Date : 2026-09-01

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 26H18-PTH01
Customer Identification : Lemongrass, Bulk - india - L80121
Type : Essential Oil
Source : *Cymbopogon flexuosus*
Customer : Plant Therapy

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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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. The compliance status of the sample is provided to facilitate the reading of the report. The client remains ultimately responsible for reviewing the results presented within this report and to establish compliance of the tested batch against relevant quality criteria.

Méthode certifiée ISO 17025:2017 Certified method

Laboratoire PhytoChemia

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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 : Jean-Christophe Fortin, M. Sc.
Date : 2026-08-31

Physicochemical data

Refractive index : 1.4855 ± 0.0003 (20 °C)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Kassandra Baker
Date : 2026-08-18

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
2-Methyl-3-buten-2-ol	0.04	Aliphatic alcohol
Isovaleral	0.01	Aliphatic aldehyde
2-Methylbutyral	0.01	Aliphatic aldehyde
Isoamyl alcohol	0.01	Aliphatic alcohol
Hexanal	0.01	Aliphatic aldehyde
Unknown	0.01	Unknown
(3*Z*)-Hexenol	0.01	Aliphatic alcohol
4-Heptanone	0.02	Aliphatic ketone
Tricyclene	0.10	Monoterpene
α-Pinene	0.15	Monoterpene
Camphene	0.85	Monoterpene
Sabinene	0.01	Monoterpene
β-Pinene	0.01	Monoterpene
6-Methyl-5-hepten-2-one	1.15	Aliphatic ketone
Myrcene	0.07	Monoterpene
6-Methyl-5-hepten-2-ol	0.06	Aliphatic alcohol
α-Phellandrene	0.01	Monoterpene
Octanal	0.07	Aliphatic aldehyde
α-Terpinene	0.02	Monoterpene
para-Cymene	0.01	Monoterpene
1,8-Cineole	0.01	Monoterpenic ether
β-Phellandrene	0.03	Monoterpene
Limonene	0.22	Monoterpene
Benzeneacetaldehyde	0.01	Simple phenolic
(*Z*)-β-Ocimene	0.28	Monoterpene
(*E*)-β-Ocimene	0.18	Monoterpene
2,6-Dimethyl-5-heptenal (melonal)	0.02	Aliphatic aldehyde
γ-Terpinene	0.01	Monoterpene
cis-Linalool oxide (fur.)	0.02	Monoterpenic alcohol
4-Nonanone	0.91	Aliphatic ketone
Terpinolene	0.04	Monoterpene
trans-Linalool oxide (fur.)	0.13	Monoterpenic alcohol
4-Nonanol	0.02	Aliphatic alcohol
Perillene	0.03	Monoterpenic ether
Rosefuran	0.18	Monoterpenic ether
Linalool	1.07	Monoterpenic alcohol
cis-Chrysanthemal?	0.01	Monoterpenic aldehyde
(*Z*)-6-Methyl-3,5-heptadien-2-one	0.02	Aliphatic ketone
trans-para-Mentha-2,8-dien-1-ol	0.02	Monoterpenic alcohol
Unknown	0.02	Unknown

Unknown	0.02	Unknown
Unknown	0.14	Unknown
exo-Isocitral	0.01	Monoterpenic aldehyde
trans-Chrysanthemal	0.31	Monoterpenic aldehyde
Citronellal	0.22	Monoterpenic aldehyde
Borneol	0.16	Monoterpenic alcohol
α-Phellandren-8-ol	0.02	Monoterpenic alcohol
Isoneral	0.44	Monoterpenic aldehyde
Rosefuran oxide	0.04	Monoterpenic ether
Unknown	0.10	Oxygenated monoterpene
Terpinen-4-ol	0.16	Monoterpenic alcohol
Isogeranial	0.72	Monoterpenic aldehyde
Unknown	0.07	Unknown
α-Terpineol	0.10	Monoterpenic alcohol
Myrtenal	0.02	Monoterpenic aldehyde
Unknown	0.06	Unknown
trans-Isopiperitenol	0.06	Monoterpenic alcohol
Unknown	0.04	Oxygenated monoterpene
Decanal	0.14	Aliphatic aldehyde
cis-Isopiperitenol	0.02	Monoterpenic alcohol
2,3-Epoxyneral?	0.04	Monoterpenic aldehyde
Nerol	0.21	Monoterpenic alcohol
Citronellol	0.11	Monoterpenic alcohol
Neral	31.00	Monoterpenic aldehyde
Piperitone	0.02	Monoterpenic ketone
Geraniol	7.27	Monoterpenic alcohol
Geranial	40.53	Monoterpenic aldehyde
Unknown	0.16	Oxygenated monoterpene
Bornyl acetate	0.02	Monoterpenic ester
Geranyl formate	0.01	Monoterpenic ester
Methyl geranate	0.04	Monoterpenic ester
Neric acid	0.06	Monoterpenic acid
Unknown	0.07	Unknown
α-Cubebene	0.02	Sesquiterpene
Citronellyl acetate	0.04	Monoterpenic ester
Cyclosativene I	0.02	Sesquiterpene
Cyclosativene II	0.10	Sesquiterpene
Neryl acetate	0.22	Monoterpenic ester
Geranic acid	0.12	Aliphatic acid
α-Copaene	0.10	Sesquiterpene
β-Bourbonene	0.02	Sesquiterpene
β-Cubebene	0.09	Sesquiterpene
Geranyl acetate	3.72	Monoterpenic ester
β-Elemene	0.11	Sesquiterpene
Longifolene	0.02	Sesquiterpene

