Date : 2025-08-19

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 25H06-PTH09
Customer Identification : Nutmeg - Indonesia - N40113R
Type : Essential Oil
Source : *Myristica fragrans*
Customer : Plant Therapy

Checked an approved by:

Sylvain Mercier, M. Sc., Chimiste 2014-005

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia. This report is digitally signed, it is only considered valid if the digital signature is intact. The results only describe the samples that were submitted to the assays.

Méthode certifiée ISO 17025:2017 Certified method

Laboratoire PhytoChemia

628 Boulevard du Saguenay Ouest, Saguenay (Qc) G7J 1H4 | www.phytochemia.com

Gas Chromatographic Analysis

Method : PC-MAT-014 - Analysis of the composition of an essential oil or other volatile liquide by FAST GC-FID
ISO
Results : See analysis summary (next page)
Analyst : Sylvain Mercier, M. Sc., Chimiste 2014-005
Date : 2025-08-12

Physicochemical data

Refractive index : 1.4817 ± 0.0003 (20 °C)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Cindy Caron B. Sc.
Date : 2025-08-06

Conclusion

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

628 Boulevard du Saguenay, Saguenay (Qc) G7J 1H4 | www.phytochemia.com

Analysis Summary - Consolidated Contents

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

Identification	%	Class
Toluene	0.01	Simple phenolic
Octane	tr	Alkane
Nonane	0.01	Alkane
Tricyclene	0.02	Monoterpene
α-Thujene	1.61	Monoterpene
α-Pinene	20.16	Monoterpene
α-Fenchene	0.06	Monoterpene
Camphene	0.30	Monoterpene
Thuja-2,4(10)-diene	0.01	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.03	Monoterpene
β-Pinene	15.13	Monoterpene
Sabinene	20.94	Monoterpene
6-Methyl-5-hepten-2-one	0.02	Aliphatic ketone
Myrcene	2.33	Monoterpene
Pseudolimonene	0.05	Monoterpene
α-Phellandrene	0.74	Monoterpene
Δ3-Carene	1.12	Monoterpene
α-Terpinene	2.83	Monoterpene
Carvomenthene	0.01	Aliphatic alcohol
para-Cymene	0.73	Monoterpene
β-Phellandrene	[2.12]	Monoterpene
Limonene	4.24	Monoterpene
1,8-Cineole	[2.12]	Monoterpenic ether
(*Z*)-β-Ocimene	0.02	Monoterpene
(*E*)-β-Ocimene	0.04	Monoterpene
γ-Terpinene	4.42	Monoterpene
cis-Sabinene hydrate	0.21	Monoterpenic alcohol
Terpinolene	1.65	Monoterpene
para-Cymenene	0.07	Monoterpene
trans-Sabinene hydrate	0.15	Monoterpenic alcohol
Unknown	0.06	Oxygenated monoterpene
Linalool	0.19	Monoterpenic alcohol
Unknown	0.01	Monoterpenic alcohol
para-Mentha-1,3,8-triene	0.02	Monoterpene
endo-Fenchol	0.01	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.13	Monoterpenic alcohol
4-Hydroxy-4-methylcyclohex-2-enone	0.02	Aliphatic alcohol
trans-Pinocarveol	0.01	Monoterpenic alcohol
trans-para-Menth-2-en-1-ol	0.09	Monoterpenic alcohol
Epoxyterpinolene	0.02	Monoterpenic ether

