Date : September 02, 2020

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 20H21-PTH02
Customer identification : Eucalyptus globulus organic - 44123 - E30114910R
Type : Essential oil
Source : *Eucalyptus globulus*
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 : Fanny Charlier, B. Sc., chimiste à l'entraînement
Analysis date : August 25, 2020

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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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: 1.4607 ± 0.0003 (20 °C; method PC-MAT-016)

ISO 770:2002 - RECTIFIED OIL OF EUCALYPTUS GLOBULUS (80-85%)

Compound	Min. %	Max. %	Observed %	Complies?
Globulol		0.05	ND	Yes
Aromadendrene	tr	1.00	ND	No
trans-Pinocarveol	tr	3.00	0.01	Yes
para-Cymene	1	4	2	Yes
1,8-Cineole	80		79	No
Limonene	4	15	8	Yes
α-Phellandrene	0.1	1.0	0.6	Yes
α-Pinene	1	10	2	Yes
Refractive index	1.4580	1.4650	1.4607	Yes

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	%	Class
Hashishene	0.01	Monoterpene
α-Thujene	0.02	Monoterpene
α-Pinene	2.08	Monoterpene
α-Fenchene	0.01	Monoterpene
Camphene	0.02	Monoterpene
β-Pinene	0.26	Monoterpene
Sabinene	0.01	Monoterpene
trans-para-Menthane	0.01	Monoterpene
Myrcene	0.65	Monoterpene
2-Pentylfuran ?	0.01	Furan
α-Phellandrene	0.60	Monoterpene
Pseudolimonene	0.02	Monoterpene
Δ3-Carene	0.01	Monoterpene
α-Terpinene	0.19	Monoterpene
para-Cymene	2.27	Monoterpene
Limonene	7.80	Monoterpene
1,8-Cineole	79.34	Monoterpenic ether
(*Z*)-β-Ocimene	0.34	Monoterpene
(*E*)-β-Ocimene	0.09	Monoterpene
γ-Terpinene	4.29	Monoterpene
cis-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
Terpinolene	0.14	Monoterpene
para-Cymenene	0.02	Monoterpene
Linalool	0.01	Monoterpenic alcohol
trans-Pinocarveol	0.01	Monoterpenic alcohol
Terpinen-4-ol	0.01	Monoterpenic alcohol
α-Terpineol	0.01	Monoterpenic alcohol
cis-Isocarveol	0.05	Monoterpenic alcohol
trans-α-Phellandrene epoxide (IPP vs Me)	0.02	Monoterpenic ether
Unknown	0.01	Unknown
Geraniol	0.01	Monoterpenic alcohol
Unknown	0.02	Unknown
Isoledene	0.01	Sesquiterpene
α-Gurjunene	0.01	Sesquiterpene
Cubeban-11-ol	0.01	Sesquiterpenic alcohol
Unknown	0.02	Oxygenated sesquiterpene
γ-Eudesmol	0.01	Sesquiterpenic alcohol
β-Eudesmol	0.04	Sesquiterpenic alcohol
Selin-11-en-4α-ol	0.01	Sesquiterpenic alcohol
Consolidated total	**98.43%**	

