Date : November 22, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21J19-PTH04
Customer identification : Guava Leaf Oil - Thailand - 662100217R
Type : Essential oil
Source : *Psidium guajava*
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 : Sylvain Mercier, M. Sc., Chimiste 2014-005
Analysis date : October 19, 2021

Checked and 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.

This report is an update of the version first issued on November 01, 2021 to correct a mistake in the lot number.

Méthode certifiée ISO 17025:2017 Certified method

Laboratoire PhytoChemia

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PHYSICOCHEMICAL DATA

Physical aspect: Faintly yellow liquid
Refractive index: 1.4895 ± 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
Hashishene	0.03	Monoterpene
α-Thujene	0.02	Monoterpene
α-Pinene	4.75	Monoterpene
Camphene	0.03	Monoterpene
Benzaldehyde	0.22	Simple phenolic
β-Pinene	0.09	Monoterpene
4-Pentenyl propionate	0.01	Aliphatic ester
6-Methyl-5-hepten-2-one	0.04	Aliphatic ketone
Myrcene	0.49	Monoterpene
6-Methyl-5-hepten-2-ol	0.01	Aliphatic alcohol
Menthatriene isomer I	0.03	Monoterpene
Pseudolimonene	0.03	Monoterpene
α-Phellandrene	0.02	Monoterpene
Δ3-Carene	0.01	Monoterpene
α-Terpinene	0.01	Monoterpene
para-Cymene	0.09	Monoterpene
Limonene	24.38	Monoterpene
β-Phellandrene	3.14	Monoterpene
(*Z*)-β-Ocimene	0.67	Monoterpene
(*E*)-β-Ocimene	0.22	Monoterpene
γ-Terpinene	0.09	Monoterpene
Acetophenone	0.01	Simple phenolic
Unknown	0.01	Oxygenated monoterpene
Terpinolene	0.03	Monoterpene
para-Cymenene	0.02	Monoterpene
Linalool	0.06	Monoterpenic alcohol
endo-Fenchol	0.01	Monoterpenic alcohol
trans-para-Mentha-2,8-dien-1-ol	0.02	Monoterpenic alcohol
Limona ketone	0.08	Normonoterpenic ketone
Unknown	0.02	Unknown
trans-Pinocarveol	0.07	Monoterpenic alcohol
trans-Verbenol	0.01	Monoterpenic alcohol
iso-Isopulegol	0.01	Monoterpenic alcohol
(*E*)-2,6-Dimethyl-1,5,7-octatrien-3-ol	0.02	Monoterpenic alcohol
Borneol	0.01	Monoterpenic alcohol
δ-Terpineol	0.02	Monoterpenic alcohol
Terpinen-4-ol	0.07	Monoterpenic alcohol
trans-Isocarveol	0.09	Monoterpenic alcohol
α-Terpineol	0.39	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Methylchavicol	0.05	Phenylpropanoid
trans-Carveol	0.03	Monoterpenic alcohol
cis-Isocarveol	0.08	Monoterpenic alcohol
cis-Carveol	0.05	Monoterpenic alcohol
Neral	0.03	Monoterpenic aldehyde