Unknown	0.02	Unknown
Sabinaketone	0.01	Normonoterpenic ketone
Pinocarvone	0.01	Monoterpenic ketone
Borneol	0.03	Monoterpenic alcohol
δ-Terpineol	0.01	Monoterpenic alcohol
Terpinen-4-ol	4.56	Monoterpenic alcohol
para-Cymen-8-ol	0.03	Monoterpenic alcohol
α-Terpineol	0.66	Monoterpenic alcohol
cis-Piperitol	0.04	Monoterpenic alcohol
Myrtenol	0.01	Monoterpenic alcohol
cis-α-Phellandrene epoxide (iPr vs Me)	0.01	Monoterpenic ether
trans-Piperitol	0.05	Monoterpenic alcohol
Citronellol	0.02	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Unknown	0.02	Unknown
Geraniol	0.03	Monoterpenic alcohol
Linalyl acetate	0.02	Monoterpenic ester
trans-Ascaridole glycol	0.01	Monoterpenic alcohol
Bornyl acetate	0.08	Monoterpenic ester
Safrole	1.68	Phenylpropanoid
Cuminol	0.01	Monoterpenic alcohol
Unknown	0.04	Unknown
Thymol	0.03	Monoterpenic alcohol
Carvacrol	0.01	Monoterpenic alcohol
Unknown	0.27	Simple phenolic
Unknown	0.01	Monoterpenic alcohol
Unknown	0.02	Unknown
α-Terpinyl acetate	0.12	Monoterpenic ester
α-Cubebene	0.06	Sesquiterpene
Eugenol	0.30	Phenylpropanoid
Citronellyl acetate	0.09	Monoterpenic ester
Neryl acetate	0.01	Monoterpenic ester
α-Ylangene	0.02	Sesquiterpene
α-Copaene	0.27	Sesquiterpene
Geranyl acetate	0.23	Monoterpenic ester
β-Cubebene	0.01	Sesquiterpene
β-Elemene	0.03	Sesquiterpene
Methyleugenol	0.30	Phenylpropanoid
β-Caryophyllene	0.08	Sesquiterpene
trans-α-Bergamotene	0.10	Sesquiterpene
(*E*)-Isoeugenol	0.59	Phenylpropanoid
α-Humulene	0.01	Sesquiterpene
(*E*)-β-Farnesene	0.03	Sesquiterpene
trans-Cadina-1(6),4-diene	0.02	Sesquiterpene
γ-Muurolene	0.02	Sesquiterpene

Germacrene D	0.04	Sesquiterpene
trans-Muurola-4(15),5-diene	0.02	Sesquiterpene
α-Muurolene	0.05	Sesquiterpene
Methyl (*E*)-isoeugenol	0.07	Phenylpropanoid
β-Bisabolene	0.06	Sesquiterpene
(3*E*,6*E*)-α-Farnesene	0.05	Sesquiterpene
Myristicin	8.39	Phenylpropanoid
trans-Calamenene	0.01	Sesquiterpene
δ-Cadinene	0.16	Sesquiterpene
trans-Cadina-1,4-diene	0.02	Sesquiterpene
(*E*)-α-Bisabolene	0.02	Sesquiterpene
Elemicin	0.50	Phenylpropanoid
Spathulenol	0.02	Sesquiterpenic alcohol
Methoxyeugenol	0.31	Phenylpropanoid
Unknown	0.02	Phenylpropanoid
(*E*)-Isoelemicin	0.03	Phenylpropanoid
Myristic acid	0.21	Aliphatic acid
meta-Camphorene	0.01	Diterpene
Palmitic acid	0.03	Aliphatic acid
13-epi-Manoyl oxide	0.01	Diterpenic ether
Consolidated total	**99.60**	

