Date : 2024-04-16

Certificate of Analysis - GC Profiling

Sample Identification

Internal code : 24D02-PTH05
Customer Identification : Organic Frankincense Serrata - India - F50113R
Type : Essential Oil
Source : *Boswellia serrata*
Customer : Plant Therapy

Checked an 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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.

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 : Sylvain Mercier, M. Sc., Chimiste 2014-005
Date : 2024-04-11

Physicochemical data

Refractive index : 1.4583 ± 0.0003 (20 °C)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Cindy Caron B. Sc.
Date : 2024-04-04

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
(*E*)-2-Methyl-1,3-pentadiene	tr	Alkene
Toluene	0.02	Simple phenolic
Unknown	tr	Unknown
Unknown	tr	Monoterpene
Unknown	0.02	Unknown
Hashishene	0.24	Monoterpene
Tricyclene	0.01	Monoterpene
α-Thujene	68.61	Monoterpene
α-Pinene	8.91	Monoterpene
α-Fenchene	0.01	Monoterpene
Unknown	0.56	Monoterpene
Camphene	0.11	Monoterpene
Thuja-2,4(10)-diene	0.03	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.05	Monoterpene
β-Pinene	0.52	Monoterpene
Sabinene	4.24	Monoterpene
Pseudolimonene isomer	0.01	Monoterpene
Myrcene	3.11	Monoterpene
2-Carene	0.01	Monoterpene
α-Phellandrene	1.82	Monoterpene
Pseudolimonene	tr	Monoterpene
Δ3-Carene	2.76	Monoterpene
α-Terpinene	0.37	Monoterpene
Carvomenthene	tr	Aliphatic alcohol
meta-Cymene	0.10	Monoterpene
para-Cymene	2.28	Monoterpene
Unknown	0.10	Unknown
β-Phellandrene	[0.41]	Monoterpene
Limonene	1.84	Monoterpene
1,8-Cineole	[0.41]	Monoterpenic ether
Unknown	0.01	Unknown
(*Z*)-β-Ocimene	0.20	Monoterpene
Unknown	0.04	Unknown
(*E*)-β-Ocimene	0.16	Monoterpene
Unknown	0.07	Unknown
γ-Terpinene	0.73	Monoterpene
cis-Sabinene hydrate	0.08	Monoterpenic alcohol
Unknown	0.01	Oxygenated monoterpene
Isoterpinolene	0.01	Monoterpene
Terpinolene	0.20	Monoterpene

para-Cymenene	0.01	Monoterpene
α-Pinene oxide	0.01	Monoterpenic ether
trans-Sabinene hydrate	0.06	Monoterpenic alcohol
Linalool	0.05	Monoterpenic alcohol
α-Thujone	0.08	Monoterpenic ketone
β-Thujone	0.12	Monoterpenic ketone
Unknown	0.03	Oxygenated monoterpene
Unknown	0.03	Oxygenated monoterpene
Dehydrosabinaketone	0.01	Normonoterpenic ketone
cis-*para*-Menth-2-en-1-ol	0.04	Monoterpenic alcohol
Unknown	0.02	Unknown
allo-Ocimene	0.02	Monoterpene
trans-Pinocarveol	0.01	Monoterpenic alcohol
trans-Sabinol	0.04	Monoterpenic alcohol
trans-Verbenol	0.03	Monoterpenic alcohol
Unknown	0.03	Unknown
para-Menth-3-en-8-ol	0.03	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Unknown	0.02	Oxygenated monoterpene
Borneol	0.02	Monoterpenic alcohol
Umbellulone	0.02	Monoterpenic ketone
cis-Sabinol	0.05	Monoterpenic alcohol
Terpinen-4-ol	0.36	Monoterpenic alcohol
meta-Cymen-8-ol	0.01	Monoterpenic alcohol
Cryptone	0.01	Normonoterpenic ketone
para-Cymen-8-ol	0.01	Monoterpenic alcohol
α-Terpineol	0.03	Monoterpenic alcohol
Methylchavicol	0.61	Phenylpropanoid
cis-α-Phellandrene epoxide (iPr vs Me)	0.03	Monoterpenic ether
Verbenone	0.02	Monoterpenic ketone
Carvone	0.01	Monoterpenic ketone
Unknown	0.06	Unknown
Linalyl acetate	0.01	Monoterpenic ester
Unknown	0.02	Oxygenated monoterpene
Carvacrol	0.03	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer III	0.03	Monoterpenic alcohol
Unknown	0.01	Unknown
α-Copaene	0.02	Sesquiterpene
β-Bourbonene	0.06	Sesquiterpene
δ-Cadinene	0.01	Sesquiterpene
Consolidated total	**99.77**	

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

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

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.

