Date : 2026-06-15

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 26E04-PTH02
Customer Identification : Clove Bud - Indonesia - CG0115
Type : Essential Oil
Source : *Syzygium aromaticum*
Customer : Plant Therapy

Checked an approved by:

Sylvain Mercier, M. Sc., Chimiste 2014-005

Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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. The compliance status of the sample is provided to facilitate the reading of the report. The client remains ultimately responsible for reviewing the results presented within this report and to establish compliance of the tested batch against relevant quality criteria.

This report is an update of the version first issued on 2026-05-05 to make a modification in the sample identification section.

Méthode certifiée ISO 17025:2017 Certified method

Laboratoire PhytoChemia

628 Boulevard du Saguenay Ouest, Saguenay (Qc) G7J 1H4 | www.phytochemia.com

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 : Jean-Christophe Fortin, M. Sc.
Date : 2026-05-05

Physicochemical data

Refractive index : 1.535 ± 0.0003 (20 °C)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Cindy Caron B. Sc.
Date : 2026-05-01

Conclusion

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

628 Boulevard du Saguenay, Saguenay (Qc) G7J 1H4 | www.phytochemia.com

Analysis Summary - Consolidated Contents

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

Identification	%	Class
Isovaleral	0.01	Aliphatic aldehyde
2-Methylbutyral	0.01	Aliphatic aldehyde
Furfural	0.04	Furan
Benzaldehyde	0.01	Simple phenolic
5-Methylfurfural	0.01	Furan
6-Methyl-5-hepten-2-one	0.01	Aliphatic ketone
Limonene	0.01	Monoterpene
Linalool	0.01	Monoterpenic alcohol
(*E*)-4,8-Dimethylnona-1,3,7-triene	0.01	Terpene derivative
Methyl salicylate	0.07	Phenolic ester
Chavicol	0.17	Phenylpropanoid
Chavicyl acetate	0.02	Phenylpropanoid ester
Eugenol	81.15	Phenylpropanoid
α-Copaene	0.17	Sesquiterpene
β-Elemene	0.02	Sesquiterpene
Isocaryophyllene	0.02	Sesquiterpene
Methyleugenol	0.04	Phenylpropanoid
β-Caryophyllene	6.25	Sesquiterpene
Caryophylla-4(12),8(13)-diene	0.04	Sesquiterpene
9-epi-Isocaryophyllene	0.04	Sesquiterpene
α-Humulene	0.79	Sesquiterpene
allo-Aromadendrene	0.01	Sesquiterpene
trans-Cadina-1(6),4-diene	0.06	Sesquiterpene
γ-Muurolene	0.03	Sesquiterpene
β-Selinene	0.01	Sesquiterpene
α-Selinene	0.02	Sesquiterpene
α-Muurolene	0.01	Sesquiterpene
(3*Z*,6*E*)-α-Farnesene	0.02	Sesquiterpene
γ-Cadinene	0.06	Sesquiterpene
trans-Calamenene	0.07	Sesquiterpene
δ-Cadinene	0.23	Sesquiterpene
Eugenyl acetate	8.81	Phenylpropanoid ester
α-Calacorene	0.03	Sesquiterpene
8,12-Cyclo-6(5→4)abeo-caryophyllan-5-al isomer 2	0.09	Norsesquiterpenic aldehyde
Unknown	0.01	Phenylpropanoid
Caryophyllenyl alcohol	0.01	Sesquiterpenic alcohol
(*E*)-Nerolidol	0.03	Sesquiterpenic alcohol
Caryophyllene oxide	0.17	Sesquiterpenic ether
Clovenol?	0.05	Sesquiterpenic alcohol

