CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 23J20-PTH02
Customer Identification : Elemi - Philippines - EE0106R
Type : Essential Oil
Source : *Canarium luzonicum*
Customer : Plant Therapy

Checked an approved by:

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

MÉTHODE CERTIFIÉE
*ISO 17025:2017
CERTIFIED METHOD

Laboratoire
Phy⎹toChemia

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 : Benoit Roger, Ph. D.
Date : 2023-10-27

PHYSICOCHEMICAL DATA

Refractive index : 1.4804 ± 0.0003 (20 ℃)
Method : PC-MAT-016 - Measure of the refractive index of a liquid.
Analyst : Cindy Caron B. Sc.
Date : 2023-10-23

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
Toluene	0.01	Simple phenolic
α-Thujene	0.12	Monoterpene
α-Pinene	0.33	Monoterpene
Camphene	0.02	Monoterpene
Sabinene	3.79	Monoterpene
β-Pinene	0.17	Monoterpene
3-Methyl-3-cyclohexenone	tr	Aliphatic ketone
Myrcene	0.54	Monoterpene
Pseudolimonene	0.03	Monoterpene
α-Phellandrene	14.85	Monoterpene
Δ3-Carene	0.04	Monoterpene
α-Terpinene	0.30	Monoterpene
para-Cymene	0.01	Monoterpene
1,8-Cineole	0.10	Monoterpenic ether
β-Phellandrene	2.07	Monoterpene
Limonene	50.95	Monoterpene
(*Z*)-β-Ocimene	0.30	Monoterpene
(*E*)-β-Ocimene	0.21	Monoterpene
γ-Terpinene	0.21	Monoterpene
cis-Sabinene hydrate	0.09	Monoterpenic alcohol
Terpinolene	1.08	Monoterpene
para-Cymenene	0.02	Monoterpene
trans-Sabinene hydrate	0.01	Monoterpenic alcohol
Linalool	0.01	Monoterpenic alcohol
1,3,8-*para*-Menthatriene	0.01	Monoterpene
cis-*para*-Menth-2-en-1-ol	0.04	Monoterpenic alcohol
trans-*para*-Mentha-2,8-dien-1-ol	0.03	Monoterpenic alcohol
all*o*-Ocimene	0.01	Monoterpene
cis-Limonene oxide	0.01	Monoterpenic ether
cis-*para*-Mentha-2,8-dien-1-ol	0.03	Monoterpenic alcohol
Camphor	0.03	Monoterpenic ketone
trans-*para*-Menth-2-en-1-ol	0.02	Monoterpenic alcohol
Epoxyterpinolene	0.02	Monoterpenic ether
Unknown	0.01	Oxygenated monoterpene
Unknown	0.06	Oxygenated monoterpene
Unknown	0.08	Oxygenated monoterpene
Terpinen-4-ol	0.31	Monoterpenic alcohol
Cryptone	0.02	Normonoterpenic ketone
para-Cymen-8-ol	0.05	Monoterpenic alcohol
α-Terpineol	1.61	Monoterpenic alcohol

