

Date : 2024-01-26

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24A19-PTH03

Customer Identification : Rose Absolute - R30113R

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 : 2024-01-23

PHYSICOCHEMICAL DATA

CONCLUSION

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

ANALYSIS SUMMARY

Identification	mg/g	% m/m	Class
(3Z)-Hexenol	0.56	0.06	Aliphatic alcohol
Hexanol	0.16	0.02	Aliphatic alcohol
Heptanal	0.16	0.02	Aliphatic aldehyde
α -Pinene	0.12	0.01	Monoterpene
β -Pinene	0.05	0.01	Monoterpene
Sabinene	0.04	0.0	Monoterpene
Myrcene	0.22	0.02	Monoterpene
Limonene	0.09	0.01	Monoterpene
Benzyl alcohol	1.48	0.15	Simple phenolic
(Z)- β -Ocimene	0.02	0.0	Monoterpene
(E)- β -Ocimene	0.04	0.0	Monoterpene
Linalool	0.15	0.01	Monoterpenic alcohol
Phenylethyl alcohol	322.61	32.26	Simple phenolic
Terpinen-4-ol	0.09	0.01	Monoterpenic alcohol
Phenylethyl formate	0.19	0.02	Phenolic ester
Rhodinol (α -citronellol)	0.61	0.06	Monoterpenic alcohol
Nerol	1.40	0.14	Monoterpenic alcohol
Citronellol	87.65	8.77	Monoterpenic alcohol
Geraniol	49.02	4.9	Monoterpenic alcohol
Geranial	0.78	0.08	Monoterpenic aldehyde
Citronellyl formate	0.04	0.0	Monoterpenic ester
Citronellyl acetate	0.27	0.03	Monoterpenic ester
Eugenol	4.88	0.49	Phenylpropanoid
Geranic acid	0.11	0.01	Aliphatic acid
Geranyl acetate	0.38	0.04	Monoterpenic ester
Ethyl decanoate	0.56	0.06	Aliphatic ester
Methyleugenol	0.98	0.1	Phenylpropanoid
β -Caryophyllene	1.08	0.11	Sesquiterpene
α -Guaiene	0.22	0.02	Sesquiterpene
α -Humulene	0.28	0.03	Sesquiterpene
Germacrene D	0.31	0.03	Sesquiterpene
δ -Guaiene	0.20	0.02	Sesquiterpene
Pentadecane	0.17	0.02	Alkane
γ -Cadinene	0.11	0.01	Sesquiterpene
Caryophyllene oxide	0.25	0.03	Sesquiterpenic ether
Ethyl laurate	0.32	0.03	Aliphatic ester
Hexadecane	0.15	0.01	Alkane
α -Bisabolol	0.28	0.03	Sesquiterpenic alcohol
(2E,6Z)-Farnesol	0.11	0.01	Sesquiterpenic alcohol
(2E,6E)-Farnesol	0.49	0.05	Sesquiterpenic alcohol
Octadecane	0.31	0.03	Alkane

Phenylethyl benzoate	0.13	0.01	Phenolic ester
(9Z)-Nonadecene	1.41	0.14	Alkene
Nonadecane	2.13	0.21	Alkane
Palmitic acid	4.64	0.46	Aliphatic acid
(9Z)-Eicosene	0.15	0.01	Alkene
Ethyl palmitate	1.00	0.1	Aliphatic ester
Eicosane	0.28	0.03	Alkane
(10Z)-Heneicosene	0.43	0.04	Alkene
Heneicosane	0.53	0.05	Alkane
Citronellyl caprate	0.18	0.02	Monoterpenic ester
Phenylethyl undecanoate?	4.92	0.49	Phenolic ester
Ethyl linoleate	2.91	0.29	Aliphatic ester
Stearic acid	12.08	1.21	Aliphatic acid
Tricosane	0.28	0.03	Alkane
Citronellyl laurate	0.17	0.02	Monoterpenic ester
Geranyl laurate	0.15	0.01	Monoterpenic ester
Tetradecyl octanoate	0.33	0.03	Aliphatic ester
Pentadecyl octanoate	0.97	0.1	Aliphatic ester
Phenylethyl myristate	0.30	0.03	Phenolic ester
Unknown	1.96	0.2	Phenolic ester
Phenylethyl palmitoleate?	0.12	0.01	Phenolic ester
Phenylethyl palmitate	0.14	0.01	Phenolic ester
Citronellyl palmitoleate?	0.23	0.02	Monoterpenic ester
Heptacosane	0.42	0.04	Alkane
Citronellyl palmitate	0.13	0.01	Monoterpenic ester
Citronellyl myristate	0.37	0.04	Monoterpenic ester
α-Tocopherol	0.15	0.01	Tocopherol
Unknown	1.88	0.19	Oxygenated triterpene
Consolidated total	515.33	51.53	

