

Date : 2025-03-11

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25B26-PTH02

Customer Identification : Rose Otto - Bulgaria - RK0102R

Type : Essential Oil

Source : *Rosa x damascena*

Customer : Plant Therapy

Checked and approved by:

Alexis St-Gelais, Ph. D., Chimiste 2013-174

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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 : Alexis St-Gelais, Ph. D., Chimiste 2013-174

Date : 2025-03-12

PHYSICOCHEMICAL DATA

Refractive index : 1.4641 ± 0.0003 (20 °C)

Method : PC-MAT-016 - Measure of the refractive index of a liquid.

Analyst : Cindy Caron B. Sc.

Date : 2025-02-26

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	0.40	Aliphatic alcohol
Pentanal	0.01	Aliphatic aldehyde
Isoamyl alcohol	tr	Aliphatic alcohol
2-Methylbutanol	0.01	Aliphatic alcohol
Pentanol	tr	Aliphatic alcohol
Hexanal	tr	Aliphatic aldehyde
(3Z)-Hexenol	0.01	Aliphatic alcohol
Hexanol	0.02	Aliphatic alcohol
Heptanal	0.02	Aliphatic aldehyde
α -Thujene	tr	Monoterpene
α -Pinene	0.31	Monoterpene
β -Pinene	0.06	Monoterpene
Sabinene	0.02	Monoterpene
6-Methyl-5-hepten-2-one	0.01	Aliphatic ketone
Myrcene	0.13	Monoterpene
Octanal	0.01	Aliphatic aldehyde
α -Terpinene	0.01	Monoterpene
<i>para</i> -Cymene	0.01	Monoterpene
Limonene	0.02	Monoterpene
1,8-Cineole	tr	Monoterpenic ether
(Z)- β -Ocimene	0.01	Monoterpene
(E)- β -Ocimene	0.02	Monoterpene
γ -Terpinene	0.02	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	tr	Monoterpenic alcohol
Terpinolene	0.01	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	0.01	Monoterpenic alcohol
Rosefuran	0.01	Monoterpenic ether
Linalool	1.58	Monoterpenic alcohol
Nonanal	0.02	Aliphatic aldehyde
Phenylethyl alcohol	1.38	Simple phenolic
<i>cis</i> -Rose oxide	0.06	Monoterpenic ether
<i>trans</i> -Rose oxide	0.03	Monoterpenic ether
Isopulegol	0.02	Monoterpenic alcohol
Citronellal	0.03	Monoterpenic aldehyde
Nerol oxide	0.02	Aliphatic ether
Terpinen-4-ol	0.06	Monoterpenic alcohol
α -Terpineol	0.07	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Decanal	0.01	Aliphatic aldehyde
Unknown	0.02	Unknown

Rhodinol (α -citronellol)	0.01	Monoterpenic alcohol
Nerol	13.36	Monoterpenic alcohol
Citronellol	40.92	Monoterpenic alcohol
Neral	0.12	Monoterpenic aldehyde
(Z)-Isogeraniol	0.01	Monoterpenic alcohol
(E)-Isogeraniol?	0.03	Monoterpenic alcohol
Geraniol	21.86	Monoterpenic alcohol
Geranial	0.22	Monoterpenic aldehyde
Citronellyl formate	0.01	Monoterpenic ester
Geranyl formate	0.01	Monoterpenic ester
Methyl geranate	0.01	Monoterpenic ester
α -Cubebene	0.02	Sesquiterpene
Eugenol	1.18	Phenylpropanoid
Citronellyl acetate	0.34	Monoterpenic ester
Neryl acetate	0.05	Monoterpenic ester
α -Copaene	0.02	Sesquiterpene
β -Bourbonene	0.04	Sesquiterpene
Geranyl acetate	2.16	Monoterpenic ester
β -Elemene	0.08	Sesquiterpene
Methyleugenol	0.19	Phenylpropanoid
β -Caryophyllene	0.26	Sesquiterpene
β -Ylangene	0.04	Sesquiterpene
β -Copaene	0.02	Sesquiterpene
α -Guaiene	0.14	Sesquiterpene
6,9-Guaiadiene	0.01	Sesquiterpene
Citronellyl propionate	0.01	Monoterpenic ester
α -Humulene	0.20	Sesquiterpene
<i>cis</i> -Cadina-1(6),4-diene	0.02	Sesquiterpene
(E)- β -Farnesene	0.04	Sesquiterpene
γ -Murolene	0.14	Sesquiterpene
Germacrene D	0.78	Sesquiterpene
β -Selinene	0.05	Sesquiterpene
Unknown	0.04	Unknown
α -Selinene	0.05	Sesquiterpene
Phenylethyl 2-methylbutyrate	0.01	Phenolic ester
Benzyl tiglate	0.01	Phenolic ester
Aciphyllene	0.04	Sesquiterpene
α -Murolene	0.23	Sesquiterpene
δ -Guaiene	0.11	Sesquiterpene
Pentadecane	0.08	Alkane
γ -Cadinene	0.08	Sesquiterpene
(3E,6E)- α -Farnesene	0.04	Sesquiterpene
<i>trans</i> -Calamenene	0.04	Sesquiterpene
δ -Cadinene	0.06	Sesquiterpene
α -Elemol	0.03	Sesquiterpenic alcohol