β-Caryophyllene	1.68	Sesquiterpene
β-Copaene	0.03	Sesquiterpene
trans-α-Bergamotene	0.02	Sesquiterpene
(*E*)-Isoeugenol	0.43	Phenylpropanoid
α-Humulene	0.18	Sesquiterpene
cis-Muurola-4(15),5-diene	0.04	Sesquiterpene
trans-Cadina-1(6),4-diene	0.03	Sesquiterpene
Germacrene D	0.23	Sesquiterpene
γ-Amorphene	0.03	Sesquiterpene
epi-Cubebol	0.13	Sesquiterpenic alcohol
α-Muurolene	0.04	Sesquiterpene
δ-Amorphene	0.08	Sesquiterpene
Cubebol	0.30	Sesquiterpenic alcohol
γ-Cadinene	1.02	Sesquiterpene
δ-Cadinene	0.30	Sesquiterpene
10-epi-Cubebol?	0.12	Sesquiterpenic alcohol
(*E*)-γ-Bisabolene	0.13	Sesquiterpene
Neryl butyrate	0.04	Monoterpenic ester
α-Elemol	0.06	Sesquiterpenic alcohol
Germacrene B	0.04	Sesquiterpene
Geranyl butyrate	0.08	Monoterpenic ester
Caryophyllene oxide isomer	0.08	Sesquiterpenic ether
Caryophyllene oxide	0.45	Sesquiterpenic ether
Humulene epoxide II	0.04	Sesquiterpenic ether
Selin-6-en-4α-ol isomer	0.02	Sesquiterpenic alcohol
1-epi-Cubenol	0.01	Sesquiterpenic alcohol
Cubenol	0.03	Sesquiterpenic alcohol
β-Eudesmol	0.02	Sesquiterpenic alcohol
α-Eudesmol	0.01	Sesquiterpenic alcohol
(2*Z*,6*Z*)-Farnesol	0.03	Sesquiterpenic alcohol
Farnesal isomer	0.02	Sesquiterpenic aldehyde
(2*E*,6*E*)-Farnesal	0.02	Sesquiterpenic aldehyde
Neophytadiene	0.03	Diterpene
meta-Camphorene	0.01	Diterpene
Unknown	0.05	Unknown
Unknown	0.01	Unknown
Dicitral	0.05	Diterpenic aldehyde
Unknown	0.02	Unknown
Phytol isomer I	0.10	Diterpenic alcohol
Unknown	0.05	Unknown
Unknown	0.02	Unknown
Unknown	0.03	Unknown
Consolidated total	**98.93**	

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.

