

Date : 2024-08-29

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24H16-PTH07

Customer Identification : Organic Juniper Berry - Greece - J50108R

Type : Essential Oil

Source : *Juniperus communis*

Customer : Plant Therapy

Checked and approved by:

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

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GAS CHROMATOGRAPHIC ANALYSIS

Method : PC-MAT-014 - Analysis of the composition of an essential oil or other volatile liquide by FAST GC-FID



Results : See analysis summary (next page)

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

Date : 2024-08-29

PHYSICOCHEMICAL DATA

Refractive index : 1.4776 ± 0.0003 (20 °C)

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

Analyst : Kassandra Baker

Date : 2024-08-19

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
Isovaleral	tr	Aliphatic aldehyde
Toluene	0.01	Simple phenolic
Hexanal	0.01	Aliphatic aldehyde
Octane	tr	Alkane
Unknown	0.01	Alkene
(2E)-Hexenal	0.01	Aliphatic aldehyde
Hexanol	0.02	Aliphatic alcohol
Santene	0.02	Normonoterpene
Bornylene	0.02	Monoterpene
Tricyclene	0.15	Monoterpene
α-Thujene	1.24	Monoterpene
α-Pinene	39.41	Monoterpene
α-Fenchene	0.09	Monoterpene
Camphene	0.51	Monoterpene
Thuja-2,4(10)-diene	0.08	Monoterpene
3,7,7-Trimethylcyclohepta-1,3,5-triene	0.03	Monoterpene
Sabinene	7.20	Monoterpene
β-Pinene	2.81	Monoterpene
Octan-3-one	0.02	Aliphatic ketone
Myrcene	12.62	Monoterpene
2-Carene	0.10	Monoterpene
α-Phellandrene	0.52	Monoterpene
Δ3-Carene	1.20	Monoterpene
α-Terpinene	1.13	Monoterpene
para-Cymene	1.10	Monoterpene
1,8-Cineole	[1.56]	Monoterpenic ether
Limonene	5.15	Monoterpene
β-Phellandrene	[1.56]	Monoterpene
(Z)-β-Ocimene	0.02	Monoterpene
(E)-β-Ocimene	0.18	Monoterpene
γ-Terpinene	1.95	Monoterpene
cis-Sabinene hydrate	0.05	Monoterpenic alcohol
Unknown	0.04	Oxygenated monoterpene
Fenchone	0.04	Monoterpenic ketone
Terpinolene	1.43	Monoterpene
para-Cymenene	0.13	Monoterpene
trans-Sabinene hydrate	0.04	Monoterpenic alcohol
Perillene	0.02	Monoterpenic ether
α-Thujone	0.04	Monoterpenic ketone
Linalool	0.07	Monoterpenic alcohol

Verbenol analog?	0.08	Monoterpenic alcohol
endo-Fenchol	0.10	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.09	Monoterpenic alcohol
α-Campholenal	0.07	Monoterpenic aldehyde
cis-Limonene oxide	0.02	Monoterpenic ether
trans-Pinocarveol	0.09	Monoterpenic alcohol
trans-Limonene oxide	0.02	Monoterpenic ether
cis-Verbenol	0.05	Monoterpenic alcohol
trans-Verbenol	0.06	Monoterpenic alcohol
Camphene hydrate	0.04	Monoterpenic alcohol
Citronellal	0.03	Monoterpenic aldehyde
Pinocarvone	0.02	Monoterpenic ketone
Borneol	0.06	Monoterpenic alcohol
α-Phellandren-8-ol	0.06	Monoterpenic alcohol
Terpinen-4-ol	2.09	Monoterpenic alcohol
para-Cymen-8-ol	0.12	Monoterpenic alcohol
α-Terpineol	0.40	Monoterpenic alcohol
Myrtenol	0.06	Monoterpenic alcohol
trans-Isopiperitenol	0.05	Monoterpenic alcohol
Verbenone	0.02	Monoterpenic ketone
trans-Carveol	0.03	Monoterpenic alcohol
cis-Carveol	0.05	Monoterpenic alcohol
Citronellol	0.07	Monoterpenic alcohol
Carvone	0.04	Monoterpenic ketone
Carvacrol methyl ether	0.03	Monoterpenic ether
Piperitone	0.03	Monoterpenic ketone
Methyl citronellate	0.05	Monoterpenic ester
Bornyl acetate	0.28	Monoterpenic ester
Unknown	0.03	Monoterpenic ester
2-Undecanone	0.02	Aliphatic ketone
Carvacrol	0.05	Monoterpenic alcohol
Myrtenyl acetate	0.02	Monoterpenic ester
Terpinyl acetate analog	0.02	Monoterpenic ester
Bicycloelemene	0.03	Sesquiterpene
α-Cubebene	0.64	Sesquiterpene
α-Terpinal acetate	0.15	Monoterpenic ester
Citronellyl acetate	0.03	Monoterpenic ester
α-Ylangene	0.05	Sesquiterpene
α-Copaene	0.42	Sesquiterpene
trans-Myrtanyl acetate	0.04	Monoterpenic ester
cis-β-Elemene	0.03	Sesquiterpene
Geranyl acetate	0.03	Monoterpenic ester
β-Cubebene	0.05	Sesquiterpene
β-Elemene	0.27	Sesquiterpene
Longifolene	0.25	Sesquiterpene