Bornyl acetate	0.02	Monoterpenic ester
Unknown	0.01	Unknown
iso-Dihydrocarvyl acetate	0.01	Monoterpenic ester
Cyclosativene I	0.02	Sesquiterpene
Cyclosativene II	0.05	Sesquiterpene
α-Ylangene	0.03	Sesquiterpene
Neryl acetate	0.02	Monoterpenic ester
Isoledene	0.02	Sesquiterpene
α-Copaene	3.39	Sesquiterpene
7-Cubebene	0.01	Sesquiterpene
Geranyl acetate	0.02	Monoterpenic ester
Unknown	0.05	Sesquiterpene
Italicene	0.04	Sesquiterpene
Isocaryophyllene	0.09	Sesquiterpene
α-Gurjunene	0.17	Sesquiterpene
β-Caryophyllene	26.10	Sesquiterpene
β-Copaene	0.11	Sesquiterpene
β-Gurjunene	0.12	Sesquiterpene
trans-α-Bergamotene	0.08	Sesquiterpene
Aromadendrene	2.75	Sesquiterpene
Selina-5,11-diene	0.16	Sesquiterpene
3-Methyl-3-butenyl benzoate	0.02	Phenolic ester
α-Humulene	2.95	Sesquiterpene
allo-Aromadendrene	0.97	Sesquiterpene
β-Acoradiene	0.06	Sesquiterpene
(*E*)-β-Farnesene	0.10	Sesquiterpene
γ-Gurjunene	0.06	Sesquiterpene
γ-Muurolene	0.08	Sesquiterpene
γ-Himachalene	0.47	Sesquiterpene
γ-Curcumene	0.09	Sesquiterpene
β-Selinene	0.31	Sesquiterpene
ar-Curcumene	0.14	Sesquiterpene
Viridiflorene	0.09	Sesquiterpene
α-Selinene	0.39	Sesquiterpene
α-Muurolene	0.34	Sesquiterpene
(*Z*)-α-Bisabolene	1.67	Sesquiterpene
β-Bisabolene	1.99	Sesquiterpene
γ-Cadinene	0.50	Sesquiterpene
β-Curcumene	0.02	Sesquiterpene
trans-Calamenene	0.86	Sesquiterpene
δ-Cadinene	1.50	Sesquiterpene
trans-Cadina-1,4-diene	0.84	Sesquiterpene
(*E*)-γ-Bisabolene	0.18	Sesquiterpene
α-Calacorene	0.29	Sesquiterpene
(*E*)-α-Bisabolene	0.60	Sesquiterpene
Epiglobulol	0.41	Sesquiterpenic alcohol
Caryophyllenyl alcohol	0.12	Sesquiterpenic alcohol
(*E*)-Nerolidol	1.57	Sesquiterpenic alcohol
Caryophyllene oxide isomer	0.14	Sesquiterpenic ether
Caryophyllene oxide	2.78	Sesquiterpenic ether
Globulol	1.62	Sesquiterpenic alcohol
Gleenol	0.19	Sesquiterpenic alcohol

Viridiflorol	0.19	Sesquiterpenic alcohol
Cubeban-11-ol	0.09	Sesquiterpenic alcohol
Humulene epoxide I	0.06	Sesquiterpenic ether
Ledol	0.65	Sesquiterpenic alcohol
Eudesm-5-en-11-ol analog	0.14	Sesquiterpenic alcohol
Humulene epoxide II	0.28	Sesquiterpenic ether
Unknown	0.31	Oxygenated sesquiterpene
Rosifoliol	0.16	Sesquiterpenic alcohol
1-epi-Cubenol	0.37	Sesquiterpenic alcohol
Muurola-4,10(14)-dien-1β-ol?	0.03	Sesquiterpenic alcohol
Caryophylladienol I	0.40	Sesquiterpenic alcohol
Humulenol II	0.22	Sesquiterpenic alcohol
Caryophylladienol II	1.35	Sesquiterpenic alcohol
τ-Cadinol	0.40	Sesquiterpenic alcohol
τ-Muurolol	0.30	Sesquiterpenic alcohol
α-Muurolol	0.54	Sesquiterpenic alcohol
α-Eudesmol	0.14	Sesquiterpenic alcohol
α-Cadinol	0.28	Sesquiterpenic alcohol
14-Hydroxy-(*Z*)-caryophyllene	0.36	Sesquiterpenic alcohol
Unknown	0.12	Oxygenated sesquiterpene
(3*Z*)-Caryophylla-3,8(13)-dien-5β-ol	0.35	Sesquiterpenic alcohol
β-Bisabolol	0.16	Sesquiterpenic alcohol
epi-α-Bisabolol	0.07	Sesquiterpenic alcohol
α-Bisabolol	0.08	Sesquiterpenic alcohol
Hydroxydihydrocaryophyllene analog	0.12	Sesquiterpenic alcohol
(2*E*,6*E*)-Farnesol	0.08	Sesquiterpenic alcohol
1,10-seco-Aromadendrane-1,10-dione?	0.02	Sesquiterpenic ketone
Benzyl benzoate	0.05	Phenolic ester
Phytone	0.01	Terpenic ketone
Phytol	0.02	Diterpenic alcohol
Consolidated total	**97.50%**	