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cis-Piperitol	0.02	Monoterpenic alcohol
cis-α-Phellandrene epoxide (iPr vs Me)	0.17	Monoterpenic ether
trans-Piperitol	0.02	Monoterpenic alcohol
trans-Carveol	0.05	Monoterpenic alcohol
cis-Carveol	0.03	Monoterpenic alcohol
Carvone	0.04	Monoterpenic ketone
Unknown	0.06	Unknown
Piperitone	0.07	Monoterpenic ketone
Limonen-10-ol	0.01	Monoterpenic alcohol
Carvacrol	0.02	Monoterpenic alcohol
para-Menth-5-en-1,2-diol isomer III	0.07	Monoterpenic alcohol
δ-Elemene	0.04	Sesquiterpene
α-Cubebene	0.02	Sesquiterpene
α-Copaene	0.13	Sesquiterpene
β-Elemene	0.12	Sesquiterpene
Methyleugenol	0.26	Phenylpropanoid
β-Caryophyllene	0.16	Sesquiterpene
(*trans*?)-6-Hydroxy-*para*-menth-1-en-3-one	0.03	Monoterpenic alcohol
β-Copaene	0.01	Sesquiterpene
α-Guaiene	0.01	Sesquiterpene
α-Humulene	0.12	Sesquiterpene
Unknown	0.02	Unknown
Germacrene D	0.16	Sesquiterpene
10,11-Epoxyguai-1(5)-ene?	0.01	Sesquiterpenic ether
Viridiflorene	0.05	Sesquiterpene
α-Muurolene	0.06	Sesquiterpene
γ-Cadinene	0.01	Sesquiterpene
epi-Elemol?	0.08	Sesquiterpenic alcohol
δ-Cadinene	0.08	Sesquiterpene
α-Elemol	12.35	Sesquiterpenic alcohol
Elemicin	3.81	Phenylpropanoid
Spathulenol	0.02	Sesquiterpenic alcohol
Guaiol	0.18	Sesquiterpenic alcohol
10-epi-γ-Eudesmol	0.03	Sesquiterpenic alcohol
γ-Eudesmol	0.38	Sesquiterpenic alcohol
β-Eudesmol	0.30	Sesquiterpenic alcohol
α-Eudesmol	0.28	Sesquiterpenic alcohol
Unknown	0.60	Oxygenated sesquiterpene
Bulnesol	0.04	Sesquiterpenic alcohol
Cryptomeridiol analog	0.01	Sesquiterpenic alcohol
α-Phellandrene dimer II	0.06	Diterpene
Cryptomeridiol	0.06	Sesquiterpenic alcohol
Unknown	0.01	Oxygenated sesquiterpene
Consolidated total	**97.71**	

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

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Essential Oil, *Canarium luzonicum*
Internal code: 23J20-PTH02