Humulene epoxide I	0.02	Sesquiterpenic ether
Humulene epoxide II	0.03	Sesquiterpenic ether
(*E*)-Isoeugenyl acetate	0.03	Phenylpropanoid ester
1-epi-Cubenol	0.04	Sesquiterpenic alcohol
Caryophylladienol I	0.04	Sesquiterpenic alcohol
Caryophylladienol II	0.07	Sesquiterpenic alcohol
τ-Muurolol	0.01	Sesquiterpenic alcohol
τ-Cadinol	0.01	Sesquiterpenic alcohol
α-Muurolol	0.01	Sesquiterpenic alcohol
14-Hydroxy-(*Z*)-caryophyllene	0.11	Sesquiterpenic alcohol
14-Hydroxy-9-epi-(*E*)-caryophyllene	0.02	Sesquiterpenic alcohol
14-Hydroxy-(*E*)-caryophyllene	0.06	Sesquiterpenic alcohol
Trimethoxypropylbenzene analog	0.14	Phenylpropanoid
(*E*)-Coniferyl alcohol	0.03	Phenylpropanoid
Benzyl benzoate	0.01	Phenolic ester
(*E*)-4-(3-Hydroxy-1-propenyl)-2-methoxyphenyl acetate	0.02	Phenylpropanoid ester
Unknown	0.03	Lignan
Unknown	0.02	Lignan
Consolidated total	**99.30**	

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

Note: no correction factor was applied

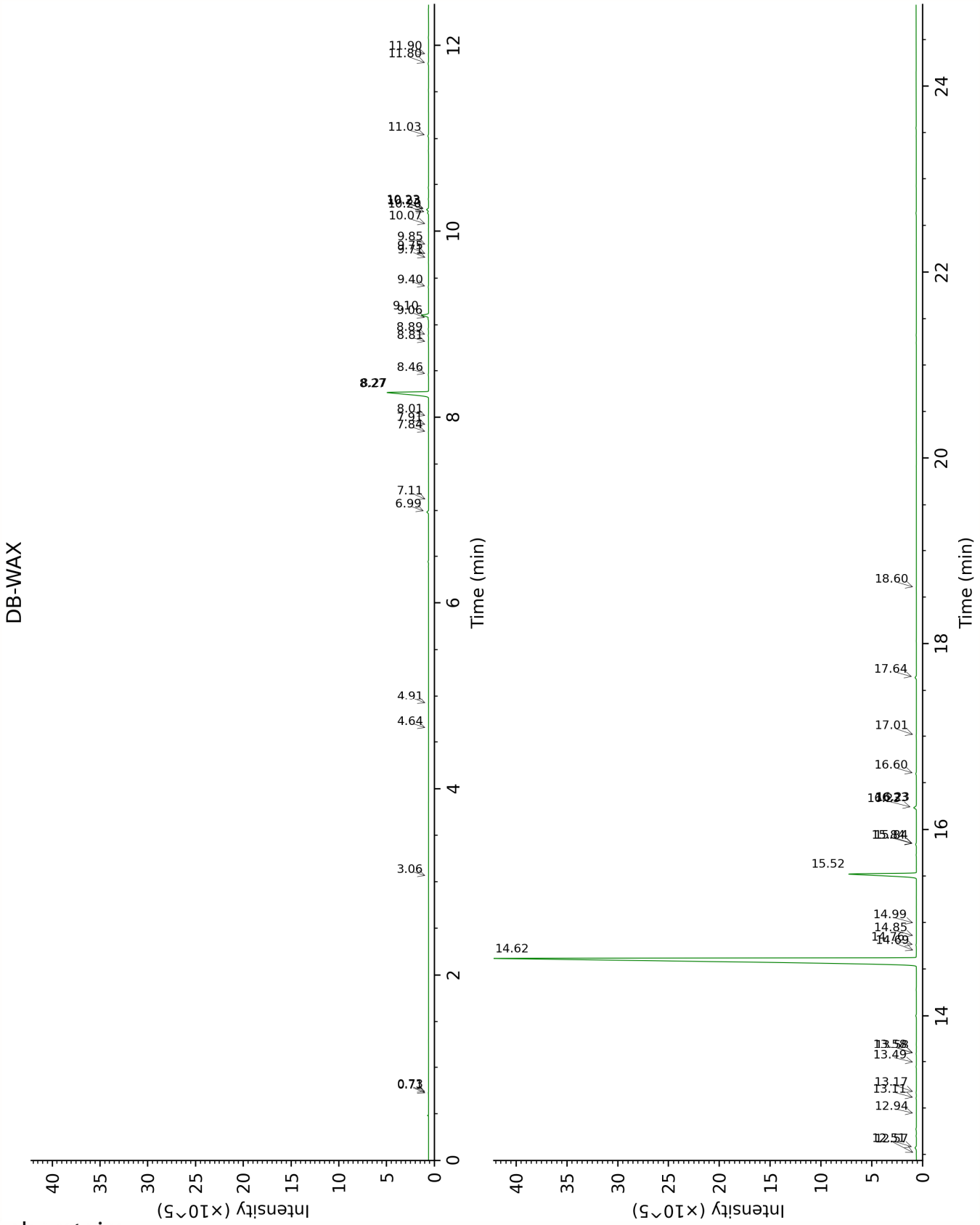
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

