Phellandrene	0.02	Monoterpene
Pseudolimonene	0.01	Monoterpene
Δ3-Carene	0.01	Monoterpene
α-Terpinene	0.08	Monoterpene
para-Cymene	0.14	Monoterpene
1,8-Cineole	9.01	Monoterpenic ether
Limonene	0.40	Monoterpene
(*Z*)-β-Ocimene	0.07	Monoterpene
(*E*)-β-Ocimene	0.63	Monoterpene
γ-Terpinene	0.09	Monoterpene
cis-Sabinene hydrate	0.12	Monoterpenic alcohol
cis-Linalool oxide (fur.)	0.04	Monoterpenic alcohol
Octanol	0.02	Aliphatic alcohol
Terpinolene	0.14	Monoterpene
6,7-Epoxymyrcene	0.03	Monoterpenic ether
trans-Sabinene hydrate	0.01	Monoterpenic alcohol
Linalool	48.62	Monoterpenic alcohol
Phenylethyl alcohol	0.01	Simple phenolic
Octen-3-yl acetate	0.01	Aliphatic ester
cis-para-Menth-2-en-1-ol	0.09	Monoterpenic alcohol
Camphor	0.48	Monoterpenic ketone
(*E*)-Myroxide	0.14	Monoterpenic ether
Borneol	0.11	Monoterpenic alcohol
δ-Terpineol	0.16	Monoterpenic alcohol
Terpinen-4-ol	0.52	Monoterpenic alcohol
para-Cymen-8-ol	0.02	Monoterpenic alcohol

α-Terpineol	0.85	Monoterpenic alcohol
Methylchavicol	1.07	Phenylpropanoid
(3*E*,5*E*)-2,6-Dimethylocta-3,5,7-trien-2-ol	0.02	Monoterpenic alcohol
Octyl acetate	0.03	Aliphatic ester
Nerol	0.07	Monoterpenic alcohol
Citronellol	0.13	Monoterpenic alcohol
Geraniol	0.18	Monoterpenic alcohol
Geranial	0.04	Monoterpenic aldehyde
Citronellyl formate	0.06	Monoterpenic ester
Bornyl acetate	0.96	Monoterpenic ester
Lavandulyl acetate	0.01	Monoterpenic ester
Geranyl formate	0.02	Monoterpenic ester
δ-Elemene isomer	0.02	Sesquiterpene
exo-2-Hydroxycineole acetate	0.08	Monoterpenic ester
α-Cubebene	0.08	Sesquiterpene
