Date : May 04, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21D20-ORA14
Customer identification : Sweet Basil - India - 3 years - B093015
Type : Essential oil
Source : *Ocimum basilicum* ct. Methylchavicol
Customer : Organic Aromas Inc.

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 : Sarah-Eve Tremblay, M. Sc. A., Chimiste
Analysis date : May 04, 2021

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: 1.5079 ± 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	tr	Aliphatic aldehyde
2-Ethylfuran	tr	Furan
Isoamyl alcohol	tr	Aliphatic alcohol
2-Methylbutanol	tr	Aliphatic alcohol
Toluene	tr	Simple phenolic
1-Methylcyclohexene	tr	Alkene
(3*Z*)-Hexenol	0.01	Aliphatic alcohol
Nonane	tr	Alkane
Tricyclene	tr	Monoterpene
α-Thujene	tr	Monoterpene
α-Pinene	0.06	Monoterpene
Camphene	tr	Monoterpene
Benzaldehyde	tr	Simple phenolic
β-Pinene	0.04	Monoterpene
Sabinene	0.01	Monoterpene
Octen-3-ol	0.01	Aliphatic alcohol
6-Methyl-5-hepten-2-one	0.09	Aliphatic ketone
Myrcene	0.03	Monoterpene
Octan-3-ol	tr	Aliphatic alcohol
Octanal	0.01	Aliphatic aldehyde
Δ3-Carene	tr	Monoterpene
(3*Z*)-Hexenyl acetate	0.01	Aliphatic ester
para-Cymene	0.02	Monoterpene
Limonene	0.04	Monoterpene
1,8-Cineole	0.09	Monoterpenic ether
2-Ethylhexanol	tr	Aliphatic alcohol
(*Z*)-β-Ocimene	tr	Monoterpene
(*E*)-β-Ocimene	0.07	Monoterpene
γ-Terpinene	tr	Monoterpene
cis-Sabinene hydrate	tr	Monoterpenic alcohol
cis-Linalool oxide (fur.)	0.10	Monoterpenic alcohol
Octanol	0.03	Aliphatic alcohol
Fenchone	0.01	Monoterpenic ketone
Terpinolene	tr	Monoterpene
trans-Linalool oxide (fur.)	0.09	Monoterpenic alcohol
trans-Sabinene hydrate	tr	Monoterpenic alcohol
Linalool	18.16	Monoterpenic alcohol
(*Z*)-6-Methyl-3,5-heptadien-2-one	0.03	Aliphatic ketone
endo-Fenchol	tr	Monoterpenic alcohol
Octen-3-yl acetate	tr	Aliphatic ester
Camphor	0.01	Monoterpenic ketone
Isomenthone	0.01	Monoterpenic ketone
Borneol	0.01	Monoterpenic alcohol
Terpinen-4-ol	0.01	Monoterpenic alcohol
Menthol	0.15	Monoterpenic alcohol

