

Date : 2025-05-22

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25E08-PTH04

Customer Identification : Organic Blood Orange - Italy - OH0106R

Type : Essential Oil

Source : *Citrus sinensis*

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

Date : 2025-05-22

PHYSICOCHEMICAL DATA

Refractive index : 1.4731 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2025-05-08

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
α -Pinene	0.57	Monoterpene
β -Pinene	0.12	Monoterpene
Sabinene	0.35	Monoterpene
Myrcene	1.96	Monoterpene
α -Phellandrene	0.03	Monoterpene
Octanal	0.33	Aliphatic aldehyde
Δ^3 -Carene	0.12	Monoterpene
<i>para</i> -Cymene	0.01	Monoterpene
β -Phellandrene	0.27	Monoterpene
Limonene	93.14	Monoterpene
(<i>E</i>)- β -Ocimene	0.03	Monoterpene
<i>cis</i> -Sabinene hydrate	0.02	Monoterpenic alcohol
Octanol	0.03	Aliphatic alcohol
Terpinolene	0.02	Monoterpene
Linalool	0.36	Monoterpenic alcohol
Nonanal	0.03	Aliphatic aldehyde
<i>trans-para</i> -Mentha-2,8-dien-1-ol	0.01	Monoterpenic alcohol
<i>cis-para</i> -Mentha-2,8-dien-1-ol	0.01	Monoterpenic alcohol
<i>trans</i> -Limonene oxide	0.01	Monoterpenic ether
Citronellal	0.04	Monoterpenic aldehyde
α -Terpineol	0.03	Monoterpenic alcohol
Decanal	0.25	Aliphatic aldehyde
Octyl acetate	0.01	Aliphatic ester
Neral	0.04	Monoterpenic aldehyde
Perillaldehyde	0.02	Monoterpenic aldehyde
Geranial	0.06	Monoterpenic aldehyde
Limonen-10-ol	0.01	Monoterpenic alcohol
Undecanal	0.01	Aliphatic aldehyde
α -Copaene	0.02	Sesquiterpene
β -Cubebene	0.02	Sesquiterpene
β -Elemene	0.01	Sesquiterpene
Dodecanal	0.03	Aliphatic aldehyde
β -Caryophyllene	0.02	Sesquiterpene
β -Copaene	0.02	Sesquiterpene
(<i>E</i>)- β -Farnesene	0.01	Sesquiterpene
Germacrene D	0.02	Sesquiterpene
Valencene	0.08	Sesquiterpene
Bicyclogermacrene	0.02	Sesquiterpene
γ -Cadinene	0.03	Sesquiterpene
(3 <i>E</i> ,6 <i>E</i>)- α -Farnesene	0.04	Sesquiterpene

β -Sinensal	0.03	Sesquiterpenic aldehyde
α -Sinensal	0.02	Sesquiterpenic aldehyde
Palmitic acid	0.04	Aliphatic acid
Linoleic acid	0.01	Aliphatic acid
Oleic acid	0.03	Aliphatic acid
cis-Vaccenic acid?	0.01	Aliphatic acid
α -Eleostearic acid	0.18	Aliphatic acid
Tangeretin isomer	0.03	Flavonoid
3,3',4',5,6,7,8-Heptamethoxyflavone	0.05	Flavonoid
Nobiletin	0.04	Flavonoid
Consolidated total	98.68	

