

Date : 2023-08-15

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 23H08-PTH02

Customer Identification : Clove Bud - Indonesia - CG0109R

Type : Essential Oil

Source : *Syzygium aromaticum*

Customer : Plant Therapy

Checked and approved by:

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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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

This report is an update from the first version issued on 2023-08-14 to update the customer identification.

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 : 2023-08-14

PHYSICOCHEMICAL DATA

Refractive index : 1.5352 ± 0.0003 (20 °C)

Method : PC-MAT-016 - Measure of the refractive index of a liquid.

Analyst : Cindy Caron B. Sc.

Date : 2023-08-08

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
Linalool	0.03	Monoterpenic alcohol
(E)-4,8-Dimethylnona-1,3,7-triene	0.01	Terpene derivative
Methyl salicylate	0.12	Phenolic ester
Chavicol	0.14	Phenylpropanoid
Chavicyl acetate	0.02	Phenylpropanoid ester
α -Cubebene	0.08	Sesquiterpene
Eugenol	80.03	Phenylpropanoid
Dihydroeugenol	0.60	Phenylpropanoid
α -Copaene	0.23	Sesquiterpene
β -Bourbonene	0.04	Sesquiterpene
β -Elemene	0.03	Sesquiterpene
Isocaryophyllene	0.02	Sesquiterpene
Methyleugenol	0.02	Phenylpropanoid
β -Caryophyllene	6.21	Sesquiterpene
Caryophylla-4(12),8(13)-diene	0.02	Sesquiterpene
α -Humulene	0.79	Sesquiterpene
allo-Aromadendrene	0.02	Sesquiterpene
trans-Cadina-1(6),4-diene	0.05	Sesquiterpene
γ -Murolene	0.02	Sesquiterpene
α -Selinene	0.03	Sesquiterpene
α -Murolene	0.03	Sesquiterpene
γ -Cadinene	0.05	Sesquiterpene
trans-Calamenene	0.05	Sesquiterpene
δ -Cadinene	0.13	Sesquiterpene
Eugenyl acetate	9.32	Phenylpropanoid ester
α -Calacorene	0.02	Sesquiterpene
Unknown	0.07	Unknown
Unknown	0.02	Phenylpropanoid
Caryophyllenyl alcohol	0.04	Sesquiterpenic alcohol
Caryophyllene oxide isomer	0.04	Sesquiterpenic ether
Caryophyllene oxide	0.39	Sesquiterpenic ether
Humulene epoxide I	0.03	Sesquiterpenic ether
Humulene epoxide II	0.06	Sesquiterpenic ether
(E)-Isoeugenyl acetate	0.03	Phenylpropanoid ester
1-epi-Cubenol	0.04	Sesquiterpenic alcohol
Caryophylladienol I	0.04	Sesquiterpenic alcohol
Caryophylladienol II	0.05	Sesquiterpenic alcohol
Unknown	0.04	Sesquiterpenic alcohol
14-Hydroxy-(Z)-caryophyllene	0.06	Sesquiterpenic alcohol
14-Hydroxy-9-epi-(E)-caryophyllene	0.02	Sesquiterpenic alcohol

14-Hydroxy-(<i>E</i>)-caryophyllene	0.05	Sesquiterpenic alcohol
Caryolane-1,9 β -diol	0.04	Sesquiterpenic alcohol
Consolidated total	99.14	

