Date : 2023-07-06

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 23F21-NPA02
Customer Identification : Eucalyptus globulus - China - NPS00080 - Lot # NP0166
Type : Essential Oil
Source : *Eucalyptus globulus*
Customer : Nature Packaged

Checked an approved by:

Alexis St-Gelais, Ph. D., Chimiste 2013-174

Notes: 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.

This report is an update from the first version issued on 2023-07-05 to format it for online publication.

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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 : Amélie Simard, Analyste
Date : 2023-07-04

Physicochemical data

Physical aspect : Clear liquid
Analyst : Cindy Caron B. Sc.
Date : 2023-06-23

Refractive index : 1.4607 ± 0.0003 (20 °C)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Cindy Caron B. Sc.
Date : 2023-06-23

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
Isovaleral	0.02	Aliphatic aldehyde
Isoamyl alcohol	0.01	Aliphatic alcohol
Hashishene	0.01	Monoterpene
α-Thujene	0.02	Monoterpene
α-Pinene	2.62	Monoterpene
Camphene	0.01	Monoterpene
α-Fenchene	0.01	Monoterpene
Thuja-2,4(10)-diene	0.01	Monoterpene
β-Pinene	0.38	Monoterpene
Sabinene	0.01	Monoterpene
Octen-3-ol	0.01	Aliphatic alcohol
Myrcene	0.73	Monoterpene
α-Phellandrene	0.76	Monoterpene
Δ3-Carene	0.03	Monoterpene
α-Terpinene	0.22	Monoterpene
para-Cymene	3.64	Monoterpene
Limonene	10.01	Monoterpene
1,8-Cineole	78.54	Monoterpenic ether
(*Z*)-β-Ocimene	0.30	Monoterpene
(*E*)-β-Ocimene	0.06	Monoterpene
γ-Terpinene	2.01	Monoterpene
Unknown	0.01	Oxygenated monoterpene
cis-Linalool oxide (fur.)	0.01	Monoterpenic alcohol
trans-Linalool oxide (fur.)	tr	Monoterpenic alcohol
Terpinolene	0.03	Monoterpene
Linalool	0.01	Monoterpenic alcohol
allo-Ocimene	0.01	Monoterpene
trans-Pinocarveol	0.01	Monoterpenic alcohol
Isopulegol	0.01	Monoterpenic alcohol
meta-Mentha-4,6-dien-8-ol	0.01	Monoterpenic alcohol
Borneol	0.02	Monoterpenic alcohol
Terpinen-4-ol	0.02	Monoterpenic alcohol
Cryptone	0.01	Normonoterpenic ketone
α-Terpineol	0.04	Monoterpenic alcohol
Myrtenol	0.01	Monoterpenic alcohol
exo-2-Hydroxycineole	0.01	Monoterpenic alcohol
Carvone	0.01	Monoterpenic ketone
Piperitone	0.02	Monoterpenic ketone
β-Caryophyllene	0.02	Sesquiterpene
α-Humulene	0.01	Sesquiterpene

allo-Aromadendr-9-ene	0.01	Sesquiterpene
Viridiflorene	0.01	Sesquiterpene
Aromadendrene	tr	Sesquiterpene
Consolidated total	**99.71**	

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.