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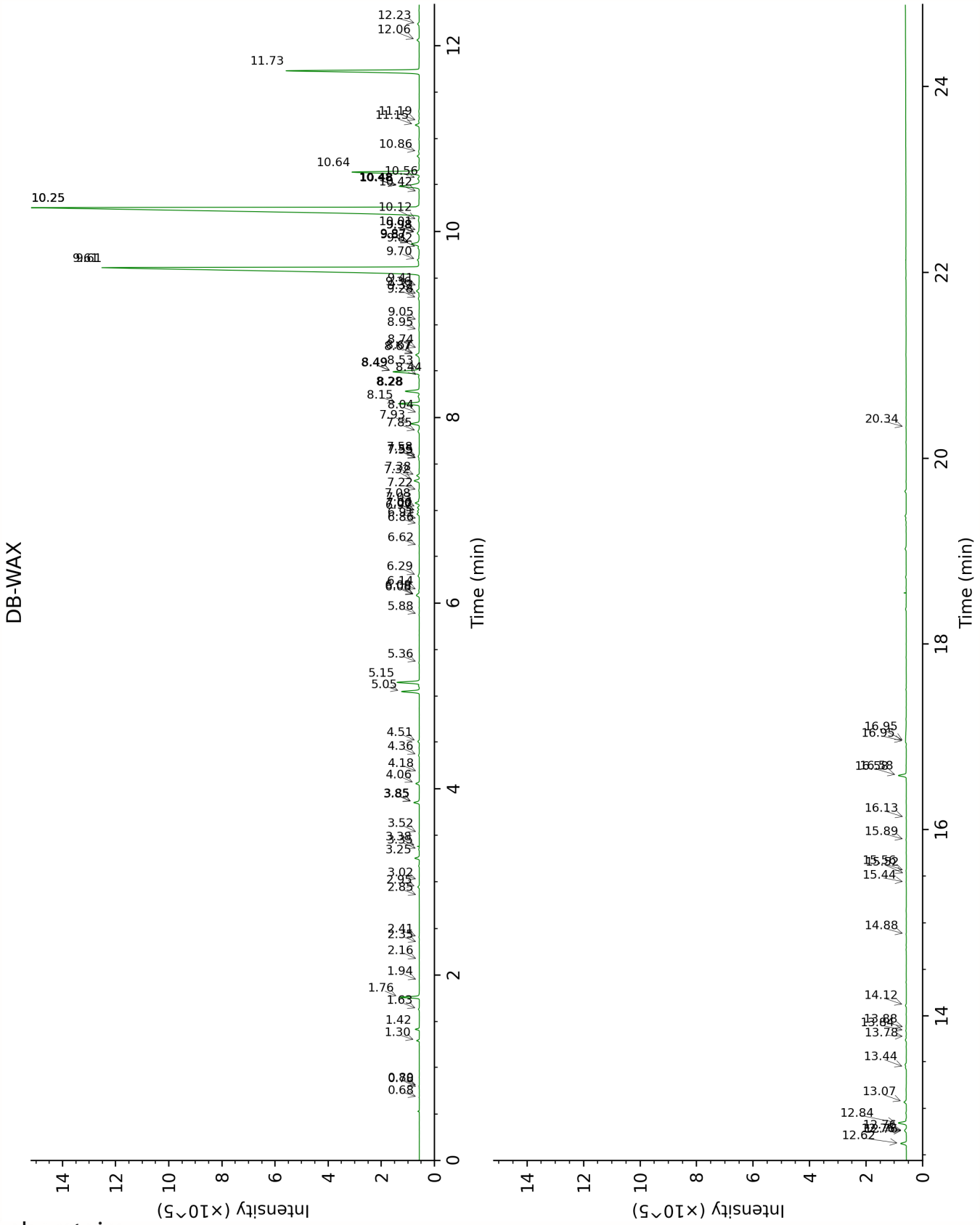
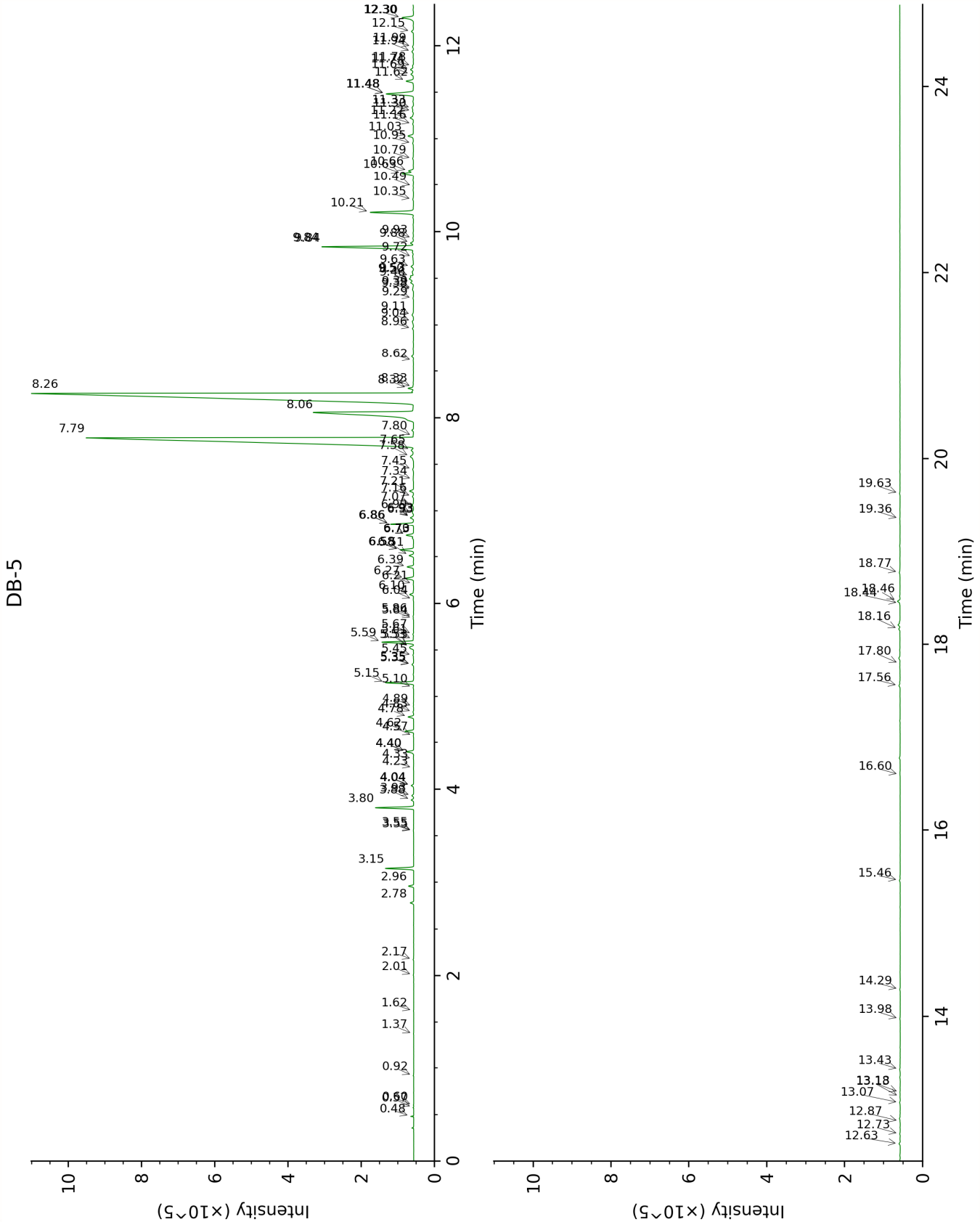