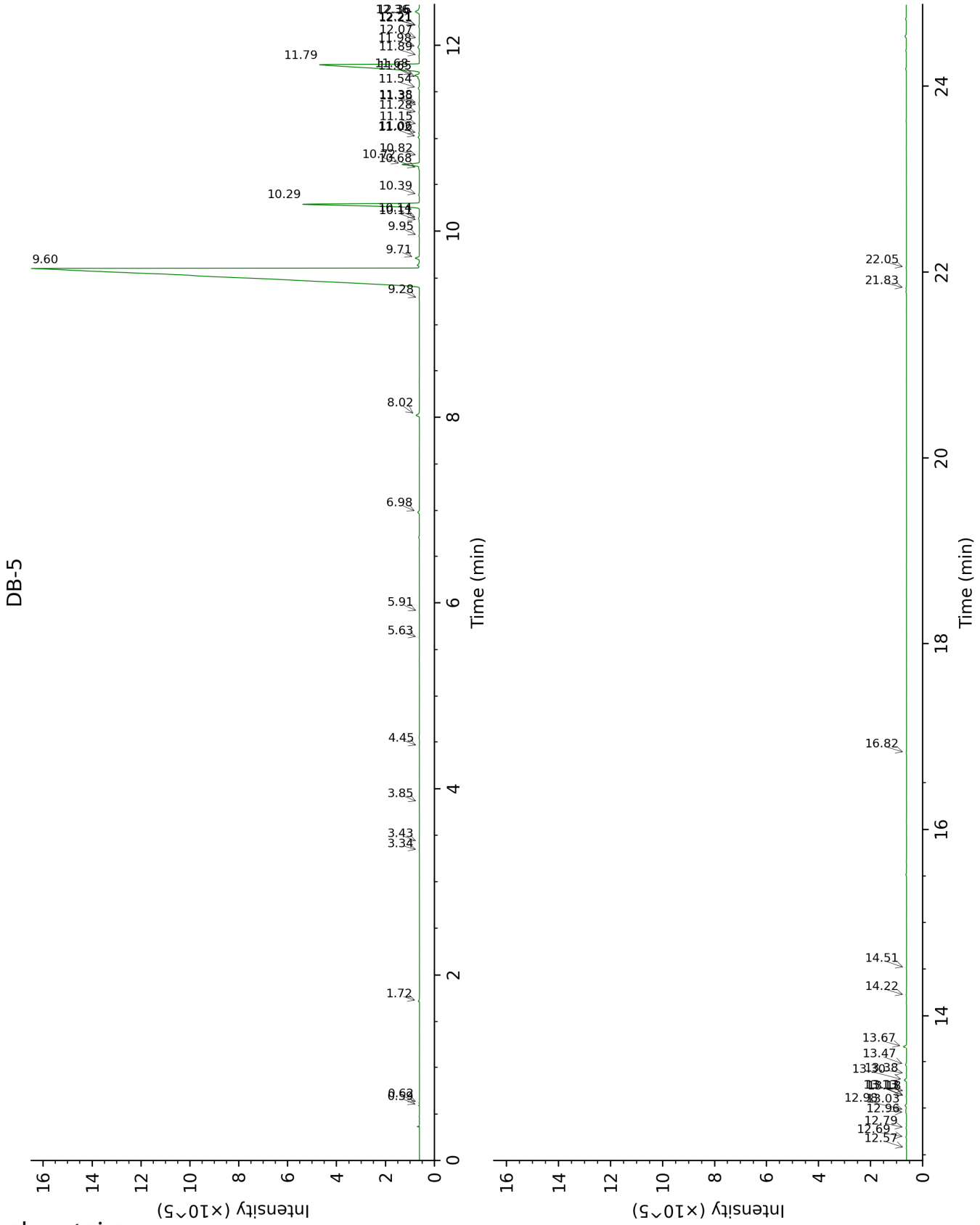
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