tr: The compound has been detected below 0.005% of the total signal

Note: no correction factor was applied

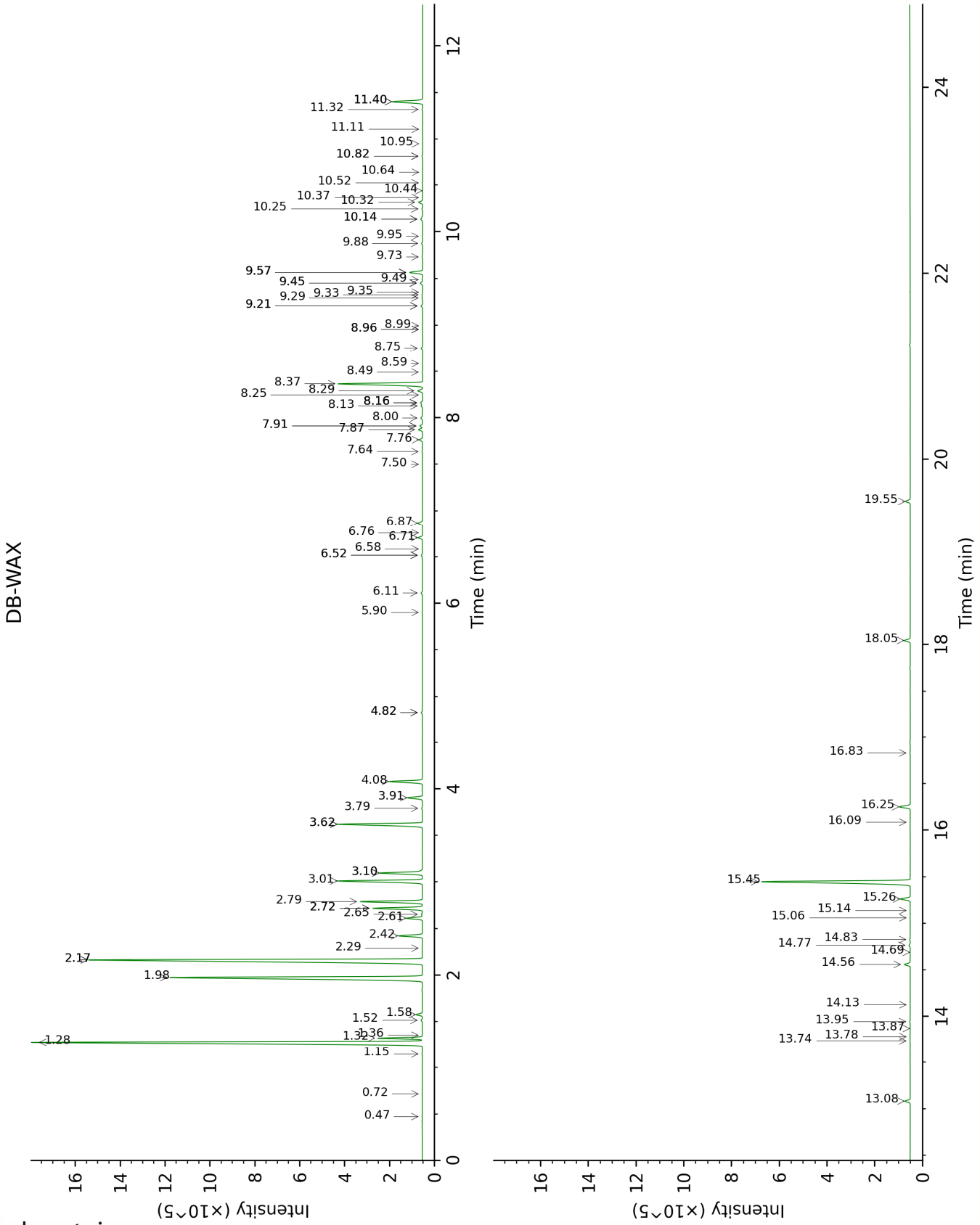
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm 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.