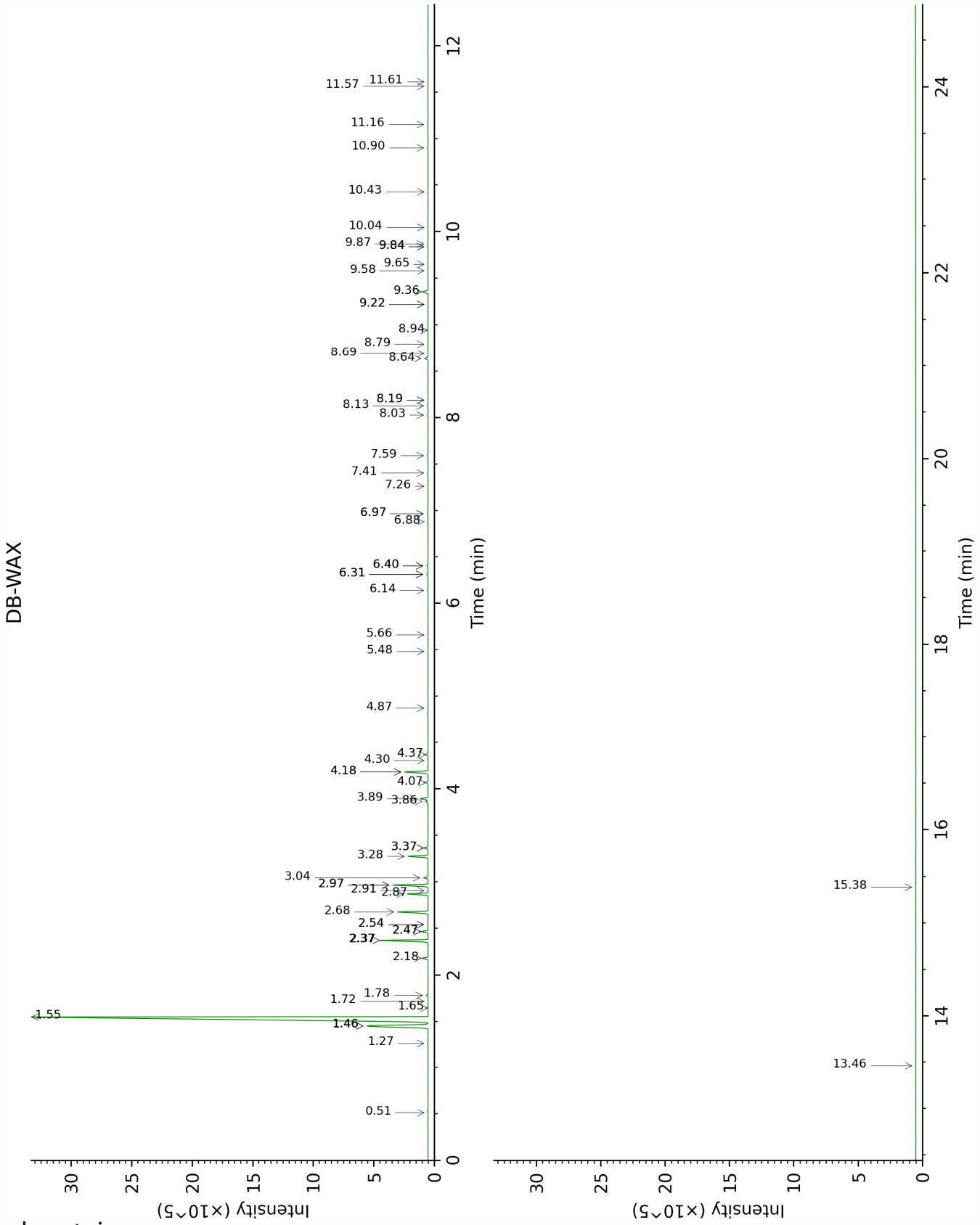
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