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

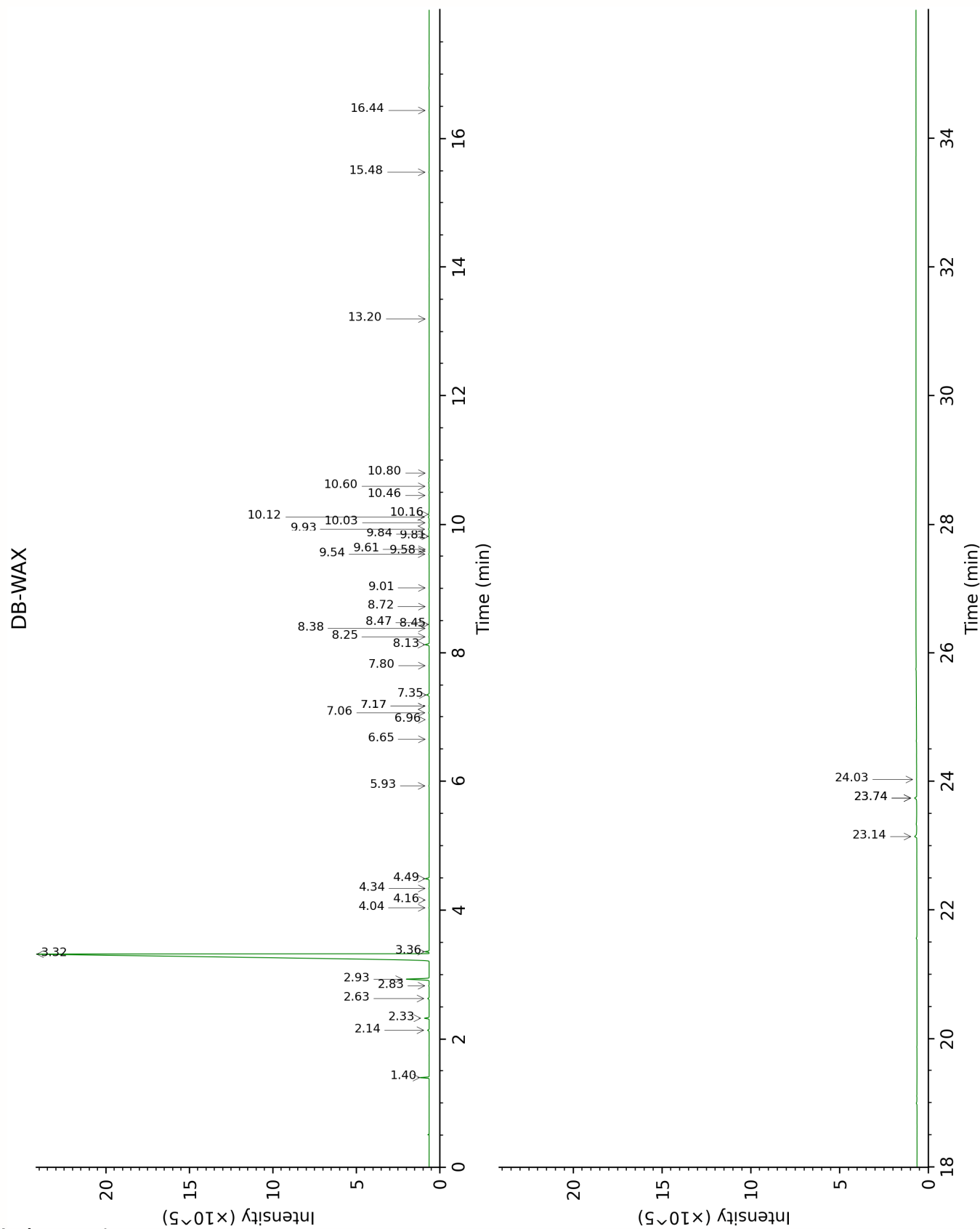
Note: no correction