DB-WAX
Time (min)
Intensity (×10^5)
12.23
12.06
11.73
10.86
10.64
10.56
10.25
10.12
9.70
9.05
8.95
8.74
8.49
8.28
8.15
8.04
7.93
7.85
7.22
6.86
6.62
6.29
5.88
5.36
5.15
5.05
4.51
4.36
4.18
4.06
3.85
3.52
3.25
3.02
2.95
2.85
2.41
2.16
1.94
1.76
1.63
1.42
1.30
0.68
20.34
16.95
16.13
15.89
15.44
14.88
14.12
13.78
13.44
13.07
12.84
12.62


DB-5
Time (min)
Intensity (×10^5)
12.30
12.15
11.48
11.03
10.95
10.79
10.49
10.35
10.21
9.84
9.72
9.63
9.29
9.11
8.96
8.62
8.26
8.06
7.79
7.80
7.45
7.34
6.86
6.39
6.27
6.21
6.10
5.59
5.15
5.10
4.89
4.78
4.62
4.57
4.40
4.23
4.04
3.80
3.15
2.96
2.78
2.17
2.01
1.62
1.37
0.92
0.48
19.63
19.36
18.77
18.46
18.44
18.16
17.80
17.56
16.60
15.46
14.29
13.98
13.43
13.18
13.07
12.87
12.73
12.63