(E)-Nerolidol	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.01	Sesquiterpenic ether
Phenylethyl tiglate	0.01	Phenolic ester
Ethyl dodecanoate	0.01	Aliphatic ester
Hexadecane	0.02	Alkane
10-epi- γ -Eudesmol	0.01	Sesquiterpenic alcohol
γ -Eudesmol	0.05	Sesquiterpenic alcohol
τ -Muurolool	0.01	Sesquiterpenic alcohol
β -Eudesmol	0.05	Sesquiterpenic alcohol
α -Eudesmol	0.04	Sesquiterpenic alcohol
Phenylethyl hexanoate	0.02	Phenolic ester
α -Cadinol	0.01	Sesquiterpenic alcohol
Borneol	tr	Monoterpenic alcohol
(8Z)-Heptadecene	0.08	Alkene
(2E,6Z)-Farnesol	0.04	Sesquiterpenic alcohol
Heptadecane	1.83	Alkane
(2E,6Z)-Farnesal	0.01	Sesquiterpenic aldehyde
(2E,6E)-Farnesol	0.31	Sesquiterpenic alcohol
(2E,6E)-Farnesal	0.01	Sesquiterpenic aldehyde
Benzyl benzoate	0.01	Phenolic ester
(8Z)-Octadecene	0.02	Alkene
Octadecane	0.04	Alkane
Hexadecanal	0.01	Aliphatic aldehyde
(2E,6E)-Farnesyl acetate	0.01	Sesquiterpenic ester
Phenylethyl benzoate	0.02	Phenolic ester
Nonadecadiene isomer	0.03	Alkene
(9Z)-Nonadecene	0.82	Alkene
Phenylethyl phenylacetate	0.01	Phenolic ester
Nonadecane	6.23	Alkane
(9Z)-Eicosene	0.05	Alkene
Ethyl palmitate	0.01	Aliphatic ester
Eicosane	0.50	Alkane
Octadecanal	0.01	Aliphatic aldehyde
(10Z)-Heneicosene	0.04	Alkene
Phenylethyl geranate	0.05	Monoterpenic ester
1-Heneicosene?	0.03	Alkene
Heneicosane	0.96	Alkane
Citronellyl caprate	0.02	Monoterpenic ester
Phenylethyl undecanoate?	0.02	Phenolic ester
Ethyl linolenate	0.01	Aliphatic ester
Docosane	0.01	Alkane
1-Tricosene?	0.04	Alkene
Tricosane	0.07	Alkane
Citronellyl laurate	0.01	Monoterpenic ester
Tetracosane	0.01	Alkane

Phenylethyl myristate	0.01	Phenolic ester
Pentacosane	0.04	Alkane
Heptacosane	0.04	Alkane
Consolidated total	99.34	