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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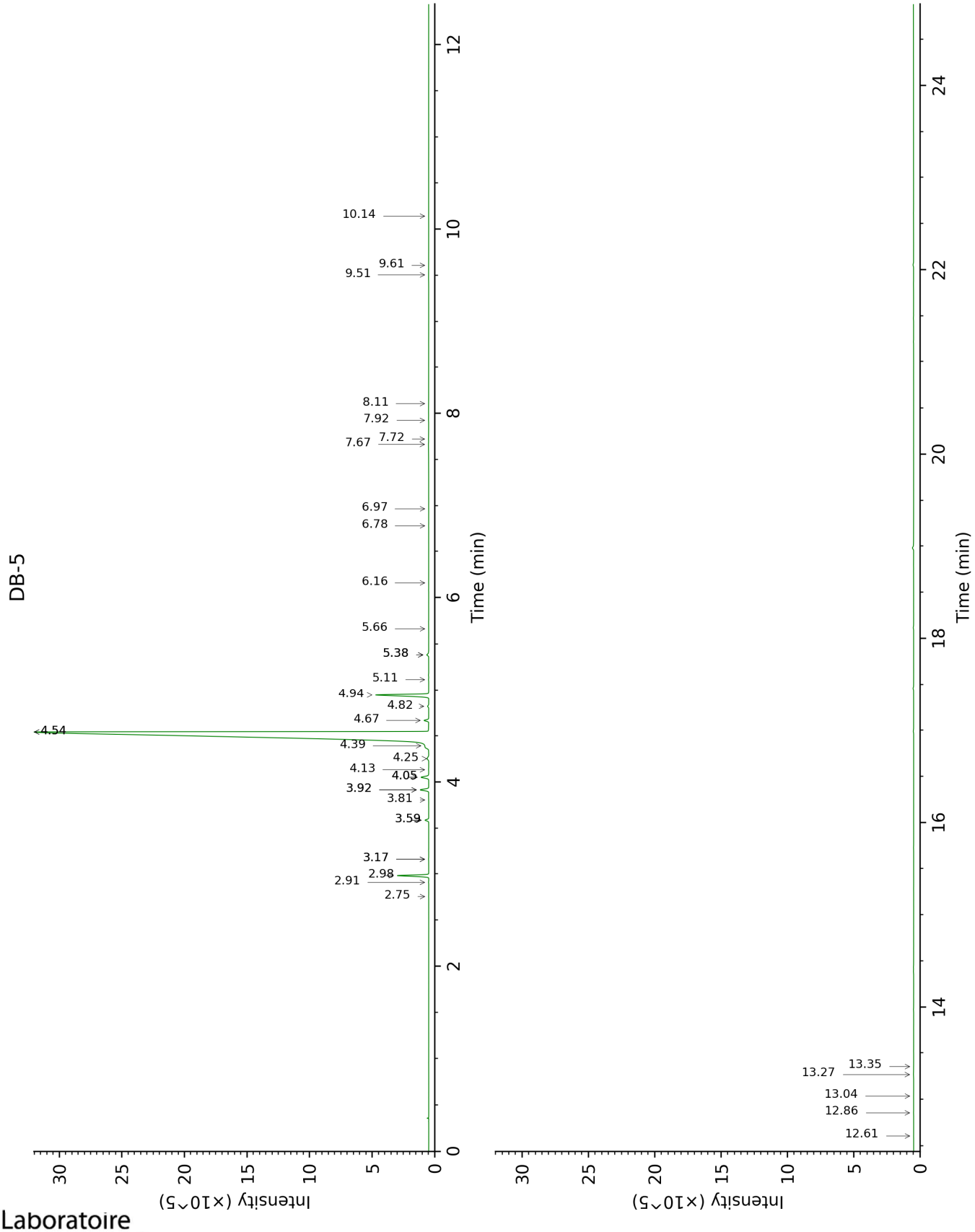
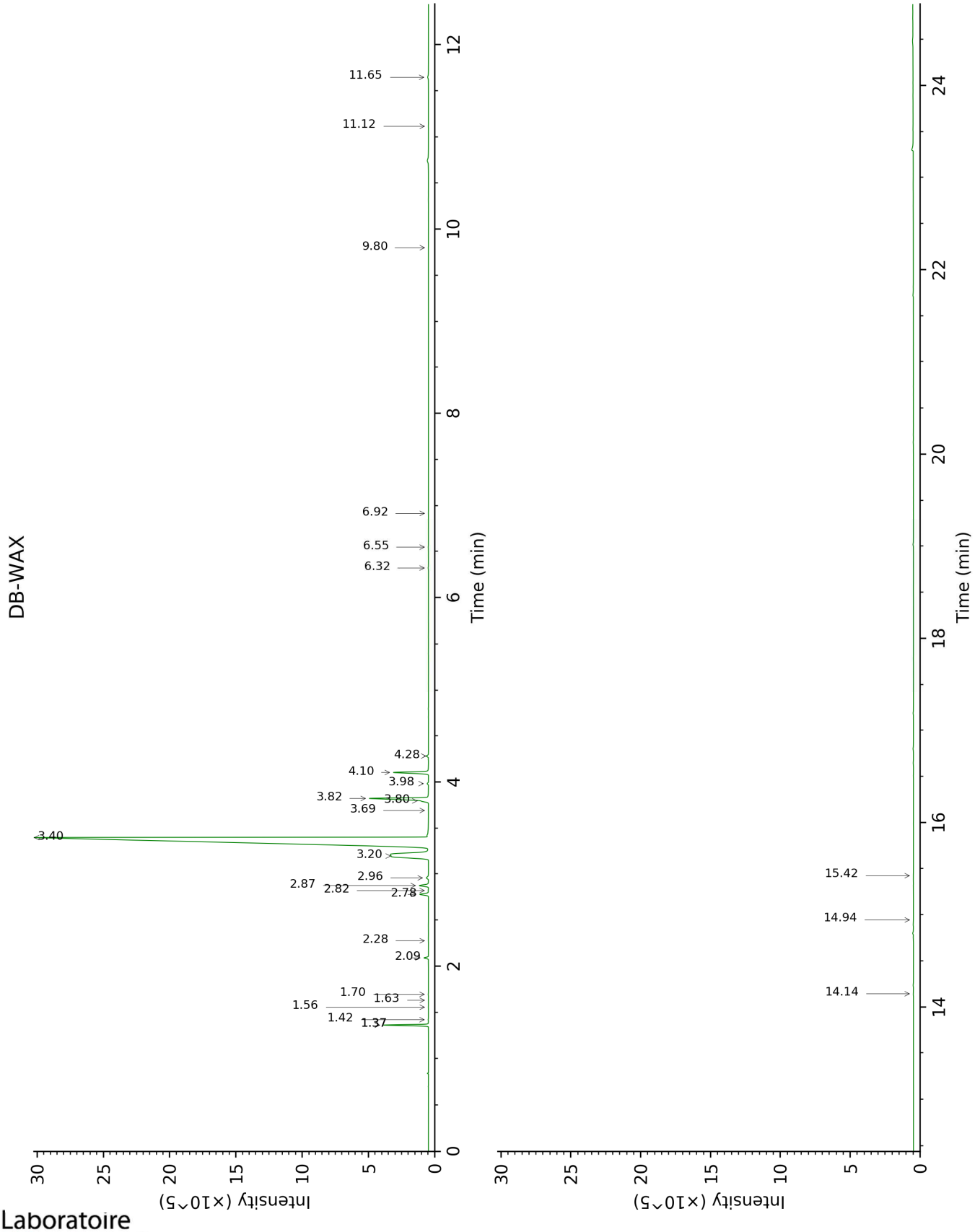