FULL ANALYSIS DATA

	Column DB-WAX			Column DB-5		
2-Methyl-3-buten-2-ol	1.63	1013.8	0.04	0.48	606.9	0.04
Isovaleral	0.80	887.4	0.01	0.58	643.5	0.01
2-Methylbutyral	0.78	880.7	tr	0.60	653.9	0.01
Isoamyl alcohol	3.52	1178.4	0.01	0.92	732.9	0.01
Hexanal	1.94	1043.8	0.01	1.37	800.9	0.01
Unknown PEGR III [m/z 81, 69 (80), 41 (65), 83 (52), 109 (48), 55 (47)...]	0.68	844.2	0.01	1.62	824.0	0.01
(3*Z*)-Hexenol	5.88	1350.2	0.01	2.01	856.8	0.01
4-Heptanone	2.41	1089.4	0.01	2.17	871.0	0.02
Tricyclene	1.30	971.4	0.10	2.78	919.2	0.10
α-Pinene	1.42	990.6	0.15	2.96	931.3	0.15
Camphene	1.76	1026.4	0.85	3.15	944.1	0.85
Sabinene	2.35	1083.6	0.01	3.55*	971.1	[0.01]
β-Pinene	2.16	1065.6	0.01	3.55*	971.1	[0.01]
6-Methyl-5-hepten-2-one	5.15	1298.8	1.14	3.80	988.0	1.15
Myrcene	2.95	1133.1	0.08	3.88	993.5	0.07
6-Methyl-5-hepten-2-ol	7.00*	1430.6	[0.10]	3.93	996.7	0.06
α-Phellandrene	2.85	1125.5	0.01	4.04*	1004.0	[0.07]
Octanal	4.51	1251.7	0.07	4.04*	1004.0	[0.07]
α-Terpinene	3.02	1138.9	tr	4.23	1016.0	0.02
para-Cymene	4.18	1227.5	0.01	4.33	1022.5	0.01
1,8-Cineole	3.38	1167.2	0.01	4.40*	1027.1	[0.25]
β-Phellandrene	3.35	1164.4	0.03	4.40*	1027.1	[0.25]
Limonene	3.26	1157.3	0.22	4.40*	1027.1	[0.25]
Benzeneacetaldehyde	8.95	1577.2	0.04	4.57	1037.9	0.01
(*Z*)-β-Ocimene	3.85*	1203.8	[0.27]	4.62	1041.1	0.28
(*E*)-β-Ocimene	4.06	1218.7	0.17	4.78	1050.8	0.18
2,6-Dimethyl-5-heptenal (melonal)	5.36	1313.8	0.02	4.83	1054.2	0.02
γ-Terpinene	3.85*	1203.8	[0.27]	4.89	1058.0	0.01
cis-Linalool oxide (fur.)	6.62	1402.8	0.01	5.10	1071.5	0.02
4-Nonanone	5.05	1291.8	0.92	5.15	1074.7	0.91
Terpinolene	4.36	1240.8	0.04	5.35*	1087.2	[0.06]
trans-Linalool oxide (fur.)	6.97	1428.5	0.13	5.35*	1087.2	[0.06]
4-Nonanol				5.44	1093.6	0.02
Perillene	6.14	1368.7	0.03	5.53*	1099.0	[0.21]
Rosefuran	6.08*	1364.9	[0.21]	5.53*	1099.0	[0.21]

