Date : August 29, 2019

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 19H15-PTH05-1-SCC
Customer identification : Eucalyptus Radiata - Australia - E40104811R
Type : Essential oil
Source : *Eucalyptus radiata*
Customer : Plant Therapy

Analysis

Method: PC-PA-014 - Analysis of the composition of an essential oil, or other volatile liquid, by FAST GC-FID (in French); identifications validated by GC-MS.
Analyst : Benoit Roger, Ph. D.
Analysis date : August 29, 2019

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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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: 1.4638 ± 0.0003 (20 °C)

CONCLUSION

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

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Analysis summary – Consolidated contents

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

Identification	%	Classe
α-Thujene	0.01	Monoterpene
α-Pinene	2.21	Monoterpene
Camphene	0.02	Monoterpene
α-Fenchene	tr	Monoterpene
Sabinene	2.11	Monoterpene
β-Pinene	0.75	Monoterpene
Unknown	0.01	Unknown
Myrcene	1.09	Monoterpene
α-Phellandrene	0.10	Monoterpene
Pseudolimonene	0.02	Monoterpene
Δ3-Carene	0.01	Monoterpene
α-Terpinene	0.04	Monoterpene
para-Cymene	1.76	Monoterpene
Limonene	6.27	Monoterpene
1,8-Cineole	68.26	Monoterpenic ether
(*Z*)-β-Ocimene	0.03	Monoterpene
(*E*)-β-Ocimene	0.01	Monoterpene
γ-Terpinene	0.12	Monoterpene
Terpinolene	0.03	Monoterpene
trans-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
para-Cymenene	0.01	Monoterpene
Linalool	0.29	Monoterpenic alcohol
trans-Pinocarveol	0.02	Monoterpenic alcohol
trans-para-Menth-2-en-1-ol	0.02	Monoterpenic alcohol
Citronellal	0.07	Monoterpenic aldehyde
δ-Terpineol	0.06	Monoterpenic alcohol
Terpinen-4-ol	1.22	Monoterpenic alcohol
Cryptone	0.01	Normonoterpenic ketone
para-Cymen-8-ol	tr	Monoterpenic alcohol
α-Terpineol	10.62	Monoterpenic alcohol
Nerol	0.01	Monoterpenic alcohol
Citronellol	0.11	Monoterpenic alcohol
Neral	0.35	Monoterpenic aldehyde
Piperitone	0.32	Monoterpenic ketone
Geraniol	0.66	Monoterpenic alcohol
Geranial	0.62	Monoterpenic aldehyde
α-Terpinyl acetate	2.01	Monoterpenic ester
Methyl (*E*)-cinnamate	0.01	Phenylpropanoid ester
β-Caryophyllene	0.03	Sesquiterpene
Viridiflorene	0.02	Sesquiterpene
δ-Cadinene	0.02	Sesquiterpene
Spathulenol	0.02	Sesquiterpenic alcohol
Consolidated total	**99.38%**	

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.