Elemi - Philippines - EE0106R
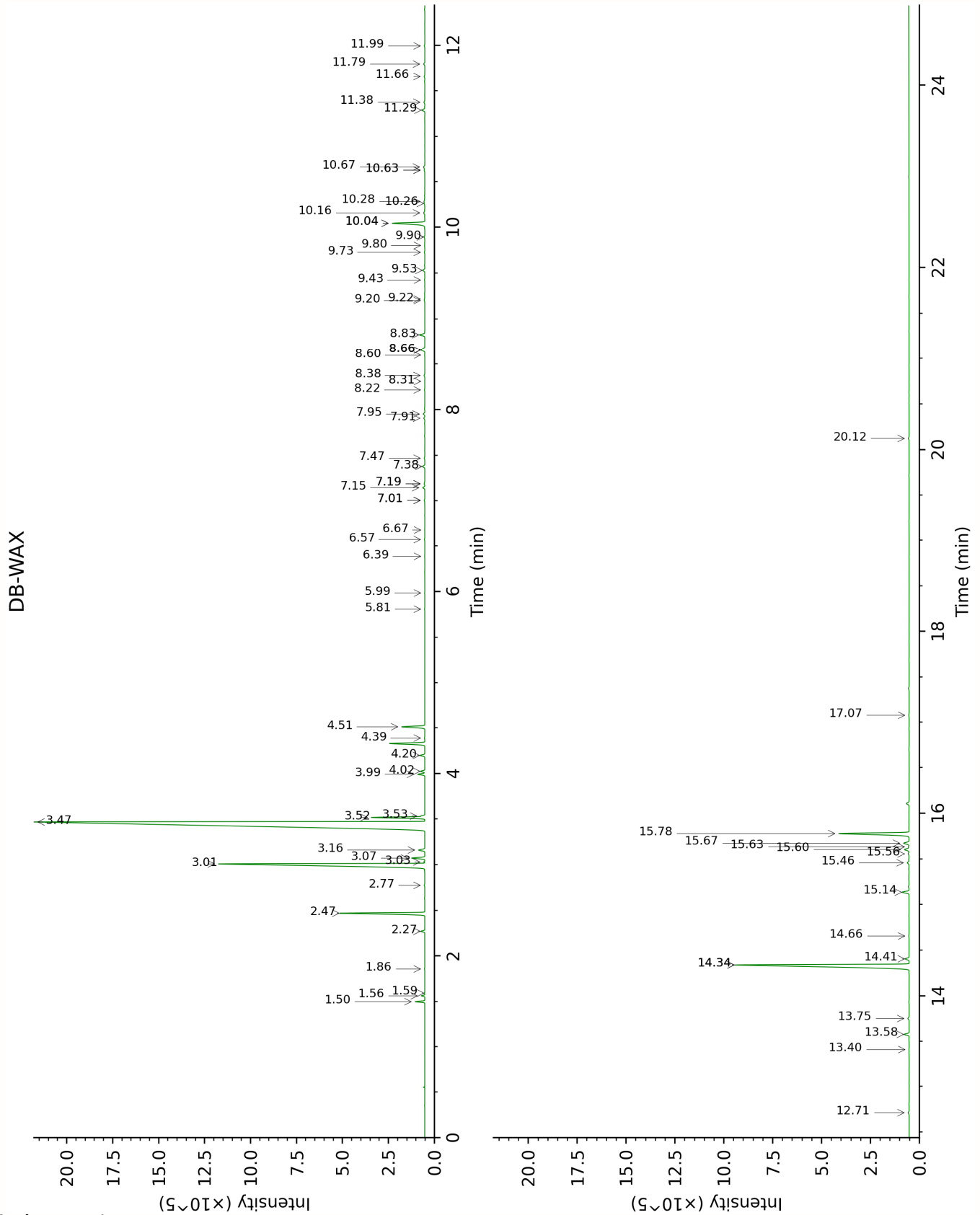
Report prepared for:
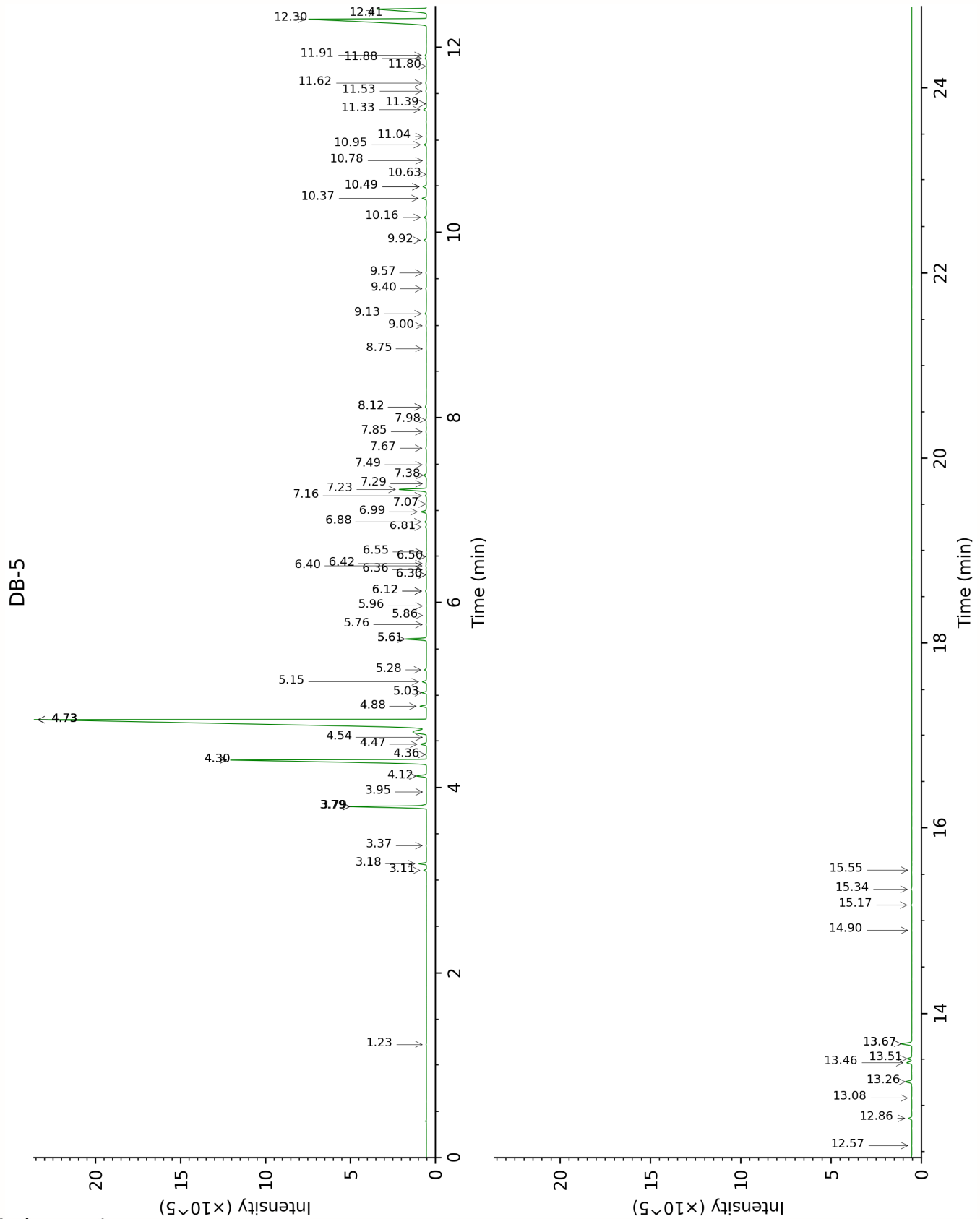Plant Therapy
Note: no correction factor was applied