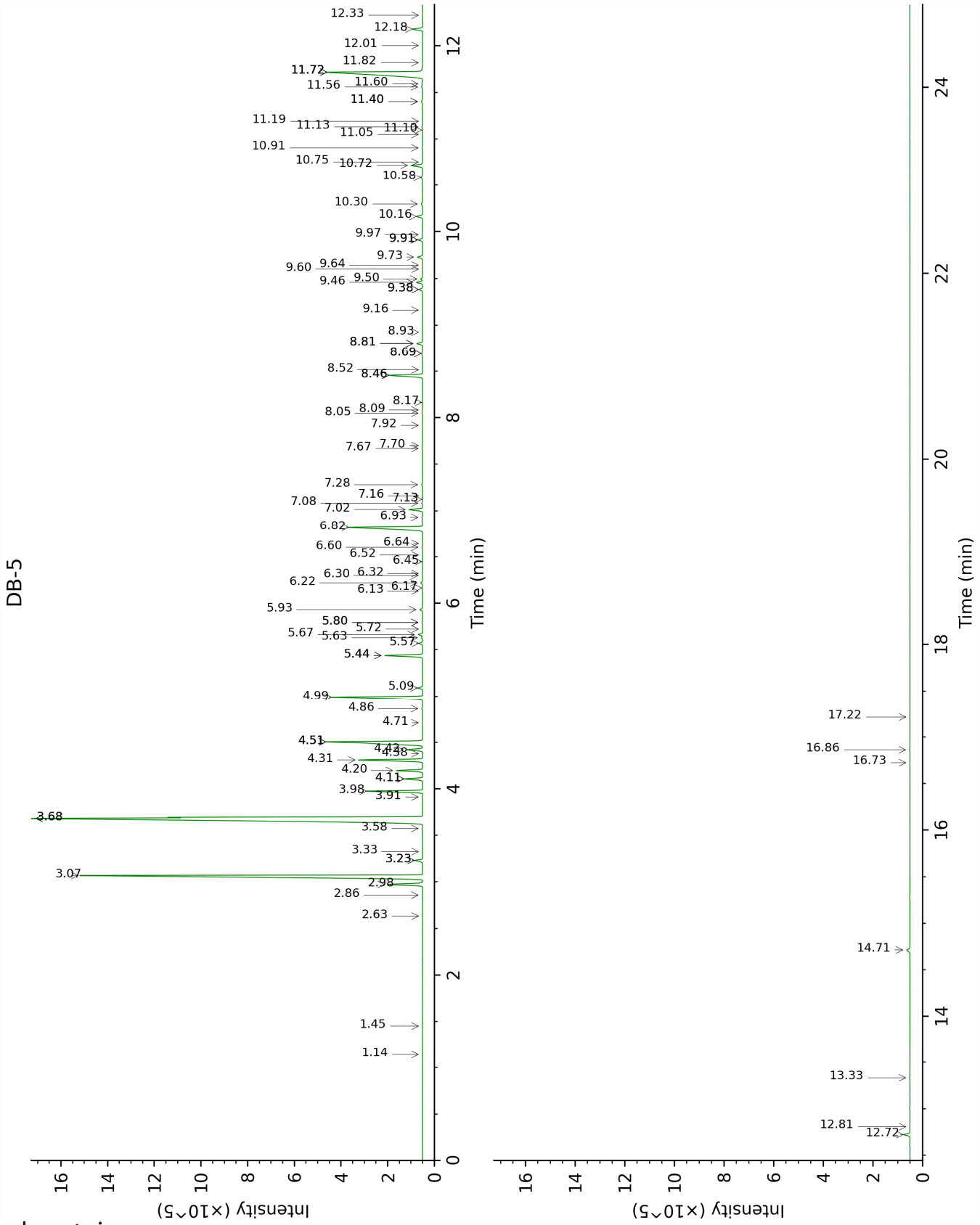
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

Bracketed value ([xx]): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

This page was intentionally left blank. The following pages present the complete data of the analysis.

628 Boulevard du Saguenay, Saguenay (Qc) G7J 1H4 | www.phytochemia.com


DB-WAX
Time (min)
Intensity (×10^5)
11.40
11.32
11.11
10.95
10.82
10.64
10.52
10.44
10.37
10.32
10.25
10.14
9.95
9.88
9.73
9.57
9.49
9.45
9.35
9.33
9.29
9.21
8.99
8.96
8.75
8.59
8.49
8.37
8.29
8.25
8.16
8.13
8.00
7.91
7.87
7.76
7.64
7.50
6.87
6.76
6.71
6.58
6.52
6.11
5.90
4.82
4.08
3.91
3.79
3.62
3.10
3.01
2.79
2.72
2.65
2.61
2.42
2.29
2.17
1.98
1.58
1.52
1.36
1.32
1.28
1.15
0.72
0.47
19.55
18.05
16.83
16.25
16.09
15.45
15.26
15.14
15.06
14.83
14.77
14.69
14.56
14.13
13.95
13.87
13.78
13.74
13.08