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

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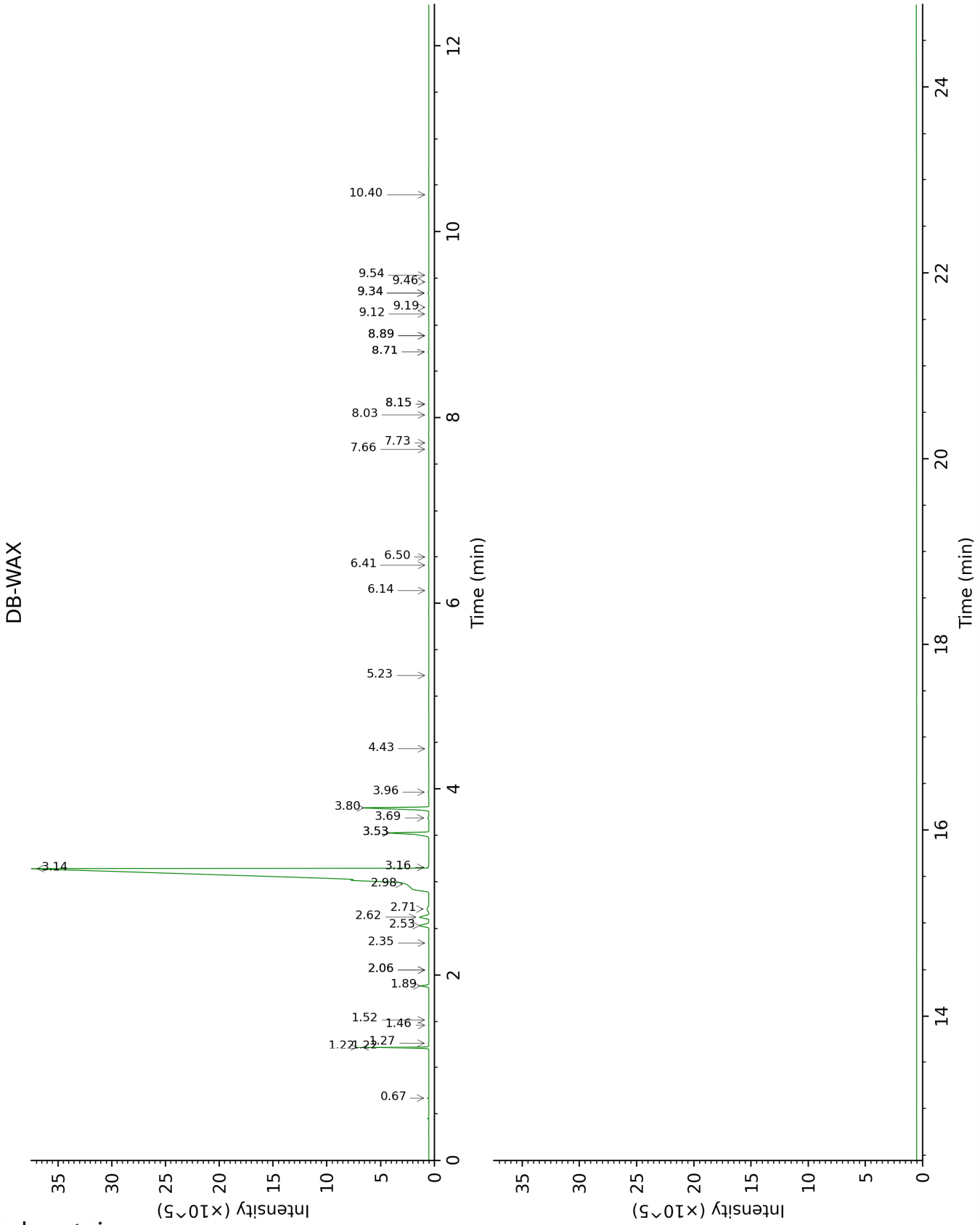
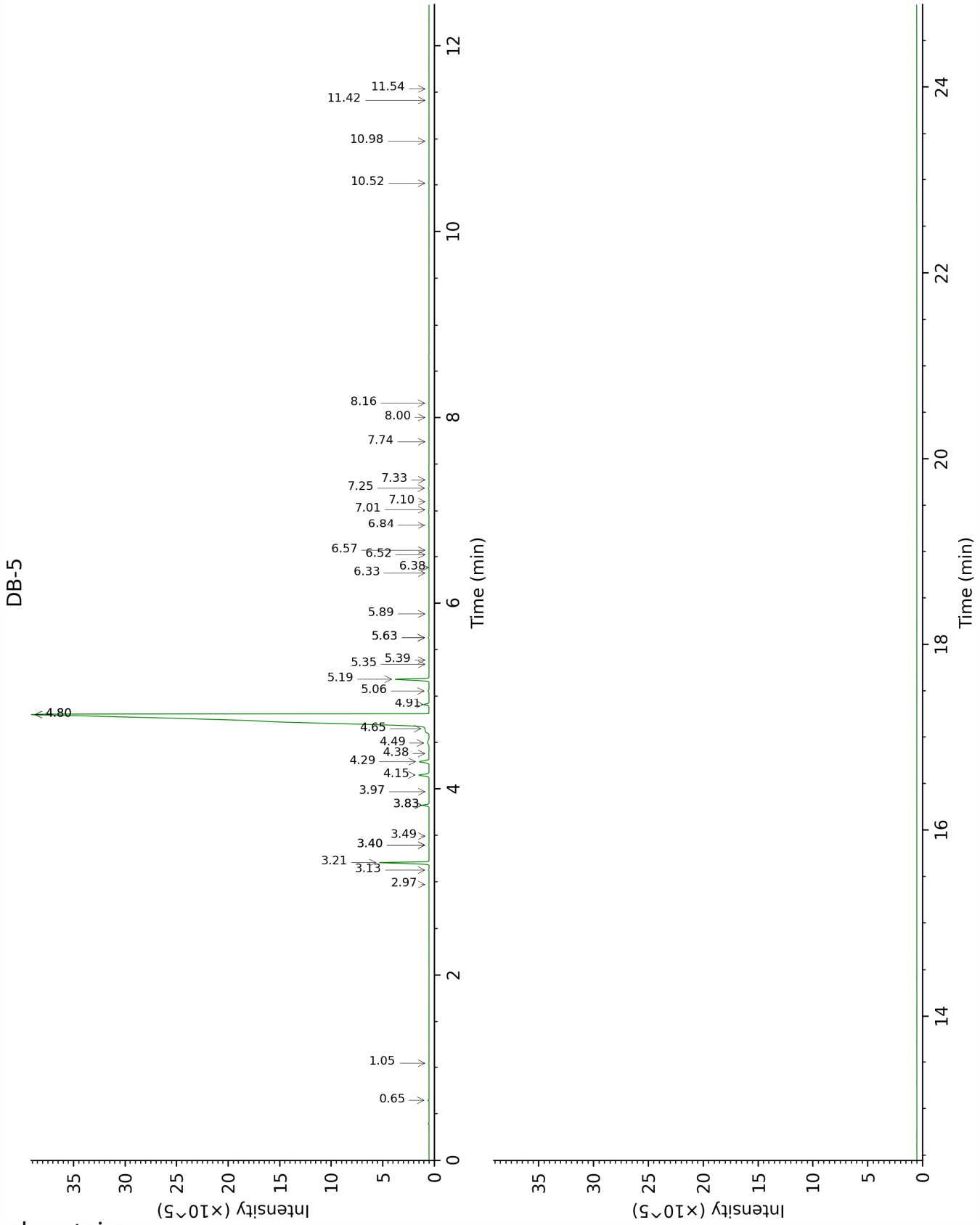