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.

628 Boulevard du Saguenay, Saguenay (Qc) G7J 1H4 | www.phytochemia.com


DB-WAX
Intensity (×10^5)
Time (min)
11.90
11.80
11.03
10.07
9.85
9.40
9.06
8.89
8.81
8.46
8.27
8.01
7.84
7.11
6.99
4.91
4.64
3.06
0.73
18.60
17.64
17.01
16.60
15.52
14.99
14.85
14.69
14.62
13.49
13.17
12.94



Laboratoire PhytoChemia
Plus que des analyses... des conseils
628 Boulevard du Saguenay, Saguenay (Qc) G7J 1H4 | www.phytochemia.com

FULL ANALYSIS DATA

	Column DB-WAX			Column DB-5		
Isovaleral	0.73	885.6	0.01	0.59	643.4	0.01
2-Methylbutyral	0.71	879.7	0.01	0.62	653.4	0.01
Furfural				1.72	828.7	0.04
Benzaldehyde	7.11	1454.7	0.01	3.34	953.3	0.01
5-Methylfurfural	7.84	1509.9	0.02	3.43	959.3	0.01
6-Methyl-5-hepten-2-one	4.91	1296.7	0.01	3.85	987.9	0.01
Limonene	3.06	1156.6	tr	4.45	1027.1	0.01
Linalool	7.91	1515.7	0.01	5.63	1102.0	0.01
(*E*)-4,8-Dimethylnona-1,3,7-triene	4.64	1277.1	0.01	5.91	1119.9	0.01
Methyl salicylate	10.23*	1702.2	[0.20]	6.98	1190.1	0.07
Chavicol	16.23*	2266.0	[0.31]	8.02	1260.5	0.17
Chavicyl acetate	12.51	1900.8	0.02	9.28	1344.6	0.02
Eugenol	14.62†	2100.9	81.09	9.60†	1367.7	81.05
α-Copaene	6.98	1445.4	0.17	9.71	1375.6	0.17
β-Elemene	8.27*	1543.6	[6.30]	9.95	1392.4	0.02
Isocaryophyllene	8.01	1523.1	0.02	10.11	1403.8	0.02
Methyleugenol	13.11	1956.5	0.03	10.14	1405.8	0.04
β-Caryophyllene	8.27*	1543.6	[6.30]	10.29	1417.1	6.25
Caryophylla-4(12),8(13)-diene	8.46	1558.7	0.03	10.39	1424.7	0.04
9-epi-Isocaryophyllene	8.89	1592.2	0.03	10.68	1446.5	0.04
α-Humulene	9.10	1609.3	0.79	10.72	1449.7	0.79
allo-Aromadendrene	8.81	1586.4	0.02	10.82	1456.7	0.01
trans-Cadina-1(6),4-diene	9.06	1606.3	0.06	11.02	1471.6	0.06
γ-Muurolene	9.40	1634.0	0.03	11.06	1474.9	0.03
β-Selinene	9.71	1658.9	0.01	11.15	1481.7	0.01
α-Selinene	9.75	1662.3	0.02	11.28	1491.4	0.02
α-Muurolene	9.85	1670.6	0.02	11.35	1496.9	0.01
(3*Z*,6*E*)-α-Farnesene	10.07	1688.9	0.01	11.38	1498.9	0.02
γ-Cadinene	10.20	1699.3	0.11	11.54	1511.4	0.06
trans-Calamenene	11.03	1770.3	0.07	11.65	1519.9	0.07
δ-Cadinene	10.23*	1702.2	[0.20]	11.68	1522.1	0.23
Eugenyl acetate	15.52	2192.1	8.78	11.79	1531.3	8.81
α-Calacorene	11.90	1846.5	0.02	11.89	1538.8	0.03
8,12-Cyclo-6(5→4)abeo-caryophyllan-5-al isomer 2	11.80	1837.8	0.06	11.98	1546.1	0.09
Unknown SYAR III [m/z 180, 93 (70), 55 (62), 77 (55), 164 (55), 103 (50)]				12.07	1553.2	0.01
Caryophyllenyl alcohol	13.49	1992.0	0.01	12.21*	1564.0	[0.04]
(*E*)-Nerolidol	13.58*	2001.0	[0.03]	12.21*	1564.0	[0.04]
Caryophyllene oxide	12.57	1906.9	0.17	12.36*	1576.2	[0.26]