Eugenol	5.44	Phenylpropanoid
Neryl acetate	0.07	Monoterpenic ester
α-Copaene	0.19	Sesquiterpene
β-Bourbonene	0.24	Sesquiterpene
1,5-diepi-β-Bourbonene	0.02	Sesquiterpene
cis-β-Elemene	0.09	Sesquiterpene
Geranyl acetate	0.13	Monoterpenic ester
β-Elemene	1.62	Sesquiterpene
Methyleugenol	0.11	Phenylpropanoid
α-Cedrene	0.07	Sesquiterpene
β-Caryophyllene	0.37	Sesquiterpene
β-Copaene	0.11	Sesquiterpene
β-Gurjunene	0.06	Sesquiterpene
trans-α-Bergamotene	5.65*	Sesquiterpene
α-Guaiene	[5.65]*	Sesquiterpene
cis-Muurola-3,5-diene	0.20	Sesquiterpene
α-Humulene	0.74	Sesquiterpene
allo-Aromadendrene	0.06	Sesquiterpene
(*E*)-β-Farnesene	0.38	Sesquiterpene
cis-Muurola-4(15),5-diene	0.51	Sesquiterpene
Germacrene D	2.87	Sesquiterpene
β-Selinene	0.52	Sesquiterpene
Bicyclogermacrene	0.97	Sesquiterpene
(*Z*)-α-Bisabolene	1.11	Sesquiterpene
δ-Guaiene	1.06	Sesquiterpene
γ-Cadinene	2.52	Sesquiterpene
δ-Cadinene	0.22	Sesquiterpene
Zonarene	0.13	Sesquiterpene
α-Cadinene	0.07	Sesquiterpene
Maaliol	0.12	Sesquiterpenic alcohol
(*E*)-Nerolidol	0.14	Sesquiterpenic alcohol
Spathulenol	0.19	Sesquiterpenic alcohol
Globulol	0.03	Sesquiterpenic alcohol
Viridiflorol	0.02	Sesquiterpenic alcohol
10-epi-Cubenol	0.51	Sesquiterpenic alcohol
τ-Cadinol	2.51	Sesquiterpenic alcohol
β-Eudesmol	0.14	Sesquiterpenic alcohol

α-Eudesmol	0.06	Sesquiterpenic alcohol
α-Cadinol	0.11	Sesquiterpenic alcohol
α-Bisabolol	0.04	Sesquiterpenic alcohol
Unknown	0.01	Lignan
Geranyl tiglate	0.05	Monoterpenic ester
Phytone	0.03	Terpenic ketone
Phytol	0.02	Diterpenic alcohol