DB-WAX
Intensity (×10^5)
Time (min)
10.40
9.54
9.46
9.34
9.19
9.12
8.89
8.71
8.15
8.03
7.73
7.66
6.50
6.41
6.14
5.23
4.43
3.96
3.80
3.69
3.53
3.16
3.14
2.98
2.71
2.62
2.53
2.35
2.06
1.89
1.52
1.46
1.27
1.22
0.67


DB-5
11.54
11.42
10.98
10.52
8.16
8.00
7.74
7.33
7.25
7.10
7.01
6.84
6.57
6.52
6.38
6.33
5.89
5.63
5.39
5.35
5.19
5.06
4.91
4.80
4.65
4.49
4.38
4.29
4.15
3.97
3.83
3.49
3.40
3.21
3.13
2.97
1.05
0.65
Time (min)
Intensity (×10^5)

FULL ANALYSIS DATA

Isovaleral	Column DB-WAX			Column DB-5		
	0.67	886.3	0.02	0.65	640.8	0.02
Isoamyl alcohol	3.16	1179.0	0.03	1.05	732.6	0.01
Hashishene	1.22*	993.8	[2.63]	2.97	916.1	0.01
α-Thujene	1.27	1002.3	0.02	3.13	926.3	0.02
α-Pinene	1.22*	993.8	[2.63]	3.21	931.6	2.62
Camphene	1.52	1029.2	0.01	3.40*	943.8	[0.03]
α-Fenchene	1.46	1023.4	0.01	3.40*	943.8	[0.03]
Thuja-2,4(10)-diene	2.06*	1084.5	[0.01]	3.49	950.2	0.01
β-Pinene	1.88	1066.8	0.38	3.82*	972.0	[0.39]
Sabinene	2.06*	1084.5	[0.01]	3.82*	972.0	[0.39]
Octen-3-ol	6.41	1420.1	0.01	3.97	981.5	0.01
Myrcene	2.62	1135.2	0.73	4.15	993.3	0.73
α-Phellandrene	2.53	1127.9	0.74	4.29	1002.7	0.75
Δ3-Carene	2.35	1112.7	0.01	4.38	1008.3	0.03
α-Terpinene	2.71	1142.3	0.22	4.49	1015.3	0.23
para-Cymene	3.80	1230.1	3.64	4.65*†	1025.0	[0.60]
Limonene	2.98†	1164.1	3.60	4.80*†	1034.4	[91.74]
1,8-Cineole	3.14	1177.9	78.54	4.80*†	1034.4	[91.74]
(*Z*)-β-Ocimene	3.53*	1209.5	[2.35]	4.91	1041.2	0.30
(*E*)-β-Ocimene	3.69	1221.8	0.06	5.06	1050.7	0.06
γ-Terpinene	3.53*	1209.5	[2.35]	5.19	1058.7	2.01
Unknown PIMA I [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	4.43	1279.1	0.01	5.35	1068.7	0.01
cis-Linalool oxide (fur.)	6.14	1399.9	0.01	5.39	1071.4	0.01
trans-Linalool oxide (fur.)	6.50	1426.8	tr	5.63*	1086.5	[0.04]
Terpinolene	3.96	1243.1	0.03	5.63*	1086.5	[0.04]
Linalool	7.66	1514.6	0.01	5.89	1102.5	0.01
allo-Ocimene	5.23	1333.5	0.01	6.32	1130.3	0.01
trans-Pinocarveol	8.71*	1596.9	[0.04]	6.38	1134.1	0.01
Isopulegol	7.73	1520.1	tr	6.52	1142.9	0.01
meta-Mentha-4,6-dien-8-ol	8.89*	1611.2	[0.01]	6.57	1146.0	0.01
Borneol	9.34*	1648.8	[0.05]	6.84	1163.2	0.02
Terpinen-4-ol	8.15*	1552.7	[0.02]	7.01	1174.2	0.01
Cryptone	8.71*	1596.9	[0.04]	7.10	1179.6	0.01
α-Terpineol	9.34*	1648.8	[0.05]	7.24	1188.9	0.04

Myrtenol	10.40	1736.7	tr	7.33	1194.5	0.01
exo-2-Hydroxycineole				7.74	1221.3	0.01
Carvone	9.54	1664.6	0.01	8.00	1238.7	0.01
Piperitone	9.46	1658.7	0.01	8.16	1249.0	0.02
β-Caryophyllene	8.03	1543.6	0.02	10.52	1412.7	0.02
α-Humulene	8.89*	1611.2	[0.01]	10.98	1446.9	0.01
allo-Aromadendr-9-ene	9.12	1630.4	0.02	11.42	1479.6	0.01
Viridiflorene	9.19	1636.3	0.01	11.54	1488.7	0.01
Aromadendrene	8.15*	1552.7	[0.02]			
Total reported		99.70%			99.83%	

*: 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

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