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

Note: no correction factor was applied

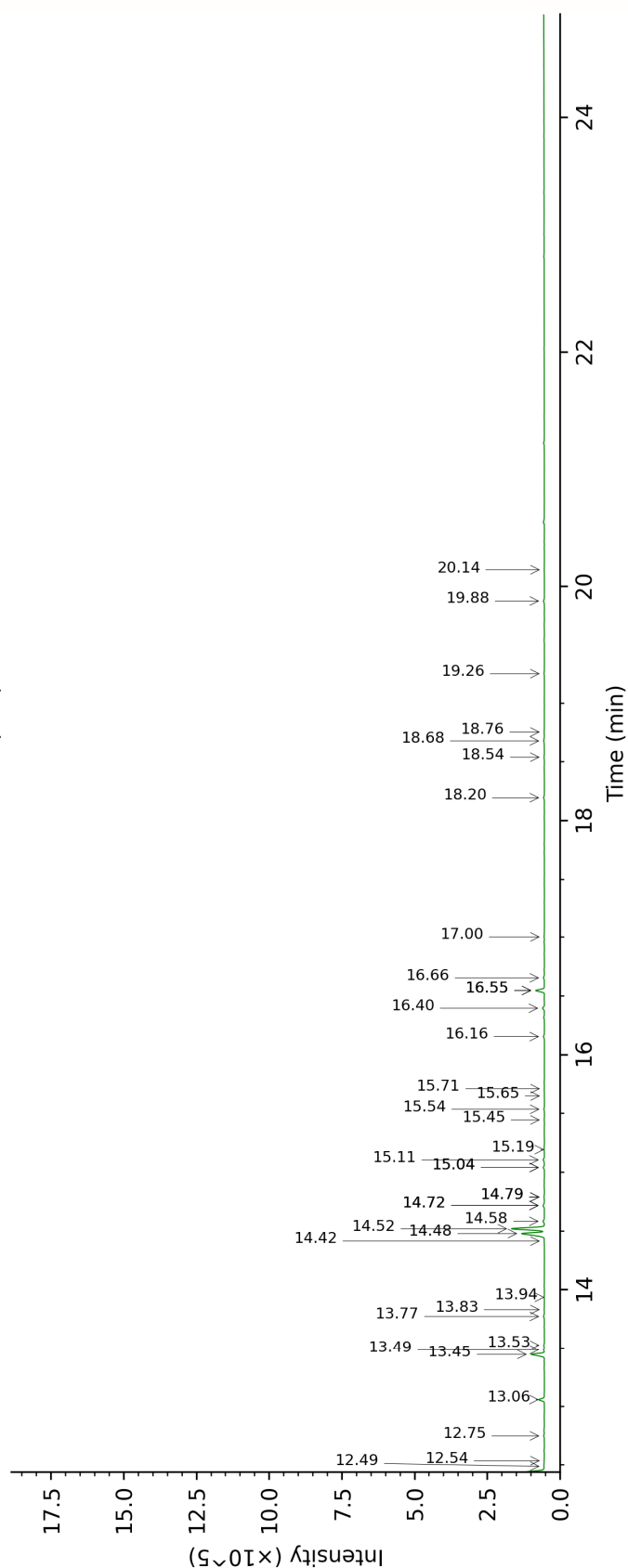
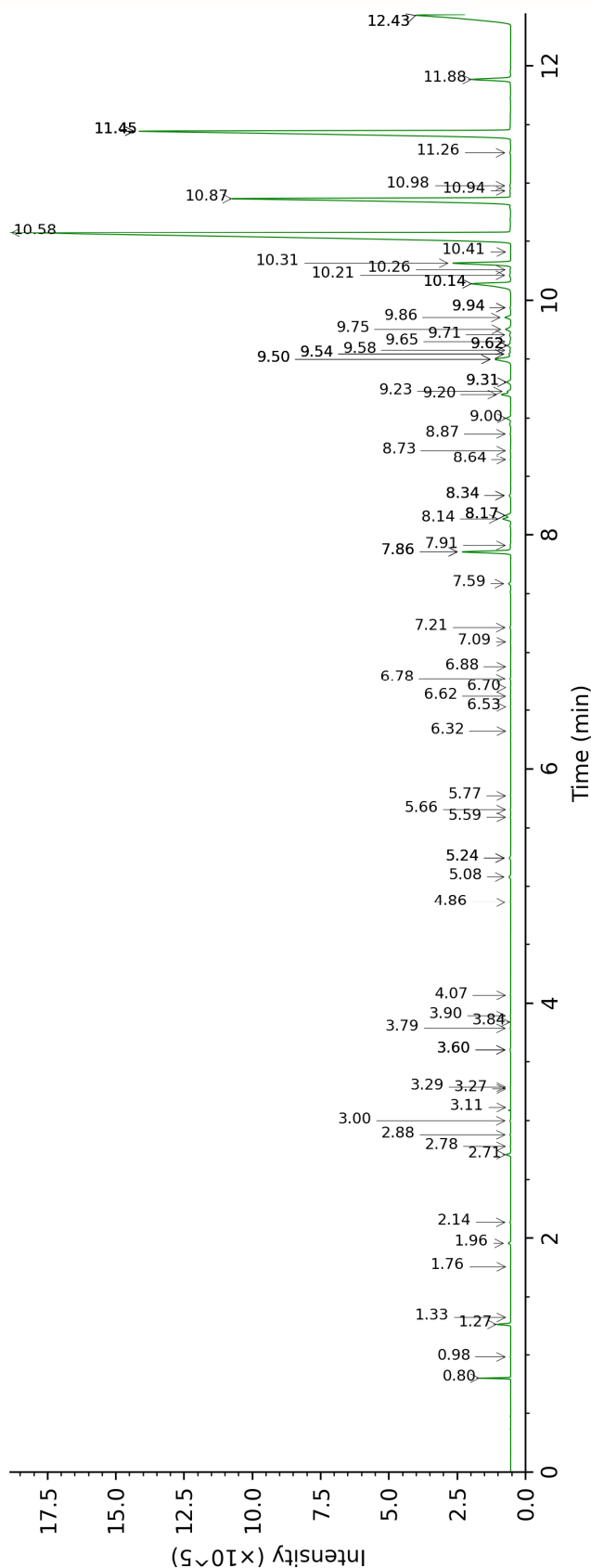
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

