Date : January 22, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21A18-PTH09
Customer identification : Wintergreen Organic - China - W2010586R
Type : Essential oil
Source : *Gaultheria procumbens*
Customer : Plant Therapy

Analysis

Method: PC-MAT-014 ISO - Analysis of the composition of an essential oil or other volatile liquid by FAST GC-FID (in French); identifications validated by GC-MS.
Analyst : Alexis St-Gelais, M. Sc., chimiste
Analysis date : January 22, 2021

Checked and approved by :

Alexis St-Gelais, M. Sc., 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.

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Physicochemical data

Physical aspect: Clear liquid
Refractive index: 1.5366 ± 0.0003 (20 °C; method PC-MAT-016)

ISO 21390:2006 - Oil of wintergreen, China, redistilled

Compound	Min. %	Max. %	Observed %	Complies?
Ethyl salicylate	tr	0.30	0.05	Yes
Methyl salicylate	97.0	99.8	99.6	Yes
Linalool	tr	0.20	0.02	Yes
1,8-Cineole	tr	0.40	0	Yes
β-Pinene	tr	0.05	0	Yes
α-Pinene	tr	0.20	0	Yes
Refractive index	1.5230	1.5430	1.5366	Yes

Conclusion

No adulterant, contaminant or diluent has been detected using this method. The oil complies with the ISO standard for wintergreen oil.

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Analysis summary – Consolidated contents

New readers of similar reports are encouraged to read table footnotes at least once.

Identification	%	Class
(3*Z*)-Hexenol	tr	Aliphatic alcohol
Hexanol	tr	Aliphatic alcohol
α-Pinene	tr	Monoterpene
Camphene	tr	Monoterpene
Benzaldehyde	tr	Simple phenolic
β-Pinene	tr	Monoterpene
Myrcene	tr	Monoterpene
(3*Z*)-Hexenyl acetate	tr	Aliphatic ester
para-Cymene	tr	Monoterpene
Limonene	tr	Monoterpene
1,8-Cineole	tr	Monoterpenic ether
cis-Linalool oxide (fur.)	tr	Monoterpenic alcohol
Octanol	tr	Aliphatic alcohol
trans-Linalool oxide (fur.)	tr	Monoterpenic alcohol
Linalool	0.02	Monoterpenic alcohol
Nonanal	tr	Aliphatic aldehyde
Camphor	tr	Monoterpenic ketone
Methyl salicylate	99.63	Phenolic ester
Nerol	tr	Monoterpenic alcohol
Neral	0.01	Monoterpenic aldehyde
Geraniol	tr	Monoterpenic alcohol
Ethyl salicylate	0.05	Phenolic ester
Geranial	tr	Monoterpenic aldehyde
Vitispirane	tr	Terpenic ether
Dehydro elsholtzia ketone	tr	Monoterpenic ketone
Eugenol	0.01	Phenylpropanoid
β-Caryophyllene	0.01	Sesquiterpene
α-Humulene	tr	Sesquiterpene
α-Muurolene	0.01	Sesquiterpene
γ-Cadinene	tr	Sesquiterpene
δ-Cadinene	0.01	Sesquiterpene
Consolidated total	**99.77%**	

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

This page was intentionally left blank. The following pages present the complete data of the analysis.