DB-5
Intensity (×10^5)
Time (min)
10.14
9.61
9.51
8.11
7.92
7.67
7.72
6.97
6.78
6.16
5.66
5.38
5.11
4.94
4.82
4.67
4.54
4.39
4.25
4.13
4.05
3.92
3.81
3.59
3.17
2.98
2.91
2.75
13.35
13.27
13.04
12.86
12.61


DB-WAX
11.65
11.12
9.80
6.92
6.55
6.32
4.28
4.10
3.98
3.82
3.80
3.69
3.40
3.20
2.96
2.87
2.82
2.78
2.28
2.09
1.70
1.63
1.56
1.42
1.37
15.42
14.94
14.14
Time (min)
Intensity (×10^5)

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Hashishene	2.76	914	0.01	1.37*	993	2.03
α-Thujene	2.91	924	0.02	1.42	1001	0.01
α-Pinene	2.98	929	2.08	1.37*	993	[2.03]
α-Fenchene	3.17*	942	0.02	1.63	1022	0.01
Camphene	3.17*	942	[0.02]	1.70	1028	0.02
β-Pinene	3.59*	970	0.27	2.09	1067	0.26
Sabinene	3.59*	970	[0.27]	2.28	1085	0.01
trans-para-Menthane	3.81	984	0.01	1.56	1014	0.01
Myrcene	3.92*	992	0.68	2.87	1134	0.65
2-Pentylfuran ?	3.92*	992	[0.68]	3.69	1198	0.01
α-Phellandrene	4.05*	1001	0.66	2.78	1127	0.60
Pseudolimonene	4.05*	1001	[0.66]	2.82	1130	0.02
Δ3-Carene	4.13	1006	0.01			
α-Terpinene	4.25	1014	0.19	2.96	1141	0.19
para-Cymene	4.39†	1022	89.99	4.10	1228	2.27
Limonene	4.54*†	1032	[89.99]	3.20	1160	7.80
1,8-Cineole	4.54*†	1032	[89.99]	3.40	1175	79.34
(*Z*)-β-Ocimene	4.67	1040	0.34	3.80	1206	0.32
(*E*)-β-Ocimene	4.82	1049	0.09	3.98	1219	0.09
γ-Terpinene	4.94	1057	4.29	3.82	1208	4.27
cis-Linalool oxide (fur.)	5.11	1068	0.01	6.55	1402	0.02
Terpinolene	5.38*	1084	0.18	4.28	1241	0.14
para-Cymenene	5.38*	1084	[0.18]	6.32	1386	0.02
Linalool	5.66	1102	0.01			
trans-Pinocarveol	6.16	1134	0.01			
Terpinen-4-ol	6.78	1173	0.01			
α-Terpineol	6.97	1185	0.01	9.80	1654	0.01
cis-Isocarveol	7.66	1231	0.05			
trans-α-Phellandrene epoxide (IPP vs Me)	7.72	1234	0.02			
Unknown [m/z 43, 97 (69), 107 (46), 41 (28), 55 (21), 109 (20)...]	7.92	1248	0.01	11.12	1764	0.01
Geraniol	8.11	1260	0.01	11.65	1809	0.12
Unknown [m/z 43, 95 (62), 107 (45), 110 (41), 55 (28), 67 (25)...]	9.50	1355	0.02			
Isoledene	9.61	1362	0.01	6.92	1430	0.01
α-Gurjunene	10.14	1400	0.01			
Cubeban-11-ol	12.61	1588	0.01			
Unknown [m/z	12.86	1608	0.02	14.14	2037	0.03

94, 91 (83), 105 (78), 79 (75), 107 (62), 120 (58)... 218 (11)]						
γ-Eudesmol	13.04	1623	0.01	14.94	2115	0.01
β-Eudesmol	13.27	1642	0.04	15.42	2162	0.02
Selin-11-en-4α-ol	13.35	1649	0.01			
Total identified		**99.03%**			**98.25%**	
Total reported		**99.08%**			**98.29%**	

*: 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

Note: no correction factor was applied
R.T.: Retention time (minutes)
R.I.: Retention index