

Date : 2025-03-19

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25C05-PTH01

Customer Identification : Rose Absolute - Bulgaria, Morocco, Turkey - R30116R

Type : Absolute

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-004 - Terpenes and volatiles profiling by response factor

Results : See analysis summary (next page)

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

Date : 2025-03-13

PHYSICOCHEMICAL DATA

CONCLUSION

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

ANALYSIS SUMMARY

Identification	mg/g	% m/m	Class
Hexanol	0.31	0.03	Aliphatic alcohol
Heptanal	0.11	0.01	Aliphatic aldehyde
α -Pinene	0.56	0.06	Monoterpene
Benzaldehyde	0.25	0.03	Simple phenolic
Sabinene	0.17	0.02	Monoterpene
β -Pinene	0.26	0.03	Monoterpene
Myrcene	0.68	0.07	Monoterpene
<i>para</i> -Cymene	0.08	0.01	Monoterpene
Limonene	0.18	0.02	Monoterpene
Benzyl alcohol	7.44	0.74	Simple phenolic
(<i>E</i>)- β -Ocimene	0.05	0.01	Monoterpene
γ -Terpinene	0.05	0.01	Monoterpene
<i>cis</i> -Sabinene hydrate	0.23	0.02	Monoterpenic alcohol
Terpinolene	0.07	0.01	Monoterpene
Rosefuran	0.08	0.01	Monoterpenic ether
Linalool	0.69	0.07	Monoterpenic alcohol
Nonanal	0.23	0.02	Aliphatic aldehyde
Phenylethyl alcohol	425.73	42.57	Simple phenolic
Nerol oxide	0.20	0.02	Aliphatic ether
(2 <i>E</i>)-Hexenal	0.13	0.01	Aliphatic aldehyde
Phenylethyl formate	0.37	0.04	Phenolic ester
Terpinen-4-ol	0.36	0.04	Monoterpenic alcohol
α -Terpineol	0.22	0.02	Monoterpenic alcohol
Rhodinol (α -citronellol)	0.12	0.01	Monoterpenic alcohol
Nerol	12.88	1.29	Monoterpenic alcohol
Citronellol	50.44	5.04	Monoterpenic alcohol
Neral	2.06	0.21	Monoterpenic aldehyde
(<i>Z</i>)-Isogeraniol	0.21	0.02	Monoterpenic alcohol
Phenylethyl acetate	2.13	0.21	Phenolic ester
Geraniol	34.10	3.41	Monoterpenic alcohol
Geranial	1.81	0.18	Monoterpenic aldehyde
Citronellyl formate	0.11	0.01	Monoterpenic ester
Geranyl formate	0.12	0.01	Monoterpenic ester
<i>cis</i> -Rose oxide	1.64	0.16	Monoterpenic ether
<i>trans</i> -Rose oxide	0.41	0.04	Monoterpenic ether
Methyl geranate	0.15	0.01	Monoterpenic ester
Citronellic acid	0.19	0.02	Monoterpenic acid
Unknown	0.41	0.04	Unknown
(3 <i>Z</i>)-Hexenol	0.16	0.02	Aliphatic alcohol
Eugenol	11.99	1.2	Phenylpropanoid
Geranic acid	5.68	0.57	Aliphatic acid

