

Date : 2025-03-19

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25C05-PTH03

Customer Identification : Organic Juniper Berry - Bulgaria - J50109R

Type : Essential Oil

Source : *Juniperus communis*

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Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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

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

Date : 2025-03-19

PHYSICOCHEMICAL DATA

Refractive index : 1.4759 ± 0.0003 (20 °C)

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

Analyst : Kassandra Baker

Date : 2025-03-05

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
2-Methyl-3-buten-2-ol	0.01	Aliphatic alcohol
3-Methylfuran	0.01	Furan
Isovaleral	tr	Aliphatic aldehyde
2-Ethylfuran	tr	Furan
Toluene	0.01	Simple phenolic
Hexanal	0.02	Aliphatic aldehyde
(2E)-Hexenal	0.01	Aliphatic aldehyde
Bornylene	0.01	Monoterpene
Tricyclene	0.11	Monoterpene
α -Thujene	1.29	Monoterpene
α -Pinene	44.98	Monoterpene
Camphene	0.37	Monoterpene
α -Fenchene	0.06	Monoterpene
Thuja-2,4(10)-diene	0.07	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.02	Monoterpene
β -Pinene	2.56	Monoterpene
Sabinene	5.57	Monoterpene
6-Methyl-5-hepten-2-one	0.01	Aliphatic ketone
Myrcene	9.83	Monoterpene
2-Carene	0.05	Monoterpene
α -Phellandrene	0.33	Monoterpene
Pseudolimonene	0.01	Monoterpene
Δ^3 -Carene	0.20	Monoterpene
α -Terpinene	1.15	Monoterpene
<i>para</i> -Cymene	0.65	Monoterpene
Limonene	4.47	Monoterpene
β -Phellandrene	1.07	Monoterpene
(Z)- β -Ocimene	0.01	Monoterpene
(E)- β -Ocimene	0.09	Monoterpene
γ -Terpinene	1.92	Monoterpene
<i>cis</i> -Sabinene hydrate	0.02	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (fur.)	0.03	Monoterpenic alcohol
<i>para</i> -Cymenene	0.16	Monoterpene
Terpinolene	1.28	Monoterpene
α -Pinene oxide	tr	Monoterpenic ether
6,7-Epoxyterpinene	tr	Monoterpenic ether
<i>trans</i> -Sabinene hydrate	0.02	Monoterpenic alcohol
Linalool	0.11	Monoterpenic alcohol
Nonanal	0.02	Aliphatic aldehyde
Verbenol analog?	0.03	Monoterpenic alcohol

endo-Fenchol	0.03	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.03	Monoterpenic alcohol
α -Campholenal	0.07	Monoterpenic aldehyde
cis-Limonene oxide	0.01	Monoterpenic ether
trans-Pinocarveol	0.06	Monoterpenic alcohol
cis-Verbenol	0.01	Monoterpenic alcohol
Camphor	0.02	Monoterpenic ketone
trans-Verbenol	0.03	Monoterpenic alcohol
meta-Mentha-4,6-dien-8-ol	0.03	Monoterpenic alcohol
Pinocamphone	0.02	Monoterpenic ketone
Borneol	0.06	Monoterpenic alcohol
Isopinocamphone	0.02	Monoterpenic ketone
Terpinen-4-ol	1.39	Monoterpenic alcohol
para-Cymen-8-ol	0.02	Monoterpenic alcohol
α -Terpineol	0.24	Monoterpenic alcohol
Myrtenal	0.04	Monoterpenic aldehyde
Myrtenol	0.05	Monoterpenic alcohol
Verbenone	0.03	Monoterpenic ketone
Decanal	0.02	Aliphatic aldehyde
trans-Carveol	0.02	Monoterpenic alcohol
Citronellol	0.04	Monoterpenic alcohol
Thymol methyl ether	0.06	Monoterpenic ether
Carvone	0.01	Monoterpenic ketone
Carvacrol methyl ether	0.02	Monoterpenic ether
Methyl citronellate	0.08	Monoterpenic ester
Geranial	0.04	Monoterpenic aldehyde
Decanol	0.03	Aliphatic alcohol
Bornyl acetate	0.26	Monoterpenic ester
Terpinen-4-yl acetate	0.03	Monoterpenic ester
2-Undecanone	0.03	Aliphatic ketone
Thymol	0.02	Monoterpenic alcohol
Myrtenyl acetate	0.02	Monoterpenic ester
Bicycloelemene	0.04	Sesquiterpene
α -Longipinene	0.02	Sesquiterpene
α -Cubebene	0.38	Sesquiterpene
Citronellyl acetate	0.02	Monoterpenic ester
α -Ylangene	0.05	Sesquiterpene
α -Copaene	0.49	Sesquiterpene
cis- β -Elemene	0.04	Sesquiterpene
trans-Myrtanyl acetate	0.04	Monoterpenic ester
β -Cubebene	0.06	Sesquiterpene
β -Elemene	1.04	Sesquiterpene
Sibirene	0.30	Sesquiterpene
Longifolene	0.09	Sesquiterpene
β -Ylangene	0.05	Sesquiterpene