α-Terpineol	0.07	Monoterpenic alcohol
Methylchavicol	74.50	Phenylpropanoid
Octyl acetate	0.02	Aliphatic ester
Nerol	0.03	Monoterpenic alcohol
Neral	0.35	Monoterpenic aldehyde
Piperitone	0.01	Monoterpenic ketone
Geraniol	0.08	Monoterpenic alcohol
Geranial	0.57	Monoterpenic aldehyde
Chavicol	0.03	Phenylpropanoid
Bornyl acetate	0.02	Monoterpenic ester
(*E*)-Anethole	0.01	Phenylpropanoid
Menthyl acetate	0.01	Monoterpenic ester
Carvacrol	tr	Monoterpenic alcohol
Eugenol	0.03	Phenylpropanoid
Neryl acetate	0.02	Monoterpenic ester
α-Copaene	0.03	Sesquiterpene
β-Bourbonene	0.01	Sesquiterpene
Geranyl acetate	tr	Monoterpenic ester
β-Elemene	0.09	Sesquiterpene
Methyleugenol	0.04	Phenylpropanoid
β-Caryophyllene	0.31	Sesquiterpene
trans-α-Bergamotene	0.47	Sesquiterpene
Sesquisabinene A	tr	Sesquiterpene
cis-β-Bergamotene?	0.05	Sesquiterpene
α-Humulene	0.18	Sesquiterpene
cis-Muurola-4(15),5-diene	0.02	Sesquiterpene
(*E*)-β-Farnesene	0.19	Sesquiterpene
γ-Muurolene	tr	Sesquiterpene
Germacrene D	0.09	Sesquiterpene
β-Selinene	0.01	Sesquiterpene
trans-β-Bergamotene	0.09	Sesquiterpene
Bicyclogermacrene	0.01	Sesquiterpene
α-Zingiberene	0.01	Sesquiterpene
β-Bisabolene	0.10	Sesquiterpene
γ-Cadinene	0.01	Sesquiterpene
δ-Cadinene	0.02	Sesquiterpene
β-Sesquiphellandrene	0.01	Sesquiterpene
(*E*)-α-Bisabolene	1.23	Sesquiterpene
(*E*)-para-Methoxycinnamaldehyde	0.36	Phenylpropanoid
(*E*)-Nerolidol	0.04	Sesquiterpenic alcohol
(*E*)-para-Methoxycinnamyl alcohol	0.30	Phenylpropanoid
Spathulenol	0.03	Sesquiterpenic alcohol
Caryophyllene oxide	0.09	Sesquiterpenic ether
Caryophyllene oxide isomer	0.02	Sesquiterpenic ether
Unknown	0.02	Phenylpropanoid
Humulene epoxide II	0.04	Sesquiterpenic ether
10-epi-Cubenol	0.01	Sesquiterpenic alcohol
1-epi-Cubenol	tr	Sesquiterpenic alcohol
τ-Cadinol	0.01	Sesquiterpenic alcohol
Unknown	0.04	Oxygenated sesquiterpene
α-Cadinol	0.01	Sesquiterpenic alcohol
α-Bisabolol	0.02	Sesquiterpenic alcohol