tr: The compound has been detected below 0.005% of the total signal

Note: no correction factor was applied

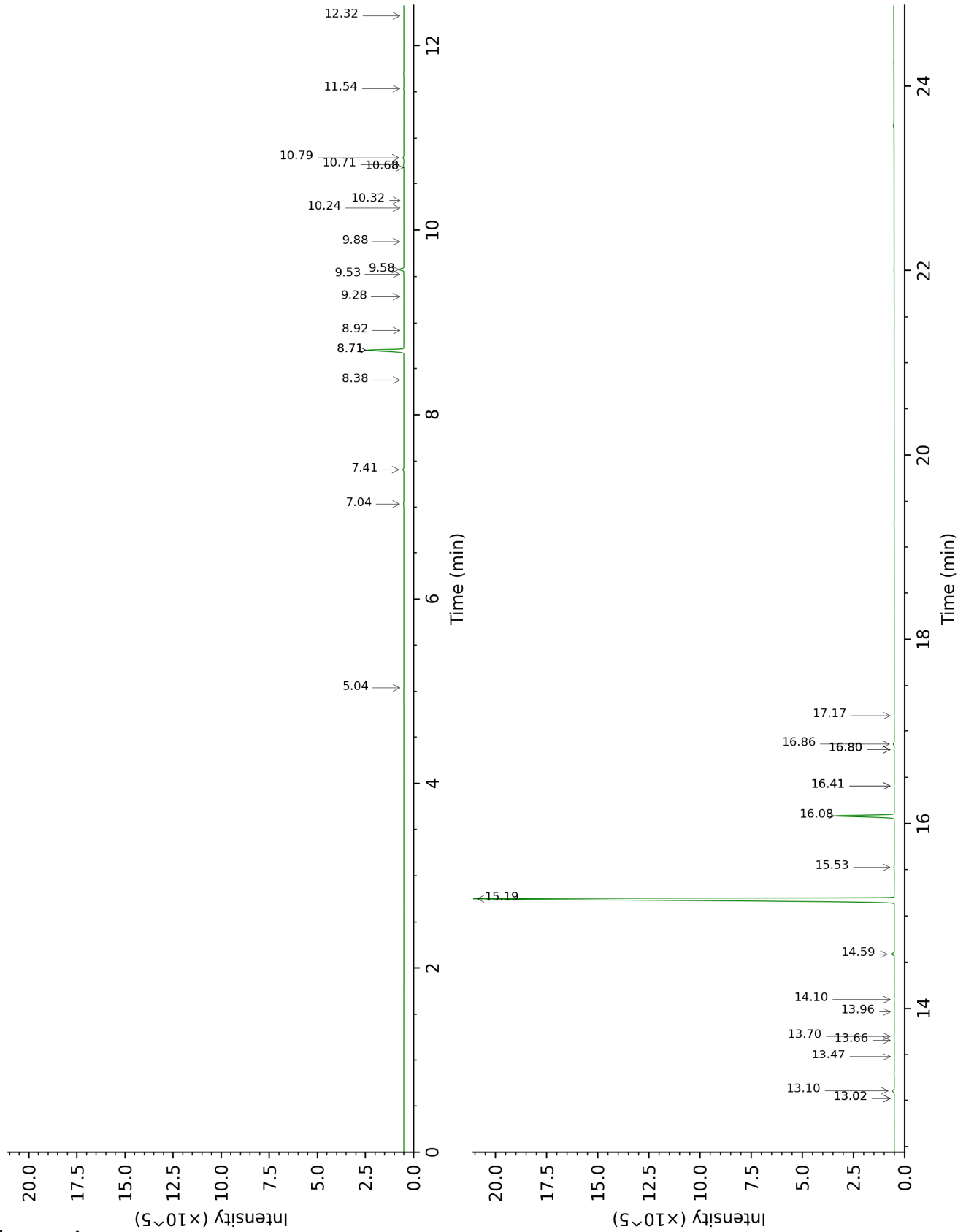
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm 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.