β -Caryophyllene	3.04	Sesquiterpene
<i>cis</i> -Thujopsene	0.09	Sesquiterpene
β -Copaene	0.08	Sesquiterpene
γ -Elemene	0.42	Sesquiterpene
Aromadendrene	0.10	Sesquiterpene
α -Himachalene	0.03	Sesquiterpene
α -Humulene	2.25	Sesquiterpene
allo-Aromadendrene	0.02	Sesquiterpene
(<i>E</i>)- β -Farnesene	0.36	Sesquiterpene
β -Acoradiene	0.11	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.23	Sesquiterpene
γ -Muurolene	0.67	Sesquiterpene
Germacrene D	1.43	Sesquiterpene
β -Selinene	0.32	Sesquiterpene
α -Curcumene	0.21	Sesquiterpene
γ -Amorphene	0.10	Sesquiterpene
Bicyclogermacrene	0.03	Sesquiterpene
epi-Cubebol	0.03	Sesquiterpenic alcohol
α -Selinene	0.39	Sesquiterpene
Valencene	0.17	Sesquiterpene
Germacrene A	0.07	Sesquiterpene
α -Muurolene	0.49	Sesquiterpene
γ -Cadinene	0.73	Sesquiterpene
<i>trans</i> -Calamenene	0.05	Sesquiterpene
δ -Cadinene	2.13	Sesquiterpene
Selina-4(15),7(11)-diene	0.41	Sesquiterpene
α -Cadinene	0.26	Sesquiterpene
Selina-3,7(11)-diene	0.14	Sesquiterpene
Selina-4,7(11)-diene	0.19	Sesquiterpene
α -Calacorene	0.07	Sesquiterpene
α -Elemol	0.05	Sesquiterpenic alcohol
Germacrene B	0.85	Sesquiterpene
(<i>E</i>)-Nerolidol	0.09	Sesquiterpenic alcohol
Spathulenol	0.08	Sesquiterpenic alcohol
Caryophyllene oxide	0.14	Sesquiterpenic ether
allo-Cedrol	0.03	Sesquiterpenic alcohol
α -Cedrol	0.02	Sesquiterpenic alcohol
Humulene epoxide II	0.09	Sesquiterpenic ether
1-epi-Cubenol	0.13	Sesquiterpenic alcohol
τ -Muurolol	0.12	Sesquiterpenic alcohol
τ -Cadinol	0.12	Sesquiterpenic alcohol
α -Muurolol	0.06	Sesquiterpenic alcohol
Unknown	0.07	Oxygenated sesquiterpene
α -Cadinol	0.17	Sesquiterpenic alcohol
(3 <i>Z</i>)-Caryophylla-3,8(13)-dien-5 β -ol	0.02	Sesquiterpenic alcohol