β-Bourbonene	0.28	0.03	Sesquiterpene
Geranyl acetate	2.42	0.24	Monoterpenic ester
β-Elemene	0.38	0.04	Sesquiterpene
Methyleugenol	4.43	0.44	Phenylpropanoid
β-Caryophyllene	1.31	0.13	Sesquiterpene
β-Copaene	0.11	0.01	Sesquiterpene
α-Guaiene	0.88	0.09	Sesquiterpene
α-Humulene	0.68	0.07	Sesquiterpene
(E)-β-Farnesene	0.10	0.01	Sesquiterpene
Germacrene D	2.17	0.22	Sesquiterpene
β-Selinene	0.26	0.03	Sesquiterpene
Unknown	0.21	0.02	Unknown
Phenylethyl 2-methylbutyrate	0.44	0.04	Phenolic ester
Aciphyllene	0.35	0.03	Sesquiterpene
α-Murolene	0.16	0.02	Sesquiterpene
δ-Guaiene	0.76	0.08	Sesquiterpene
Pentadecane	0.72	0.07	Alkane
(3E,6E)-α-Farnesene	0.25	0.03	Sesquiterpene
γ-Cadinene	0.13	0.01	Sesquiterpene
δ-Cadinene	0.16	0.02	Sesquiterpene
Citronellyl butyrate	0.04	0.0	Monoterpenic ester
α-Elemol	0.36	0.04	Sesquiterpenic alcohol
(E)-Nerolidol	0.14	0.01	Sesquiterpenic alcohol
Caryophyllene oxide	0.27	0.03	Sesquiterpenic ether
Phenylethyl tiglate	0.19	0.02	Phenolic ester
Methoxyeugenol	0.22	0.02	Phenylpropanoid
Hexadecane	0.30	0.03	Alkane
β-Eudesmol	0.17	0.02	Sesquiterpenic alcohol
Phenylethyl hexanoate	0.36	0.04	Phenolic ester
(8Z)-Heptadecene	0.75	0.07	Alkene
(2E,6Z)-Farnesol	0.53	0.05	Sesquiterpenic alcohol
Heptadecane	4.36	0.44	Alkane
(2E,6E)-Farnesol	3.81	0.38	Sesquiterpenic alcohol
(2E,6E)-Farnesal	0.19	0.02	Sesquiterpenic aldehyde
Benzyl benzoate	0.29	0.03	Phenolic ester
(8Z)-Octadecene	0.20	0.02	Alkene
Octadecane	0.52	0.05	Alkane
Phenylethyl benzoate	0.79	0.08	Phenolic ester
(9Z)-Nonadecene	11.16	1.12	Alkene
Phenylethyl phenylacetate	0.22	0.02	Phenolic ester
Nonadecane	19.25	1.93	Alkane
Palmitic acid	3.75	0.38	Aliphatic acid
(9Z)-Eicosene	0.97	0.1	Alkene
Ethyl palmitate	0.61	0.06	Aliphatic ester
Eicosane	1.20	0.12	Alkane

Octadecanal	0.37	0.04	Aliphatic aldehyde
Phenylethyl decanoate	0.31	0.03	Phenolic ester
(10Z)-Heneicosene	0.84	0.08	Alkene
Heneicosane	3.63	0.36	Alkane
Citronellyl caprate	0.40	0.04	Monoterpenic ester
Geranyl caprate	0.13	0.01	Monoterpenic ester
Linoleic acid	3.96	0.4	Aliphatic acid
Oleic acid	1.74	0.17	Aliphatic acid
Ethyl linoleate	0.48	0.05	Aliphatic ester
Stearic acid	1.43	0.14	Aliphatic acid
Docosane	0.23	0.02	Alkane
1-Tricosene?	2.08	0.21	Alkene
Tricosane	0.64	0.06	Alkane
Citronellyl laurate	0.50	0.05	Monoterpenic ester
Geranyl laurate	0.44	0.04	Monoterpenic ester
Tetradecyl octanoate	0.34	0.03	Aliphatic ester
Tetradecyl nonanoate	1.14	0.11	Aliphatic ester
Pentadecyl octanoate	1.62	0.16	Aliphatic ester
Phenylethyl myristate	2.20	0.22	Phenolic ester
Pentacosane	0.18	0.02	Alkane
Unknown	4.00	0.4	Phenolic ester
Phenylethyl palmitoleate?	1.06	0.11	Phenolic ester
Phenylethyl palmitate	0.54	0.05	Phenolic ester
Citronellyl palmitoleate?	0.47	0.05	Monoterpenic ester
Geranyl palmitoleate?	2.05	0.2	Monoterpenic ester
Geranyl palmitate	2.23	0.22	Monoterpenic ester
Citronellyl myristate	1.83	0.18	Monoterpenic ester
Nonacosane	0.27	0.03	Alkane
Untriacontane	0.20	0.02	Alkane
α-Tocopherol	2.45	0.25	Tocopherol
Unknown	19.63	1.96	Unknown
Lupeol	15.05	1.51	Triterpenic alcohol
Unknown	42.74	4.27	Oxygenated triterpene
Consolidated total	745.09	74.51	

