Date : April 06, 2021

Certificate of Analysis – GC Profiling

Sample identification

Internal code : 21C26-PTH08
Customer identification : Eucalyptus Globulus - China - E201092011R
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 : Seydou Ka, M. Sc.
Analysis date : March 30, 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.

Méthode certifiée ISO 17025:2017 Certified method

Laboratoire PhytoChemia
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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?
α-Pinene	1	10	1	Yes
α-Phellandrene	0.1	1.0	0.9	Yes
Limonene	4	15	8	Yes
1,8-Cineole	80		80	Yes
para-Cymene	1	4	1	Yes
trans-Pinocarveol	tr	3.00	0.02	Yes
Aromadendrene	tr	1.00	0	Yes
Globulol		0.05	0	Yes
Refractive index	1.4580	1.4650	1.4607	Yes

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
Isoamyl alcohol	tr	Aliphatic alcohol
α-Thujene	tr	Monoterpene
α-Pinene	0.69	Monoterpene
Camphene	0.01	Monoterpene
α-Fenchene	tr	Monoterpene
Sabinene	tr	Monoterpene
β-Pinene	0.48	Monoterpene
trans-meta-Mentha-2,8-diene	0.01	Monoterpene
Myrcene	1.18	Monoterpene
α-Phellandrene	0.89	Monoterpene
Pseudolimonene	0.01	Monoterpene
Δ3-Carene	0.02	Monoterpene
α-Terpinene	0.25	Monoterpene
para-Cymene	0.53	Monoterpene
Limonene	7.69	Monoterpene
1,8-Cineole	80.36	Monoterpenic ether
(*Z*)-β-Ocimene	0.29	Monoterpene
(*E*)-β-Ocimene	0.07	Monoterpene
γ-Terpinene	4.38	Monoterpene
Unknown	0.01	Unknown
cis-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
trans-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
para-Cymenene	0.02	Monoterpene
Terpinolene	0.18	Monoterpene
α-Pinene oxide	tr	Monoterpenic ether
Linalool	0.04	Monoterpenic alcohol
Unknown	0.01	Unknown
endo-Fenchol	0.01	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	tr	Monoterpenic alcohol
allo-Ocimene	0.01	Monoterpene
trans-Pinocarveol	0.02	Monoterpenic alcohol
Borneol	0.01	Monoterpenic alcohol
Terpinen-4-ol	0.10	Monoterpenic alcohol
α-Terpineol	0.14	Monoterpenic alcohol
Unknown	0.01	Unknown
Cubeban-11-ol	0.05	Sesquiterpenic alcohol
β-Eudesmol	0.08	Sesquiterpenic alcohol
Aromadendrene	tr	Sesquiterpene
Consolidated total	**97.59%**	