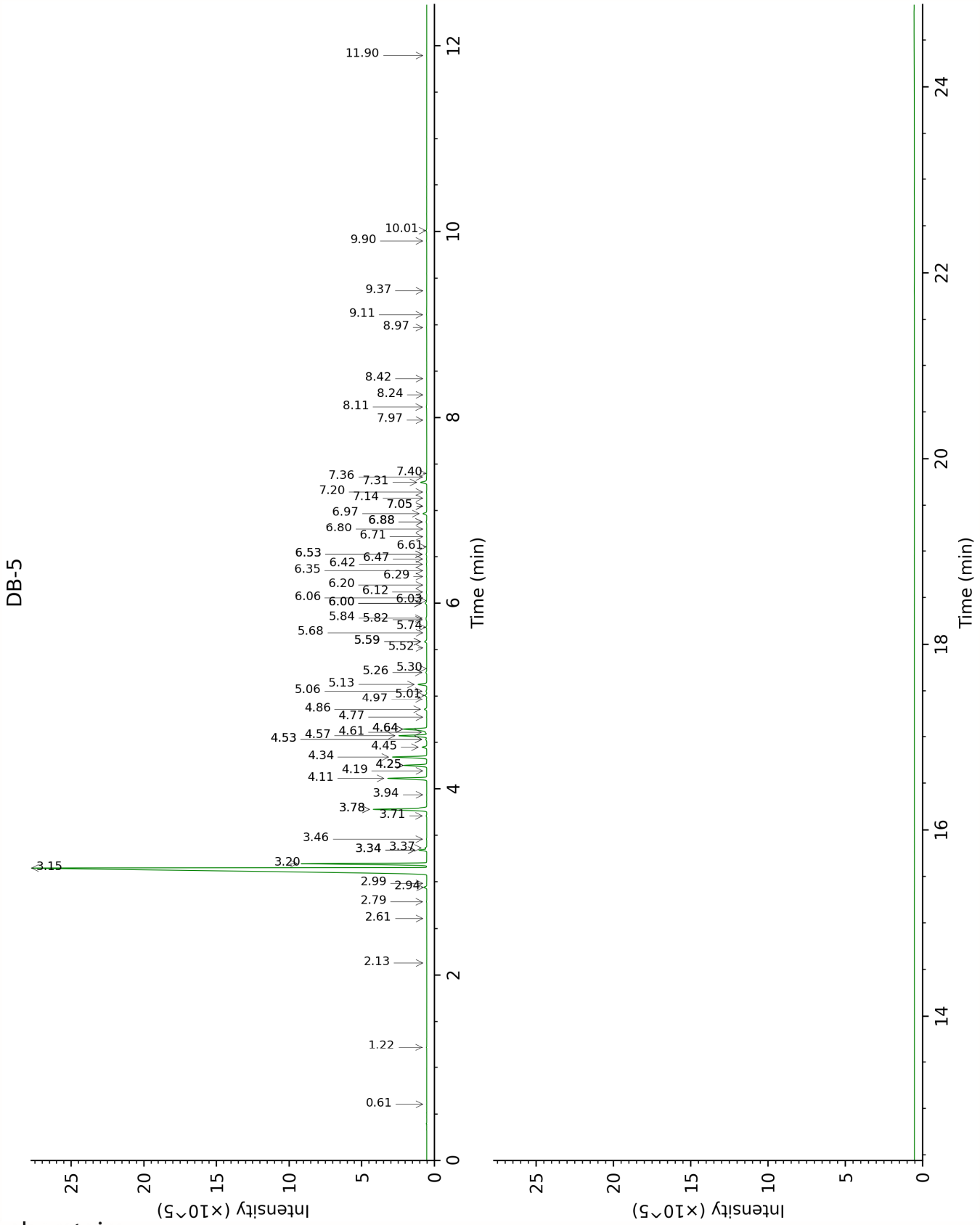
Bracketed value ([xx]): A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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

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
Time (min)
Intensity (×10^5)
11.57
11.61
11.16
10.90
10.43
10.04
9.87
9.84
9.58
9.65
9.36
9.22
8.94
8.79
8.69
8.64
8.13
8.19
8.03
7.59
7.41
7.26
6.97
6.88
6.31
6.40
6.14
5.66
5.48
4.87
4.30
4.37
4.18
4.07
3.89
3.86
3.28
3.37
3.04
2.97
2.91
2.87
2.68
2.54
2.47
2.37
2.18
1.72
1.78
1.65
1.55
1.46
1.27
0.51
15.38
13.46


DB-5
Time (min)
Intensity (×10^5)
11.90
10.01
9.90
9.37
9.11
8.97
8.42
8.24
8.11
7.97
7.40
7.36
7.31
7.20
7.14
7.05
6.97
6.88
6.80
6.71
6.61
6.53
6.47
6.42
6.35
6.29
6.20
6.12
6.06
6.03
6.00
5.84
5.82
5.74
5.68
5.59
5.52
5.30
5.26
5.13
5.06
5.01
4.97
4.86
4.77
4.64
4.61
4.57
4.53
4.45
4.34
4.25
4.19
4.11
3.94
3.78
3.71
3.46
3.37
3.34
3.20
3.15
2.99
2.94
2.79
2.61
2.13
1.22
0.61