Germacre-4(15),5,10(14)-trien-1-ol isomer	0.02	Sesquiterpenic alcohol
Aromadendrane-4,10-diol	0.05	Sesquiterpenic alcohol
meta-Camphorene	0.01	Diterpene
Trachylobane?	0.06	Diterpene
18-Norabieta-8,11,13-triene?	0.01	Norditerpene
ar-Abietatriene	0.02	Diterpene
7,13-Abietadiene	0.02	Diterpene
Consolidated total	98.86	

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

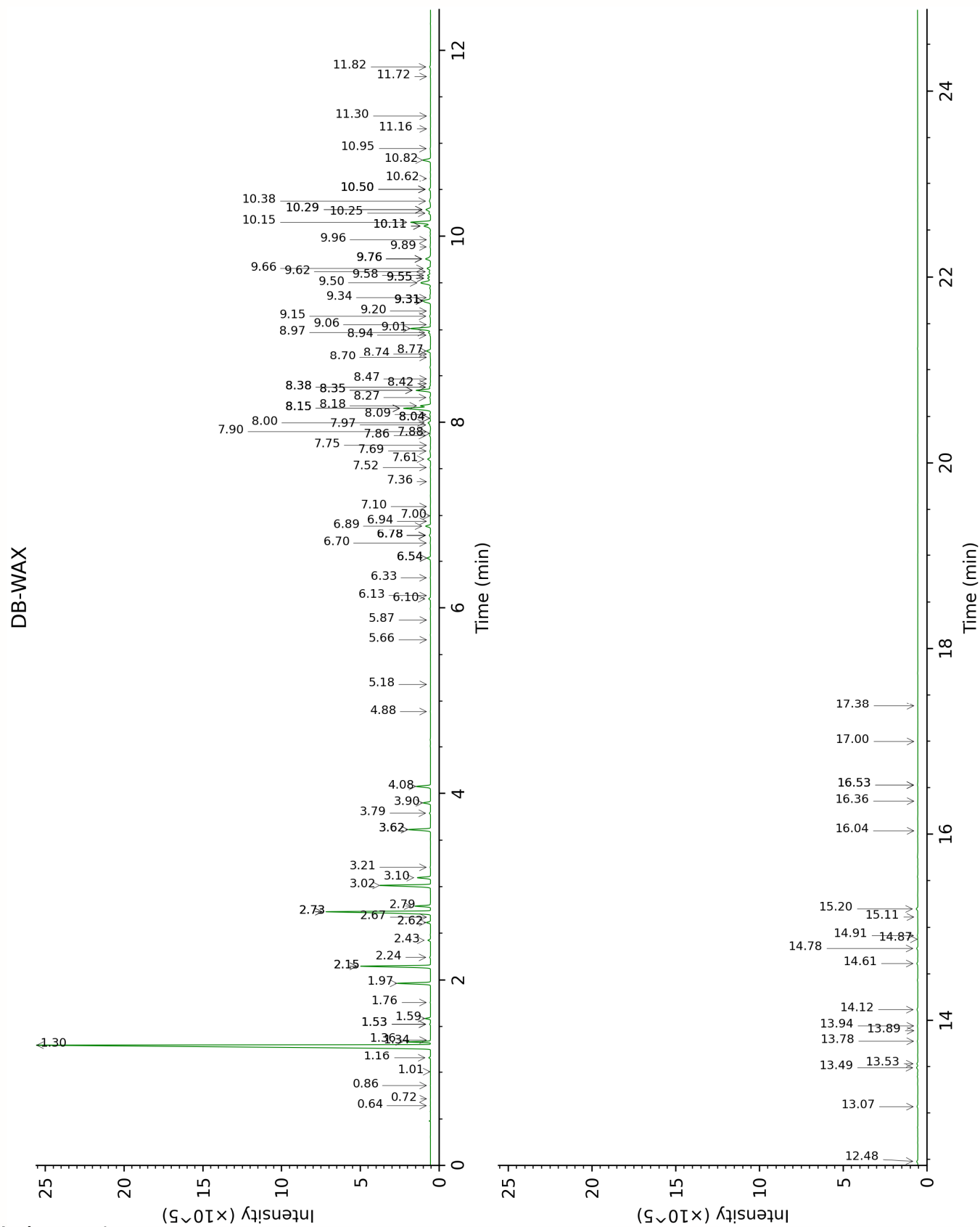
Note: no correction factor was applied

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.