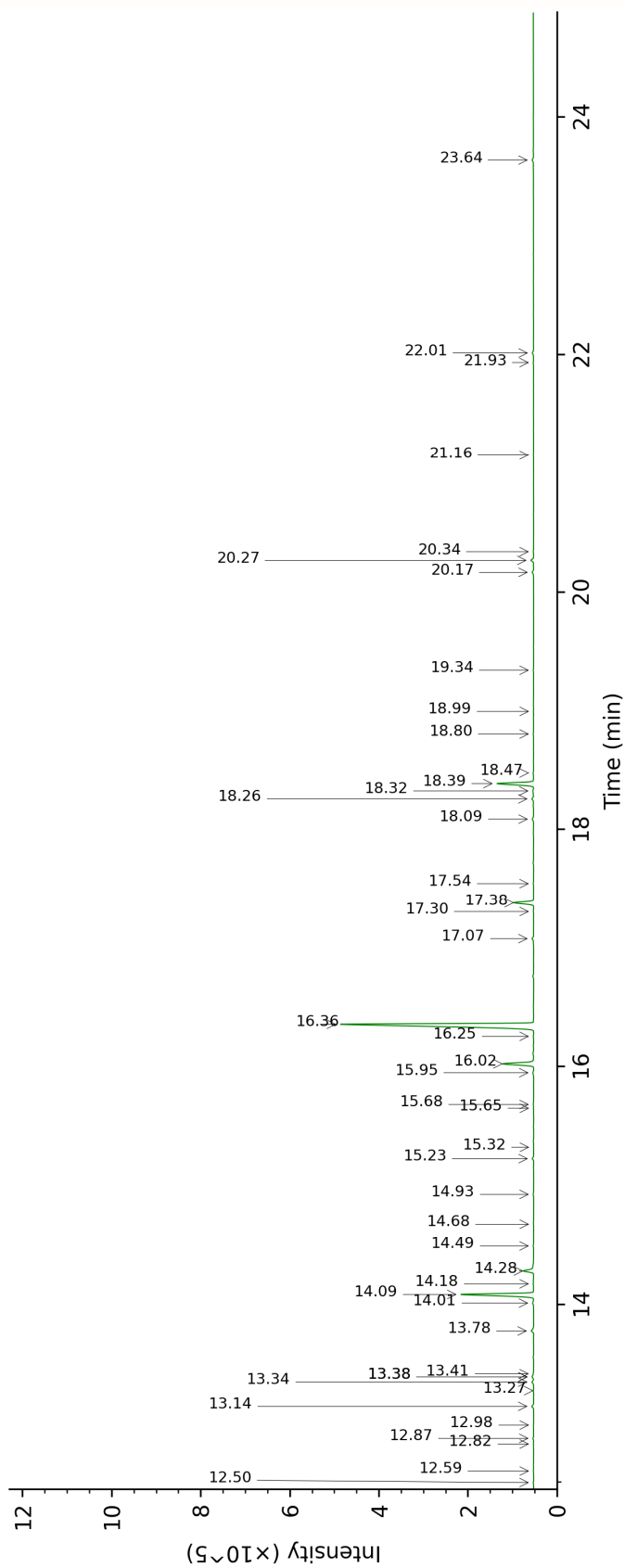
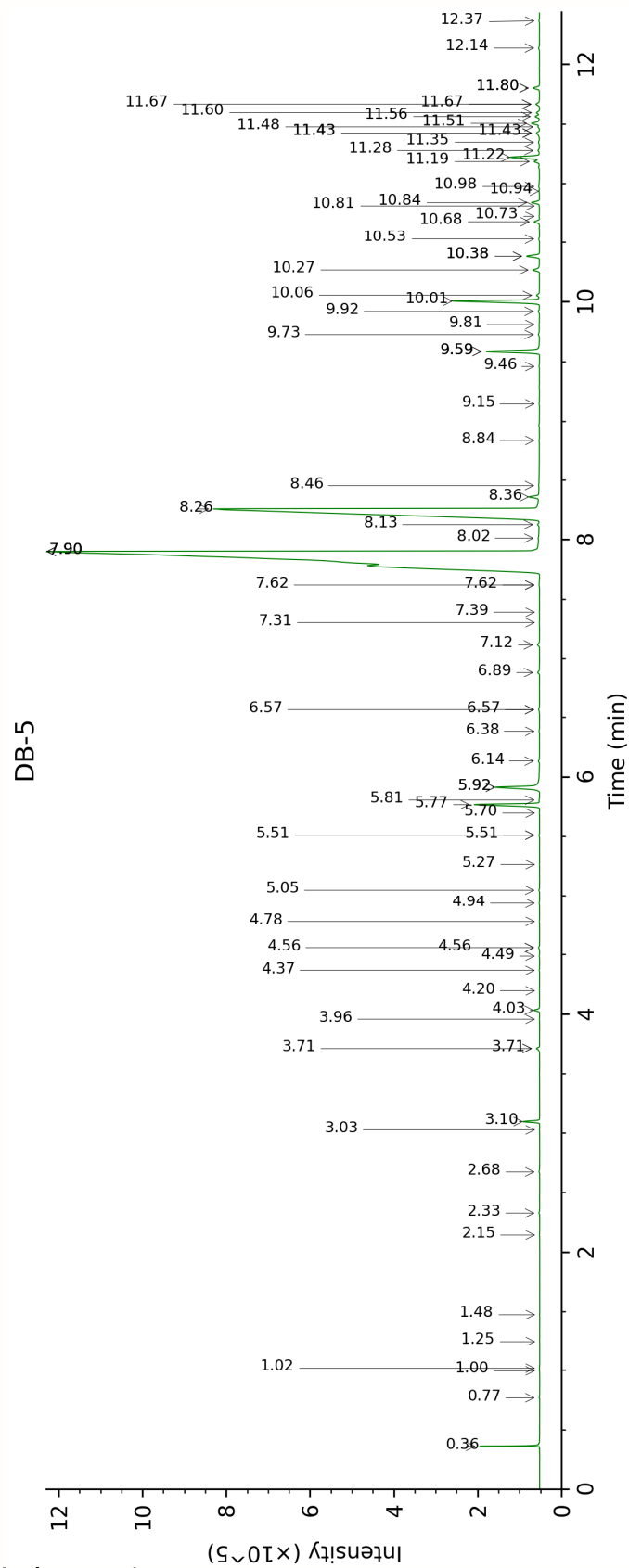
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