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

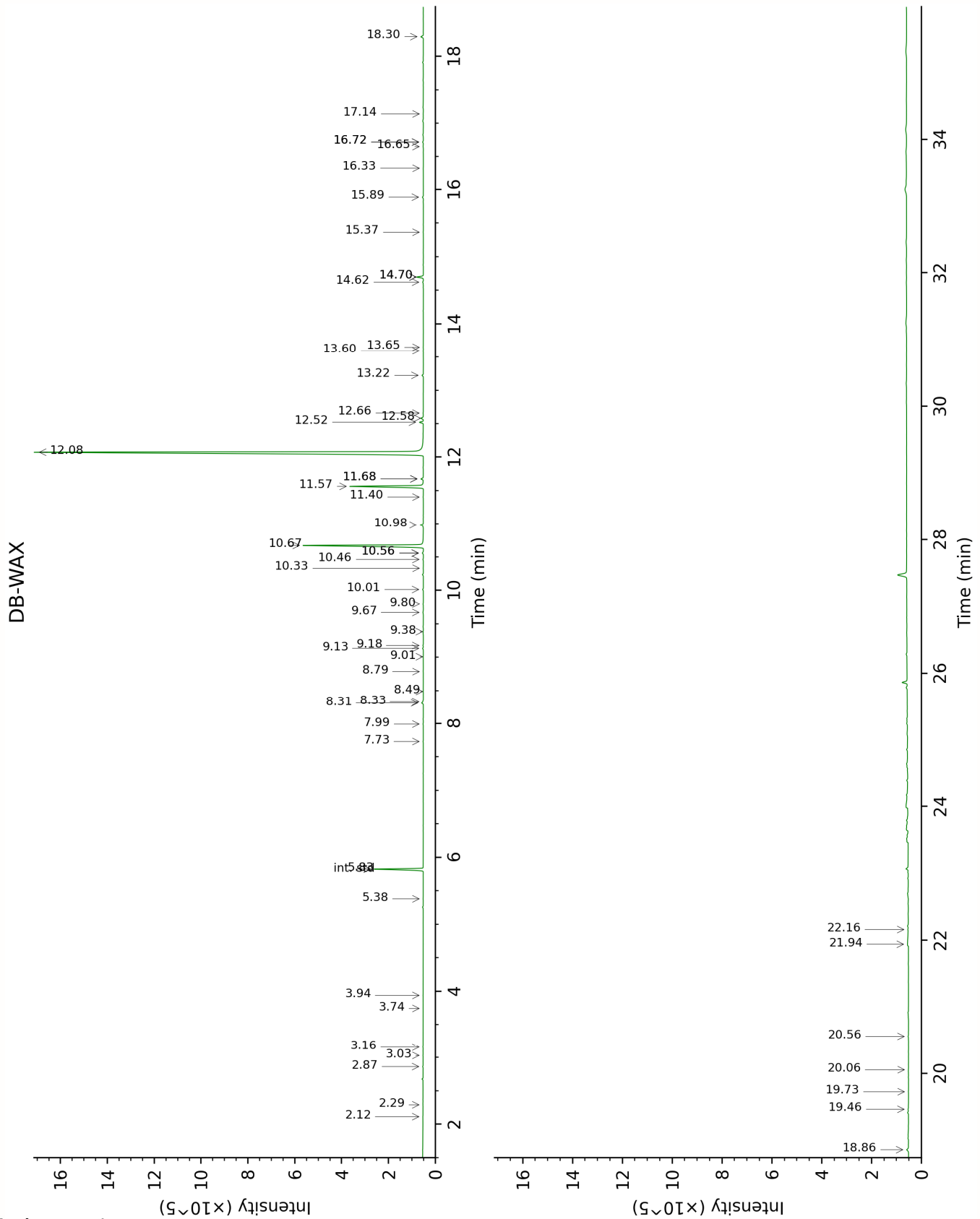
Note: Individual compounds contents were corrected following the method of Cachet et al., 2016 (Flavour and Fragrance Journal guidelines).