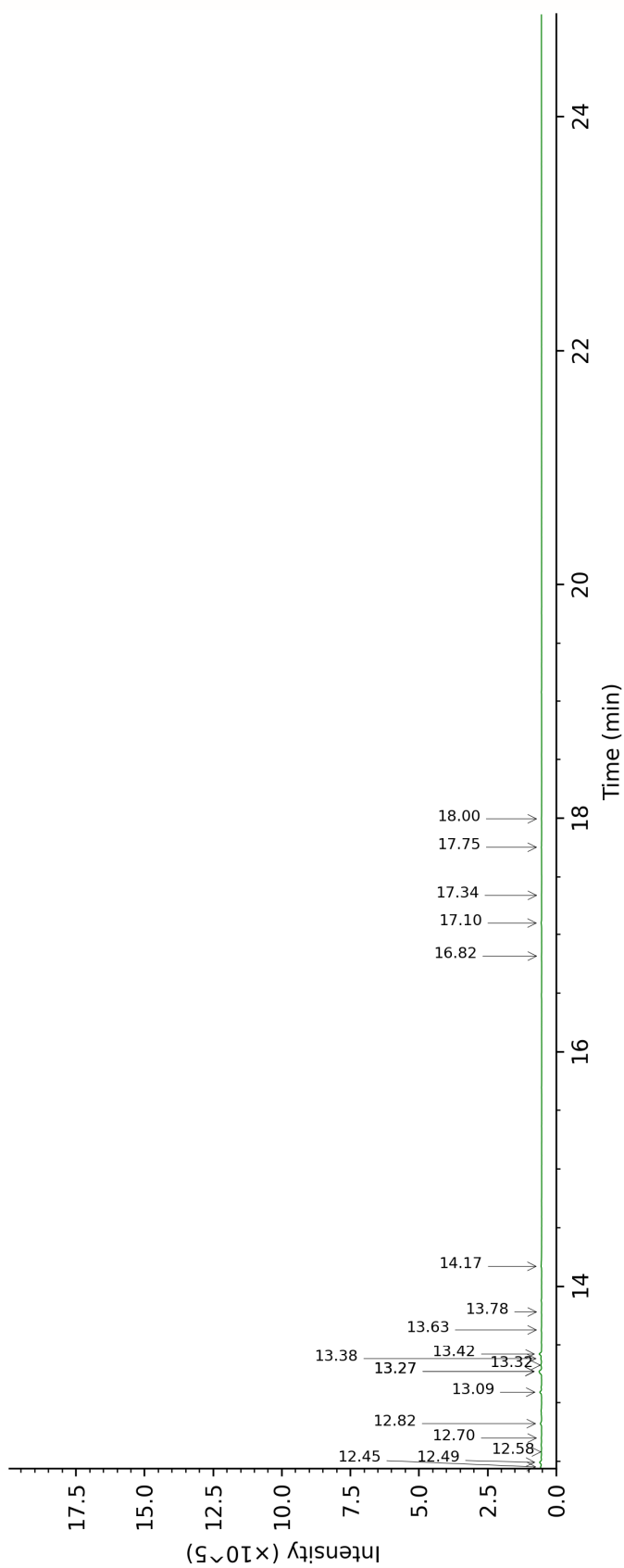
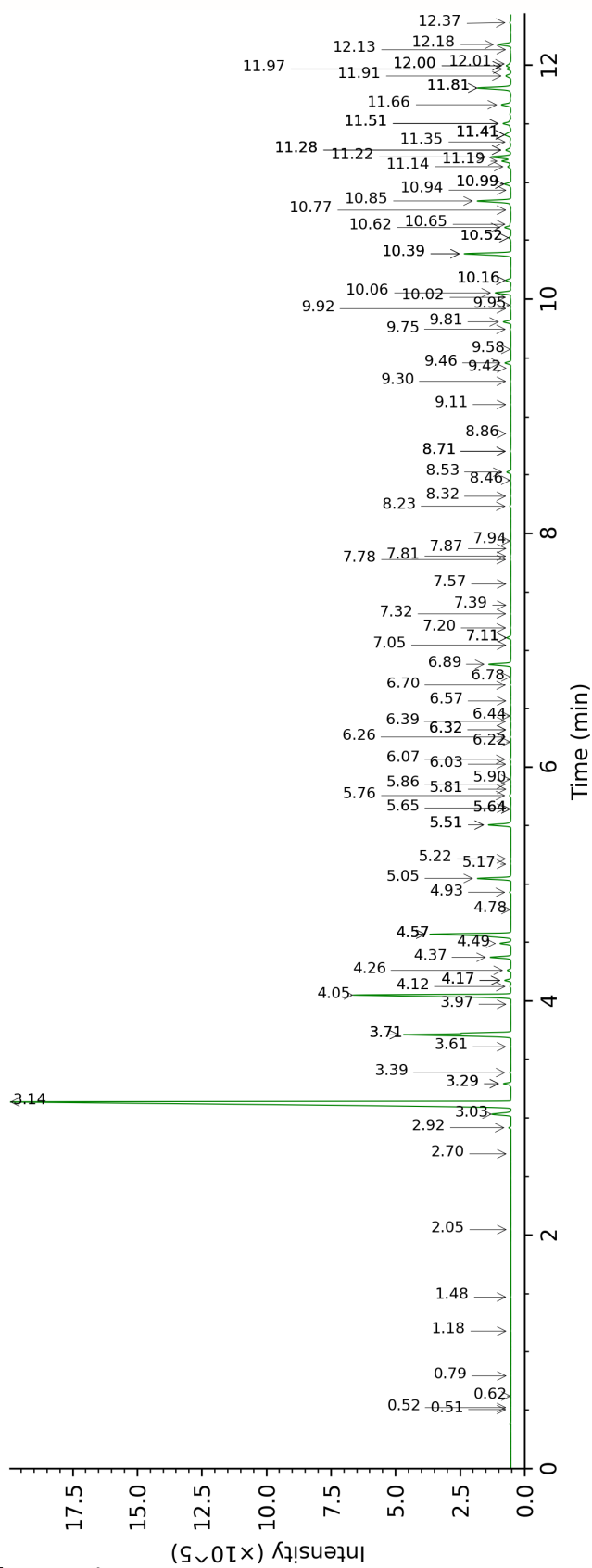
Unknowns: Unknown compounds' mass spectral data is presented in the "Full analysis data" table. The occurrence of unknown compounds is to be expected in many samples, and does not denote particular problems unless noted otherwise in the conclusion.