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





FULL ANALYSIS DATA

Ethanol	Column DB-WAX			Column DB-5		
	0.80	910.7	0.43	0.36	502.3	0.40
Pentanal	0.98	941.5	0.01	0.77	695.5	0.01
Isoamyl alcohol	3.27	1177.5	tr	1.00	734.1	tr
2-Methylbutanol	3.29	1178.7	tr	1.02	737.2	0.01
Pentanol	3.84	1221.4	0.01	1.25	769.8	tr
Hexanal	1.76	1044.5	tr	1.48	802.0	tr
(3Z)-Hexenol	5.59	1349.0	0.01	2.15	859.4	0.01
Hexanol	5.24*	1324.0	[0.05]	2.33	874.8	0.02
Heptanal	2.88	1146.3	0.02	2.68	903.7	0.02
α -Thujene	1.33	1000.3	tr	3.03	927.4	tr
α -Pinene	1.27	990.2	0.31	3.10	932.1	0.31
β -Pinene	1.96	1064.8	0.06	3.71*	972.7	[0.09]
Sabinene	2.14	1082.9	0.02	3.71*	972.7	[0.09]
6-Methyl-5-hepten-2-one	4.86	1297.4	0.02	3.96	989.0	0.01
Myrcene	2.71	1132.8	0.13	4.03	994.0	0.13
Octanal				4.20	1004.8	0.01
α -Terpinene	2.78	1138.5	0.01	4.37	1015.6	0.01
<i>para</i> -Cymene	3.90	1225.4	0.01	4.49	1023.1	0.01
Limonene	3.00	1155.8	0.02	4.56*	1027.6	[0.03]
1,8-Cineole	3.11	1164.8	tr	4.56*	1027.6	[0.03]
(Z)- β -Ocimene	3.60*	1203.9	[0.03]	4.78	1041.3	0.01
(E)- β -Ocimene	3.79	1217.5	0.02	4.94	1051.0	0.02
γ -Terpinene	3.60*	1203.9	[0.03]	5.05	1058.2	0.02
<i>cis</i> -Linalool oxide (fur.)	6.32	1401.8	0.01	5.27	1071.7	tr
Terpinolene	4.07	1238.3	0.01	5.51*	1087.2	[0.02]
<i>trans</i> -Linalool oxide (fur.)	6.70	1429.3	0.01	5.51*	1087.2	[0.02]
Rosefuran	5.77	1362.1	0.01	5.70	1098.9	0.01
Linalool	7.86*	1516.4	[1.62]	5.77	1103.3	1.58
Nonanal	5.66	1353.7	0.01	5.81	1105.7	0.02
Phenylethyl alcohol	11.88	1848.7	1.38	5.92*	1112.6	[1.38]
<i>cis</i> -Rose oxide	5.08	1312.4	0.06	5.92*	1112.6	[1.38]
<i>trans</i> -Rose oxide	5.24*	1324.0	[0.05]	6.14	1126.6	0.03
Isopulegol	7.91	1520.7	0.02	6.38	1142.5	0.02
Citronellal	6.78	1435.4	0.03	6.57*	1154.1	[0.04]
Nerol oxide	6.62	1423.9	0.02	6.57*	1154.1	[0.04]
Terpinen-4-ol	8.34*	1553.7	[0.06]	6.89	1174.5	0.06
α -Terpineol	9.54*	1649.8	[0.07]	7.12	1189.3	0.07
Unknown CYFL VI [m/z 84, 41]	9.94*	1681.8	[0.03]	7.31	1201.3	0.01

