Date : 2024-04-11

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 24C26-PTH02
Customer Identification : Rose Absolute - France - R30114R
Type : Absolute
Source : *Rosa centifolia*
Customer : Plant Therapy

Checked an approved by:

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

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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

Méthode certifiée ISO 17025:2017 Certified method

Laboratoire PhytoChemia

628 Boulevard du Saguenay Ouest, Saguenay (Qc) G7J 1H4 | www.phytochemia.com

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 : 2024-04-07

Physicochemical data

Conclusion

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

628 Boulevard du Saguenay, Saguenay (Qc) G7J 1H4 | www.phytochemia.com

Analysis Summary

Identification	mg/g	% m/m	Class
(3*Z*)-Hexenol	0.52	0.05	Aliphatic alcohol
Hexanol	0.02	0.0	Aliphatic alcohol
Heptanal	0.06	0.01	Aliphatic aldehyde
α-Pinene	0.16	0.02	Monoterpene
Benzaldehyde	0.08	0.01	Simple phenolic
Sabinene	0.05	0.01	Monoterpene
β-Pinene	0.07	0.01	Monoterpene
Myrcene	0.19	0.02	Monoterpene
Limonene	0.09	0.01	Monoterpene
Benzyl alcohol	1.73	0.17	Simple phenolic
(*Z*)-β-Ocimene	0.05	0.01	Monoterpene
(*E*)-β-Ocimene	0.14	0.01	Monoterpene
Linalool	0.20	0.02	Monoterpenic alcohol
cis-Rose oxide	0.44	0.04	Monoterpenic ether
Phenylethyl alcohol	358.43	35.84	Simple phenolic
Terpinen-4-ol	0.15	0.01	Monoterpenic alcohol
Phenylethyl formate	0.84	0.08	Phenolic ester
α-Terpineol	0.08	0.01	Monoterpenic alcohol
Nerol	1.53	0.15	Monoterpenic alcohol
Citronellol	95.89	9.59	Monoterpenic alcohol
Neral	0.26	0.03	Monoterpenic aldehyde
Phenylethyl acetate	0.55	0.06	Phenolic ester
Geraniol	53.53	5.35	Monoterpenic alcohol
Geranial	0.97	0.1	Monoterpenic aldehyde
Citronellyl formate	0.18	0.02	Monoterpenic ester
Unknown	0.13	0.01	Unknown
Eugenol	6.22	0.62	Phenylpropanoid
Geranic acid	0.93	0.09	Aliphatic acid
Geranyl acetate	0.38	0.04	Monoterpenic ester
Methyleugenol	1.05	0.11	Phenylpropanoid
β-Caryophyllene	1.14	0.11	Sesquiterpene
α-Guaiene	0.24	0.02	Sesquiterpene
α-Humulene	0.31	0.03	Sesquiterpene
Germacrene D	0.47	0.05	Sesquiterpene
Aciphyllene	0.08	0.01	Sesquiterpene
δ-Guaiene	0.20	0.02	Sesquiterpene
Pentadecane	0.14	0.01	Alkane
γ-Cadinene	0.10	0.01	Sesquiterpene
α-Elemol	0.05	0.01	Sesquiterpenic alcohol
Caryophyllene oxide	0.23	0.02	Sesquiterpenic ether
Hexadecane	0.07	0.01	Alkane