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.



DB-5



FULL ANALYSIS DATA

2-Methyl-3-buten-2-ol	Column DB-WAX			Column DB-5		
	1.53*	1021.4	[0.06]	0.51	594.3	0.01
3-Methylfuran	0.64	860.1	0.01	0.52	606.7	0.01
Isovaleral	0.72	888.7	tr	0.62	641.1	tr
2-Ethylfuran	0.86	920.8	0.01	0.79	702.0	tr
Toluene	1.36	1004.1	0.01	1.18	759.2	0.01
Hexanal	1.76	1045.1	0.02	1.48	800.5	0.02
(2E)-Hexenal	3.21	1174.0	0.04	2.05	850.4	0.01
Bornylene	1.01	946.1	tr	2.70	904.4	0.01
Tricyclene	1.16	971.7	0.11	2.92	919.3	0.11
α-Thujene	1.34	1002.2	1.30	3.03	927.0	1.29
α-Pinene	1.30	996.2	44.75	3.14	933.9	44.98
Camphene	1.59	1027.6	0.37	3.29*	944.3	[0.44]
α-Fenchene	1.53*	1021.4	[0.06]	3.29*	944.3	[0.44]
Thuja-2,4(10)-diene	2.15*	1084.9	[5.57]	3.39	950.5	0.07
3,7,7-Trimethylcyclohepta-1,3,5-triene	2.73*	1135.7	[9.79]	3.61	965.2	0.02
β-Pinene	1.96	1066.1	2.56	3.71*	972.0	[8.13]
Sabinene	2.15*	1084.9	[5.57]	3.71*	972.0	[8.13]
6-Methyl-5-hepten-2-one	4.88	1302.0	0.02	3.97	989.3	0.01
Myrcene	2.73*	1135.7	[9.79]	4.05	994.5	9.83
2-Carene	2.24	1094.6	0.06	4.12	999.3	0.05
α-Phellandrene	2.62	1126.4	0.33	4.18*	1002.8	[0.34]
Pseudolimonene	2.68	1131.0	0.01	4.18*	1002.8	[0.34]
Δ3-Carene	2.43	1111.1	0.20	4.26	1008.3	0.20
α-Terpinene	2.79	1140.5	1.13	4.37	1015.3	1.15
para-Cymene	3.90	1228.1	0.64	4.49	1022.7	0.65
Limonene	3.02	1158.4	4.47	4.57*	1027.7	[5.59]
β-Phellandrene	3.10	1165.0	1.07	4.57*	1027.7	[5.59]
(Z)-β-Ocimene	3.62*	1206.6	[1.92]	4.78	1040.8	0.01
(E)-β-Ocimene	3.79	1219.8	0.09	4.93	1050.6	0.09
γ-Terpinene	3.62*	1206.6	[1.92]	5.05	1058.0	1.92
cis-Sabinene hydrate	6.70	1431.8	0.04	5.17	1065.6	0.02
cis-Linalool oxide (fur.)	6.32	1403.9	0.03	5.22	1068.5	0.03
para-Cymenene	6.10	1387.5	0.16	5.51*	1086.6	[1.42]
Terpinolene	4.08	1241.4	1.28	5.51*	1086.6	[1.42]
α-Pinene oxide	5.18	1320.8	tr	5.64*	1095.2	[0.01]
6,7-Epoxymyrcene	5.87	1371.0	tr	5.64*	1095.2	[0.01]
trans-Sabinene hydrate	7.76	1511.2	0.02	5.65	1095.6	0.02
Linalool	7.86	1519.4	0.10	5.76	1102.4	0.11