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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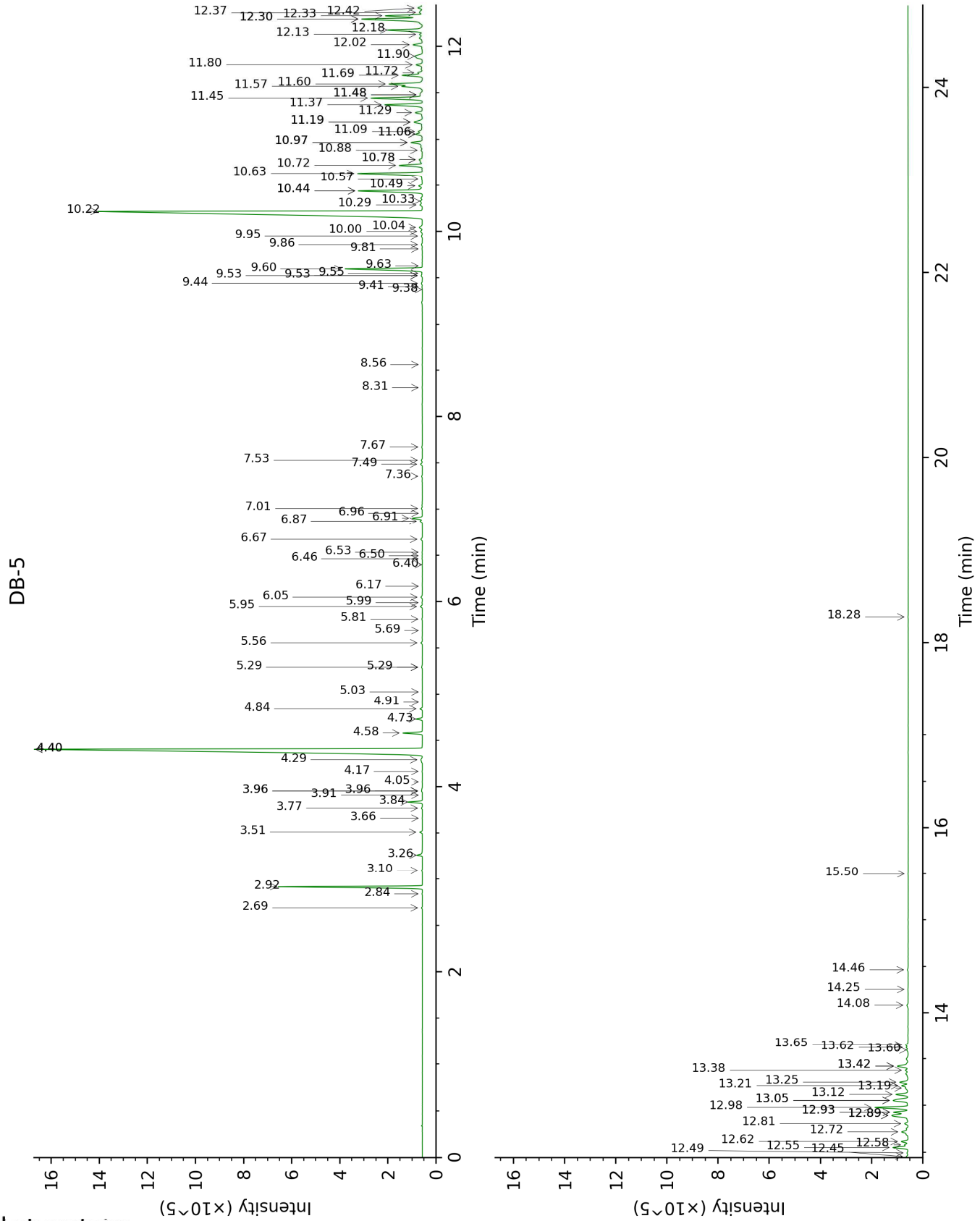
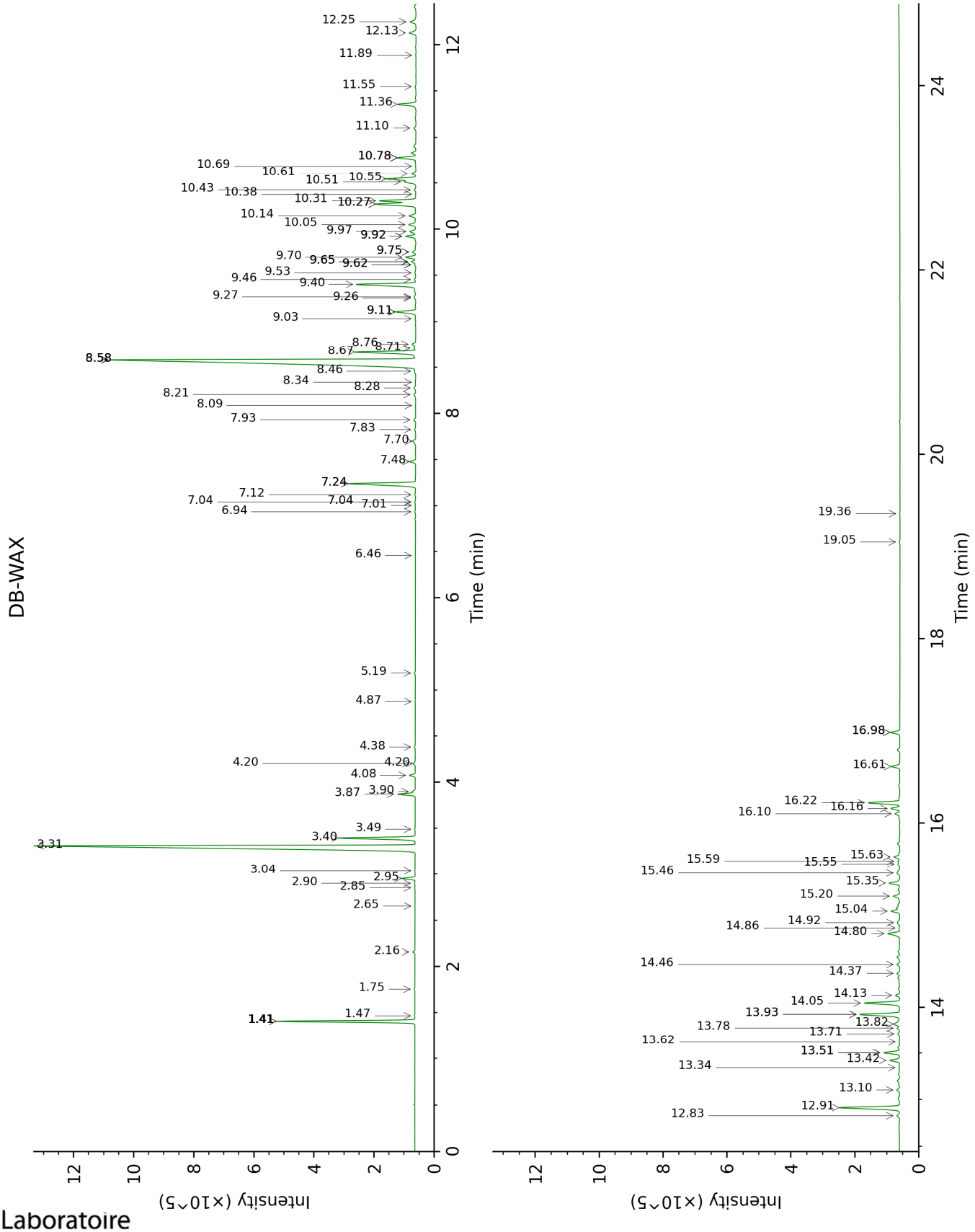