Consolidated total	**98.83%**	

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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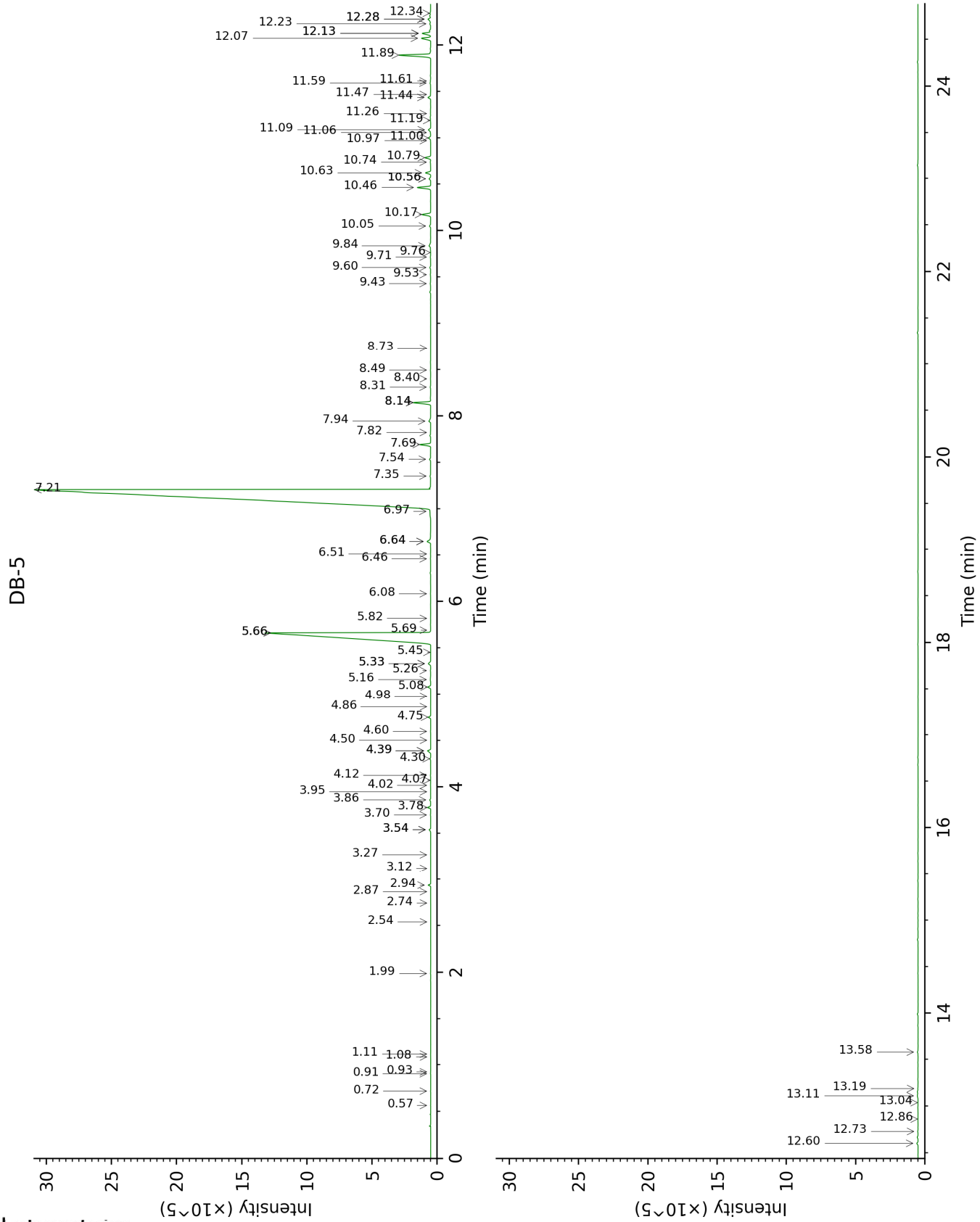
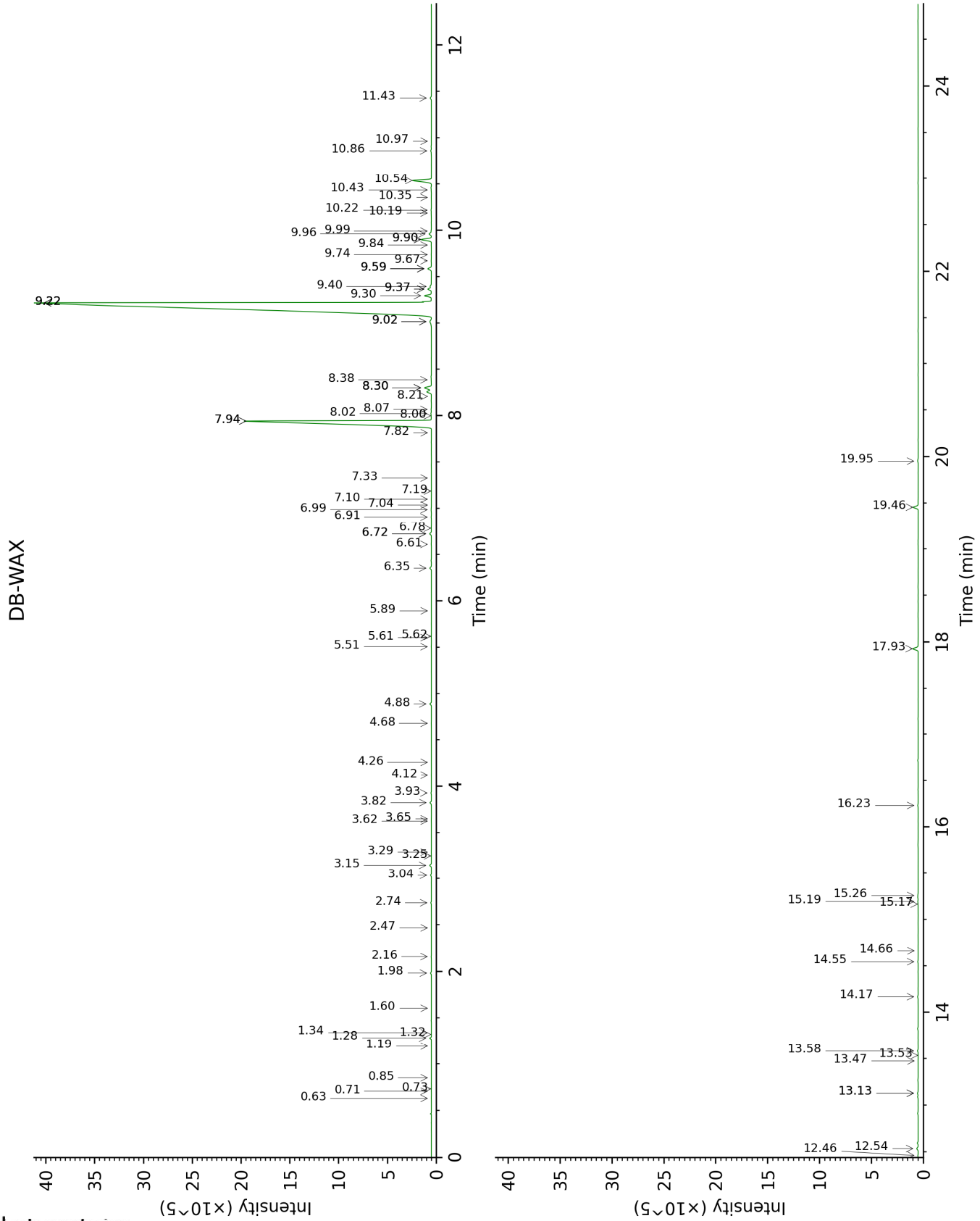