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

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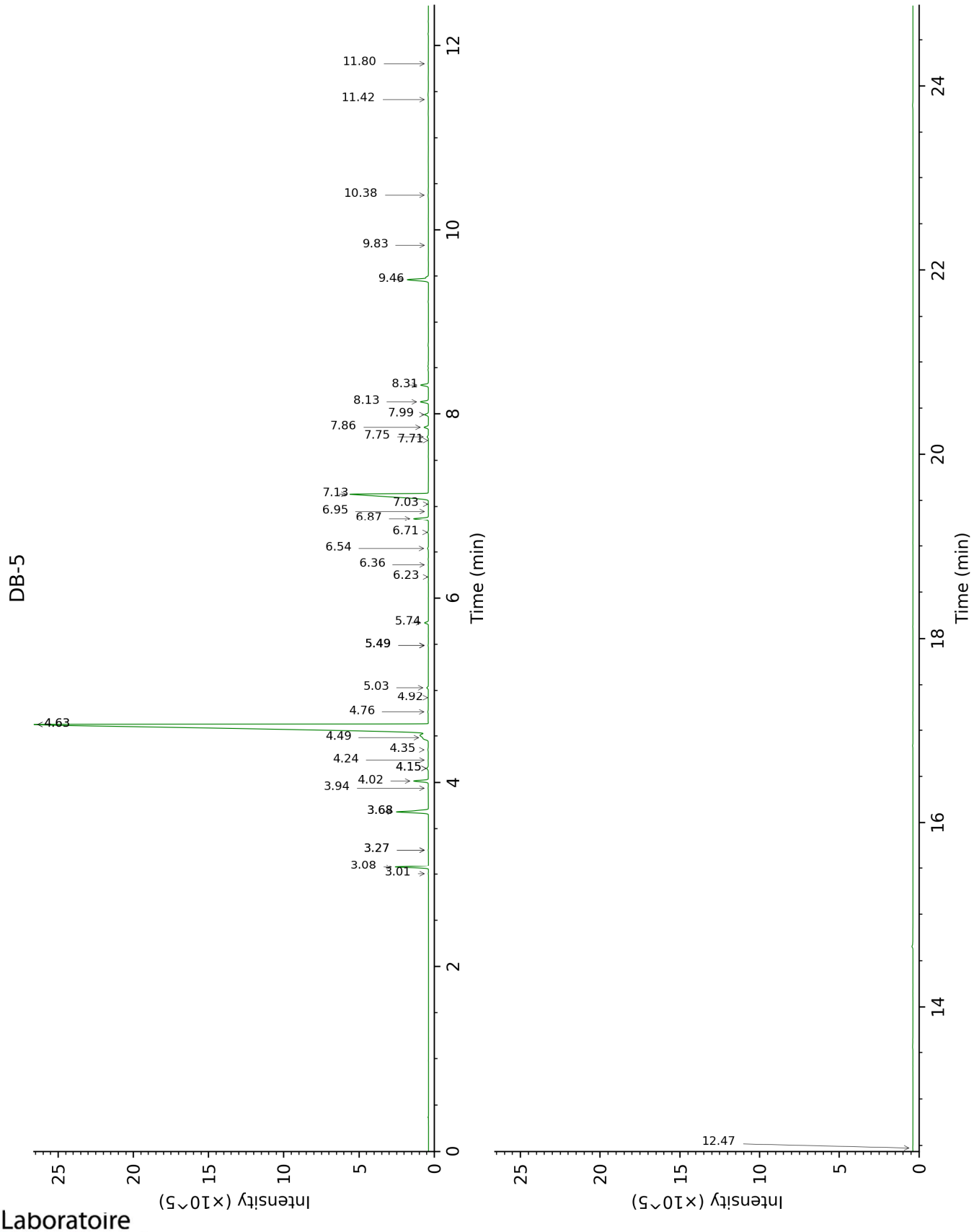
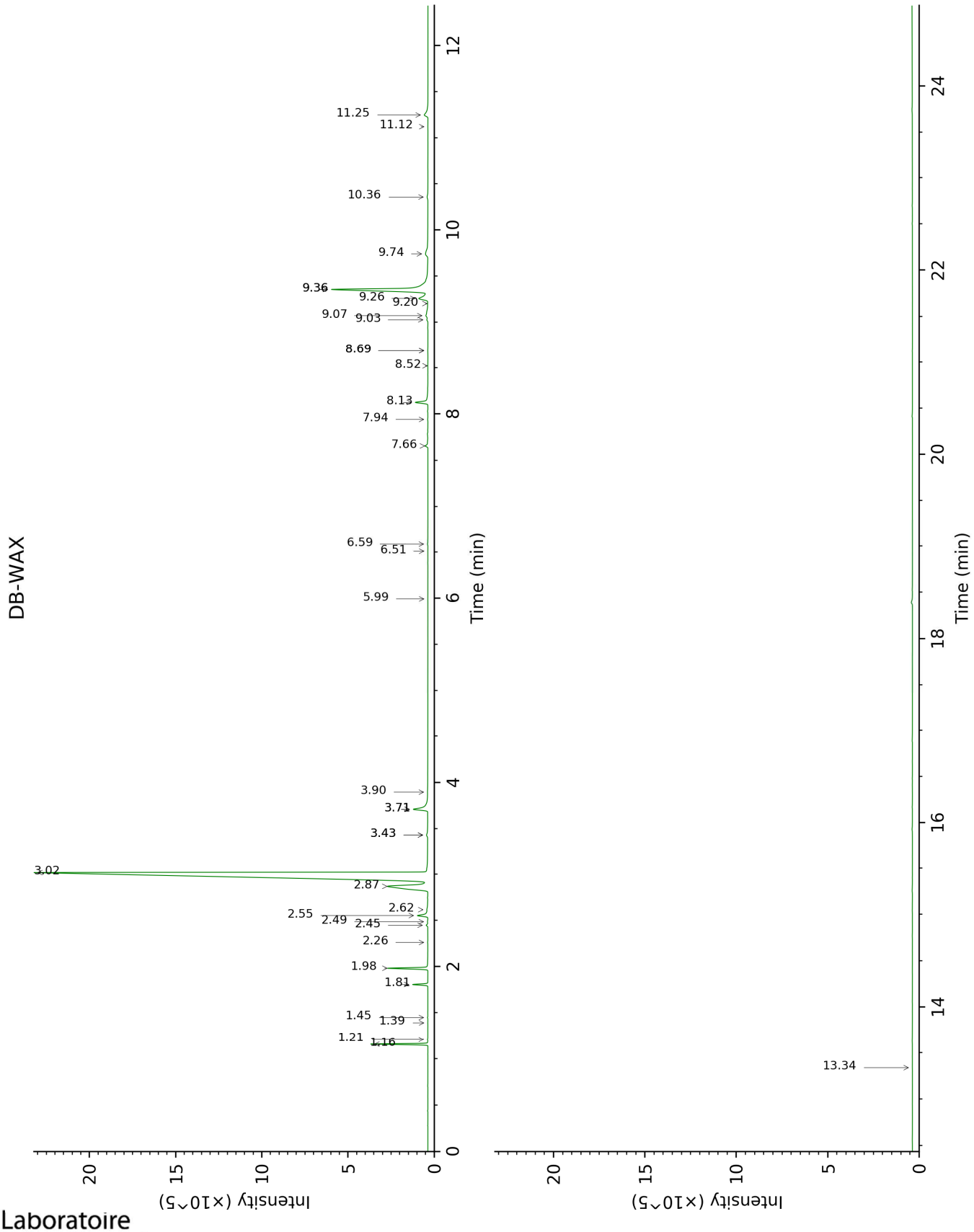