Phenylethyl hexanoate	0.11	0.01	Phenolic ester
(8*Z*)-Heptadecene	0.19	0.02	Alkene
(2*E*,6*Z*)-Farnesol	0.11	0.01	Sesquiterpenic alcohol
Heptadecane	0.53	0.05	Alkane
(2*E*,6*E*)-Farnesol	0.52	0.05	Sesquiterpenic alcohol
Octadecane	0.14	0.01	Alkane
Phenylethyl benzoate	0.18	0.02	Phenolic ester
(9*Z*)-Nonadecene	1.58	0.16	Alkene
Nonadecane	2.26	0.23	Alkane
Palmitic acid	4.55	0.45	Aliphatic acid
Ethyl palmitate	0.77	0.08	Aliphatic ester
Eicosane	0.25	0.03	Alkane
Phenylethyl decanoate	0.78	0.08	Phenolic ester
(10*Z*)-Heneicosene	0.26	0.03	Alkene
Heneicosane	0.43	0.04	Alkane
Citronellyl caprate	0.13	0.01	Monoterpenic ester
Geranyl caprate	1.63	0.16	Monoterpenic ester
Phenylethyl undecanoate?	2.43	0.24	Phenolic ester
Docosene isomer	0.44	0.04	Alkene
Stearic acid	7.59	0.76	Aliphatic acid
Tricosane	0.15	0.01	Alkane
Citronellyl laurate	0.19	0.02	Monoterpenic ester
Tetradecyl nonanoate	1.89	0.19	Aliphatic ester
Pentadecyl octanoate	1.77	0.18	Aliphatic ester
Phenylethyl myristate	0.83	0.08	Phenolic ester
Citronellyl myristate	2.13	0.21	Monoterpenic ester
Unknown	0.10	0.01	Phenolic ester
Unknown	3.51	0.35	Phenolic ester
Phenylethyl palmitoleate?	1.39	0.14	Phenolic ester
Heptacosane	0.08	0.01	Alkane
Citronellyl palmitate	0.48	0.05	Monoterpenic ester
Geranyl palmitate	0.44	0.04	Monoterpenic ester
α-Tocopherol	0.77	0.08	Tocopherol
Unknown	9.13	0.91	Oxygenated triterpene
Consolidated total	**575.70**	**57.57**	

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

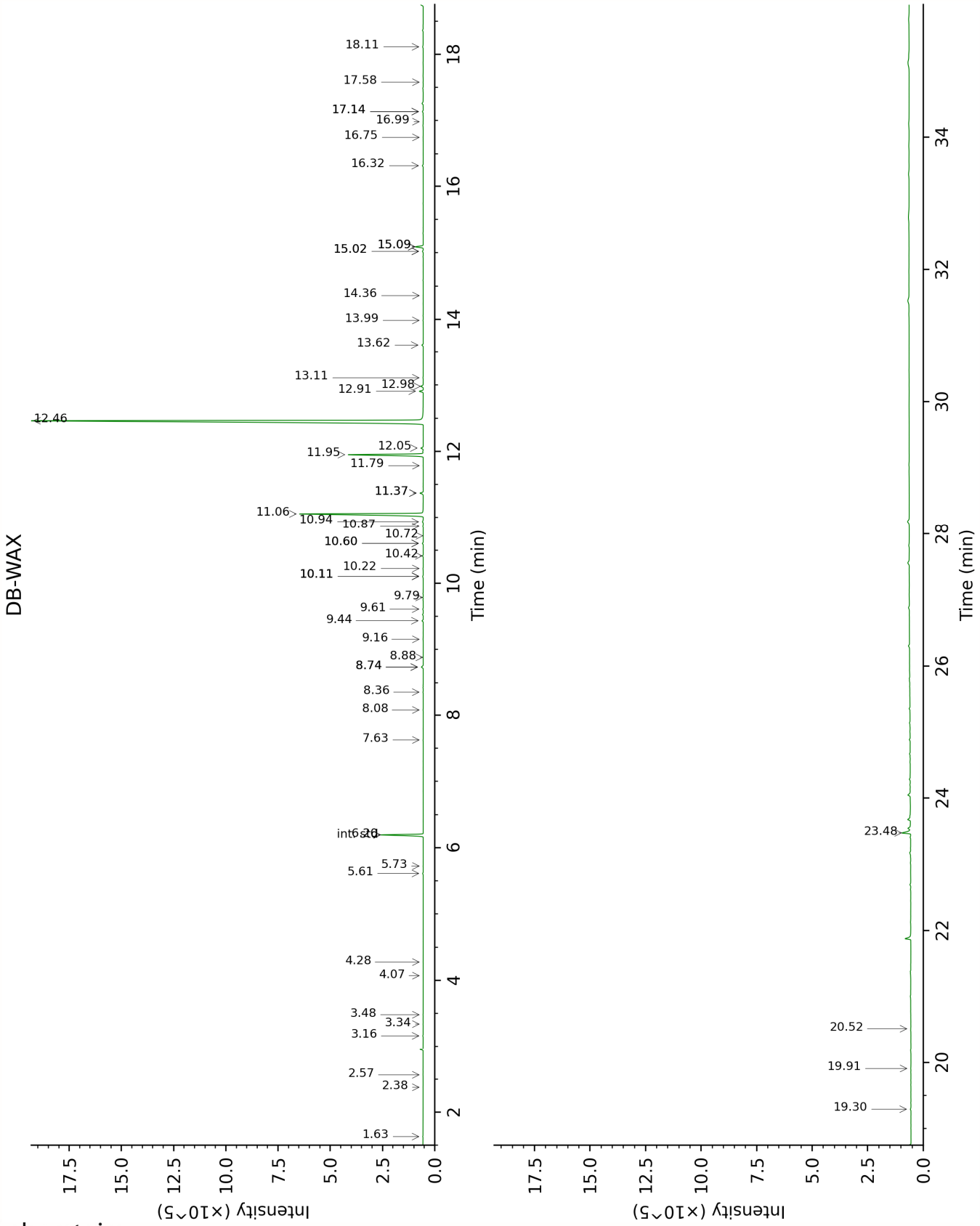
Note: Individual compounds contents were corrected following the method of Cachet et al., 2016 (Flavour and Fragrance Journal guidelines).
Unknown compounds are expressed in equivalents of internal standard without correction.