DB-5
Time (min)
Intensity (×10^5)
12.34
12.28
12.23
12.13
12.07
11.89
11.61
11.59
11.47
11.44
11.26
11.19
11.09
11.06
10.97
11.00
10.79
10.74
10.63
10.56
10.46
10.17
10.05
9.84
9.76
9.71
9.60
9.53
9.43
8.73
8.49
8.40
8.31
8.14
7.94
7.82
7.69
7.54
7.35
7.21
6.97
6.64
6.51
6.46
6.08
5.82
5.69
5.66
5.45
5.33
5.26
5.16
5.08
4.98
4.86
4.75
4.60
4.50
4.39
4.30
4.12
4.07
4.02
3.95
3.86
3.78
3.70
3.54
3.27
3.12
2.94
2.87
2.74
2.54
1.99
1.11
1.08
0.91
0.93
0.72
0.57
13.58
13.19
13.11
13.04
12.86
12.73
12.60


DB-WAX
Time (min)
Intensity (×10^5)
11.43
10.97
10.86
10.54
10.43
10.35
10.22
10.19
9.96
9.99
9.84
9.90
9.74
9.67
9.59
9.40
9.37
9.30
9.22
9.02
8.38
8.30
8.21
8.02
8.07
8.00
7.94
7.82
7.33
7.19
7.10
7.04
6.99
6.91
6.72
6.78
6.61
6.35
5.89
5.61
5.62
5.51
4.88
4.68
4.26
4.12
3.93
3.82
3.62
3.65
3.29
3.25
3.15
3.04
2.74
2.47
2.16
1.98
1.60
1.34
1.28
1.32
1.19
0.85
0.71
0.73
0.63
19.95
19.46
17.93
16.23
15.19
15.26
15.17
14.66
14.55
14.17
13.58
13.47
13.53
13.13
12.46
12.54