DB-5
11.80
11.42
10.38
9.83
9.46
8.31
8.13
7.99
7.86
7.75
7.71
7.13
7.03
6.95
6.87
6.71
6.54
6.36
6.23
5.74
5.49
5.03
4.92
4.76
4.63
4.49
4.35
4.24
4.15
4.02
3.94
3.68
3.27
3.08
3.01
12.47
Time (min)
Intensity (×10^5)



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FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
α-Thujene	3.01	925	0.01	1.21	1000	0.02
α-Pinene	3.08	930	2.21	1.16	990	2.23
Camphene	3.27*	942	0.02	1.45	1027	0.02
α-Fenchene	3.27*	942	[0.02]	1.39	1021	tr
Sabinene	3.68*	970	2.91	1.98	1083	2.11
β-Pinene	3.68*	970	[2.91]	1.81	1064	0.75
Unknown [m/z 67, 68 (95), 43 (73), 94 (65), 79 (54), 41 (50)...]	3.94	986	0.01			
Myrcene	4.02	992	1.09	2.55	1134	0.90
α-Phellandrene	4.15*	1001	0.14	2.45	1126	0.10
Pseudolimonene	4.15*	1001	[0.14]	2.49	1129	0.02
Δ3-Carene	4.24	1006	0.01	2.26	1110	0.01
α-Terpinene	4.35	1013	0.04	2.62	1139	0.16
para-Cymene	4.48	1022	1.76	3.71*	1227	1.75
Limonene	4.63*	1031	74.30	2.87	1160	6.27
1,8-Cineole	4.63*	1031	[74.30]	3.02	1172	68.26
(*Z*)-β-Ocimene	4.76	1039	0.03	3.43*	1206	0.15
(*E*)-β-Ocimene	4.92	1049	0.01	3.71*	1227	[1.75]
γ-Terpinene	5.03	1056	0.12	3.43*	1206	[0.15]
Terpinolene	5.49*	1085	0.02	3.90	1241	0.03
trans-Linalool oxide (fur.)	5.49*	1085	[0.02]	6.51	1430	0.01
para-Cymenene	5.49*	1085	[0.02]	5.99	1391	0.01
Linalool	5.74	1100	0.29	7.66	1517	0.22
trans-Pinocarveol	6.23	1132	0.02	8.69*	1598	0.01
trans-para-Menth-2-en-1-ol	6.36	1141	0.02	8.52	1585	0.01
Citronellal	6.54	1152	0.07	6.59	1436	0.04
δ-Terpineol	6.71	1164	0.06	9.03	1626	0.11
Terpinen-4-ol	6.87	1174	1.22	8.13	1554	1.17
Cryptone	6.95	1179	0.01	8.69*	1598	[0.01]
para-Cymen-8-ol	7.03	1184	tr	11.12	1803	0.01
α-Terpineol	7.13	1191	10.62	9.36*†	1653	[12.84]
Nerol	7.72	1230	0.01			
Citronellol	7.75	1233	0.11	10.36	1736	0.12
Neral	7.86	1240	0.35	9.07	1630	0.48
Piperitone	7.99	1250	0.32	9.36*†	1653	[12.84]
Geraniol	8.13	1259	0.66	11.25	1814	0.66
Geranial	8.31	1272	0.62	9.74	1685	0.68
α-Terpinyl acetate	9.46	1347	2.01	9.26†	1645	12.84
Methyl (*E*)-cinnamate	9.83	1373	0.01	13.34	2005	0.02
β-Caryophyllene	10.38	1412	0.03	7.94	1540	0.02
Viridiflorene	11.42	1490	0.02	9.20	1640	0.03

δ-Cadinene	11.80	1520	0.02	
Spathulenol	12.47	1572	0.02	
Total identified		**99.16%**		**99.23%**
Total reported		**99.18%**		**99.23%**

*: Two or more compounds are coeluting on this column
[xx]: Duplicate percentage due to coelutions, not 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

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