DB-5
Time (min)
Intensity (×10^5)
12.37
12.30
12.33
12.42
12.13
12.18
12.02
11.90
11.80
11.69
11.72
11.57
11.60
11.45
11.48
11.37
11.29
11.19
11.09
11.06
10.97
10.88
10.78
10.72
10.63
10.57
10.44
10.49
10.29
10.33
10.22
10.00
10.04
9.95
9.86
9.81
9.63
9.60
9.53
9.55
9.44
9.41
9.38
8.56
8.31
7.67
7.53
7.49
7.36
7.01
6.96
6.91
6.87
6.67
6.53
6.50
6.46
6.40
6.17
6.05
5.99
5.95
5.81
5.69
5.56
5.29
5.29
5.03
4.91
4.84
4.73
4.58
4.40
4.29
4.17
4.05
3.96
3.91
3.96
3.84
3.77
3.66
3.51
3.26
3.10
2.92
2.84
2.69
18.28
15.50
14.46
14.25
14.08
13.65
13.62
13.60
13.38
13.42
13.21
13.25
13.19
13.12
13.05
12.98
12.93
12.89
12.81
12.72
12.62
12.55
12.58
12.49
12.45


DB-WAX
Time (min)
Intensity (×10^5)
12.25
12.13
11.89
11.55
11.36
11.10
10.78
10.69
10.61
10.51
10.55
10.43
10.38
10.31
10.27
10.14
10.05
9.97
9.92
9.75
9.70
9.65
9.62
9.53
9.46
9.40
9.27
9.26
9.11
9.03
8.76
8.67
8.71
8.58
8.46
8.34
8.28
8.21
8.09
7.93
7.83
7.70
7.48
7.24
7.12
7.04
7.04
7.01
6.94
6.46
5.19
4.87
4.38
4.20
4.20
4.08
3.87
3.90
3.49
3.40
3.31
3.04
2.95
2.90
2.85
2.65
2.16
1.75
1.47
1.41
19.36
19.05
16.98
16.61
16.22
16.16
16.10
15.59
15.55
15.63
15.46
15.35
15.20
15.04
14.86
14.92
14.80
14.46
14.37
14.13
14.05
13.93
13.82
13.78
13.71
13.62
13.51
13.42
13.34
13.10
12.91
12.83

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Hashishene	2.69	915	0.03	1.41*	991	4.89
α-Thujene	2.84	925	0.02	1.47	997	0.02
α-Pinene	2.92	930	4.75	1.41*	991	[4.89]
Camphene	3.10	942	0.03	1.76	1025	0.02
Benzaldehyde	3.26	954	0.22	7.48	1465	0.25
β-Pinene	3.51	971	0.09	2.16	1065	0.09
4-Pentenyl propionate	3.66	981	0.01	4.20*	1231	0.09
6-Methyl-5-hepten-2-one	3.77	988	0.04	5.19	1300	0.04
Myrcene	3.84	992	0.49	2.95	1134	0.49
6-Methyl-5-hepten-2-ol	3.91	998	0.01	7.01†	1430	0.06
Menthatriene isomer I	3.96*	1000	0.06	3.49	1176	0.03
Pseudolimonene	3.96*	1000	[0.06]	2.90	1129	0.03
α-Phellandrene	3.96*	1000	[0.06]	2.85	1126	0.02
Δ3-Carene	4.05	1007	0.01	2.65	1110	0.01
α-Terpinene	4.17	1014	0.01	3.04	1140	0.02
para-Cymene	4.29	1022	0.09	4.20*	1231	[0.09]
Limonene	4.40*	1029	27.35	3.31	1162	24.38
β-Phellandrene	4.40*	1029	[27.35]	3.40	1169	3.14
(*Z*)-β-Ocimene	4.58	1040	0.67	3.87	1206	0.69
(*E*)-β-Ocimene	4.73	1050	0.22	4.08	1221	0.22
γ-Terpinene	4.84	1057	0.09	3.90	1208	0.10
Acetophenone	4.91	1061	0.01	9.03	1582	0.03
Unknown [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	5.03	1068	0.01	4.87	1281	0.01
Terpinolene	5.30*	1085	0.04	4.38	1244	0.03
para-Cymenene	5.30*	1085	[0.04]	6.46	1390	0.02
Linalool	5.56	1102	0.06	8.20	1519	0.09
endo-Fenchol	5.69	1110	0.01	8.46	1538	0.07
trans-para-Mentha-2,8-dien-1-ol	5.81	1118	0.02	9.11*	1588	0.97
Limona ketone	5.95	1127	0.08	7.93	1498	0.08
Unknown [m/z 95, 43 (41), 110 (36), 41 (19), 67 (18)... 150 (tr)]	5.99	1130	0.02			
trans-Pinocarveol	6.05	1134	0.07	9.27	1601	0.06
trans-Verbenol	6.17	1141	0.01	9.65*	1631	0.21
iso-Isopulegol	6.40	1156	0.01	8.09	1510	0.01
(*E*)-2,6-Dimethyl-1,5,7-octatrien-3-ol	6.46	1160	0.02	10.42	1693	0.07
Borneol	6.50	1162	0.01	9.92*	1653	0.45
δ-Terpineol	6.53	1165	0.02	9.62*	1628	0.05
Terpinen-4-ol	6.67	1174	0.07	8.71	1558	0.08
trans-Isocarveol	6.87	1186	0.09	11.10	1750	0.10
α-Terpineol	6.91	1188	0.39	9.92*	1653	[0.45]
Unknown [m/z 67, 41 (99), 109 (98), 43 (97), 81 (94), 91 (93)...152 (12)]	6.96	1192	0.01			
Methylchavicol	7.01	1195	0.05	9.46	1616	0.07