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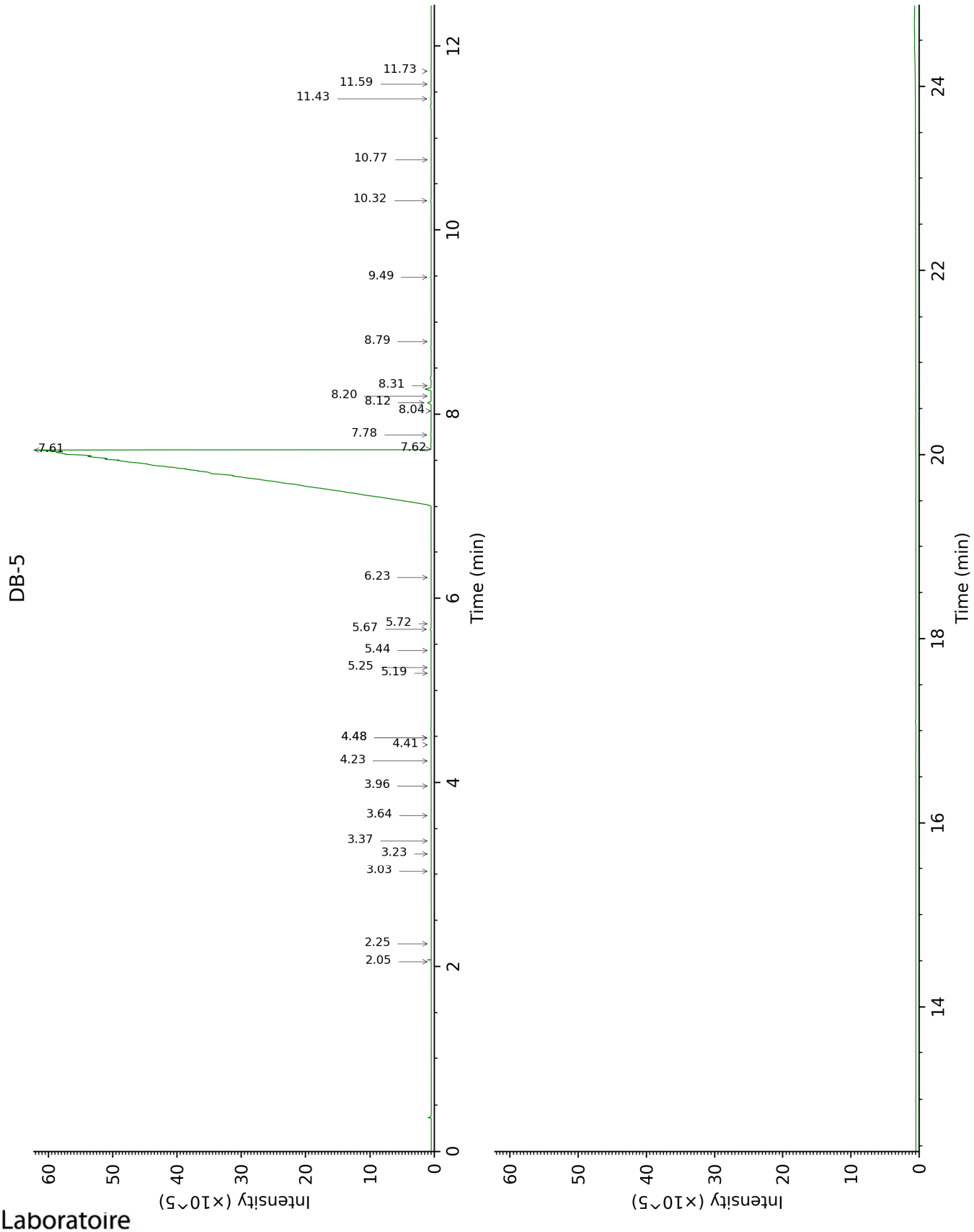
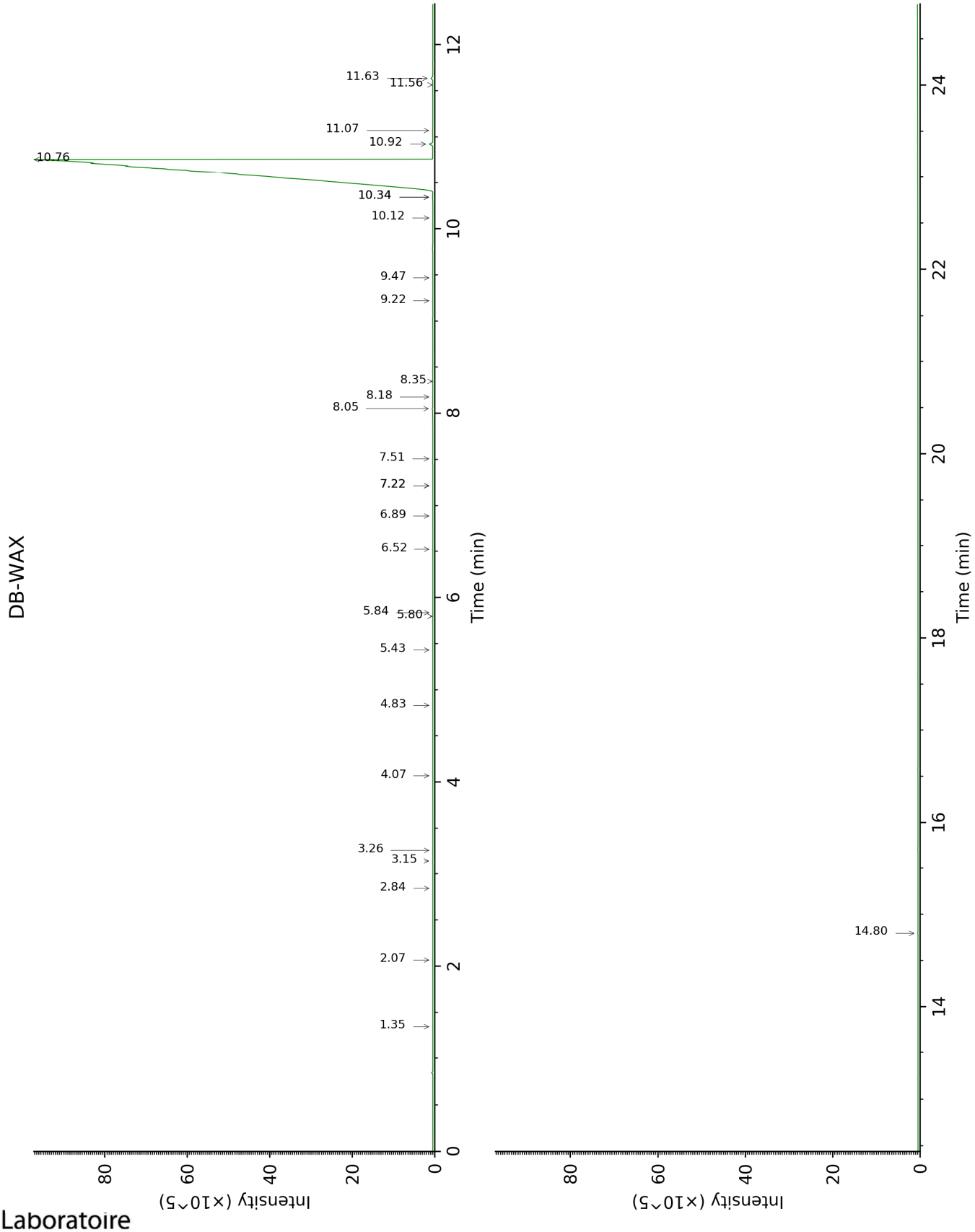