Consolidated total	**97.42%**	

*: 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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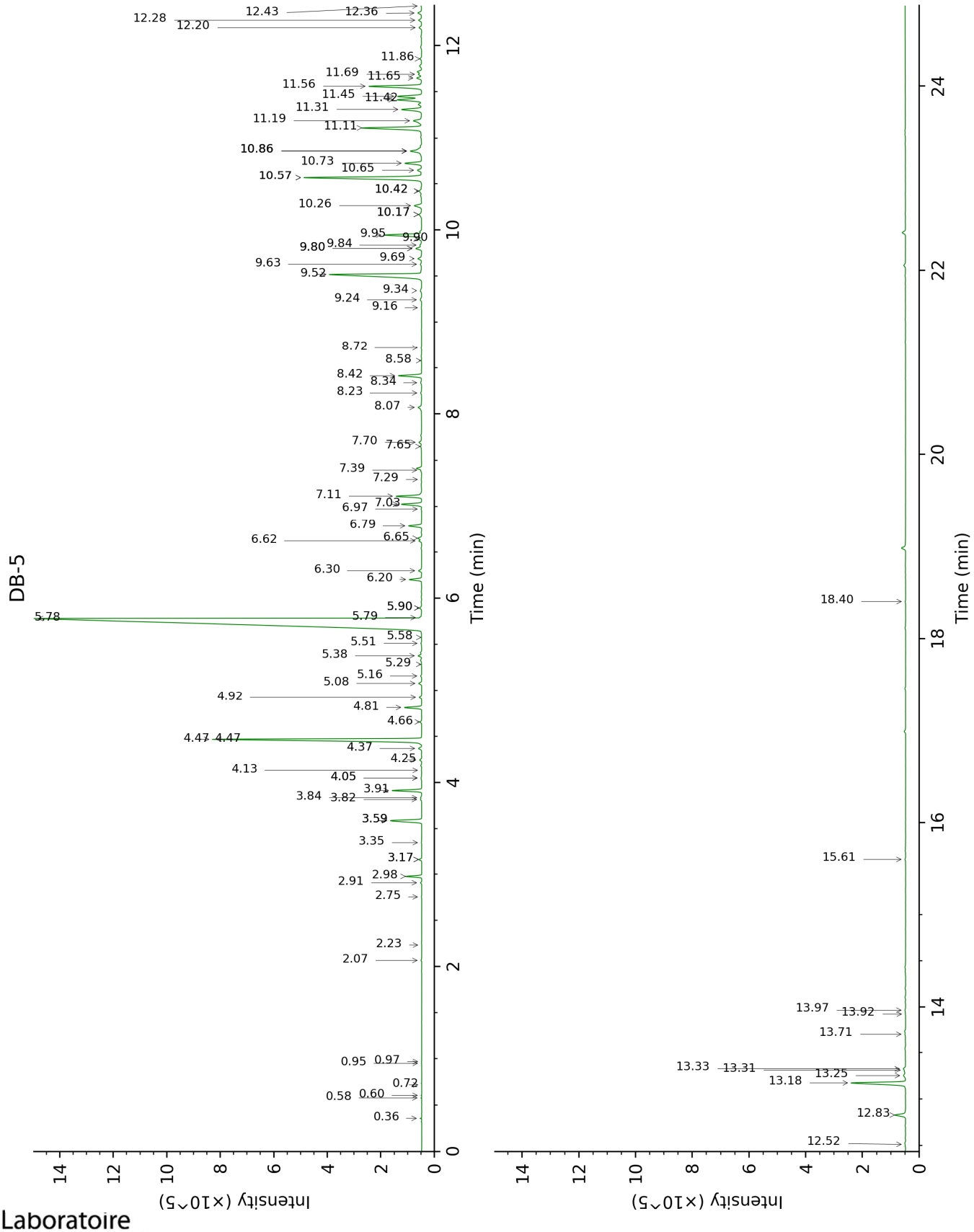
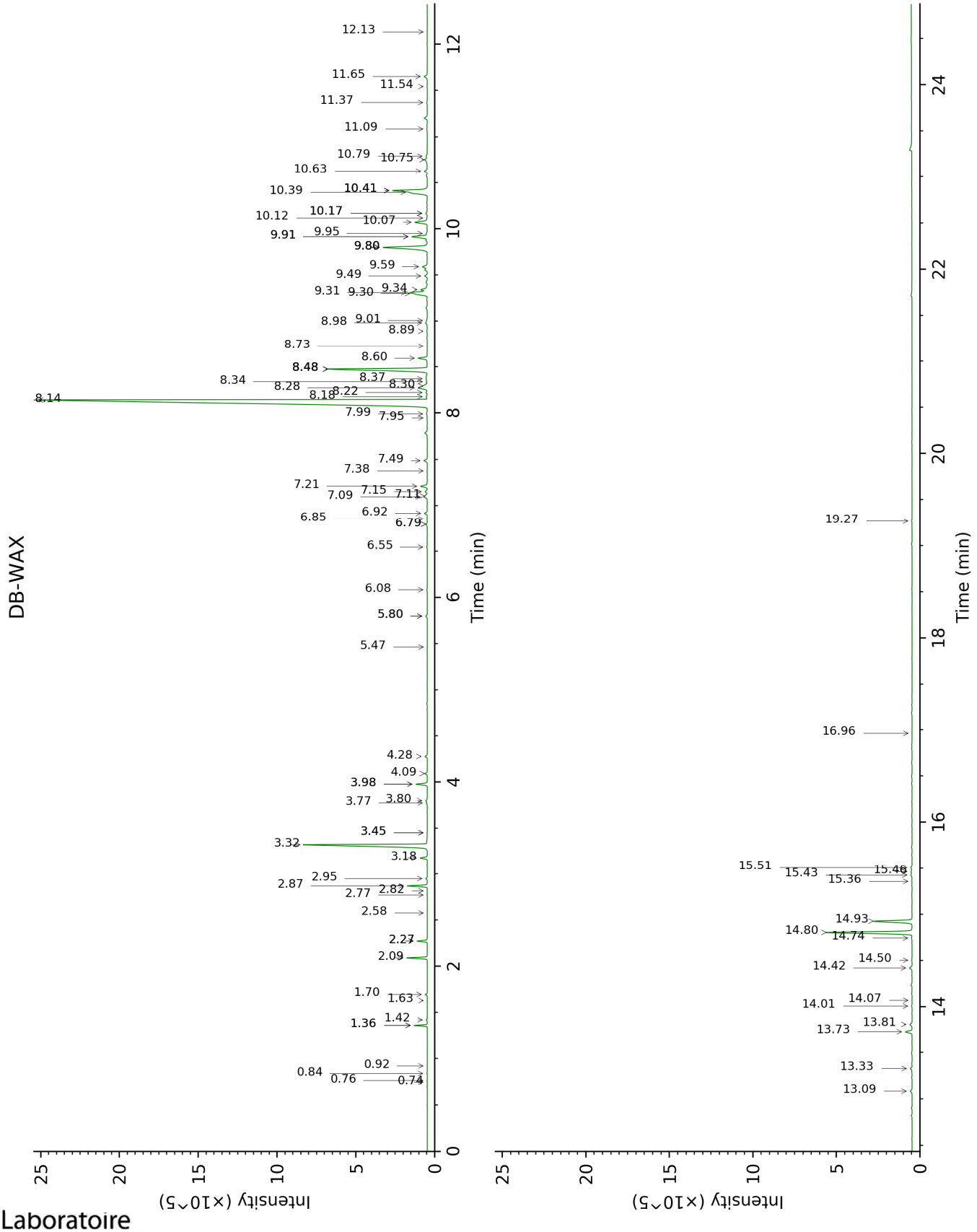

DB-5
Intensity (×10^5)
Time (min)
12.43
12.36
12.28
12.20
11.86
11.69
11.65
11.56
11.45
11.42
11.31
11.19
11.11
10.86
10.73
10.65
10.57
10.42
10.26
10.17
9.95
9.90
9.80
9.84
9.69
9.63
9.52
9.34
9.24
9.16
8.72
8.58
8.42
8.34
8.23
8.07
7.70
7.65
7.39
7.29
7.11
6.97
7.03
6.79
6.62
6.65
6.30
6.20
5.90
5.78
5.79
5.58
5.51
5.38
5.29
5.16
5.08
4.92
4.81
4.66
4.47
4.47
4.37
4.25
4.13
4.05
3.91
3.84
3.82
3.59
3.35
3.17
2.98
2.91
2.75
2.23
2.07
0.95
0.97
0.72
0.58
0.60
0.36
18.40
15.61
13.97
13.92
13.71
13.33
13.31
13.25
13.18
12.83
12.52


DB-WAX
Time (min)
Intensity (×10^5)
12.13
11.65
11.54
11.37
11.09
10.79
10.75
10.63
10.39
10.41
10.12
10.17
10.07
9.91
9.95
9.80
9.59
9.49
9.31
9.30
9.34
8.98
9.01
8.89
8.73
8.60
8.48
8.34
8.37
8.28
8.30
8.22
8.18
8.14
7.99
7.95
7.49
7.38
7.21
7.09
7.15
7.11
6.85
6.92
6.79
6.55
6.08
5.80
5.47
4.28
4.09
3.98
3.77
3.80
3.45
3.32
3.18
2.87
2.95
2.77
2.82
2.58
2.27
2.09
1.70
1.63
1.36
1.42
0.84
0.92
0.76
0.74
19.27
16.96
15.51
15.43
15.46
15.36
14.93
14.80
14.74
14.42
14.50
14.01
14.07
13.73
13.81
13.33
13.09

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Ethanol	0.36	504	0.02	0.84	905	0.01
Isovaleral	0.58	642	0.01	0.76	886	0.01
2-Methylbutyral	0.60	652	0.01	0.74	880	0.01
2-Ethylfuran	0.72	696	tr	0.92	918	0.01
Isoamyl alcohol	0.95	736	0.01	3.45*	1181	0.01
2-Methylbutanol	0.97	739	tr	3.45*	1181	[0.01]