FULL ANALYSIS DATA

(*E*)-2-Methyl-1,3-pentadiene	**Column DB-WAX**			**Column DB-5**		
	0.51	765.1	tr	0.61	629.3	tr
Toluene	1.46*	997.2	[9.08]	1.22	759.3	0.02
Unknown PRME II [m/z 109, 43 (28), 124 (28), 41 (14), 55 (11), 79 (9), 81 (8)...]	1.65	1019.7	0.01	2.13	852.7	tr
Unknown BOFR I [m/z 93, 91 (75), 121 (61), 77 (58), 79 (38), 92 (26), 43 (24), 41 (23), 105 (22),107 (19), 136 (16)]				2.61	891.9	tr
Unknown BOFR II [m/z 93, 91 (72), 121 (58), 77 (49), 79 (41), 43 (22), 105 (20),107 (20), 41 (18), 136 (17), 92 (17)]				2.79	906.5	0.02
Hashishene	1.46*	997.2	[9.08]	2.94	916.7	0.24
Tricyclene	1.27	969.2	0.03	2.99	919.5	0.01
α-Thujene	1.55	1010.6	68.37	3.15	930.4	68.61
α-Pinene	1.46*	997.2	[9.08]	3.20	933.5	8.91
α-Fenchene	1.72	1026.4	0.01	3.34*†	943.0	[0.58]
Unknown SAOF I [m/z 91, 92 (47), 65 (11)... 134 (1)]	2.47*	1096.7	[0.57]	3.34*†	943.0	[0.58]
Camphene	1.78	1032.4	0.11	3.37*†	944.6	[0.12]
Thuja-2,4(10)-diene	2.37*	1087.7	[4.23]	3.46	950.8	0.03
3,7,7-Trimethylcyclohepta-1,3,5-triene	2.97*	1136.5	[3.18]	3.71	967.2	0.05
β-Pinene	2.18	1069.8	0.52	3.78*	971.9	[4.76]
Sabinene	2.37*	1087.7	[4.23]	3.78*	971.9	[4.76]
Pseudolimonene isomer	2.54*	1103.6	[0.04]	3.94	982.2	0.01
Myrcene	2.97*	1136.5	[3.18]	4.11	993.8	3.11
2-Carene	2.47*	1096.7	[0.57]	4.19	999.1	0.01
α-Phellandrene	2.87	1129.3	1.82	4.25*	1003.0	[1.85]
Pseudolimonene	2.91	1132.0	tr	4.25*	1003.0	[1.85]
Δ3-Carene	2.68	1114.7	2.74	4.34	1008.7	2.76
α-Terpinene	3.04	1142.4	0.37	4.45	1015.3	0.37
Carvomenthene	2.54*	1103.6	[0.04]	4.53*	1020.6	[0.10]
meta-Cymene	4.18*	1227.2	[2.38]	4.53*	1020.6	[0.10]

para-Cymene	4.18*	1227.2	[2.38]	4.57	1023.1	2.28
Unknown BODA IV [m/z 109, 43 (58), 95 (26)... 137 (15)...]	6.31*	1379.7	[0.13]	4.61	1025.3	0.10
β-Phellandrene	3.36*	1166.6	[0.41]	4.64*	1027.5	[2.26]
Limonene	3.28	1159.9	1.84	4.64*	1027.5	[2.26]
1,8-Cineole	3.36*	1166.6	[0.41]	4.64*	1027.5	[2.26]
Unknown BOSA IV [m/z 67, 93 (70), 82 (70), 121 (42), 107 (39), 91 (33), 79 (28)...]				4.77	1035.5	0.01
(*Z*)-β-Ocimene	3.86	1204.4	0.20	4.86	1040.8	0.20
Unknown BOFR III [m/z 109, 43 (57), 91 (28), 67 (25), 93 (24), 95 (22), 77 (21), 137 (21), 41 (17), 79 (14)...]	7.41	1461.0	0.04	4.97	1047.8	0.04
(*E*)-β-Ocimene	4.07	1219.0	0.17	5.01	1050.6	0.16
Unknown BOFR IV [m/z 109 , 45 (67), 41 (40), 67 (39), 81 (33), 79 (27), 95 (24), 91 (23), 82 (21), 55 (21), 93 (20)...]	6.97*	1428.1	[0.08]	5.06	1053.4	0.07
γ-Terpinene	3.89	1206.7	0.73	5.13	1058.0	0.73
cis-Sabinene hydrate	6.97*	1428.1	[0.08]	5.26	1066.0	0.08
Unknown PIMA I [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	4.87	1275.9	0.01	5.30	1068.6	0.01
Isoterpinolene	4.30	1235.9	0.01	5.52	1082.6	0.01
Terpinolene	4.37	1240.4	0.20	5.59*	1086.7	[0.21]
para-Cymenene	6.40*	1386.4	[0.14]	5.59*	1086.7	[0.21]
α-Pinene oxide	5.48	1320.0	0.01	5.68	1092.7	0.01
trans-Sabinene hydrate	8.03	1507.8	0.06	5.74	1096.4	0.06
Linalool	8.13	1515.6	0.06	5.82	1101.5	0.05
α-Thujone	6.14	1367.3	0.05	5.84	1102.5	0.08
β-Thujone	6.40*	1386.4	[0.14]	6.00*	1112.6	[0.15]
Unknown BOSE I [m/z 109, 81 (54), 91 (32), 79 (22)...]	6.31*	1379.7	[0.13]	6.00*	1112.6	[0.15]
Unknown BOSE II [m/z 109, 91 (57), 93 (47), 81 (44), 77 (40)...				6.03	1114.5	0.03