DB-5
11.73
11.59
11.43
10.77
10.32
9.49
8.79
8.31
8.20
8.12
8.04
7.78
7.61
7.62
6.23
5.67
5.72
5.44
5.25
5.19
4.48
4.41
4.23
3.96
3.64
3.37
3.23
3.03
2.25
2.05
Time (min)
Intensity (×10^5)



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FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
(3*Z*)-Hexenol	2.05	857	tr	5.80	1353	tr
Hexanol	2.25	873	tr	5.43	1326	tr
α-Pinene	3.03	930	tr	1.35	992	tr
Camphene	3.23	943	tr			
Benzaldehyde	3.37	952	tr	7.22*	1457	tr
β-Pinene	3.64	971	tr	2.07	1066	tr
Myrcene	3.96	992	tr	2.84	1134	tr
(3*Z*)-Hexenyl acetate	4.23	1010	tr	4.83	1284	tr
para-Cymene	4.41	1020	tr	4.07	1228	tr
Limonene	4.48*	1025	0.01	3.15	1158	tr
1,8-Cineole	4.48*	1025	[0.01]	3.26	1167	tr
cis-Linalool oxide (fur.)	5.19	1070	tr	6.52	1405	tr
Octanol	5.25	1074	tr	8.18	1530	tr
trans-Linalool oxide (fur.)	5.44	1086	tr	6.89	1433	tr
Linalool	5.67	1100	0.02	8.05	1520	0.01
Nonanal	5.72	1104	tr	5.84	1356	tr
Camphor	6.23	1137	tr	7.22*	1457	[tr]
Methyl salicylate	7.61	1229	99.63	10.76	1738	99.64
Nerol	7.62	1230	tr	11.07	1764	0.01
Neral	7.78	1240	0.01	9.47	1632	tr
Geraniol	8.04	1259	tr	11.56	1806	tr
Ethyl salicylate	8.12	1265	0.05	10.92	1752	0.10
Geranial	8.20	1270	tr	10.12	1684	tr
Vitispirane	8.31	1278	tr	7.51	1479	0.01
Dehydro elsholtzia ketone	8.79	1306	tr	11.63	1812	0.06
Eugenol	9.49	1355	0.01	14.80	2105	0.01
β-Caryophyllene	10.32	1414	0.01	8.34	1543	tr
α-Humulene	10.77	1448	tr	9.22	1612	tr
α-Muurolene	11.43	1497	0.01			
γ-Cadinene	11.59	1509	tr	10.34*	1703	0.02
δ-Cadinene	11.73	1520	0.01	10.34*	1703	[0.02]
Total identified		**99.77%**			**99.88%**	
Total reported		**99.77%**			**99.88%**	

*: Two or more compounds are coeluting on this column
[xx]: Duplicate percentage due to coelutions, not taken into account in the consolidated total
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