(3*Z*)-Hexenol	2.07	860	0.03	5.80*	1349	0.10
Hexanol	2.23	874	tr	5.47	1325	tr
Hashishene	2.76	916	0.01	1.36*	992	0.51
α-Thujene	2.91	926	0.04	1.42	1000	0.04
α-Pinene	2.98	930	0.51	1.36*	992	[0.51]
Camphene	3.17*	943	0.10	1.70	1028	0.09
α-Fenchene	3.17*	943	[0.10]	1.63	1021	0.01
Thuja-2,4(10)-diene	3.35	955	0.02	2.27*	1086	0.48
β-Pinene	3.59*	971	1.48	2.09	1068	0.97
Sabinene	3.59*	971	[1.48]	2.27*	1086	[0.48]
Octen-3-ol	3.82	987	0.05	6.79*	1421	0.10
Octan-3-one	3.84	988	0.05	3.98*	1220	0.64
Myrcene	3.91	993	1.04	2.87	1135	1.00
α-Phellandrene	4.05*	1002	0.04	2.77	1127	0.02
Pseudolimonene	4.05*	1002	[0.04]	2.82	1131	0.01
Δ3-Carene	4.13	1008	0.01	2.58	1112	0.01
α-Terpinene	4.24	1015	0.08	2.95	1141	0.08
para-Cymene	4.37	1022	0.14	4.09	1228	0.14
1,8-Cineole	4.47*	1029	9.47	3.32	1170	9.01
Limonene	4.47*	1029	[9.47]	3.18	1159	0.40
(*Z*)-β-Ocimene	4.66	1041	0.07	3.77	1205	0.06
(*E*)-β-Ocimene	4.81	1050	0.63	3.98*	1220	[0.64]
γ-Terpinene	4.92	1057	0.09	3.80	1207	0.09
cis-Sabinene hydrate	5.08	1067	0.12	6.92	1430	0.18
cis-Linalool oxide (fur.)	5.16	1072	0.04	6.55	1403	0.04
Octanol	5.29	1080	0.02	8.22	1528	0.08
Terpinolene	5.38	1086	0.14	4.28	1242	0.13
6,7-Epoxymyrcene	5.51	1095	0.03	6.08	1369	0.04
trans-Sabinene hydrate	5.58	1099	0.01	7.95	1507	0.04
Linalool	5.78†	1112	48.80	8.14	1522	48.62
Phenylethyl alcohol	5.79†	1112	[48.80]	12.14	1850	0.01
Octen-3-yl acetate	5.90*	1119	0.10	5.80*	1349	[0.10]
cis-para-Menth-2-en-1-ol	5.90*	1119	[0.10]	8.18	1525	0.09
Camphor	6.20	1139	0.48	7.21	1452	0.47
(*E*)-Myroxide	6.30	1145	0.14	7.15	1448	0.15