Nonanal	5.66	1355.5	0.01	5.81	1105.8	0.02
Verbenol analog?	8.04*	1533.9	[0.06]	5.86	1108.6	0.03
endo-Fenchol	8.15*†	1542.3	[3.12]	5.90	1111.2	0.03
cis-para-Menth-2-en-1-ol	7.90	1522.7	0.03	6.03	1119.4	0.03
α-Campholenal	6.78*	1437.9	[0.13]	6.07	1122.1	0.07
cis-Limonene oxide	6.13	1390.0	0.01	6.22	1131.5	0.01
trans-Pinocarveol	8.94	1604.2	0.06	6.26	1134.2	0.06
cis-Verbenol				6.32*	1138.2	[0.03]
Camphor	6.94	1449.9	0.02	6.32*	1138.2	[0.03]
trans-Verbenol	9.31*	1634.2	[1.15]	6.39	1142.7	0.03
meta-Mentha-4,6-dien-8-ol	9.06	1613.4	0.04	6.44	1145.8	0.03
Pinocamphone	7.00	1454.3	0.02	6.57	1153.9	0.02
Borneol	9.55*	1654.0	[0.31]	6.70	1162.5	0.06
Isopinocamphone	7.36	1481.7	0.02	6.78	1167.3	0.02
Terpinen-4-ol	8.34*	1557.4	[1.42]	6.89	1174.4	1.39
para-Cymen-8-ol	11.30	1800.8	0.03	7.05	1184.8	0.02
α-Terpineol	9.55*	1654.0	[0.31]	7.11*	1188.8	[0.28]
Myrtenal	8.42	1563.0	0.04	7.11*	1188.8	[0.28]
Myrtenol	10.62	1743.4	0.03	7.20	1194.2	0.05
Verbenone	9.34	1637.0	0.03	7.32	1201.9	0.03
Decanal	7.10	1461.7	0.02	7.39	1206.7	0.02
trans-Carveol	11.16	1789.0	0.02	7.57	1218.8	0.02
Citronellol	10.50*	1732.9	[0.17]	7.78	1232.8	0.04
Thymol methyl ether	8.18†	1544.4	0.94	7.81	1234.7	0.06
Carvone	9.76*	1670.9	[0.64]	7.87	1239.1	0.01
Carvacrol methyl ether	8.38*	1560.0	[0.12]	7.94	1243.4	0.02
Methyl citronellate	7.97	1528.3	0.07	8.23	1263.2	0.08
Geranial	9.89	1681.4	0.06	8.32	1268.9	0.04
Decanol	10.50*	1732.9	[0.17]	8.46	1278.0	0.03
Bornyl acetate	8.00	1530.1	0.27	8.52	1282.7	0.26
Terpinen-4-yl acetate	8.47	1567.0	0.03	8.71*	1295.1	[0.06]
2-Undecanone	8.34*	1557.4	[1.42]	8.71*	1295.1	[0.06]
Thymol	14.87	2136.3	0.03	8.86	1305.2	0.02
Myrtenyl acetate	9.31*	1634.2	[1.15]	9.11	1322.7	0.02
Bicycloelemene	6.78*	1437.9	[0.13]	9.30	1336.6	0.04
α-Longipinene	6.54*	1419.7	[0.35]	9.42	1344.6	0.02
α-Cubebene	6.54*	1419.7	[0.35]	9.46	1347.6	0.38
Citronellyl acetate	9.20	1625.3	0.05	9.58	1355.7	0.02
α-Ylangene	6.78*	1437.9	[0.13]	9.75	1367.7	0.05
α-Copaene	6.89	1446.0	0.49	9.81	1372.2	0.49
cis-β-Elemene	8.04*	1533.9	[0.06]	9.92	1380.1	0.04
trans-Myrtanyl	9.96	1687.6	0.03	9.95	1382.3	0.04