trans-Carveol	7.36	1218	0.03	11.55	1788	0.04
cis-Isocarveol	7.49	1227	0.08	12.13	1838	0.35
cis-Carveol	7.53	1230	0.05	11.89	1817	0.02
Neral	7.67	1239	0.03	9.62*	1628	[0.05]
Bornyl acetate	8.31	1282	0.02	8.34	1529	0.03
Unknown [m/z 94, 81 (81), 93 (79), 107 (69), 136 (67), 79 (48)...]	8.56	1298	0.01			
iso-Dihydrocarvyl acetate	9.38	1356	0.01			
Cyclosativene I	9.41	1358	0.02	7.04*†	1433	[0.06]
Cyclosativene II	9.44	1360	0.05	7.04*†	1433	[0.06]
α-Ylangene	9.53*	1366	0.05	7.12	1439	0.03
Neryl acetate	9.53*	1366	[0.05]	10.31†	1684	[3.57]
Isoledene	9.55	1368	0.02	6.94	1425	0.04
α-Copaene	9.60	1372	3.39	7.24*	1447	3.37
7-Cubebene	9.63	1374	0.01	7.24*	1447	[3.37]
Geranyl acetate	9.81	1387	0.02	10.69	1715	0.02
Unknown [m/z 93, 122 (98), 161 (98), 107 (86), 95 (46), 105 (72)... 204 (34)]	9.86	1390	0.05			
Italicene	9.95	1396	0.04	7.83	1490	0.05
Isocaryophyllene	10.00	1400	0.09	8.28	1524	0.09
α-Gurjunene	10.04	1403	0.17	7.70	1481	0.18
β-Caryophyllene	10.22	1416	26.10	8.58*	1548	26.00
β-Copaene	10.29	1421	0.11	8.58*	1548	[26.00]
β-Gurjunene	10.33	1424	0.12	8.58*	1548	[26.00]
trans-α-Bergamotene	10.44*	1432	2.83	8.58*	1548	[26.00]
Aromadendrene	10.44*	1432	[2.83]	8.67	1554	2.75
Selina-5,11-diene	10.49	1436	0.16	8.76	1561	0.19
3-Methyl-3-butenyl benzoate	10.57	1442	0.02			
α-Humulene	10.63	1447	2.95	9.40	1612	2.90
allo-Aromadendrene	10.72	1453	0.97	9.11*	1588	[0.97]
β-Acoradiene	10.78*	1458	0.16	9.53	1622	0.06
(*E*)-β-Farnesene	10.78*	1458	[0.16]	9.65*	1631	[0.21]
γ-Gurjunene	10.88	1465	0.06	9.26	1600	0.04
γ-Muurolene	10.97*	1472	0.55	9.65*	1631	[0.21]
γ-Himachalene	10.97*	1472	[0.55]	9.70	1635	0.47
γ-Curcumene	11.06*†	1478	0.54	9.75*	1640	0.18
β-Selinene	11.06*†	1478	[0.54]	9.98	1657	0.31
ar-Curcumene	11.08†	1480	[0.54]	10.78*	1723	0.83
Viridiflorene	11.19*	1488	0.48	9.75*	1640	[0.18]
α-Selinene	11.19*	1488	[0.48]	10.05	1663	0.39
α-Muurolene	11.29	1496	0.34	10.14	1671	0.33
(*Z*)-α-Bisabolene	11.37	1502	1.67	10.27*†	1681	3.57
β-Bisabolene	11.44†	1507	2.51	10.27*†	1681	[3.57]
γ-Cadinene	11.48*†	1510	[2.51]	10.51	1701	0.50
β-Curcumene	11.48*†	1510	[2.51]	10.38	1689	0.02
trans-Calamenene	11.57	1517	0.86	11.36	1772	0.89
δ-Cadinene	11.60	1519	1.50	10.55	1704	1.40
trans-Cadina-1,4-diene	11.69	1527	0.84	10.78*	1723	[0.83]
(*E*)-γ-Bisabolene	11.72	1529	0.18	10.60	1708	0.21
α-Calacorene	11.80	1536	0.29	12.25	1849	0.36