Borneol	6.62	1166	0.11	9.80*	1652	3.87

δ-Terpineol	6.65	1168	0.16	9.49	1627	0.17
Terpinen-4-ol	6.78	1176	0.52	8.60	1557	0.55
para-Cymen-8-ol	6.97	1188	0.02	11.54	1798	0.02
α-Terpineol	7.03	1192	0.85	9.80*	1652	[3.87]
Methylchavicol	7.11	1197	1.07	9.31	1613	1.06
(3*E*,5*E*)-2,6-Dimethylocta-3,5,7-trien-2-ol	7.29	1209	0.02	11.37	1783	0.04
Octyl acetate	7.40	1216	0.03	7.11	1444	0.11
Nerol	7.65	1233	0.07	11.09	1759	0.03
Citronellol	7.70	1236	0.13	10.75	1731	0.26
Geraniol	8.07	1262	0.18	11.65	1807	0.25
Geranial	8.23	1272	0.04	10.12	1678	0.03
Citronellyl formate	8.34	1280	0.06	8.89	1580	0.03
Bornyl acetate	8.42	1285	0.96	8.28	1532	0.84
Lavandulyl acetate	8.58	1296	0.01	8.73	1567	0.02
Geranyl formate	8.72	1302	0.02	9.95	1664	0.07
δ-Elemene isomer	9.16	1333	0.02	6.85	1426	0.03
exo-2-Hydroxycineole acetate	9.24	1340	0.08	10.17*	1682	0.10
α-Cubebene	9.34	1346	0.08	6.79*	1421	[0.10]
Eugenol	9.52	1359	5.44	14.80	2098	5.53
Neryl acetate	9.63	1367	0.07	10.17*	1682	[0.10]
α-Copaene	9.69	1371	0.19	7.10	1443	0.21
β-Bourbonene	9.80*	1379	0.26	7.49	1472	0.24
1,5-diepi-β-Bourbonene	9.80*	1379	[0.26]	7.38	1464	0.02
cis-β-Elemene	9.84	1381	0.09	8.30	1534	0.19
Geranyl acetate	9.90	1386	0.13	10.63	1720	0.19
β-Elemene	9.95	1389	1.62	8.48*	1548	7.36
Methyleugenol	10.17*	1405	0.17	13.33	1958	0.11
α-Cedrene	10.17*	1405	[0.17]	7.99	1510	0.07
β-Caryophyllene	10.26	1412	0.37	8.48*	1548	[7.36]
β-Copaene	10.42*	1424	0.14	8.37	1540	0.11
β-Gurjunene	10.42*	1424	[0.14]	8.34	1537	0.06
trans-α-Bergamotene	10.57*	1435	5.65	8.48*	1548	[7.36]