DB-5
Time (min)
Intensity (×10^5)
12.33
12.18
12.01
11.82
11.72
11.60
11.56
11.40
11.19
11.13
11.10
11.05
10.91
10.75
10.72
10.58
10.30
10.16
9.97
9.91
9.73
9.64
9.60
9.50
9.46
9.38
9.16
8.93
8.81
8.69
8.52
8.46
8.17
8.09
8.05
7.92
7.70
7.67
7.28
7.16
7.13
7.08
7.02
6.93
6.82
6.64
6.60
6.52
6.45
6.32
6.30
6.22
6.17
6.13
5.93
5.80
5.72
5.67
5.63
5.57
5.44
5.09
4.99
4.86
4.71
4.51
4.42
4.38
4.31
4.20
4.11
3.98
3.91
3.68
3.58
3.33
3.23
3.07
2.98
2.86
2.63
1.45
1.14
17.22
16.86
16.73
14.71
13.33
12.81
12.72

FULL ANALYSIS DATA

Toluene	**Column DB-WAX**			**Column DB-5**		
	1.36	1003.5	0.01	1.14	758.9	0.01
Octane	0.47	785.2	tr	1.45	803.7	tr
Nonane	0.72	891.3	tr	2.64	903.8	0.01
Tricyclene	1.15	970.9	0.02	2.86	919.0	0.02
α-Thujene	1.32	1000.2	1.62	2.98	926.7	1.61
α-Pinene	1.28	994.2	20.27	3.07	933.1	20.16
α-Fenchene	1.52	1020.2	0.06	3.23*	943.9	[0.36]
Camphene	1.58	1026.5	0.30	3.23*	943.9	[0.36]
Thuja-2,4(10)-diene	2.16*	1087.7	[21.01]	3.33	950.3	0.01
3,7,7-Trimethylcyclohepta-1,3,5-triene	2.72*	1134.6	[2.34]	3.58	966.9	0.03
β-Pinene	1.98	1068.0	15.13	3.68*	974.1	[36.08]
Sabinene	2.16*	1087.7	[21.01]	3.68*	974.1	[36.08]
6-Methyl-5-hepten-2-one	4.82*	1296.3	[0.06]	3.91	989.5	0.02
Myrcene	2.72*	1134.6	[2.34]	3.98	993.8	2.33
Pseudolimonene	2.65	1129.4	0.05	4.11*	1002.6	[0.80]
α-Phellandrene	2.61	1126.0	0.74	4.11*	1002.6	[0.80]
Δ3-Carene	2.42	1110.8	1.11	4.20	1008.4	1.12
α-Terpinene	2.79	1140.4	2.84	4.31	1015.6	2.83
Carvomenthene	2.29	1100.1	0.01	4.38	1019.9	0.01
para-Cymene	3.91	1228.1	0.73	4.42	1022.6	0.73
β-Phellandrene	3.10*	1165.3	[2.13]	4.51*	1027.9	[6.36]
Limonene	3.01	1158.3	4.24	4.51*	1027.9	[6.36]
1,8-Cineole	3.10*	1165.3	[2.13]	4.51*	1027.9	[6.36]
(*Z*)-β-Ocimene	3.62*	1207.0	[4.43]	4.71	1040.9	0.02
(*E*)-β-Ocimene	3.79	1219.7	0.04	4.86	1050.6	0.04
γ-Terpinene	3.62*	1207.0	[4.43]	4.99	1058.8	4.42
cis-Sabinene hydrate	6.71	1432.9	0.22	5.09	1065.1	0.21
Terpinolene	4.08	1241.1	1.65	5.44*	1087.3	[1.72]
para-Cymenene	6.11	1389.1	0.07	5.44*	1087.3	[1.72]
trans-Sabinene hydrate	7.76	1512.0	0.16	5.57	1095.6	0.15
Unknown MYFR I [m/z 95, 152 (20), 67 (17), 96 (16), 41 (12)]	4.82*	1296.3	[0.06]	5.63	1099.4	0.06
Linalool	7.87	1520.4	0.19	5.67	1101.6	0.19
Unknown ORMA I [m/z 119, 109 (94), 43 (61), 95 (56), 91 (48), 77 (32), 152 (32), 137 (31), 134 (24)]	8.25	1549.2	0.02	5.72	1105.4	0.01