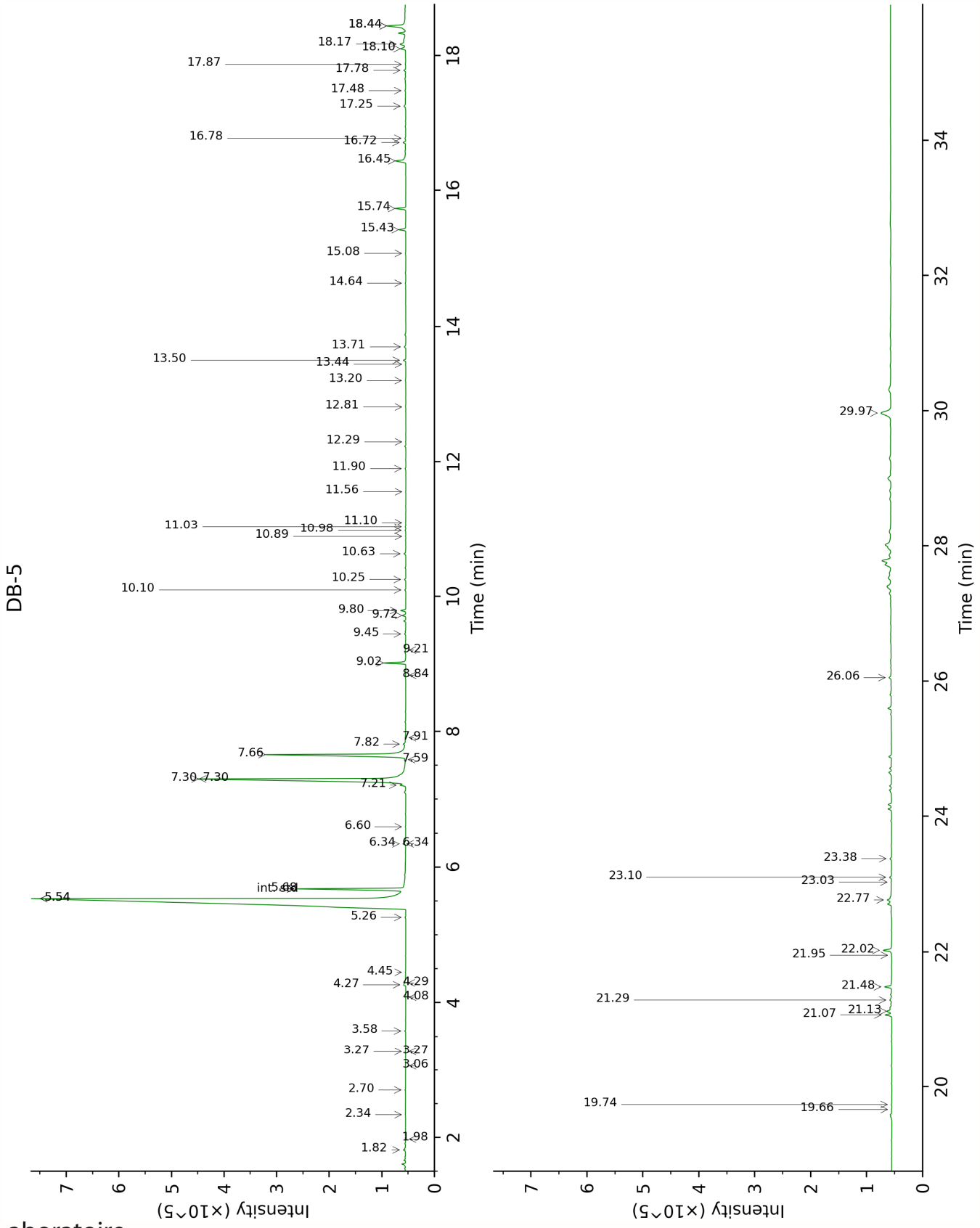
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