α -Gurjunene	0.02	Sesquiterpene
α -Cedrene	0.14	Sesquiterpene
β -Caryophyllene	2.00	Sesquiterpene
<i>cis</i> -Thujopsene	2.20	Sesquiterpene
γ -Elemene	0.05	Sesquiterpene
Aromadendrene	0.03	Sesquiterpene
α -Himachalene	0.03	Sesquiterpene
<i>trans</i> -Muurola-3,5-diene	0.05	Sesquiterpene
α -Humulene	1.28	Sesquiterpene
allo-Aromadendrene	0.02	Sesquiterpene
(<i>E</i>)- β -Farnesene	0.14	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.20	Sesquiterpene
γ -Muurolene	0.42	Sesquiterpene
Germacrene D	1.20	Sesquiterpene
β -Selinene	0.12	Sesquiterpene
ar-Curcumene	0.04	Sesquiterpene
γ -Amorphene	0.09	Sesquiterpene
Bicyclogermacrene	0.13	Sesquiterpene
α -Selinene	0.15	Sesquiterpene
epi-Cubebol	0.02	Sesquiterpenic alcohol
β -Alaskene	0.03	Sesquiterpene
α -Chamigrene	0.06	Sesquiterpene
α -Muurolene	0.48	Sesquiterpene
Cuparene	0.18	Sesquiterpene
Cubebol	0.03	Sesquiterpenic alcohol
α -Alaskene	0.14	Sesquiterpene
γ -Cadinene	0.38	Sesquiterpene
<i>trans</i> -Calamenene	0.09	Sesquiterpene
δ -Cadinene	1.57	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.07	Sesquiterpene
Selina-4(15),7(11)-diene	0.03	Sesquiterpene
α -Cadinene	0.09	Sesquiterpene
Selina-3,7(11)-diene	0.08	Sesquiterpene
Germacrene B	0.24	Sesquiterpene
Caryophyllenyl alcohol	0.05	Sesquiterpenic alcohol
Spathulenol	0.05	Sesquiterpenic alcohol
Caryophyllene oxide	0.22	Sesquiterpenic ether
allo-Cedrol	0.02	Sesquiterpenic alcohol
α -Cedrol	0.09	Sesquiterpenic alcohol
Humulene epoxide II	0.12	Sesquiterpenic ether
1,10-diepi-Cubenol	0.03	Sesquiterpenic alcohol
Junenol	0.03	Sesquiterpenic alcohol
1-epi-Cubenol	0.08	Sesquiterpenic alcohol
β -Acorenol	0.02	Sesquiterpenic alcohol
τ -Cadinol	0.05	Sesquiterpenic alcohol

τ-Muurolol	0.06	Sesquiterpenic alcohol
α-Muurolol	0.04	Sesquiterpenic alcohol
α-Cadinol	0.10	Sesquiterpenic alcohol
Cedrenol analog	0.02	Sesquiterpenic alcohol
(3Z)-Caryophylla-3,8(13)-dien-5β-ol	0.03	Sesquiterpenic alcohol
Shyobunol	0.02	Sesquiterpenic alcohol
Mayurone?	0.02	Norsesquiterpenic ketone
Thujopsenal	0.02	Sesquiterpenic aldehyde
5-Ethenyl-1,5-bis(4-methyl-3-penten-1-yl)-cyclohexene?	0.05	Diterpene
4-Ethenyl-1,4-bis(4-methyl-3-penten-1-yl)-cyclohexene?	0.03	Diterpene
meta-Camphorene	0.59	Diterpene
para-Camphorene	0.22	Diterpene
ar-Abietatriene	0.02	Diterpene
7,13-Abietadiene	0.03	Diterpene
Consolidated total	99.14	