para-Mentha-1,3,8-triene	5.90	1374.1	0.02	5.80*	1110.0	[0.03]
endo-Fenchol	8.16*†	1542.7	[0.12]	5.80*	1110.0	[0.03]
cis-para-Menth-2-en-1-ol	7.91*	1523.5	[0.13]	5.93	1118.9	0.13
4-Hydroxy-4-methylcyclohex-2-enone	13.78	2027.1	0.02	6.13	1131.9	0.02
trans-Pinocarveol	8.96*	1604.7	[0.02]	6.16	1133.9	0.01
trans-para-Menth-2-en-1-ol	8.75	1588.6	0.08	6.22	1137.5	0.09
Epoxyterpinolene	6.52*	1418.8	[0.07]	6.30	1142.7	0.02
Unknown MEAL II [m/z 109, 124 (45), 119 (41), 43 (35), 91 (28), 95 (25)...]	6.58	1423.8	0.01	6.32	1144.1	0.02
Sabinaketone	8.49	1568.3	0.03	6.45	1152.3	0.01
Pinocarvone	7.64	1502.2	0.02	6.52	1156.9	0.01
Borneol	9.57*	1654.1	[0.67]	6.60	1162.4	0.03
δ-Terpineol	9.21*	1625.0	[0.09]	6.64	1165.0	0.01
Terpinen-4-ol	8.37	1558.6	4.57	6.82	1176.3	4.56
para-Cymen-8-ol	11.32	1801.3	0.03	6.93	1183.7	0.03
α-Terpineol	9.57*	1654.1	[0.67]	7.02	1189.2	0.66
cis-Piperitol	9.33	1634.6	0.04	7.08	1193.6	0.04
Myrtenol	10.64	1743.7	0.01	7.13	1196.4	0.01
cis-α-Phellandrene epoxide (iPr vs Me)	10.82*	1758.4	[0.04]	7.16	1198.8	0.01
trans-Piperitol	10.14*	1700.5	[0.16]	7.28	1206.6	0.05
Citronellol	10.52	1733.4	0.03	7.67	1233.2	0.02
Unknown CIAU II [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	11.11	1783.0	0.01	7.70	1235.2	0.01
Unknown MISC CV [m/z 43, 109 (63), 71 (50), 81 (31), 55 (29), 85 (26)...]	9.45*	1644.8	[0.14]	7.92	1250.0	0.02
Geraniol	11.40*	1808.8	[1.66]	8.05	1258.9	0.03
Linalyl acetate	7.91*	1523.5	[0.13]	8.08	1261.3	0.02
trans-Ascaridole glycol	13.87	2035.6	0.01	8.17	1266.8	0.01
Bornyl acetate	8.00	1530.1	0.08	8.46*	1286.8	[1.75]
Safrole	11.40*	1808.8	[1.66]	8.46*	1286.8	[1.75]
Cuminol	13.94	2042.8	0.03	8.52	1290.8	0.01
Unknown MYFR III	10.82*	1758.4	[0.04]	8.69*	1302.9	[0.07]