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

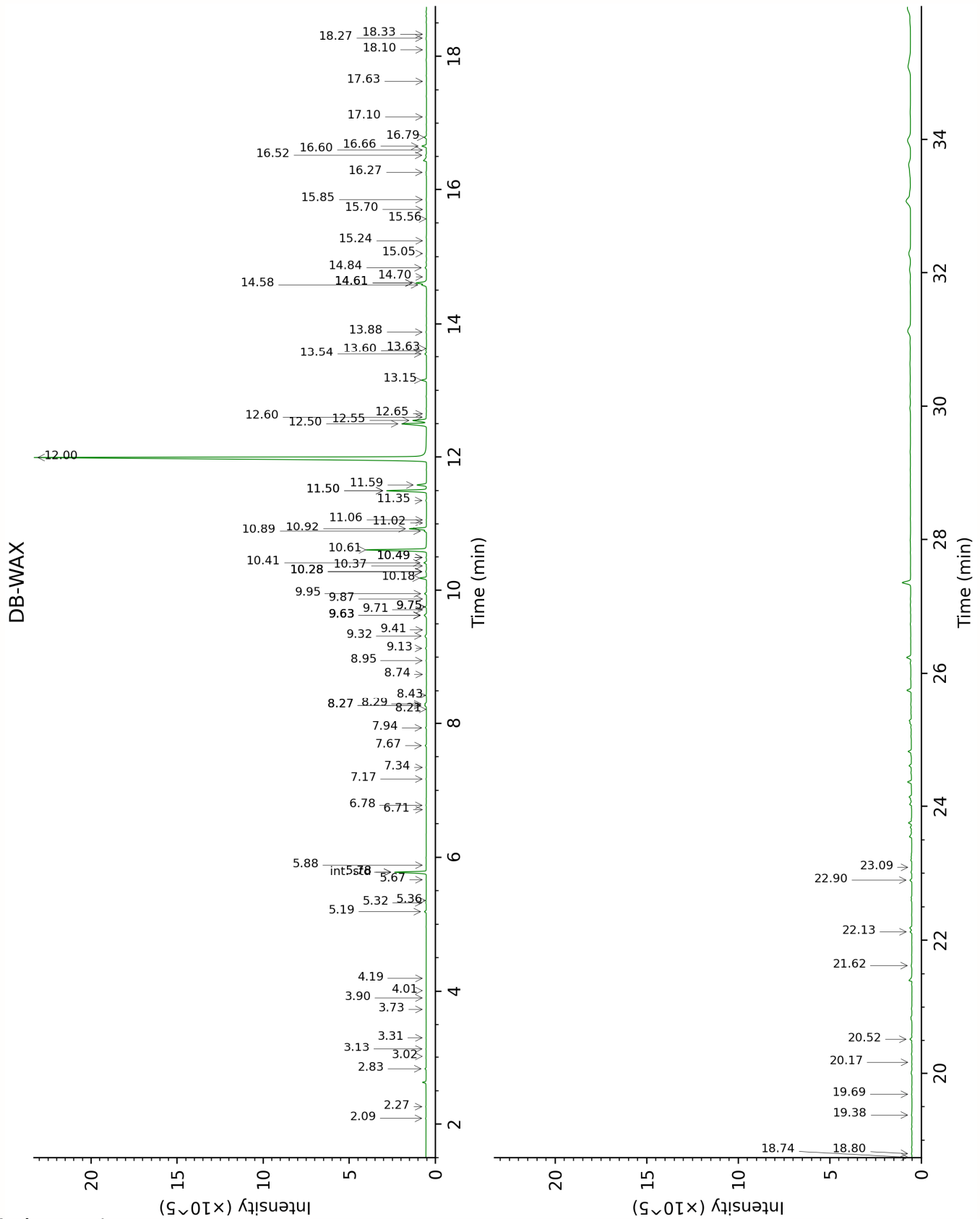
Note: Individual compounds contents were corrected following the method of Cachet et al., 2016 (Flavour and Fragrance Journal guidelines).