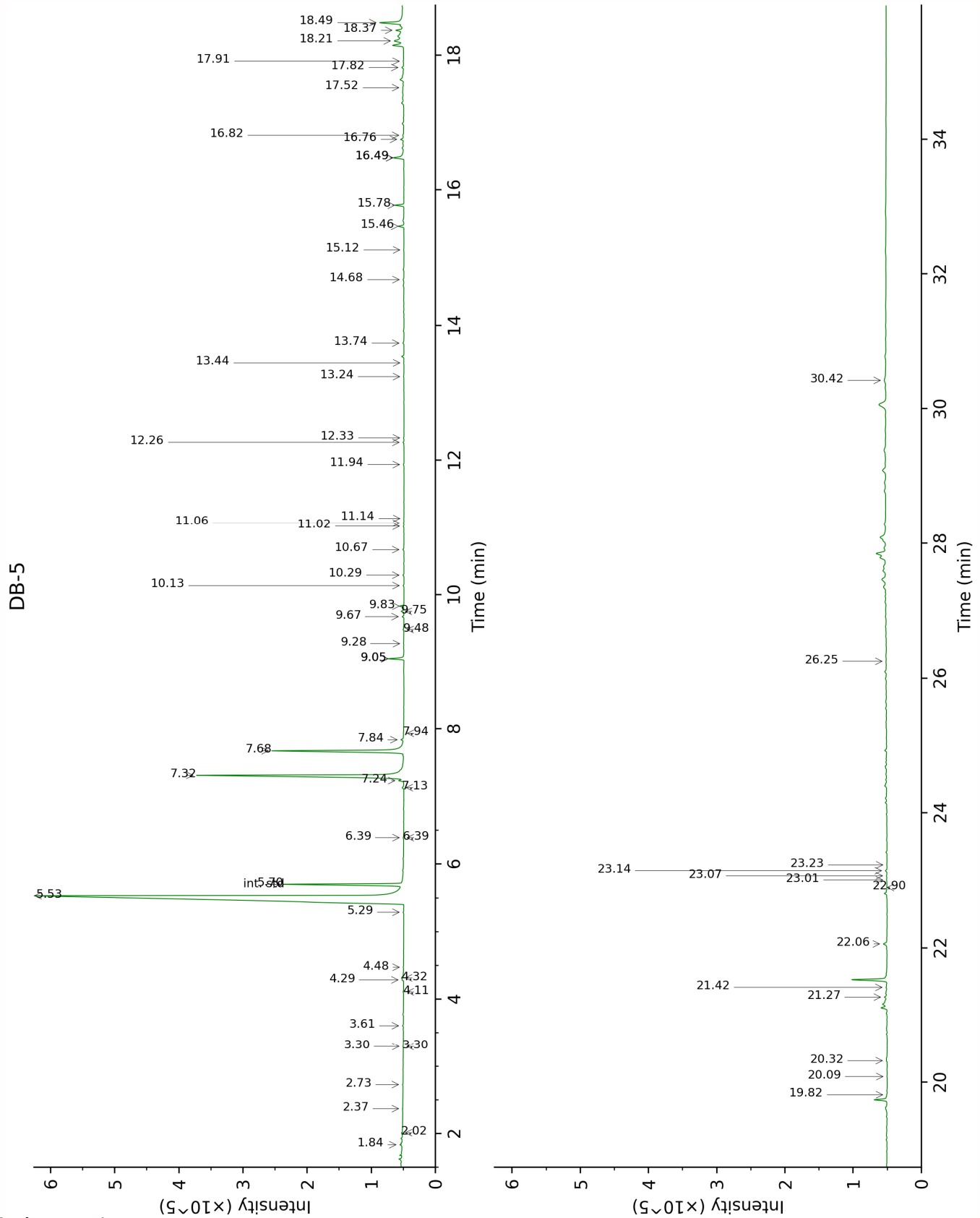
Unknown compounds are expressed in equivalents of internal standard without correction.