628 Boulevard du Saguenay, Saguenay (Qc) G7J 1H4 | www.phytochemia.com


DB-WAX
18.11
17.58
17.14
16.99
16.75
16.32
15.02
15.09
14.36
13.99
13.62
13.11
12.91
12.98
12.46
12.05
11.95
11.79
11.37
11.06
10.94
10.87
10.72
10.60
10.42
10.22
10.11
9.79
9.61
9.44
9.16
8.88
8.74
8.36
8.08
7.63
6.28
5.73
5.61
4.28
4.07
3.48
3.34
3.16
2.57
2.38
1.63
23.48
20.52
19.91
19.30
Time (min)
Intensity (×10^5)


DB-5
Time (min)
Intensity (×10^5)
18.44
18.17
18.10
17.87
17.78
17.48
17.25
16.78
16.72
16.45
15.74
15.43
15.08
14.64
13.71
13.50
13.44
13.20
12.81
12.29
11.90
11.56
11.10
11.03
10.98
10.89
10.63
10.25
10.10
9.80
9.72
9.45
9.21
9.02
8.84
7.91
7.82
7.66
7.59
7.30
7.30
7.21
6.60
6.34
6.34
5.54
5.26
4.45
4.27
4.29
4.08
3.58
3.27
3.27
3.06
2.70
2.34
1.98
1.82
29.97
26.06
23.38
23.10
23.03
22.77
22.02
21.95
21.48
21.29
21.13
21.07
19.74
19.66

FULL ANALYSIS DATA

(3Z)-Hexenol	Column DB-WAX			Column DB-5		
				1.82	858.9	0.07
Hexanol	5.73	1322.0	0.01	1.98	873.8	tr
Heptanal	3.34	1148.0	0.02	2.34	906.4	0.01
α-Pinene	1.63	1000.7	0.02	2.70	932.1	0.03
Benzaldehyde	7.63	1459.2	0.03	3.06	957.1	0.01
Sabinene	2.57	1088.1	0.01	3.27*	972.1	[0.02]
β-Pinene	2.38	1070.5	0.01	3.27*	972.1	[0.02]
Myrcene	3.16	1134.7	0.03	3.58	993.8	0.03
Limonene	3.48	1158.6	0.02	4.08	1026.8	0.02
Benzyl alcohol	12.05	1813.1	0.27	4.27*†	1038.6	[0.11]
(*Z*)-β-Ocimene	4.07	1202.0	0.01	4.29*†	1040.4	[0.12]
(*E*)-β-Ocimene	4.28	1216.3	0.02	4.45	1050.5	0.02
Linalool	8.36	1513.9	0.03	5.26	1102.7	0.03
cis-Rose oxide	5.61	1314.1	0.07	5.54*	1120.7	[54.13]
Phenylethyl alcohol	12.46	1849.3	56.89	5.54*	1120.7	[54.13]
Terpinen-4-ol	8.88	1554.2	0.02	6.34*	1173.2	[0.16]
Phenylethyl formate	10.94	1718.6	0.11	6.34*	1173.2	[0.16]
α-Terpineol	10.11*	1650.6	[0.09]	6.60	1189.5	0.01
Nerol	11.37*	1755.1	[0.38]	7.21	1230.4	0.23
Citronellol	11.06	1728.6	14.96	7.30*	1236.6	[14.63]
Neral	9.79	1625.0	0.04	7.30*	1236.6	[14.63]
Phenylethyl acetate	11.37*	1755.1	[0.38]	7.59	1255.8	0.08
Geraniol	11.95	1804.3	8.28	7.66	1260.8	7.98
Geranial	10.42	1675.4	0.08	7.82	1271.3	0.14
Citronellyl formate	9.16	1575.1	0.02	7.91	1277.7	0.02
Unknown MISC LVII [m/z 43, 59 (52), 139 (51), 69 (43), 41 (42), 55 (37)...]				8.84	1342.6	0.02
Eugenol	15.09*	2093.1	[0.86]	9.02	1355.5	0.85
Geranic acid	17.14*	2301.6	[0.10]	9.21†	1369.0	0.06
Geranyl acetate	10.86	1712.3	0.05	9.45	1385.9	0.05
Methyleugenol	13.62	1953.2	0.15	9.72	1405.4	0.15
β-Caryophyllene	8.74*	1543.0	[0.24]	9.80	1410.9	0.20
α-Guaiene	8.74*	1543.0	[0.24]	10.10	1433.7	0.04
α-Humulene	9.61	1610.8	0.05	10.25	1445.2	0.05
Germacrene D	10.11*	1650.6	[0.09]	10.63	1473.7	0.08
Aciphyllene	10.11*	1650.6	[0.09]	10.89	1493.0	0.01