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Isovaleral	0.57	640	tr	0.71	887	tr
2-Ethylfuran	0.72	701	tr	0.85	919	tr
Isoamyl alcohol	0.90	732	tr	3.29	1177	tr
2-Methylbutanol	0.92	735	tr	3.25	1174	tr
Toluene	1.08	759	tr	1.34	1001	tr
1-Methylcyclohexene	1.12	764	tr	0.63	858	tr
(3*Z*)-Hexenol	1.99	857	0.01	5.61	1347	0.01
Nonane	2.54	905	tr	0.73	897	tr
Tricyclene	2.74	919	tr	1.19	977	tr
α-Thujene	2.87	927	tr	1.32	999	tr
α-Pinene	2.94	932	0.06	1.28	992	0.06
Camphene	3.12	944	tr	1.60	1028	tr
Benzaldehyde	3.27	954	tr	7.19	1464	tr
β-Pinene	3.54*	972	0.05	1.98	1066	0.04
Sabinene	3.54*	972	[0.05]	2.16	1084	0.01
Octen-3-ol	3.70	983	0.01	6.61	1420	0.01
6-Methyl-5-hepten-2-one	3.78	988	0.09	4.88	1298	0.08
Myrcene	3.86	994	0.03	2.74	1133	0.02
Octan-3-ol	3.95	1000	tr	5.89	1368	tr
Octanal	4.02	1005	0.01	4.26	1251	tr
Δ3-Carene	4.07	1008	tr	2.47	1112	tr
(3*Z*)-Hexenyl acetate	4.12	1011	0.01	4.68	1282	0.01
para-Cymene	4.30	1023	0.02	3.93	1226	0.02
Limonene	4.39*	1028	0.13	3.04	1157	0.04
1,8-Cineole	4.39*	1028	[0.13]	3.15	1166	0.09
2-Ethylhexanol	4.50	1035	tr	7.10	1458	0.01
(*Z*)-β-Ocimene	4.60	1041	tr	3.65	1206	tr
(*E*)-β-Ocimene	4.75	1051	0.07	3.82	1219	0.07
γ-Terpinene	4.86	1058	tr	3.62	1204	tr
cis-Sabinene hydrate	4.98	1066	tr	6.72*	1429	0.09
cis-Linalool oxide (fur.)	5.08	1072	0.10	6.35	1401	0.09
Octanol	5.16	1077	0.03	8.00	1526	0.01
Fenchone	5.26	1083	0.01	5.51	1340	0.01
Terpinolene	5.33*	1088	0.10	4.12	1241	tr
trans-Linalool oxide (fur.)	5.33*	1088	[0.10]	6.72*	1429	[0.09]
trans-Sabinene hydrate	5.45	1096	tr	7.82	1511	tr
Linalool	5.66*	1109	18.19	7.94*	1521	18.36
(*Z*)-6-Methyl-3,5-heptadien-2-one	5.66*	1109	[18.19]	8.02	1528	0.03
endo-Fenchol	5.69	1111	tr	8.21	1542	tr
Octen-3-yl acetate	5.82	1119	tr	5.62	1348	tr
Camphor	6.08	1136	0.01	7.04	1453	tr
Isomenthone	6.46	1160	0.01	6.78	1434	0.01
Borneol	6.51	1163	0.01	9.59*	1652	0.21
Terpinen-4-ol	6.64*	1172	0.16	8.38	1556	0.01
Menthol	6.64*	1172	[0.16]	9.02*	1606	0.15
α-Terpineol	6.98	1193	0.07	9.59*	1652	[0.21]
Methylchavicol	7.21	1208	74.50	9.22*	1622	74.79