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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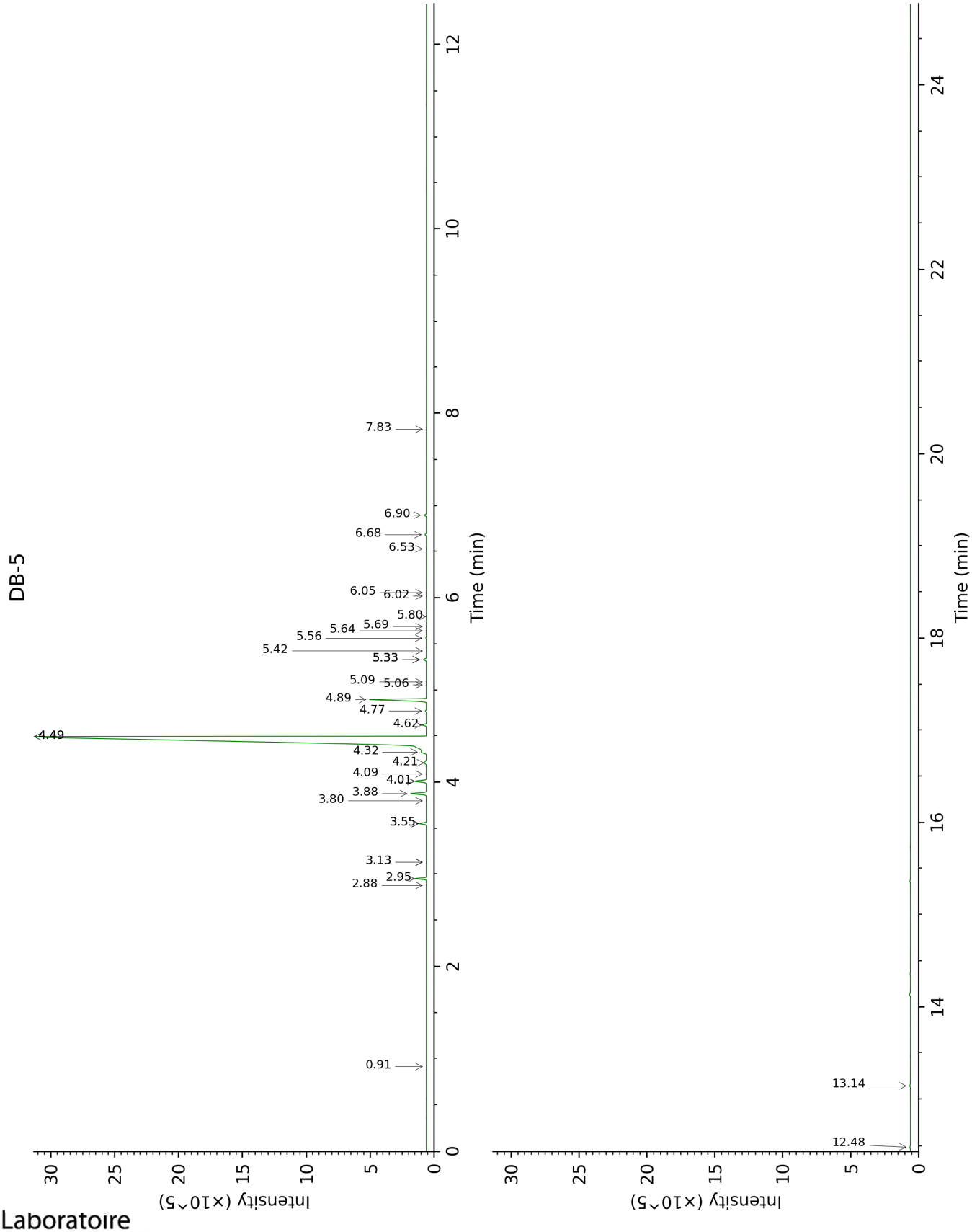
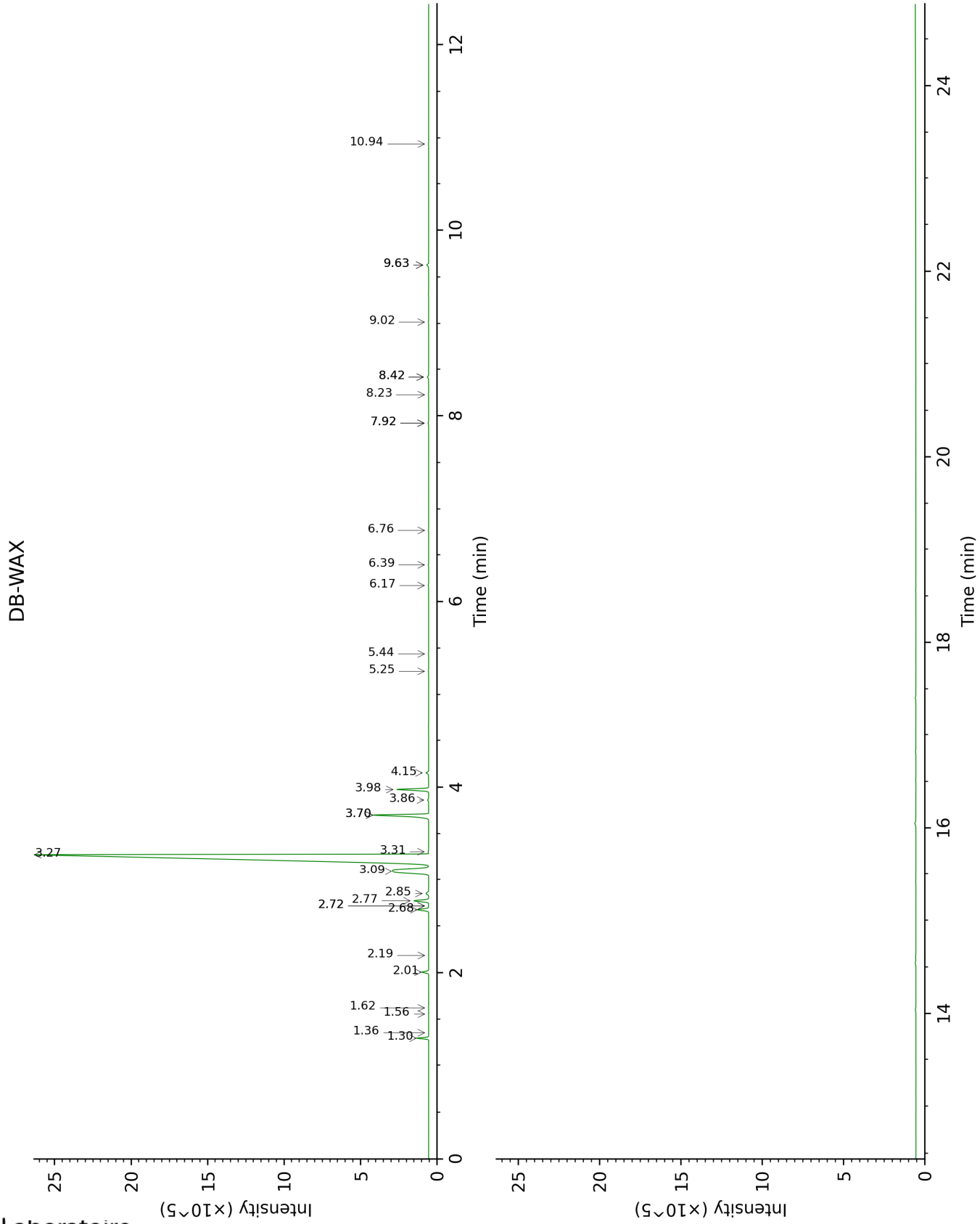