Linalool	8.15	1516.1	1.02	5.59	1102.6	1.07
cis-Chrysanthemal?	6.08*	1364.9	[0.21]	5.61	1104.3	0.01
(*Z*)-6-Methyl-3,5-heptadien-2-one	8.28*	1526.4	[0.77]	5.67	1107.9	0.02
trans-para-Mentha-2,8-dien-1-ol	9.05	1585.0	0.01	5.84	1119.0	0.02
Unknown CYFL II [m/z 81, 79 (19), 41 (12), 92 (8), 77 (8)...]	6.29	1379.8	0.07	5.86	1120.4	0.02
Unknown CYFL III [m/z 81, 70 (98), 67 (63), 82 (53), 41 (46), 69 (46), 109 (43)...]	6.91	1424.4	0.01	6.04	1132.1	0.02
Unknown CYFL IV [m/z 95, 67 (86), 41 (68), 82 (64), 123 (62)...]	7.58	1473.6	0.07	6.10	1135.8	0.14
exo-Isocitral	7.55*	1471.6	[0.03]	6.21	1143.0	0.01
trans-Chrysanthemal	7.32	1454.5	0.28	6.27	1147.0	0.31
Citronellal	7.08	1437.1	0.21	6.39	1155.0	0.22
Borneol	9.87*	1650.3	[0.51]	6.51	1162.8	0.16
α-Phellandren-8-ol	10.25*	1681.4	[40.84]	6.58*	1166.9	[0.46]
Isoneral	7.93	1499.7	0.44	6.58*	1166.9	[0.46]
Rosefuran oxide	8.67*	1556.3	[0.23]	6.70	1175.2	0.04
Unknown CYFL V [m/z 84, 83 (74), 137 (56), 41 (47), 93 (43), 108 (40)... 152 (2)]	9.70	1636.6	0.10	6.73*	1177.2	[0.26]
Terpinen-4-ol	8.67*	1556.3	[0.23]	6.73*	1177.2	[0.26]
Isogeranial	8.28*	1526.4	[0.77]	6.86*	1185.3	[0.79]
Unknown CYFL XIV [m/z 69, 41 (65), 109 (36), 67 (16), 84 (11), 43 (10), 55 (9)...]				6.86*	1185.3	[0.79]
α-Terpineol	9.87*	1650.3	[0.51]	6.93*	1189.8	[0.12]
Myrtenal	8.74	1561.7	0.02	6.93*	1189.8	[0.12]
Unknown DRMO III [m/z 43, 81 (47), 67 (45), 69 944), 41 (42), 59 (40), 55 (39)...]	9.28	1603.5	0.05	6.98	1193.6	0.06
trans-Isopiperitenol	10.48*	1700.2	[1.37]	7.07	1198.9	0.06
Unknown CYFL VI [m/z 84, 41 (83), 83 (79), 91 (76), 93 (67), 119 (64), 137 (63), 109	10.25*	1681.4	[40.84]	7.16	1204.8	0.04

(54), 108 (54)... 152 (4)]						
Decanal	7.38	1458.6	0.13	7.21	1208.7	0.14
cis-Isopiperitenol	10.42	1694.8	0.01	7.34	1217.3	0.02
2,3-Epoxyneral?				7.45	1224.6	0.04
Nerol	11.15	1756.0	0.21	7.58	1234.0	0.21
Citronellol	10.86	1732.0	0.04	7.65	1238.6	0.11
Neral	9.61*	1630.0	[31.16]	7.78	1247.8	31.00
Piperitone	10.01	1661.6	0.02	7.80	1249.1	0.02
Geraniol	11.73	1805.8	7.48	8.06	1266.5	7.27
Geranial	10.25*	1681.4	[40.84]	8.26	1280.5	40.53
Unknown CYFL VII [m/z 43, 69 (77), 41 (70), 109 (54)... 152 (6)]	13.07	1924.9	0.14	8.32	1284.2	0.16
Bornyl acetate	8.28*	1526.4	[0.77]	8.33	1285.2	0.02
Geranyl formate	9.98*	1659.5	[0.13]	8.62	1304.9	0.01
Methyl geranate	9.82	1646.9	0.05	8.96	1325.3	0.04
Neric acid	16.58*	2269.3	[0.44]	9.04	1330.8	0.06
Unknown CYFL VIII [m/z 82, 59 (44), 41 (43), 95 (31), 43 (29), 81 (24)...]	12.76*	1896.8	[0.12]	9.11	1335.8	0.07
α-Cubebene	6.86	1420.4	0.01	9.29	1348.5	0.02
Citronellyl acetate	9.61*	1630.0	[31.16]	9.38	1355.1	0.04
Cyclosativene I	7.00*	1430.6	[0.10]	9.39	1356.0	0.02
Cyclosativene II	7.03	1433.5	0.10	9.46*†	1360.4	[0.12]
Neryl acetate	10.25*	1681.4	[40.84]	9.50*†	1363.3	[0.23]
Geranic acid	16.95*	2308.1	[0.17]	9.52*†	1365.4	[0.09]
α-Copaene	7.22	1447.0	0.03	9.63	1372.6	0.10
β-Bourbonene	7.55*	1471.6	[0.03]	9.72	1379.7	0.02
β-Cubebene	7.85	1493.4	0.09	9.84*	1387.8	[3.70]
Geranyl acetate	10.64	1713.6	3.72	9.84*	1387.8	[3.70]
β-Elemene	8.49*	1542.4	[1.68]	9.88	1390.6	0.11
Longifolene	8.04	1508.1	0.01	9.93	1394.2	0.02
β-Caryophyllene	8.49*	1542.4	[1.68]	10.21	1414.7	1.68
β-Copaene	8.44	1538.1	0.03	10.35	1425.1	0.03
trans-α-Bergamotene	8.53	1545.3	0.02	10.49	1435.7	0.02
(*E*)-Isoeugenol	16.58*	2269.3	[0.44]	10.63	1446.3	0.43
α-Humulene	9.36	1609.9	0.18	10.66	1448.5	0.18
cis-Muurola-4(15),5-diene	9.41	1613.9	0.03	10.79	1458.5	0.04
trans-Cadina-1(6),4-diene	9.32	1606.7	0.02	10.95	1470.8	0.03
Germacrene D	9.87*	1650.3	[0.51]	11.03	1476.7	0.23