(*E*)-α-Bisabolene	11.90	1543	0.60	10.78*	1723	[0.83]
Epiglobulol	12.02	1552	0.41	13.42	1954	0.42
Caryophyllenyl alcohol	12.13	1561	0.12	13.78	1987	0.12
(*E*)-Nerolidol	12.18	1565	1.57	13.92*	2001	1.95
Caryophyllene oxide isomer	12.30*	1574	3.02	12.83	1900	0.14
Caryophyllene oxide	12.30*	1574	[3.02]	12.92	1908	2.78
Globulol	12.33	1577	1.62	14.05	2013	1.63
Gleenol	12.37	1580	0.19	13.71	1981	0.08
Viridiflorol	12.42	1584	0.19	14.13	2020	0.18
Cubeban-11-ol	12.45	1586	0.09	13.82	1991	0.37
Humulene epoxide I	12.49	1590	0.06	13.34	1947	0.04
Ledol	12.55	1594	0.65	13.50*	1962	0.73
Eudesm-5-en-11-ol analog	12.58	1596	0.14	14.37	2043	0.12
Humulene epoxide II	12.62	1599	0.28	13.50*	1962	[0.73]
Unknown [m/z 179, 161 (66), 119 (44), 95 (38), 105 (35)... 204 (24), 222 (1)]	12.72	1608	0.31	14.80	2084	0.65
Rosifoliol	12.81	1615	0.16	14.46	2052	0.12
1-epi-Cubenol	12.89*	1622	1.05	13.92*	2001	[1.95]
Muurola-4,10(14)-dien-1β-ol?	12.89*	1622	[1.05]	13.62	1972	0.03
Caryophylladienol I	12.93*	1625	0.62	16.16	2221	0.40
Humulenol II	12.93*	1625	[0.62]	16.10	2215	0.22
Caryophylladienol II	12.98	1629	1.35	16.22	2227	1.44
τ-Cadinol	13.05*	1635	0.91	15.04	2108	0.40
τ-Muurolol	13.05*	1635	[0.91]	15.20	2124	0.30
α-Muurolol	13.12	1641	0.54	15.34	2139	0.52
α-Eudesmol	13.19	1646	0.14	15.46	2150	0.20
α-Cadinol	13.21	1648	0.28	15.63	2167	0.26
14-Hydroxy-(*Z*)-caryophyllene	13.25	1651	0.36	16.61	2268	0.38
Unknown [m/z 93, 79 (96), 41 (96), 107 (87), 81 (85), 121 (84), 95 (84)...]	13.38	1662	0.12	13.10	1925	0.13
(3*Z*)-Caryophylla-3,8(13)-dien-5β-ol	13.42*	1666	0.60	16.98*	2307	0.42
β-Bisabolol	13.42*	1666	[0.60]	14.92	2096	0.16
epi-α-Bisabolol	13.60	1680	0.07	15.59	2163	0.08
α-Bisabolol	13.62	1682	0.08	15.56	2160	0.10
Hydroxydihydrocaryophyllene analog	13.65	1685	0.12			
(2*E*,6*E*)-Farnesol	14.08	1721	0.08	16.98*	2307	[0.42]
1,10-seco-Aromadendrane-1,10-dione?	14.25	1736	0.02			
Benzyl benzoate	14.46	1754	0.05	19.05	2536	0.03
Phytone	15.50	1846	0.01	14.86	2090	0.04
Phytol	18.28	2112	0.02	19.36	2572	0.01
Total identified		**97.84%**			**96.28%**	
Total reported		**98.36%**			**97.07%**	

*: 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

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