acetate						
β-Cubebene	7.52	1493.1	0.04	10.02	1386.9	0.06
β-Elemene	8.15*†	1542.3	[3.12]	10.06	1389.6	1.04
Sibirene	7.61	1499.8	0.30	10.16*	1397.1	[0.36]
Longifolene	7.69	1506.4	0.09	10.16*	1397.1	[0.36]
β-Ylangene	7.88	1521.2	0.05	10.39*	1413.5	[3.09]
β-Caryophyllene	8.15*†	1542.3	[3.12]	10.39*	1413.5	[3.09]
cis-Thujopsene	8.38*	1560.0	[0.12]	10.52*	1423.6	[0.17]
β-Copaene	8.08	1537.1	0.08	10.52*	1423.6	[0.17]
γ-Elemene	8.77	1591.0	0.42	10.62	1430.8	0.42
Aromadendrene	8.27	1551.3	0.09	10.65	1432.8	0.10
α-Himachalene	8.70	1585.0	0.03	10.77	1441.8	0.03
α-Humulene	9.01	1610.0	2.17	10.85	1447.6	2.25
allo-Aromadendrene	8.74	1588.4	0.01	10.94	1454.4	0.02
(E)-β-Farnesene	9.31*	1634.2	[1.15]	10.99*	1458.3	[0.47]
β-Acoradiene	9.15	1620.8	0.11	10.99*	1458.3	[0.47]
trans-Cadina-1(6),4-diene	8.97	1606.4	0.21	11.14	1469.4	0.23
γ-Murolene	9.31*	1634.2	[1.15]	11.18	1472.9	0.67
Germacrene D	9.50	1649.9	1.42	11.22	1475.6	1.43
β-Selinene	9.58	1656.4	0.32	11.28*	1480.0	[0.43]
ar-Curcumene	10.38	1722.1	0.21	11.28*	1480.0	[0.43]
γ-Amorphene				11.35	1485.1	0.10
Bicyclogermacrene	9.76*	1670.9	[0.64]	11.41*	1489.6	[0.62]
epi-Cubebol	11.72	1838.6	0.03	11.41*	1489.6	[0.62]
α-Selinene	9.66	1662.5	0.39	11.41*	1489.6	[0.62]
Valencene	9.62	1659.7	0.17	11.41*	1489.6	[0.62]
Germacrene A	10.11*	1699.6	[0.81]	11.50*	1496.8	[0.56]
α-Murolene	9.76*	1670.9	[0.64]	11.50*	1496.8	[0.56]
γ-Cadinene	10.11*	1699.6	[0.81]	11.66	1508.9	0.73
trans-Calamenene	10.95	1770.9	0.05	11.81*	1520.2	[2.34]
δ-Cadinene	10.15	1702.9	2.13	11.81*	1520.2	[2.34]
Selina-4(15),7(11)-diene	10.29*	1714.4	[0.61]	11.91	1528.3	0.41
α-Cadinene	10.50*	1732.9	[0.17]	11.97	1532.9	0.26
Selina-3,7(11)-diene	10.29*	1714.4	[0.61]	12.00*	1535.1	[0.33]
Selina-4,7(11)-diene	10.25	1711.1	0.19	12.00*	1535.1	[0.33]
α-Calacorene	11.82	1847.8	0.10	12.01	1536.3	0.07
α-Elemol	13.78	2028.8	0.05	12.14	1545.8	0.05
Germacrene B	10.82	1760.4	0.86	12.18	1549.3	0.85
(E)-Nerolidol	13.49	2000.5	0.13	12.37	1564.0	0.09
Spathulenol	14.12	2061.7	0.11	12.45	1570.6	0.08
Caryophyllene oxide	12.48	1906.5	0.12	12.49	1573.8	0.14
allo-Cedrol	13.89	2039.8	0.01	12.58	1580.9	0.03
α-Cedrol	13.94	2044.8	0.05	12.70	1590.2	0.02

Humulene epoxide II	13.07	1961.5	0.08	12.82	1599.8	0.09
1-epi-Cubenol	13.53	2004.6	0.09	13.09	1621.7	0.13
τ-Muurolol	14.78	2126.3	0.12	13.27*	1636.3	[0.25]
τ-Cadinol	14.61	2110.0	0.12	13.27*	1636.3	[0.25]
α-Muurolol	14.91	2140.2	0.05	13.32	1640.8	0.06
Unknown JUVI XIV [m/z 41, 91 (96), 79 (88), 69 (82), 123 (80), 93 (80)... 220 (8)]				13.38	1645.4	0.07
α-Cadinol	15.20	2169.0	0.18	13.42	1648.7	0.17
(3Z)-Caryophylla- 3,8(13)-dien-5β-ol	16.53*	2307.3	[0.05]	13.63	1666.3	0.02
Germacra- 4(15),5,10(14)-trien- 1-ol isomer	16.36	2289.0	0.01	13.78	1679.0	0.02
Aromadendrane- 4,10-diol	16.53*	2307.3	[0.05]	14.17	1711.4	0.05
meta-Camphorene	15.11	2160.3	0.03	16.82	1949.7	0.01
Trachylobane?	16.04	2255.6	0.01	17.10	1976.5	0.06
18-Norabieta- 8,11,13-triene?				17.34	1999.8	0.01
ar-Abietatriene	17.38	2399.9	0.02	17.75	2040.3	0.02
7,13-Abietadiene	17.00	2358.2	0.02	18.00	2064.4	0.02
Total reported		98.11%			98.92%	

*: 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