γ-Amorphene	9.98*	1659.5	[0.13]	11.16	1486.5	0.03
epi-Cubebol	12.06	1834.7	0.12	11.22	1491.3	0.13
α-Muurolene	10.12	1670.5	0.06	11.30	1496.9	0.04
δ-Amorphene	9.98*	1659.5	[0.13]	11.33	1499.5	0.08
Cubebol	12.62	1884.2	0.30	11.48*	1511.0	[1.32]
γ-Cadinene	10.48*	1700.2	[1.37]	11.48*	1511.0	[1.32]
δ-Cadinene	10.48*	1700.2	[1.37]	11.62	1521.9	0.30
10-epi-Cubebol?	13.84	1996.5	0.03	11.69	1527.7	0.12
(*E*)-γ-Bisabolene	10.56	1706.9	0.07	11.74	1531.6	0.13
Neryl butyrate				11.78	1534.8	0.04
α-Elemol	14.12	2022.5	0.05	11.94	1546.9	0.06
Germacrene B	11.19	1759.7	0.04	11.99	1551.1	0.04
Geranyl butyrate	12.23	1849.9	0.09	12.15	1564.0	0.08
Caryophyllene oxide isomer	12.76*	1896.8	[0.12]	12.30*	1575.8	[0.52]
Caryophyllene oxide	12.84	1904.3	0.45	12.30*	1575.8	[0.52]
Humulene epoxide II	13.44	1959.0	0.05	12.63	1601.6	0.04
Selin-6-en-4α-ol isomer	14.88	2096.0	0.02	12.73	1610.2	0.02
1-epi-Cubenol	13.88	1999.7	0.01	12.87	1621.6	0.01
Cubenol	13.78	1990.5	0.02	13.07	1638.2	0.03
β-Eudesmol	15.52	2160.2	0.01	13.13	1643.3	0.02
α-Eudesmol	15.44	2151.8	0.01	13.18	1647.4	0.01
(2*Z*,6*Z*)-Farnesol	16.13	2222.4	0.02	13.43	1668.0	0.03
Farnesal isomer				13.98	1714.0	0.02
(2*E*,6*E*)-Farnesal	15.89	2197.9	0.03	14.29	1741.7	0.02
Neophytadiene	12.76*	1896.8	[0.12]	15.46	1845.3	0.03
meta-Camphorene	15.56	2164.0	0.02	16.60	1950.6	0.01
Unknown LICU VII [m/z 69, 41 (94), 81 (42), 109 (39), 107 (33), 43 (31)...]				17.56	2043.9	0.05
Unknown CYFL IX [m/z 93, 69 (95), 135 (76), 107 (53), 41 (53), 109 (50)... 235 (10)...]				17.80	2067.4	0.01
Dicitral	16.95*	2308.1	[0.17]	18.16	2104.0	0.05
Unknown LICU II [m/z 69, 41 (38), 151 (36), 123 (34), 82 (24), 43 (23), 109 (21)...]	20.34	2697.0	0.01	18.44	2132.8	0.02
Phytol isomer I				18.46	2134.9	0.10
Unknown CYFL XIII [m/z 94, 43 (85), 93 (81), 69 (76), 137 (76),				18.77	2166.8	0.05

95 (60), 134 (51)...]						
Unknown CYFL X [m/z 94, 43 (56), 123 (55), 69 (53), 95 (42), 79 (39)...]				19.36	2228.4	0.02
Unknown CYFL XII [m/z 123, 94 (100), 43 (86), 69 (75), 95 (47), 41 (47), 93 (45)...]				19.63	2257.3	0.03
Total reported	98.14%			98.70%		

*: 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