[m/z 81, 55 (82), 41 (58), 69 (51), 67 (49)...]						
Thymol	14.83	2129.5	0.03	8.69*	1302.9	[0.07]
Carvacrol	15.06	2153.0	0.01	8.81*	1307.3	[0.28]
Unknown MYFR IV [m/z 121, 178 (20), 77 (13), 122 (10)]	8.29	1552.8	0.27	8.81*	1307.3	[0.28]
Unknown MEAL I [m/z 97, 112 (92), 83 (62), 43 (44), 41 (25)... 170? (4)]	14.69	2115.7	0.01	8.93	1315.9	0.01
Unknown MYFR V [m/z 149, 178 (41), 121 (36), 91 (30), 55 (21)]	8.58	1575.5	0.02	9.16	1332.7	0.02
α-Terpinyl acetate	9.45*	1644.8	[0.14]	9.38*	1348.4	[0.18]
α-Cubebene	6.52*	1418.8	[0.07]	9.38*	1348.4	[0.18]
Eugenol	14.56	2102.5	0.31	9.46	1353.9	0.30
Citronellyl acetate	9.21*	1625.0	[0.09]	9.50	1356.4	0.09
Neryl acetate	9.95	1685.4	0.03	9.60	1363.9	0.01
α-Ylangene	6.76	1436.8	0.01	9.64	1367.0	0.02
α-Copaene	6.87	1444.9	0.26	9.73	1373.1	0.27
Geranyl acetate	10.32	1715.9	0.23	9.92*	1386.2	[0.22]
β-Cubebene	7.50	1491.9	0.01	9.92*	1386.2	[0.22]
β-Elemene	8.13*†	1540.1	[0.08]	9.97	1390.2	0.03
Methyleugenol	13.08	1960.9	0.27	10.16	1404.0	0.30
β-Caryophyllene	8.16*†	1542.7	[0.12]	10.30	1413.9	0.08
trans-α-Bergamotene	8.16*†	1542.7	[0.12]	10.58	1435.3	0.10
(*E*)-Isoeugenol	16.25	2276.0	0.57	10.72	1445.4	0.59
α-Humulene	9.00	1607.8	0.01	10.75	1448.1	0.01
(*E*)-β-Farnesene	9.29	1632.0	0.05	10.91	1459.6	0.03
trans-Cadina-1(6),4-diene	8.96*	1604.7	[0.02]	11.05	1470.4	0.02
γ-Muurolene	9.35	1636.9	0.02	11.10	1473.9	0.02
Germacrene D	9.49	1647.8	0.04	11.13	1476.4	0.04
trans-Muurola-4(15),5-diene	9.57*	1654.1	[0.67]	11.19	1480.9	0.02
α-Muurolene	9.73	1667.5	0.05	11.40*	1496.9	[0.08]
Methyl (*E*)-isoeugenol	14.76	2123.3	0.07	11.40*	1496.9	[0.08]
β-Bisabolene	9.88	1679.3	0.06	11.56	1508.7	0.06
(3*E*,6*E*)-α-Farnesene	10.25	1709.9	0.04	11.60	1511.4	0.05
Myristicin	15.45	2192.1	8.39	11.72*	1521.3	[8.56]

trans-Calamenene	10.95	1769.7	0.01	11.72*	1521.3	[8.56]
δ-Cadinene	10.14*	1700.5	[0.16]	11.72*	1521.3	[8.56]
trans-Cadina-1,4-diene	10.37	1720.0	0.02	11.82	1529.4	0.02
(*E*)-α-Bisabolene	10.44	1726.3	0.01	12.01	1543.9	0.02
Elemicin	15.26	2173.4	0.50	12.18	1557.9	0.50
Spathulenol	14.13	2060.3	0.01	12.33	1569.6	0.02
Methoxyeugenol	18.05	2472.9	0.31	12.72	1600.6	0.31
Unknown MYFR VII [m/z 165, 121 (81), 181 (25), 238 (25)]	13.74	2022.8	0.02	12.81	1607.4	0.02
(*E*)-Isoelemicin	16.83	2337.9	0.02	13.33	1651.1	0.03
Myristic acid	19.55	2649.6	0.26	14.71	1768.7	0.21
meta-Camphorene	15.14	2160.9	0.01	16.72	1952.3	0.01
Palmitic acid				16.86	1965.5	0.03
13-epi-Manoyl oxide	16.09	2258.6	0.01	17.22	1999.2	0.01
Total reported		99.57%			99.53%	

*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, only the first one is 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