factor was applied

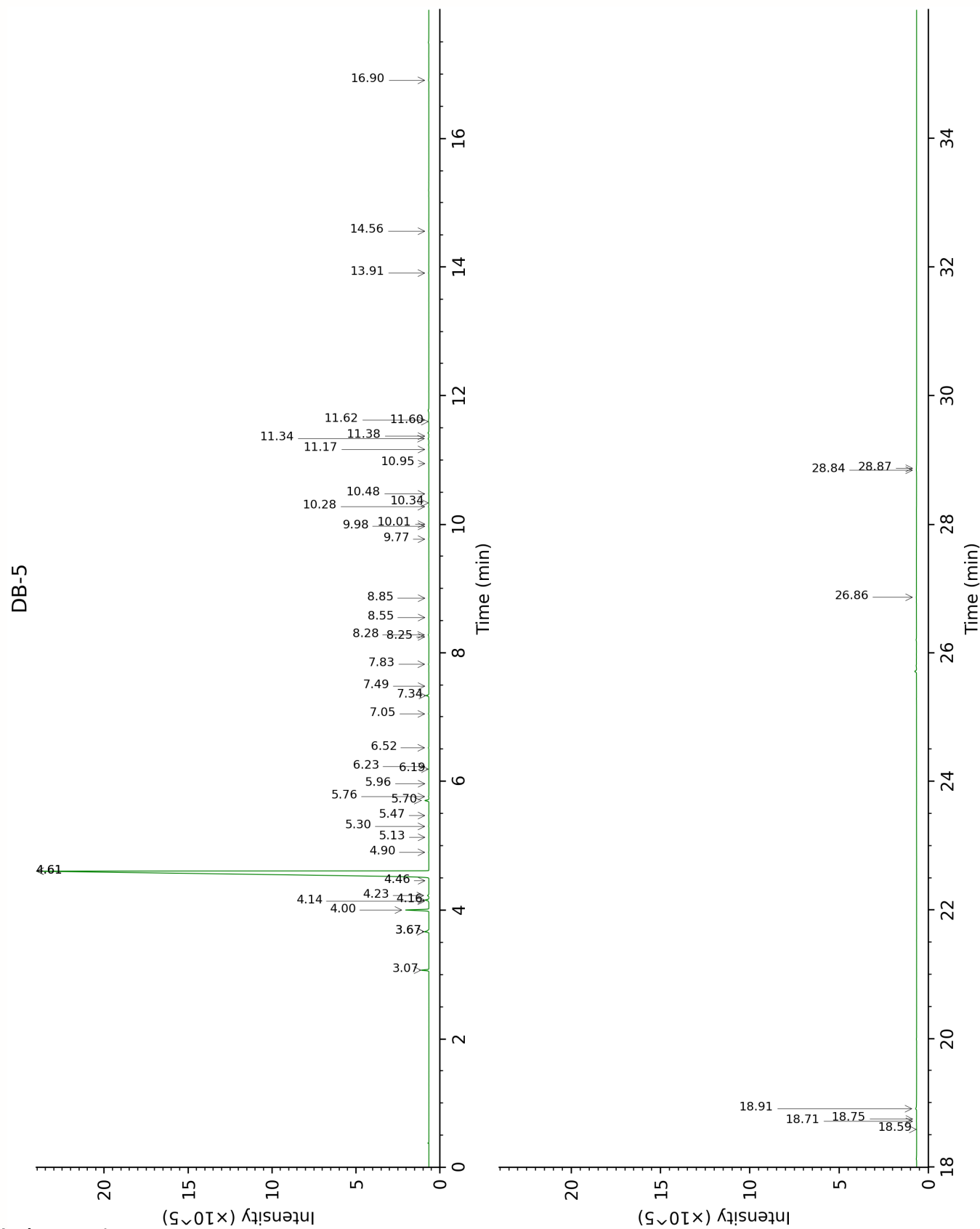
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