(83), 83 (79), 91 (76), 93 (67), 119 (64), 137 (63), 109 (54), 108 (54)... 152 (4)]						
Decanal	7.09	1458.8	0.01	7.39	1206.9	0.01
Unknown ARAB I [m/z 69, 41 (55), 111 (25), 93 (14), 109 (14)...]				7.62*	1222.2	[0.03]
Rhodinol (α - citronellol)	10.41	1721.0	0.01	7.62*	1222.2	[0.03]
Nerol	10.87	1760.2	13.36	7.90*	1241.1	[54.61]
Citronellol	10.58	1735.3	40.92	7.90*	1241.1	[54.61]
Neral	9.23	1624.0	0.12	7.90*	1241.1	[54.61]
(Z)-Isogeraniol				8.02	1248.5	0.01
(E)-Isogeraniol?	10.94	1765.8	0.03	8.13	1256.2	0.03
Geraniol	11.44*	1809.5	[21.70]	8.26	1264.9	21.86
Geranial	9.86	1675.0	0.21	8.36	1271.7	0.22
Citronellyl formate	8.64	1577.5	0.01	8.46	1278.1	0.01
Geranyl formate	9.65	1658.3	0.03	8.84	1303.9	0.01
Methyl geranate	9.58	1652.3	0.04	9.15	1325.4	0.01
α -Cubebene	6.53	1417.1	0.01	9.46	1347.5	0.02
Eugenol	14.52	2095.2	1.18	9.59*	1356.3	[1.47]
Citronellyl acetate	9.20	1621.8	0.34	9.59*	1356.3	[1.47]
Neryl acetate	9.94*	1681.8	[0.03]	9.73	1366.3	0.05
α -Copaene	6.88	1443.1	0.01	9.81	1372.2	0.02
β -Bourbonene	7.21	1467.9	0.04	9.92	1379.9	0.04
Geranyl acetate	10.32	1713.0	2.15	10.01	1386.0	2.16
β -Elemene	8.17*†	1540.5	[0.20]	10.06	1389.4	0.08
Methyleugenol	13.06	1955.5	0.20	10.27	1404.4	0.19
β -Caryophyllene	8.17*†	1540.5	[0.20]	10.38*	1412.9	[0.33]
β -Ylangene	7.86*	1516.4	[1.62]	10.38*	1412.9	[0.33]
β -Copaene	8.14*†	1538.2	[0.31]	10.53	1423.6	0.02
α -Guaiene	8.17*†	1540.5	[0.20]	10.68	1434.9	0.14
6,9-Guaiadiene	8.34*	1553.7	[0.06]	10.73	1438.3	0.01
Citronellyl propionate				10.81	1444.9	0.01
α -Humulene	9.00	1605.5	0.17	10.84	1447.0	0.20
cis-Cadina- 1(6),4-diene	8.73	1583.9	0.02	10.94	1454.0	0.02
(E)- β -Farnesene	9.31*	1630.4	[0.17]	10.98	1457.0	0.04
γ -Murolene	9.31*	1630.4	[0.17]	11.19	1472.6	0.14

Germacrene D	9.50*	1646.1	[0.82]	11.22	1475.3	0.78
β-Selinene	9.62*	1655.7	[0.13]	11.28	1479.4	0.05
Unknown PRME XIV [m/z 43, 58 (75), 57 (58), 71 (55), 41 (41), 59 (31)...]				11.35	1484.6	0.04
α-Selinene	9.71	1663.0	0.05	11.43*	1490.4	[0.12]
Phenylethyl 2- methylbutyrate	12.54	1907.2	0.01	11.43*	1490.4	[0.12]
Benzyl tiglate	13.94	2038.8	0.01	11.43*	1490.4	[0.12]
Aciphyllene	9.50*	1646.1	[0.82]	11.48	1494.2	0.04
α-Muurolene	9.75	1666.8	0.22	11.51	1496.5	0.23
δ-Guaiene	9.62*	1655.7	[0.13]	11.56	1500.8	0.11
Pentadecane	7.59	1495.7	0.08	11.60	1503.1	0.08
γ-Cadinene	10.14*	1698.2	[2.09]	11.67*	1508.7	[0.11]
(3E,6E)-α- Farnesene	10.26	1708.2	0.04	11.67*	1508.7	[0.11]
trans- Calamenene	10.98	1769.6	0.04	11.80*	1519.3	[0.18]
δ-Cadinene	10.21	1704.2	0.06	11.80*	1519.3	[0.18]
α-Elemol	13.77	2023.0	0.04	12.14	1545.7	0.03
(E)-Nerolidol	13.53	1999.2	0.02	12.37	1563.6	0.02
Caryophyllene oxide	12.49	1902.7	0.03	12.50	1573.6	0.01
Phenylethyl tiglate	14.79*	2122.3	[0.02]	12.59	1581.2	0.01
Ethyl dodecanoate	11.44*	1809.5	[21.70]	12.82	1599.1	0.01
Hexadecane	8.87	1595.0	0.02	12.87	1602.8	0.02
10-epi-γ- Eudesmol	13.83	2028.7	0.01	12.98	1612.0	0.01
γ-Eudesmol	14.72*	2115.0	[0.06]	13.14	1625.0	0.05
τ-Murolol	14.79*	2122.3	[0.02]	13.27	1635.8	0.01
β-Eudesmol	15.11	2154.1	0.06	13.34	1641.8	0.05
α-Eudesmol	15.04*	2147.6	[0.04]	13.38*	1645.4	[0.05]
Phenylethyl hexanoate				13.38*	1645.4	[0.05]
α-Cadinol	15.19	2162.9	0.01	13.41	1647.6	0.01
Borneol	9.54*	1649.8	[0.07]			
(8Z)- Heptadecene				13.78	1677.9	0.08
(2E,6Z)-Farnesol	16.16	2262.2	0.05	14.01	1697.3	0.04
Heptadecane	10.14*	1698.2	[2.09]	14.09	1703.2	1.83
(2E,6Z)-Farnesal	15.04*	2147.6	[0.04]	14.18	1710.9	0.01