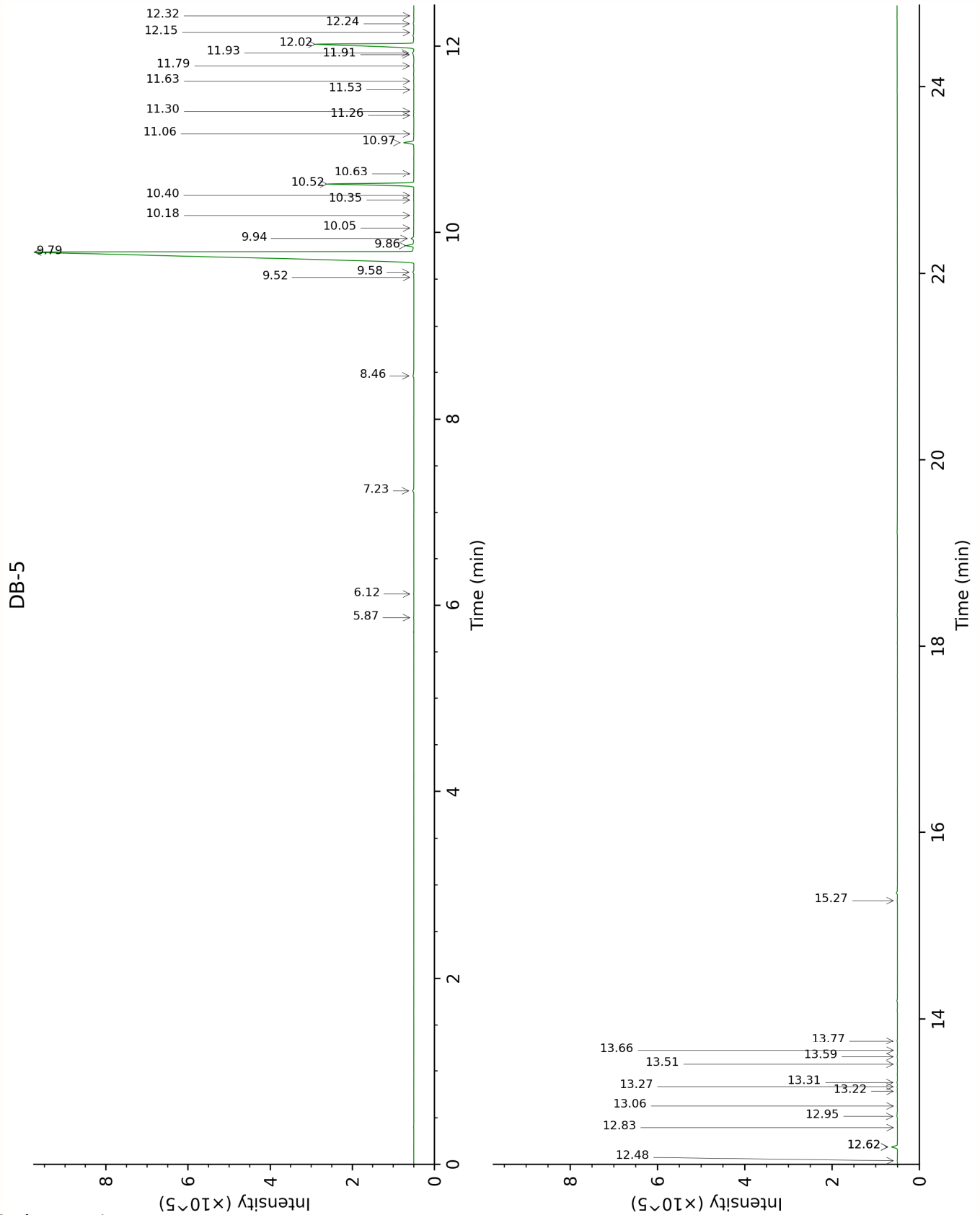
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

Bracketed value (xx): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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DB-WAX