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

DB-WAX

Top chromatogram (Time 0–12 min):
11.99, 11.79, 11.66, 11.38, 11.29, 10.67, 10.63, 10.28, 10.26, 10.16, 10.04, 9.90, 9.80, 9.73, 9.53, 9.43, 9.22, 9.20, 8.83, 8.66, 8.60, 8.38, 8.31, 8.22, 7.95, 7.91, 7.47, 7.38, 7.19, 7.15, 7.01, 6.67, 6.57, 6.39, 5.99, 5.81, 4.51, 4.39, 4.20, 4.02, 3.99, 3.53, 3.52, 3.47, 3.16, 3.07, 3.03, 3.01, 2.77, 2.47, 2.27, 1.86, 1.59, 1.56, 1.50

Time (min)

Intensity (×10^5)

Bottom chromatogram (Time 12–24 min):
20.12, 17.07, 15.78, 15.67, 15.63, 15.60, 15.56, 15.46, 15.14, 14.66, 14.41, 14.34, 13.75, 13.58, 13.40, 12.71

Time (min)

Intensity (×10^5)

DB-5

Time (min)

Intensity (×10^5)

Time (min)

Intensity (×10^5)

FULL ANALYSIS DATA

Toluene	Column DB-WAX			Column DB-5		
	1.60	1003.9	0.01	1.23	760.4	0.01
α-Thujene	1.56	1001.1	0.12	3.11	927.0	0.12
α-Pinene	1.50	993.0	0.33	3.18	931.7	0.33
Camphene	1.86	1028.8	0.01	3.37	944.5	0.02
Sabinene	2.47	1086.3	3.79	3.79*	972.1	[3.95]
β-Pinene	2.27	1067.6	0.17	3.79*	972.1	[3.95]
3-Methyl-3-cyclohexenone	6.39	1375.6	0.01	3.95	982.5	tr
Myrcene	3.07	1134.1	0.55	4.12	993.7	0.54
Pseudolimonene	3.03	1130.9	0.03	4.30*	1005.1	[14.87]
α-Phellandrene	3.01	1129.3	14.85	4.30*	1005.1	[14.87]
Δ3-Carene	2.78	1111.6	0.03	4.36	1008.8	0.04
α-Terpinene	3.16	1140.8	0.30	4.47	1015.7	0.30
para-Cymene	4.39	1231.0	0.02	4.54	1020.4	0.01
1,8-Cineole	3.53	1168.9	0.10	4.73*	1032.1	[54.84]
β-Phellandrene	3.52	1167.8	2.07	4.73*	1032.1	[54.84]
Limonene	3.47	1164.0	50.95	4.73*	1032.1	[54.84]
(*Z*)-β-Ocimene	3.99	1203.0	0.31	4.88	1041.2	0.30
(*E*)-β-Ocimene	4.20	1217.6	0.22	5.03	1050.8	0.21
γ-Terpinene	4.02	1205.3	0.20	5.15	1058.1	0.21
cis-Sabinene hydrate	7.15	1430.5	0.10	5.28	1066.1	0.09
Terpinolene	4.51	1239.8	1.08	5.61*	1086.8	[1.09]
para-Cymenene	6.57	1388.6	0.02	5.61*	1086.8	[1.09]
trans-Sabinene hydrate	8.22	1509.6	0.02	5.76	1096.5	0.01
Linalool	8.31	1516.8	0.01	5.86	1102.7	0.01
1,3,8-*para*-Menthatriene	5.98	1347.2	0.01	5.96	1109.2	0.01
cis-*para*-Menth-2-en-1-ol	8.38	1521.8	0.04	6.12*	1119.4	[0.05]
trans-*para*-Mentha-2,8-dien-1-ol	9.20	1585.0	0.03	6.12*	1119.4	[0.05]
all*o*-Ocimene	5.81	1334.7	0.01	6.30*	1130.5	[0.02]
cis-Limonene oxide	6.68	1396.0	0.01	6.30*	1130.5	[0.02]
cis-*para*-Mentha-2,8-dien-1-ol	9.73	1626.8	0.03	6.36	1134.0	0.03
Camphor	7.47	1454.2	0.03	6.40	1136.7	0.03
trans-*para*-Menth-2-en-1-ol	9.22	1586.3	0.02	6.42	1138.3	0.02
Epoxyterpinolene	7.01*	1420.3	[0.03]	6.50	1143.0	0.02

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Compound						
Unknown CALU I [m/z 95, 43 (74), 109 (72), 82 (62), 110 (50)... 152 (14)]	7.19*	1433.7	[0.04]	6.55	1146.2	0.01
Unknown CALU II [m/z 95, 110 (38), 81 (21), 79 (16)... 152 (7)]	7.91	1486.3	0.06	6.81	1163.3	0.06
Unknown CALU III [m/z 95, 110 (43), 81 (28), 41 (15)... 152 (8)]	7.95	1489.7	0.08	6.88	1167.4	0.08
Terpinen-4-ol	8.83	1556.3	0.30	6.99	1174.3	0.31
Cryptone	9.43	1602.5	0.02	7.07	1179.6	0.02
para-Cymen-8-ol	11.79	1797.4	0.07	7.16	1185.3	0.05
α-Terpineol	10.04*	1652.2	[1.81]	7.23	1189.6	1.61
cis-Piperitol	9.80	1632.8	0.02	7.29	1193.5	0.02
cis-α-Phellandrene epoxide (iPr vs Me)	11.29	1754.8	0.17	7.38	1199.3	0.17
trans-Piperitol	10.63*	1699.6	[0.04]	7.49	1206.6	0.02
trans-Carveol	11.66	1785.7	0.04	7.67	1218.5	0.05
cis-Carveol	11.99	1814.9	0.03	7.85	1230.4	0.03
Carvone	10.26	1669.6	0.05	7.98	1238.9	0.04
Unknown CALU IV [m/z 43, 97 (69), 107 (46), 41 (28), 55 (21), 109 (20)...]	11.38	1762.1	0.06	8.12*	1248.1	[0.09]
Piperitone	10.16	1661.3	0.07	8.12*	1248.1	[0.09]
Limonen-10-ol	13.40	1941.0	0.02	8.75	1290.5	0.01
Carvacrol	15.63	2154.8	0.02	9.00	1307.2	0.02
para-Menth-5-en-1,2-diol isomer III	15.46	2137.4	0.10	9.13	1316.2	0.07
δ-Elemene	7.19*	1433.7	[0.04]	9.40	1335.1	0.04
α-Cubebene	7.01*	1420.3	[0.03]	9.57	1347.0	0.02
α-Copaene	7.38	1447.5	0.13	9.92	1371.7	0.13
β-Elemene	8.66*	1543.3	[0.31]	10.16	1389.0	0.12
Methyleugenol	13.58	1957.0	0.26	10.37	1403.3	0.26
β-Caryophyllene	8.66*	1543.3	[0.31]	10.49*	1412.6	[0.20]
(*trans*?)-6-Hydroxy-*para*-	17.08	2303.5	0.03	10.49*	1412.6	[0.20]