α-Guaiene	10.57*	1435	[5.65]	8.48*	1548	[7.36]
cis-Muurola-3,5-diene	10.65	1441	0.20	8.98	1587	0.14
α-Humulene	10.73	1447	0.74	9.30	1612	0.68
allo-Aromadendrene	10.86*†	1457	0.74	9.01	1589	0.06
(*E*)-β-Farnesene	10.86*†	1457	[0.74]	9.59	1635	0.38
cis-Muurola-4(15),5-diene	10.86*†	1457	[0.74]	9.34	1616	0.51
Germacrene D	11.11	1476	2.87	9.80*	1652	[3.87]
β-Selinene	11.19	1481	0.52	9.92*	1662	1.13
Bicyclogermacrene	11.31	1490	0.97	10.07	1674	0.92
(*Z*)-α-Bisabolene	11.42	1498	1.11	10.40	1701	1.04
δ-Guaiene	11.45	1501	1.06	9.92*	1662	[1.13]

γ-Cadinene	11.56	1510	2.52	10.41*	1702	2.56
δ-Cadinene	11.65	1517	0.22	10.41*	1702	[2.56]
Zonarene	11.69	1520	0.13	10.41*	1702	[2.56]
α-Cadinene	11.86	1533	0.07	10.79	1734	0.10
Maaliol	12.20	1560	0.12	13.08	1935	0.15
(*E*)-Nerolidol	12.28	1566	0.14	13.81	2002	0.17
Spathulenol	12.36	1572	0.19	14.42	2061	0.18
Globulol	12.43	1578	0.03	14.01	2021	0.04
Viridiflorol	12.52	1585	0.02	14.07	2027	0.01
10-epi-Cubenol	12.83	1610	0.51	13.73	1995	0.45
τ-Cadinol	13.18	1638	2.51	14.93	2110	2.52
β-Eudesmol	13.25	1645	0.14	15.42	2160	0.11
α-Eudesmol	13.31	1650	0.06	15.36	2153	0.02
α-Cadinol	13.33	1651	0.11	15.51	2168	0.10
α-Bisabolol	13.71	1682	0.04	15.46	2163	0.08
Unknown [m/z 133, 93 (97), 131 (85), 145 (83), 107 (69)...220]	13.92	1700	0.01	16.96	2319	0.01
Geranyl tiglate	13.97	1704	0.05	14.50	2069	0.03
Phytone	15.61	1848	0.03	14.74	2092	0.04
Phytol	18.40	2118	0.02	19.27	2576	0.03
Total identified		**97.46%**			**96.64%**	
Total reported		**97.47%**			**96.65%**	

*: 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