Octyl acetate	7.35	1218	0.02	6.91	1443	0.01
Nerol	7.54	1230	0.03	10.86	1759	0.04
Neral	7.69	1241	0.35	9.30	1628	0.37
Piperitone	7.82	1250	0.01	9.74	1664	0.01
Geraniol	7.94	1258	0.08	11.43	1808	0.07
Geranial	8.14*	1271	0.60	9.90*	1678	0.58
Chavicol	8.14*	1271	[0.60]	16.23	2270	0.03
Bornyl acetate	8.31	1282	0.02	8.07	1531	0.02
(*E*)-Anethole	8.40	1288	0.01	10.97	1768	0.01
Menthyl acetate	8.49	1295	0.01	7.94*	1521	[18.36]
Carvacrol	8.73	1311	tr	15.17	2160	0.01
Eugenol	9.43	1361	0.03	14.55	2097	0.03
Neryl acetate	9.53	1367	0.02	9.99	1685	0.01
α-Copaene	9.60	1373	0.03	6.99	1449	0.02
β-Bourbonene	9.72	1381	0.01	7.33	1475	0.01
Geranyl acetate	9.76	1384	tr	10.35	1715	0.01
β-Elemene	9.84	1389	0.09	8.30*	1549	0.76
Methyleugenol	10.05	1404	0.04	13.13*	1962	0.05
β-Caryophyllene	10.17	1414	0.31	8.30*	1549	[0.76]
trans-α-Bergamotene	10.46	1435	0.47	8.30*	1549	[0.76]
Sesquisabinene A	10.56*	1442	0.05	9.02*	1606	[0.15]
cis-β-Bergamotene?	10.56*	1442	[0.05]			
α-Humulene	10.63	1448	0.18	9.22*	1622	[74.79]
cis-Muurola-4(15),5-diene	10.74	1456	0.02	9.22*	1622	[74.79]
(*E*)-β-Farnesene	10.79	1460	0.19	9.37*	1634	0.21
γ-Muurolene	10.97	1473	tr	9.40	1636	0.07
Germacrene D	11.00	1476	0.09	9.59*	1652	[0.21]
β-Selinene	11.06	1480	0.01	9.67	1659	0.02
trans-β-Bergamotene	11.09	1482	0.09	9.37*	1634	[0.21]
Bicyclogermacrene	11.19	1490	0.01	9.84	1673	0.01
α-Zingiberene	11.26	1495	0.01	9.90*	1678	[0.58]
β-Bisabolene	11.44	1508	0.10	9.96	1683	0.14
γ-Cadinene	11.47	1511	0.01	10.19	1701	0.01
δ-Cadinene	11.59	1520	0.02	10.22	1704	0.02
β-Sesquiphellandrene	11.61	1522	0.01	10.43	1722	0.01
(*E*)-α-Bisabolene	11.89	1544	1.23	10.54	1731	1.18
(*E*)-para-Methoxycinnamaldehyde	12.07	1558	0.36	17.93	2454	0.34
(*E*)-Nerolidol	12.13*	1562	0.32	13.58	2004	0.04
(*E*)-para-Methoxycinnamyl alcohol	12.13*	1562	[0.32]	19.46	2632	0.30
Spathulenol	12.23	1570	0.03	14.17	2061	0.04
Caryophyllene oxide	12.28*	1574	0.12	12.54	1906	0.09
Caryophyllene oxide isomer	12.28*	1574	[0.12]	12.46	1900	0.02
Unknown [m/z 137, 109 (18), 77 (16), 94 (14), 180 (13)]	12.34	1580	0.02	19.95	2691	0.05
Humulene epoxide II	12.60	1600	0.04	13.13*	1962	[0.05]
10-epi-Cubenol	12.73	1610	0.01	13.47	1994	0.01
1-epi-Cubenol	12.86	1621	tr	13.53	1999	tr

τ-Cadinol	13.04	1636	0.01	14.66	2109	tr
Unknown [m/z 119, 91 (44), 94 (36), 107 (35), 93 (29)... 202 (19)...]	13.11	1642	0.04			
α-Cadinol	13.19	1648	0.01	15.26	2169	0.02
α-Bisabolol	13.58	1680	0.02	15.19	2162	0.02
Total identified		**98.77%**			**98.87%**	
Total reported		**98.83%**			**98.92%**	

*: Two or more compounds are coeluting on this column
[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
R.T.: Retention time (minutes)
R.I.: Retention index

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