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menth-1-en-3-one						
β-Copaene	8.60	1539.0	0.01	10.63	1423.0	0.01
α-Guaiene	8.66*	1543.3	[0.31]	10.78	1433.9	0.01
α-Humulene	9.53	1611.0	0.12	10.95	1446.8	0.12
Unknown CALU X [m/z 109, 110 (33), 43 (30), 95 (23), 71 (20), 41 (19)...]				11.04	1453.3	0.02
Germacrene D	10.04*	1652.2	[1.81]	11.33	1474.8	0.16
10,11-Epoxyguai-1(5)-ene?				11.39	1479.5	0.01
Viridiflorene	9.90	1640.2	0.04	11.53	1489.6	0.05
α-Muurolene	10.28	1671.2	0.05	11.62	1496.1	0.06
γ-Cadinene	10.63*	1699.6	[0.04]	11.80	1509.8	0.01
epi-Elemol?	13.75	1973.0	0.08	11.88	1516.4	0.08
δ-Cadinene	10.67	1702.6	0.09	11.91	1519.0	0.08
α-Elemol	14.34*	2028.3	[12.34]	12.30	1549.5	12.35
Elemicin	15.78	2169.3	3.85	12.41	1558.1	3.81
Spathulenol	14.66	2058.6	0.03	12.57	1570.3	0.02
Guaiol	14.41	2034.7	0.21	12.86	1593.3	0.18
10-epi-γ-Eudesmol	14.34*	2028.3	[12.34]	13.08	1610.8	0.03
γ-Eudesmol	15.14	2105.2	0.37	13.26	1625.3	0.38
β-Eudesmol	15.67	2158.7	0.29	13.46	1642.2	0.30
α-Eudesmol	15.60	2151.8	0.25	13.51	1645.8	0.28
Unknown CYWI V [suspected m/z 59, 93 (79), 161 (61), 107 (47), 81 (44), 121 (37)...]				13.67*	1659.7	[0.64]
Bulnesol	15.56	2147.1	0.04	13.67*	1659.7	[0.64]
Cryptomeridiol analog				14.90	1763.4	0.01
α-Phellandrene dimer II	12.71	1878.0	0.07	15.17	1787.0	0.06
Cryptomeridiol	20.12	2649.2	0.05	15.34	1801.7	0.06
Unknown CALU XI [m/z 159, 93 (87), 146 (72), 43 (72), 119 (48), 121 (48), 59 (25)... 220 (31)]				15.55	1820.3	0.01
Total reported		97.16%			99.34%	

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*: 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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