FULL ANALYSIS DATA

Linalool	Column DB-WAX			Column DB-5		
	8.38	1515.3	0.02	5.87	1102.0	0.03
(E)-4,8-Dimethylnona-1,3,7-triene	5.04	1276.1	0.01	6.12	1118.0	0.01
Methyl salicylate	10.79	1706.6	0.15	7.23	1188.8	0.12
Chavicol	16.86	2267.0	0.18	8.46	1270.2	0.14
Chavicyl acetate	13.02*	1898.4	[0.03]	9.52	1342.9	0.02
α -Cubebene	7.04	1415.0	0.08	9.58	1346.8	0.08
Eugenol	15.19	2100.3	80.41	9.79	1361.9	80.03
Dihydroeugenol	14.59	2043.0	0.49	9.86	1366.7	0.60
α -Copaene	7.41	1442.5	0.18	9.94	1372.1	0.23
β -Bourbonene				10.05	1379.9	0.04
β -Elemene	8.71*	1540.7	[6.21]	10.18	1389.4	0.03
Isocaryophyllene				10.35	1400.9	0.02
Methyleugenol	13.66	1956.3	0.03	10.40	1404.5	0.02
β -Caryophyllene	8.71*	1540.7	[6.21]	10.52	1413.5	6.21
Caryophylla-4(12),8(13)-diene	8.92	1557.1	0.02	10.63	1422.2	0.02
α -Humulene	9.58	1608.4	0.75	10.97	1446.9	0.79
allo-Aromadendrene	9.28	1585.0	0.04	11.06	1453.9	0.02
<i>trans</i> -Cadina-1(6),4-diene	9.53	1604.4	0.03	11.26	1468.6	0.05
γ -Murolene	9.88	1632.5	0.01	11.30	1471.8	0.02
α -Selinene	10.24	1661.6	0.02	11.53	1489.0	0.03
α -Murolene	10.32	1668.2	0.02	11.63	1495.8	0.03
γ -Cadinene	10.68	1697.7	0.02	11.79	1508.2	0.05
<i>trans</i> -Calamenene	11.54	1769.1	0.05	11.91	1517.6	0.05
δ -Cadinene	10.71	1700.2	0.10	11.93	1519.1	0.13
Eugenyl acetate	16.08	2188.3	9.31	12.02	1526.4	9.32
α -Calacorene				12.15	1536.2	0.02
Unknown SYAR II [m/z 164, 135 (98), 93 (86), 107 (83), 79 (69)...]	12.32	1837.2	0.06	12.24	1543.5	0.07
Unknown SYAR III [m/z 180, 93 (70), 55 (62), 77 (55), 164 (55), 103 (50)]				12.32	1550.1	0.02
Caryophyllenyl alcohol	13.96	1984.2	0.03	12.48	1562.1	0.04
Caryophyllene oxide isomer	13.02*	1898.4	[0.03]	12.62*	1573.7	[0.43]

Caryophyllene oxide	13.10	1906.0	0.39	12.62*	1573.7	[0.43]
Humulene epoxide I	13.47	1939.6	0.03	12.83	1589.9	0.03
Humulene epoxide II	13.70	1960.1	0.06	12.95	1599.3	0.06
(E)-Isoeugenyl acetate				13.06	1608.3	0.03
1-epi-Cubenol	14.10	1996.7	0.04	13.22	1621.2	0.04
Caryophylladienol I	16.41*	2221.2	[0.05]	13.27	1625.4	0.04
Caryophylladienol II	16.41*	2221.2	[0.05]	13.32	1629.0	0.05
Unknown cadinol analog II [m/z 95, 121 (73), 43 (57), 79 (43), 161 (43), 109 (40)... 204 (35), 222 (2)]	15.53	2133.5	0.08	13.51	1645.2	0.04
14-Hydroxy-(Z)-caryophyllene	16.80*	2260.8	[0.05]	13.59	1651.8	0.06
14-Hydroxy-9-epi-(E)-caryophyllene	16.80*	2260.8	[0.05]	13.66	1657.4	0.02
14-Hydroxy-(E)-caryophyllene	17.17	2299.0	0.05	13.76	1666.1	0.05
Caryolane-1,9 β -diol				15.27	1794.5	0.04
Total reported		99.03%			99.14%	

*: 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