Clovenol?	14.76	2114.9	0.05	12.36*	1576.2	[0.26]
Humulene epoxide I	12.94	1940.9	0.02	12.57	1592.6	0.02
Humulene epoxide II	13.17	1962.0	0.03	12.69	1602.1	0.03
(*E*)-Isoeugenyl acetate	17.01	2348.5	0.02	12.79	1610.1	0.03
1-epi-Cubenol	13.58*	2001.0	[0.03]	12.96	1624.0	0.04
Caryophylladienol I	15.84*	2224.7	[0.08]	12.98	1626.0	0.04
Caryophylladienol II	15.84*	2224.7	[0.08]	13.03	1630.0	0.07
τ-Muurolol	14.85	2124.3	0.01	13.13*	1638.0	[0.02]
τ-Cadinol	14.69	2108.3	0.01	13.13*	1638.0	[0.02]
α-Muurolol	14.99	2138.2	0.01	13.18	1642.8	0.01
14-Hydroxy-(*Z*)-caryophyllene	16.23*	2266.0	[0.31]	13.30	1652.8	0.11
14-Hydroxy-9-epi-(*E*)-caryophyllene	16.23*	2266.0	[0.31]	13.38	1658.7	0.02
14-Hydroxy-(*E*)-caryophyllene	16.60	2304.2	0.06	13.47	1666.4	0.06
Trimethoxypropylbenzene analog	17.64	2417.3	0.14	13.67	1683.2	0.14
(*E*)-Coniferyl alcohol				14.22	1730.0	0.03
Benzyl benzoate	18.60	2526.2	0.01	14.51	1755.5	0.01
(*E*)-4-(3-Hydroxy-1-propenyl)-2-methoxyphenyl acetate				16.82	1966.6	0.02
Unknown OCSA V [m/z 326, 148 (67), 147 (41), 117 (30), 91 (22)...]				21.83	2500.4	0.03
Unknown CIZE V [m/z 326, 150 (54), 161 (42), 202 (41), 201 (28)]				22.05	2526.8	0.02
Total reported		98.94%			99.25%	

*: 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

628 Boulevard du Saguenay, Saguenay (Qc) G7J 1H4 | www.phytochemia.com