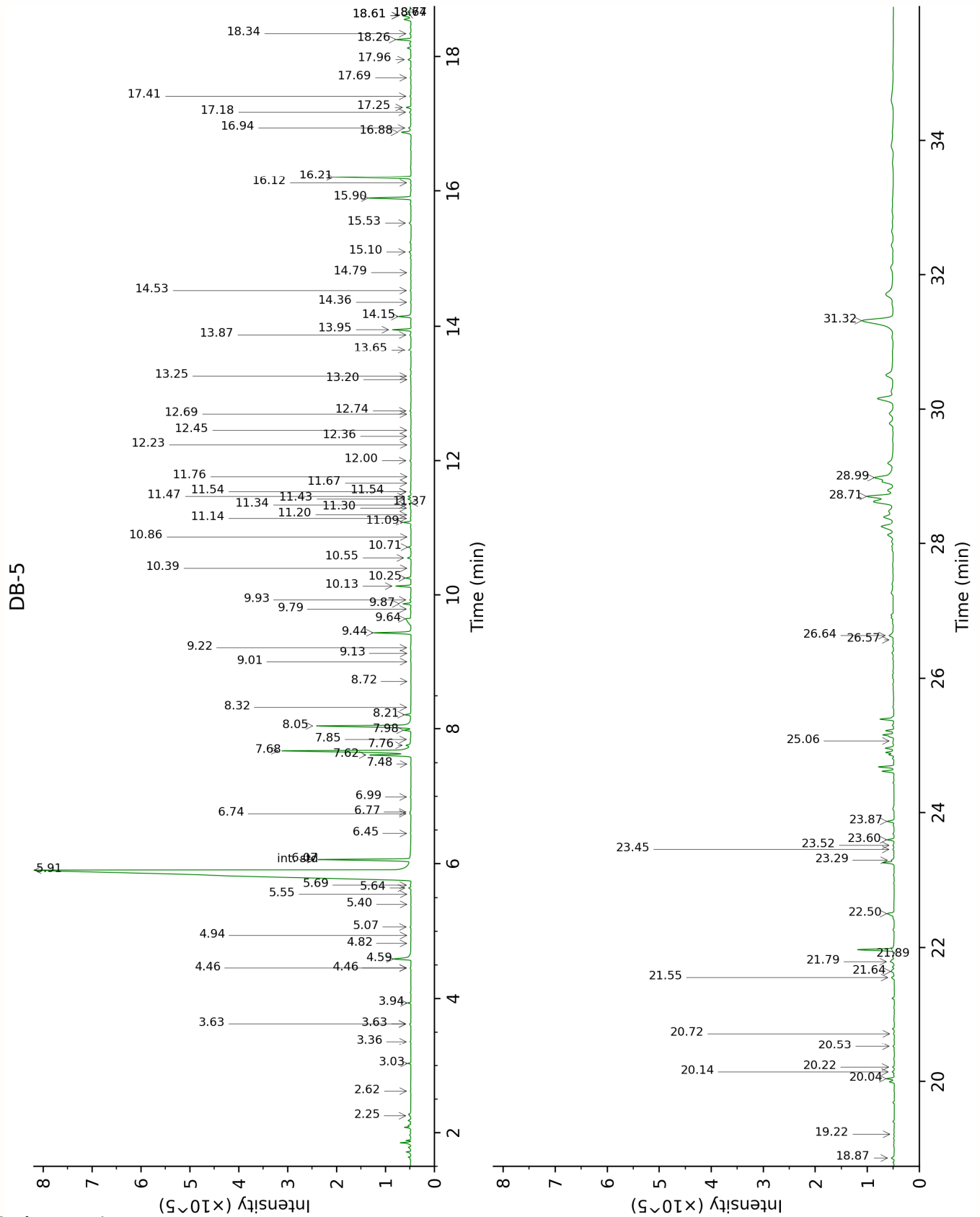
Unknown compounds are expressed in equivalents of internal standard without correction.

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: 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.





FULL ANALYSIS DATA

Hexanol	Column DB-WAX			Column DB-5		
	5.36	1323.3	0.04	2.25	873.8	0.03
Heptanal	3.02	1149.6	0.01	2.62	904.9	0.01
α -Pinene	1.41	1000.1	0.07	3.03	932.6	0.06
Benzaldehyde	7.17	1456.0	0.04	3.36	955.0	0.02
Sabinene	2.26	1088.4	0.02	3.63*	972.8	[0.05]
β -Pinene	2.09	1070.4	0.03	3.63*	972.8	[0.05]
Myrcene	2.83	1134.8	0.09	3.94	993.8	0.08
<i>para</i> -Cymene	4.01	1225.7	0.01	4.46*	1027.3	[0.02]
Limonene	3.13	1158.5	0.02	4.46*	1027.3	[0.02]
Benzyl alcohol	11.59	1812.0	0.94	4.59	1035.7	0.75
(<i>E</i>)- β -Ocimene	3.90	1217.7	0.01	4.82	1050.4	0.01
γ -Terpinene	3.73	1205.3	0.01	4.94	1057.9	0.01
<i>cis</i> -Sabinene hydrate	6.78	1426.8	0.04	5.07	1065.8	0.02
Terpinolene	4.19	1239.0	tr	5.40	1087.0	0.01
Rosefuran	5.88	1361.4	0.02	5.55	1096.5	0.01
Linalool	7.94	1513.8	0.08	5.64	1102.4	0.07
Nonanal				5.69	1105.1	0.02
Phenylethyl alcohol	12.00	1848.3	52.10	5.91	1119.4	44.31
Nerol oxide	6.71	1422.0	0.02	6.45	1154.4	0.02
(2 <i>E</i>)-Hexenal	3.31	1172.6	0.01			
Phenylethyl formate	10.49*	1718.4	[0.05]	6.74	1173.2	0.03
Terpinen-4-ol	8.43	1552.2	0.04	6.77	1174.8	0.04
α -Terpineol	9.63*	1647.2	[0.31]	6.99	1189.2	0.02
Rhodinol (α -citronellol)	10.49*	1718.4	[0.05]	7.48	1221.2	0.01
Nerol	10.92	1754.7	1.67	7.62	1230.3	1.29
Citronellol	10.61	1728.0	6.00	7.68	1234.5	5.16
Neral	9.32	1622.2	0.21	7.76	1239.9	0.20
(<i>Z</i>)-Isogeraniol	11.06	1766.9	0.03	7.85	1245.8	0.02
Phenylethyl acetate	10.89	1751.8	0.20	7.98	1255.0	0.20
Geraniol	11.50*	1804.4	[4.00]	8.05	1259.3	3.42
Geranial	9.95	1673.4	0.18	8.21	1270.4	0.18
Citronellyl formate	8.74	1576.3	0.01	8.32	1277.7	0.01
Geranyl formate	9.75*	1657.4	[0.11]	8.72	1304.2	0.01
<i>cis</i> -Rose oxide	5.19	1311.3	0.18			
<i>trans</i> -Rose oxide	5.32	1320.8	0.04			
Methyl geranate	9.63*	1647.2	[0.31]	9.01	1324.9	0.01
Citronellic acid				9.13	1333.7	0.02