154 (1)]						
Dehydrosabinaketone	8.69	1560.0	0.03	6.06	1116.3	0.01
cis-para-Menth-2-en-1-ol	8.19*	1520.4	[0.03]	6.12	1120.4	0.04
Unknown BOSE III [m/z 111, 43 (22), 55 (14), 41 (12), 110 (11)...]				6.20	1125.1	0.02
allo-Ocimene	5.66	1332.8	0.02	6.29	1131.0	0.02
trans-Pinocarveol	9.22*	1602.0	[0.02]	6.35	1135.0	0.01
trans-Sabinol	9.87	1655.2	0.04	6.42	1139.3	0.04
trans-Verbenol	9.58	1631.4	0.02	6.48	1142.9	0.03
Unknown MEAL II [m/z 109, 124 (45), 119 (41), 43 (35), 91 (28), 95 (25)...]	6.88	1421.8	0.03	6.53*	1146.2	[0.07]
para-Menth-3-en-8-ol	8.80	1568.2	0.03	6.53*	1146.2	[0.07]
Unknown BOSE IV [m/z 109, 81 (39), 41 (38), 95 (24)... 152 (1)]				6.61	1151.3	0.02
Unknown RHGR XIX [m/z 109, 43 (75), 137 (46), 67 (31), 93 (25)... 152 (4)]				6.72	1158.3	0.02
Borneol	9.84*	1652.8	[0.03]	6.80	1163.5	0.02
Umbellulone	8.94	1580.0	0.02	6.88*	1168.9	[0.06]
cis-Sabinol	10.90	1742.9	0.05	6.88*	1168.9	[0.06]
Terpinen-4-ol	8.64	1555.7	0.37	6.97	1174.5	0.36
meta-Cymen-8-ol	11.57	1791.0	0.01	7.05*	1179.7	[0.02]
Cryptone	9.22*	1602.0	[0.02]	7.05*	1179.7	[0.02]
para-Cymen-8-ol	11.61	1795.1	0.01	7.14	1185.1	0.01
α-Terpineol	9.84*	1652.8	[0.03]	7.20	1189.4	0.03
Methylchavicol	9.36	1612.8	0.66	7.31	1196.0	0.61
cis-α-Phellandrene epoxide (iPr vs Me)	11.16	1755.1	0.05	7.36	1199.7	0.03
Verbenone	9.65	1637.2	0.01	7.40	1202.2	0.02
Carvone	10.04	1669.9	0.02	7.97	1240.2	0.01
Unknown CALU IV [m/z 43, 97 (69), 107 (46), 41 (28), 55 (21), 109 (20)...]				8.11	1249.6	0.06
Linalyl acetate	8.19*	1520.4	[0.03]	8.24	1258.3	0.01
Unknown BOSE VI [m/z 109, 41 (22), 81 (14), 43 (11)... 152 (4)]				8.42	1270.0	0.02

Carvacrol	15.38	2154.5	0.02	8.98	1307.2	0.03
para-Menth-5-en-1,2-diol isomer III				9.11	1316.9	0.03
Unknown SCMO III [m/z 43, 97 (99), 107 (47), 41 (35), 55 (30)...]	13.46	1965.3	0.01	9.37	1334.9	0.01
α-Copaene	7.26	1450.3	0.02	9.90	1372.5	0.02
β-Bourbonene	7.59	1475.0	0.06	10.01	1380.3	0.06
δ-Cadinene	10.42	1701.6	0.01	11.90	1519.9	0.01
Total reported		99.18%			99.82%	

*: 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