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

(3Z)-Hexenol	Column DB-WAX			Column DB-5		
				1.84	857.4	0.08
Hexanol	5.38	1324.5	0.01	2.02	874.2	0.02
Heptanal	3.03	1148.4	0.01	2.37	906.7	0.02
α -Pinene	1.43	999.4	0.02	2.73	931.9	0.02
β -Pinene	2.12	1070.6	0.01	3.30*	972.1	[0.02]
Sabinene	2.29	1088.8	0.01	3.30*	972.1	[0.02]
Myrcene	2.86	1135.2	0.03	3.61	994.0	0.04
Limonene	3.16	1158.2	0.02	4.11	1027.4	0.01
Benzyl alcohol	11.68*	1816.1	[0.29]	4.29*†	1038.7	[0.08]
(Z)- β -Ocimene	3.74	1202.4	tr	4.32*†	1040.7	[0.15]
(E)- β -Ocimene	3.94	1216.1	0.01	4.48	1050.8	0.01
Linalool	7.99	1515.9	0.03	5.29	1103.1	0.02
Phenylethyl alcohol	12.08	1851.2	54.70	5.53	1118.9	50.46
Terpinen-4-ol	8.49	1554.1	0.01	6.39*	1174.1	[0.04]
Phenylethyl formate	10.56*	1720.4	[0.12]	6.39*	1174.1	[0.04]
Rhodinol (α -citronellol)	10.56*	1720.4	[0.12]	7.13	1222.2	0.09
Nerol	10.98	1756.4	0.33	7.24	1229.1	0.21
Citronellol	10.67	1730.1	14.20	7.32	1234.4	13.48
Geraniol	11.57	1806.2	8.10	7.68	1258.4	7.39
Geranial	10.01	1675.2	0.08	7.84	1269.2	0.11
Citronellyl formate	8.79	1577.0	0.04	7.94	1275.5	tr
Citronellyl acetate	9.38	1624.4	0.04	9.05*	1353.1	[0.71]
Eugenol	14.70*	2096.0	[0.75]	9.05*	1353.1	[0.71]
Geranic acid	16.72*	2303.2	[0.09]	9.28	1369.1	0.01
Geranyl acetate	10.46	1712.4	0.05	9.48	1384.1	0.05
Ethyl decanoate	9.14	1604.4	0.08	9.67	1397.7	0.08
Methyleugenol	13.22	1955.4	0.14	9.75	1403.4	0.14
β -Caryophyllene	8.31	1540.4	0.19	9.83	1409.3	0.19
α -Guaiene	8.33	1541.7	0.05	10.13	1432.2	0.04
α -Humulene	9.18	1607.8	0.05	10.29	1443.8	0.05
Germacrene D	9.67	1647.6	0.08	10.67	1472.4	0.05
δ -Guaiene	9.80	1657.8	0.03	11.02	1498.7	0.03
Pentadecane	7.73	1495.8	0.03	11.06	1502.4	0.03
γ -Cadinene	10.33	1701.3	0.02	11.14	1508.0	0.02
Caryophyllene oxide	12.66	1903.4	0.03	11.94	1571.6	0.04
Ethyl laurate	11.68*	1816.1	[0.29]	12.26	1597.7	0.05
Hexadecane	9.01	1594.2	0.02	12.33	1603.0	0.03

α-Bisabolol	15.37	2162.6	0.03	13.24	1678.5	0.04
(2E,6Z)-Farnesol	16.33	2261.8	0.03	13.44	1695.4	0.02
(2E,6E)-Farnesol	16.72*	2303.2	[0.09]	13.74	1721.4	0.08
Octadecane	11.40	1792.1	0.03	14.68	1803.1	0.06
Phenylethyl benzoate	19.46	2613.0	0.07	15.12	1843.0	0.02
(9Z)-Nonadecene	12.58	1896.3	0.26	15.46	1874.9	0.26
Nonadecane	12.52	1890.9	0.38	15.78	1903.2	0.39
Palmitic acid	21.94	2924.0	0.70	16.49*	1970.9	[0.77]
(9Z)-Eicosene	13.65	1995.1	0.03	16.49*	1970.9	[0.77]
Ethyl palmitate	15.89	2216.0	0.11	16.76	1996.9	0.16
Eicosane	13.60	1989.7	0.03	16.82	2002.6	0.05
(10Z)-Heneicosene	14.70*	2096.0	[0.75]	17.52	2072.6	0.08
Heneicosane	14.62	2088.3	0.09	17.82	2102.1	0.10
Citronellyl caprate	17.14	2348.6	0.04	17.91	2111.7	0.03
Phenylethyl undecanoate?				18.22	2142.8	0.78
Ethyl linoleate	18.30	2476.5	0.30	18.37	2159.1	0.45
Stearic acid				18.49	2170.8	1.87
Tricosane	16.65	2295.9	0.05			
Citronellyl laurate	18.86	2541.8	0.31	19.82	2312.7	0.03
Geranyl laurate	19.73	2644.5	0.03	20.09	2342.8	0.02
Tetradecyl octanoate				20.32	2369.0	0.05
Pentadecyl octanoate				21.27	2477.6	0.16
Phenylethyl myristate	22.16	2953.1	0.10	21.42	2494.4	0.05
Unknown ROAB II [m/z 105, 79 (23), 104 (16), 67 (12), 95 (12), 106 (9)... 382 (1)]				22.06	2570.9	0.26
Phenylethyl palmitoleate?				22.90	2673.2	0.02
Phenylethyl palmitate				23.01	2686.9	0.02
Citronellyl palmitoleate?				23.07	2694.4	0.04
Heptacosane	20.06	2684.3	0.02	23.14	2703.9	0.08
Citronellyl				23.23	2715.0	0.02

palmitate						
Citronellyl myristate	20.56	2747.2	0.06			
α-Tocopherol				26.25	3116.5	0.03
Unknown ROAB III [m/z 109, 69 (43), 95 (41), 43 (27), 205 (25)... 424 (11)...]				30.42	3470.3	0.25
Total reported	87.19%			84.84%		

*: 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