Unknown MISC LVII [m/z 43, 59 (52), 139 (51), 69 (43), 41 (42), 55 (37)...]	15.05	2136.0	0.02	9.22	1339.6	0.04
(3Z)-Hexenol	5.67	1345.7	0.02			
Eugenol	14.61*	2092.3	[1.17]	9.44	1355.3	1.10
Geranic acid				9.64	1369.9	0.49
β-Bourbonene	7.34	1468.9	0.03	9.79	1380.2	0.03
Geranyl acetate	10.41	1711.6	0.25	9.87	1385.6	0.22
β-Elemene	8.30*†	1541.5	[0.15]	9.93	1389.8	0.04
Methyleugenol	13.15	1953.2	0.46	10.13	1404.2	0.42
β-Caryophyllene	8.27*†	1539.6	[0.17]	10.25	1413.2	0.15
β-Copaene	8.21	1535.2	0.01	10.39	1423.9	0.01
α-Guaiene	8.27*†	1539.6	[0.17]	10.55	1435.4	0.10
α-Humulene	9.14	1607.2	0.09	10.71	1447.4	0.08
(E)-β-Farnesene	9.41	1629.5	0.02	10.86	1458.6	0.01
Germacrene D	9.63*	1647.2	[0.31]	11.09	1475.5	0.25
β-Selinene	9.71	1653.9	0.02	11.14	1479.9	0.03
Unknown PRME XIV [m/z 43, 58 (75), 57 (58), 71 (55), 41 (41), 59 (31)...]				11.20	1483.8	0.02
Phenylethyl 2- methylbutyrate	12.65	1906.8	0.02	11.30	1491.4	0.04
Aciphyllene	9.63*	1647.2	[0.31]	11.34	1494.7	0.04
α-Murolene	9.87	1667.0	0.02	11.37	1496.9	0.02
δ-Guaiene	9.75*	1657.4	[0.11]	11.43	1501.3	0.09
Pentadecane	7.67	1493.2	0.10	11.47	1504.2	0.09
(3E,6E)-α- Farnesene	10.37	1707.7	0.03	11.54*	1509.6	[0.04]
γ-Cadinene	10.28*	1700.5	[0.10]	11.54*	1509.6	[0.04]
δ-Cadinene	10.28*	1700.5	[0.10]	11.67	1519.6	0.02
Citronellyl butyrate	11.02	1763.0	0.03	11.76	1527.1	tr
α-Elemol	13.88	2021.6	0.07	12.00	1545.9	0.04
(E)-Nerolidol	13.64	1998.1	0.03	12.23	1564.2	0.01
Caryophyllene oxide	12.60	1902.2	0.04	12.36	1574.2	0.03
Phenylethyl tiglate	14.84	2114.9	0.16	12.45	1581.2	0.02
Methoxyeugenol	18.10	2459.9	0.03	12.69	1600.0	0.02
Hexadecane	8.95	1592.4	0.04	12.74	1603.9	0.04
β-Eudesmol	15.24	2155.1	0.01	13.20	1642.2	0.02