DB-5
Intensity (×10^5)
Time (min)
7.83
6.90
6.68
6.53
6.05
6.02
5.80
5.69
5.64
5.56
5.42
5.33
5.09
5.06
4.89
4.77
4.62
4.49
4.32
4.21
4.09
4.01
3.88
3.80
3.55
3.13
2.95
2.88
0.91
13.14
12.48


DB-WAX
10.94
9.63
9.02
8.42
8.23
7.92
6.76
6.39
6.17
5.44
5.25
4.15
3.98
3.86
3.70
3.31
3.27
3.09
2.85
2.77
2.72
2.68
2.19
2.01
1.62
1.56
1.36
1.30
Time (min)
Intensity (×10^5)

FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
Isoamyl alcohol	0.91	732	tr	3.31	1176	0.04
α-Thujene	2.88	926	tr	1.36	1002	tr
α-Pinene	2.95	931	0.69	1.30	992	0.69
Camphene	3.13*	944	0.01	1.62	1028	0.01
α-Fenchene	3.13*	944	[0.01]	1.56	1022	tr
Sabinene	3.55*	972	0.49	2.19	1085	tr
β-Pinene	3.55*	972	[0.49]	2.01	1067	0.48
trans-meta-Mentha-2,8-diene	3.80	989	0.01	2.72*	1130	0.02
Myrcene	3.88	994	1.18	2.77	1135	1.17
α-Phellandrene	4.01*	1003	0.93	2.68	1127	0.89
Pseudolimonene	4.01*	1003	[0.93]	2.72*	1130	[0.02]
Δ3-Carene	4.09	1008	0.02			
α-Terpinene	4.21	1016	0.25	2.85	1141	0.24
para-Cymene	4.32	1023	0.53	3.98	1226	2.37
Limonene	4.49*	1033	90.19	3.09	1160	7.69
1,8-Cineole	4.49*	1033	[90.19]	3.27	1174	80.36
(*Z*)-β-Ocimene	4.62	1041	0.29	3.70*	1207	4.74
(*E*)-β-Ocimene	4.77	1051	0.07	3.86	1218	0.07
γ-Terpinene	4.89	1059	4.38	3.70*	1207	[4.74]
Unknown [m/z 85, 43 (48), 57 (45), 70 (29), 41 (28), 103 (23), 60 (19)...]	5.06	1069	0.01			
cis-Linalool oxide (fur.)	5.09	1071	0.01	6.39	1403	0.02
trans-Linalool oxide (fur.)	5.33*	1087	0.21	6.76	1431	0.01
para-Cymenene	5.33*	1087	[0.21]	6.17	1387	0.02
Terpinolene	5.33*	1087	[0.21]	4.15	1239	0.18
α-Pinene oxide	5.42	1093	tr	5.25	1320	0.02
Linalool	5.56	1101	0.04	7.92*	1518	0.04
Unknown [m/z 43, 59 (37), 79 (33), 91 (32), 119 (31)...]	5.64	1106	0.01			
endo-Fenchol	5.69	1109	0.01	8.23	1542	tr
cis-para-Menth-2-en-1-ol	5.80	1116	tr	7.92*	1518	[0.04]
allo-Ocimene	6.02	1130	0.01	5.44	1333	0.01
trans-Pinocarveol	6.06	1133	0.02	9.02	1604	0.02
Borneol	6.53	1163	0.01	9.63*	1654	0.14
Terpinen-4-ol	6.68	1173	0.10	8.42*	1557	0.10
α-Terpineol	6.90	1187	0.14	9.63*	1654	[0.14]

Unknown [m/z 43, 97 (69), 107 (46), 41 (28), 55 (21), 109 (20)...]	7.83	1249	0.01	10.94	1763	0.01
Cubeban-11-ol	12.48	1589	0.05			
β-Eudesmol	13.14	1643	0.08			
Aromadendrene				8.42*	1557	[0.10]
Total identified		**99.73%**			**99.36%**	
Total reported		**99.76%**			**99.37%**	

*: 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