δ-Guaiene	10.22	1660.1	0.05	10.98	1499.7	0.03
Pentadecane	8.08	1492.5	0.02	11.03	1503.7	0.03
γ-Cadinene	10.72	1700.0	0.02	11.10	1509.0	0.02
α-Elemol	14.36	2022.8	tr	11.56	1545.2	0.01
Caryophyllene oxide	13.11	1907.0	0.03	11.90	1572.1	0.04
Hexadecane	9.44	1596.7	0.13	12.29	1603.4	0.01
Phenylethyl hexanoate	15.09*	2093.1	[0.86]	12.81	1646.1	0.02
(8*Z*)-Heptadecene	10.60*	1690.5	[0.10]	13.20	1678.5	0.03
(2*E*,6*Z*)-Farnesol	16.75	2260.8	0.02	13.44	1698.5	0.02
Heptadecane	10.60*	1690.5	[0.10]	13.50	1703.4	0.10
(2*E*,6*E*)-Farnesol	17.14*	2301.6	[0.10]	13.70	1721.6	0.08
Octadecane	11.79	1789.8	0.02	14.64	1803.3	0.03
Phenylethyl benzoate	19.91	2612.8	0.04	15.08	1843.4	0.03
(9*Z*)-Nonadecene	12.98	1895.2	0.27	15.43	1875.3	0.28
Nonadecane	12.91	1888.6	0.40	15.74	1903.9	0.41
Palmitic acid				16.45	1971.7	0.68
Ethyl palmitate	16.32	2216.7	0.10	16.72	1997.6	0.12
Eicosane	13.99	1987.3	0.03	16.78	2003.6	0.05
Phenylethyl decanoate				17.25	2050.9	0.12
(10*Z*)-Heneicosene	15.02*	2086.4	[0.10]	17.48	2073.7	0.05
Heneicosane	15.02*	2086.4	[0.10]	17.78	2103.8	0.08
Citronellyl caprate	17.58	2349.3	0.02	17.87	2112.9	0.02
Geranyl caprate	18.12	2407.3	0.09	18.10	2136.9	0.25
Phenylethyl undecanoate?				18.17	2144.0	0.38
Docosene isomer				18.44*	2172.1	[1.24]
Stearic acid	23.48	3066.8	1.19	18.44*	2172.1	[1.24]
Tricosane	16.99	2285.3	0.02	19.66	2303.8	0.03
Citronellyl laurate	19.30	2540.8	0.08	19.74	2312.0	0.03
Tetradecyl nonanoate				21.07	2464.7	0.30
Pentadecyl octanoate				21.13	2471.1	0.28
Phenylethyl myristate				21.29	2490.4	0.13

Citronellyl myristate				21.48	2513.6	0.34
Unknown ROAB II [m/z 105, 79 (23), 104 (16), 67 (12), 95 (12), 106 (9)... 382 (1)]				21.95	2570.2	0.01
Unknown ROAB I [m/z 105, 104 (21), 67 (13), 81 (11), 106 (9)... 384 (1)]				22.02	2579.0	0.45
Phenylethyl palmitoleate?				22.77	2671.7	0.23
Heptacosane	20.52	2685.6	0.02	23.03	2704.8	0.01
Citronellyl palmitate				23.10	2714.1	0.08
Geranyl palmitate				23.38	2749.9	0.07
α-Tocopherol				26.06	3117.6	0.13
Unknown ROAB III [m/z 109, 69 (43), 95 (41), 43 (27), 205 (25)... 424 (11)...]				29.97	3480.5	1.18
Total reported		89.86%			90.94%	

*: 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

628 Boulevard du Saguenay, Saguenay (Qc) G7J 1H4 | www.phytochemia.com