Phenylethyl hexanoate	14.70	2101.3	0.03	13.25	1646.4	0.04
(8Z)-Heptadecene	10.28*	1700.5	[0.10]	13.65	1679.1	0.09
(2E,6Z)-Farnesol	16.27	2260.7	0.07	13.87	1697.7	0.06
Heptadecane	10.18	1692.3	0.64	13.95	1704.1	0.53
(2E,6E)-Farnesol	16.66	2302.1	0.48	14.15	1721.0	0.41
(2E,6E)-Farnesal	15.70	2202.2	0.02	14.36	1739.2	0.02
Benzyl benzoate	18.74	2533.7	0.01	14.53	1754.2	0.03
(8Z)-Octadecene	11.50*	1804.4	[4.00]	14.79	1777.1	0.02
Octadecane	11.35	1791.4	0.08	15.10	1803.7	0.06
Phenylethyl benzoate	19.38	2608.1	0.10	15.53	1842.4	0.08
(9Z)-Nonadecene	12.55	1897.6	1.53	15.90	1876.0	1.35
Phenylethyl phenylacetate	20.17	2703.4	0.04	16.12	1896.6	0.02
Nonadecane	12.50	1893.0	2.70	16.21	1904.5	2.35
Palmitic acid				16.88	1968.3	0.38
(9Z)-Eicosene	13.60	1994.9	0.08	16.94	1974.3	0.12
Ethyl palmitate	15.85	2217.5	0.07	17.18	1996.5	0.06
Eicosane	13.54	1989.3	0.16	17.25	2003.2	0.15
Octadecanal	16.60	2295.8	0.05	17.42	2019.7	0.04
Phenylethyl decanoate				17.69	2046.8	0.03
(10Z)-Heneicosene	14.61*	2092.3	[1.17]	17.96	2073.5	0.10
Heneicosane	14.58	2089.4	0.46	18.26	2103.1	0.44
Citronellyl caprate	17.10	2349.1	0.04	18.34	2112.1	0.04
Geranyl caprate	17.63	2407.2	0.01	18.61*	2139.7	[0.41]
Linoleic acid				18.61*	2139.7	[0.41]
Oleic acid				18.67	2145.5	0.18
Ethyl linoleate	18.27	2479.5	0.04	18.74	2152.8	0.05
Stearic acid				18.87	2166.1	0.15
Docosane	15.56	2187.7	0.02	19.22	2202.6	0.03
1-Tricosene?	16.79	2316.4	0.24	20.04	2291.3	0.25
Tricosane	16.52	2287.3	0.10	20.14	2302.0	0.08
Citronellyl laurate	18.80	2540.2	0.08	20.22	2310.1	0.05
Geranyl laurate	19.69	2645.4	0.05	20.53	2344.6	0.05
Tetradecyl octanoate				20.72	2366.4	0.04
Tetradecyl nonanoate				21.56	2461.9	0.12

Pentadecyl octanoate				21.64	2472.2	0.17
Phenylethyl myristate	22.13	2953.7	0.20	21.79	2489.1	0.24
Pentacosane	18.33	2486.0	0.03	21.89	2500.9	0.02
Unknown ROAB II [m/z 105, 79 (23), 104 (16), 67 (12), 95 (12), 106 (9)... 382 (1)]				22.50	2574.3	0.35
Phenylethyl palmitoleate?				23.29	2671.7	0.12
Phenylethyl palmitate				23.46	2691.7	0.06
Citronellyl palmitoleate?				23.52	2699.2	0.05
Geranyl palmitoleate?				23.60	2709.7	0.22
Geranyl palmitate	22.90	3057.7	0.22	23.87	2744.9	0.24
Citronellyl myristate	20.52	2747.5	0.21			
Nonacosane	21.62	2887.1	0.16	25.06	2901.7	0.03
Untriacontane	23.09	3083.8	0.03	26.57	3104.1	0.02
α-Tocopherol				26.64	3111.0	0.27
Unknown PLAL IV [m/z 218, 203 (49), 207 (42), 219 (19), 69 (18), 95 (17), 189 (17)...]				28.71	3306.3	1.71
Lupeol				28.99	3325.6	1.70
Unknown ROAB III [m/z 109, 69 (43), 95 (41), 43 (27), 205 (25)... 424 (11)...]				31.32	3468.8	3.73
Total reported		80.47%			79.06%	

*: 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