(2E,6E)-Farnesol	16.55*	2303.6	[0.32]	14.28	1720.3	0.31
(2E,6E)-Farnesal	15.54	2197.5	0.02	14.49	1738.6	0.01
Benzyl benzoate	18.54	2526.1	0.02	14.68	1754.4	0.01
(8Z)-Octadecene	11.44*	1809.5	[21.70]	14.93	1776.2	0.02
Octadecane	11.26	1793.4	0.04	15.23	1802.2	0.04
Hexadecanal	14.42	2085.1	0.01	15.32	1810.8	0.01
(2E,6E)-Farnesyl acetate	15.65	2209.3	0.01	15.65	1840.7	0.01
Phenylethyl benzoate	19.26	2610.3	0.02	15.68	1843.5	0.02
Nonadecadiene isomer	12.75	1926.8	0.03	15.95	1867.8	0.03
(9Z)-Nonadecene	12.43*	1897.3	[6.95]	16.02	1874.7	0.82
Phenylethyl phenylacetate	20.14	2717.8	0.01	16.25	1895.7	0.01
Nonadecane	12.43*	1897.3	[6.95]	16.36	1905.0	6.23
(9Z)-Eicosene	13.49	1995.3	0.03	17.08	1973.4	0.05
Ethyl palmitate	15.71	2215.8	0.01	17.30	1995.1	0.01
Eicosane	13.44	1991.4	0.49	17.38	2002.2	0.50
Octadecanal	16.55*	2303.6	[0.32]	17.54	2018.6	0.01
(10Z)-Heneicosene	14.58	2101.5	0.06	18.09	2072.6	0.04
Phenylethyl geranate				18.26	2089.5	0.05
1-Heneicosene?	14.72*	2115.0	[0.06]	18.32	2096.1	0.03
Heneicosane	14.48	2091.3	0.95	18.38	2102.2	0.96
Citronellyl caprate	17.00	2353.1	0.02	18.47	2111.4	0.02
Phenylethyl undecanoate?				18.80	2145.4	0.02
Ethyl linolenate	18.76	2551.0	0.02	18.99	2165.1	0.01
Docosane	15.45	2188.3	0.01	19.34	2201.8	0.01
1-Tricosene?	16.66	2315.3	0.04	20.17	2290.7	0.04
Tricosane	16.40	2287.5	0.08	20.27	2301.6	0.07
Citronellyl laurate	18.68	2542.2	0.05	20.34	2309.6	0.01
Tetracosane				21.16	2401.2	0.01
Phenylethyl myristate				21.93	2492.1	0.01
Pentacosane	18.20	2486.2	0.03	22.01	2501.5	0.04
Heptacosane	19.88	2684.9	0.04	23.64	2701.7	0.04
Total reported		98.95%			99.59%	

*: 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