α-Pinene	Column DB-WAX			Column DB-5		
	1.40	991.1	0.57	3.07	930.9	0.57
β -Pinene	2.14	1066.0	0.12	3.67*	970.8	[0.47]
Sabinene	2.33	1084.5	0.35	3.67*	970.8	[0.47]
Myrcene	2.93	1134.0	1.94	4.00	993.4	1.96
α -Phellandrene	2.83	1126.0	0.04	4.14	1002.5	0.03
Octanal	4.49	1252.3	0.31	4.16	1003.7	0.33
Δ^3 -Carene	2.63	1110.5	0.12	4.23	1008.2	0.12
<i>para</i> -Cymene	4.16	1228.1	0.01	4.46	1022.7	0.01
β -Phellandrene	3.36	1167.6	0.27	4.61*	1032.1	[93.89]
Limonene	3.32	1164.6	93.14	4.61*	1032.1	[93.89]
(<i>E</i>)- β -Ocimene	4.04	1219.3	0.02	4.90	1050.7	0.03
<i>cis</i> -Sabinene hydrate	6.96	1430.1	0.01	5.13	1065.4	0.02
Octanol	8.25	1526.5	0.03	5.30	1076.2	0.03
Terpinolene	4.34	1241.2	0.02	5.47	1086.9	0.02
Linalool	8.13	1517.2	0.36	5.70	1101.7	0.36
Nonanal	5.93	1356.1	0.03	5.76	1105.6	0.03
<i>trans-para</i> -Mentha-2,8-dien-1-ol	9.01	1584.7	0.01	5.96	1118.5	0.01
<i>cis-para</i> -Mentha-2,8-dien-1-ol	9.58	1630.1	0.01	6.19	1133.2	0.01
<i>trans</i> -Limonene oxide	6.65	1407.8	0.01	6.23	1135.8	0.01
Citronellal	7.06	1437.9	0.04	6.52	1154.7	0.04
α -Terpineol	9.84	1651.2	0.03	7.05	1188.8	0.03
Decanal	7.35	1459.1	0.24	7.34	1208.2	0.25
Octyl acetate	7.17*	1445.7	[0.02]	7.49	1218.1	0.01
Neral	9.54	1626.4	0.04	7.83	1241.3	0.04
Perillaldehyde	10.80	1729.9	0.02	8.25	1270.3	0.02
Geranial	10.16	1676.8	0.06	8.28	1272.4	0.06
Limonen-10-ol	13.20	1940.4	0.01	8.55	1290.8	0.01
Undecanal	8.72	1562.4	0.01	8.85	1307.7	0.01
α -Copaene	7.17*	1445.7	[0.02]	9.77	1372.9	0.02
β -Cubebene	7.80	1492.3	0.02	9.98	1387.9	0.02
β -Elemene	8.44	1541.3	0.01	10.01	1390.3	0.01
Dodecanal	10.03	1666.3	0.04	10.28	1409.8	0.03
β -Caryophyllene	8.47	1543.3	0.01	10.34	1414.2	0.02
β -Copaene	8.38	1536.6	0.02	10.48	1424.7	0.02
(<i>E</i>)- β -Farnesene	9.61	1632.4	0.01	10.95	1460.0	0.01
Germacrene D	9.81	1648.5	0.02	11.17	1476.4	0.02
Valencene	9.93	1658.2	0.07	11.34	1489.0	0.08
Bicyclgermacrene	10.12	1673.4	0.10	11.38	1491.9	0.02
γ -Cadinene	10.46	1700.8	0.03	11.60	1509.0	0.03
(3 <i>E</i> ,6 <i>E</i>)- α -Farnesene	10.60	1712.7	0.04	11.62	1510.9	0.04
β -Sinensal	15.48	2159.9	0.03	13.91	1696.0	0.03

α -Sinensal	16.44	2258.6	0.02	14.56	1751.8	0.02
Palmitic acid				16.90	1965.8	0.04
Linoleic acid	24.03	3195.1	0.02	18.59	2132.4	0.01
Oleic acid	23.74*	3153.9	[0.25]	18.71	2145.3	0.03
cis-Vaccenic acid?	23.74*	3153.9	[0.25]	18.75	2149.0	0.01
α -Eleostearic acid	23.14	3069.8	0.34	18.91	2165.5	0.18
Tangeretin isomer				26.86	3126.7	0.03
3,3',4',5,6,7,8- Heptamethoxyflavone				28.84	3307.1	0.05
Nobiletin				28.87	3309.2	0.04
Total reported		98.88%			99.17%	

*: 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