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

Note: no correction factor was applied

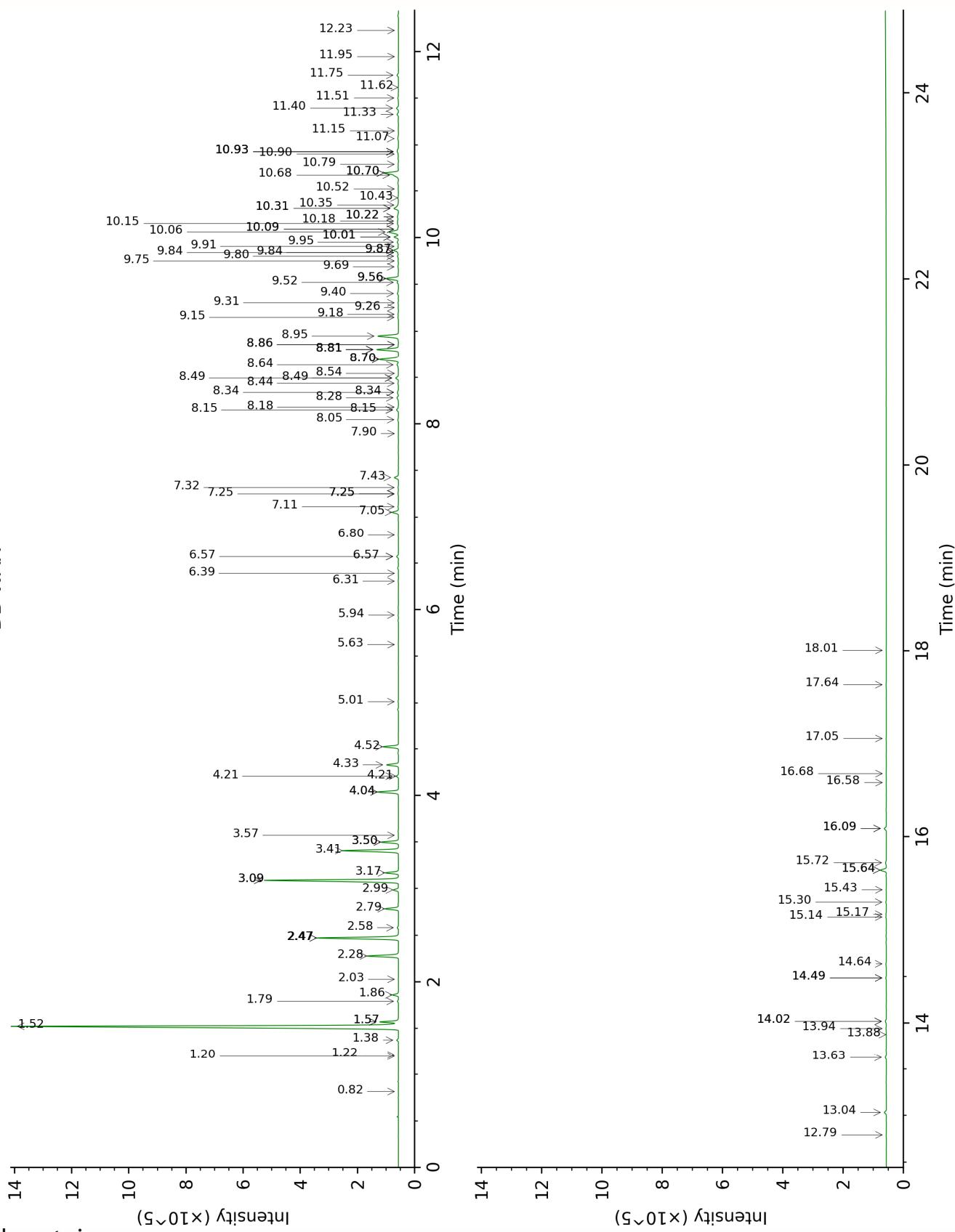
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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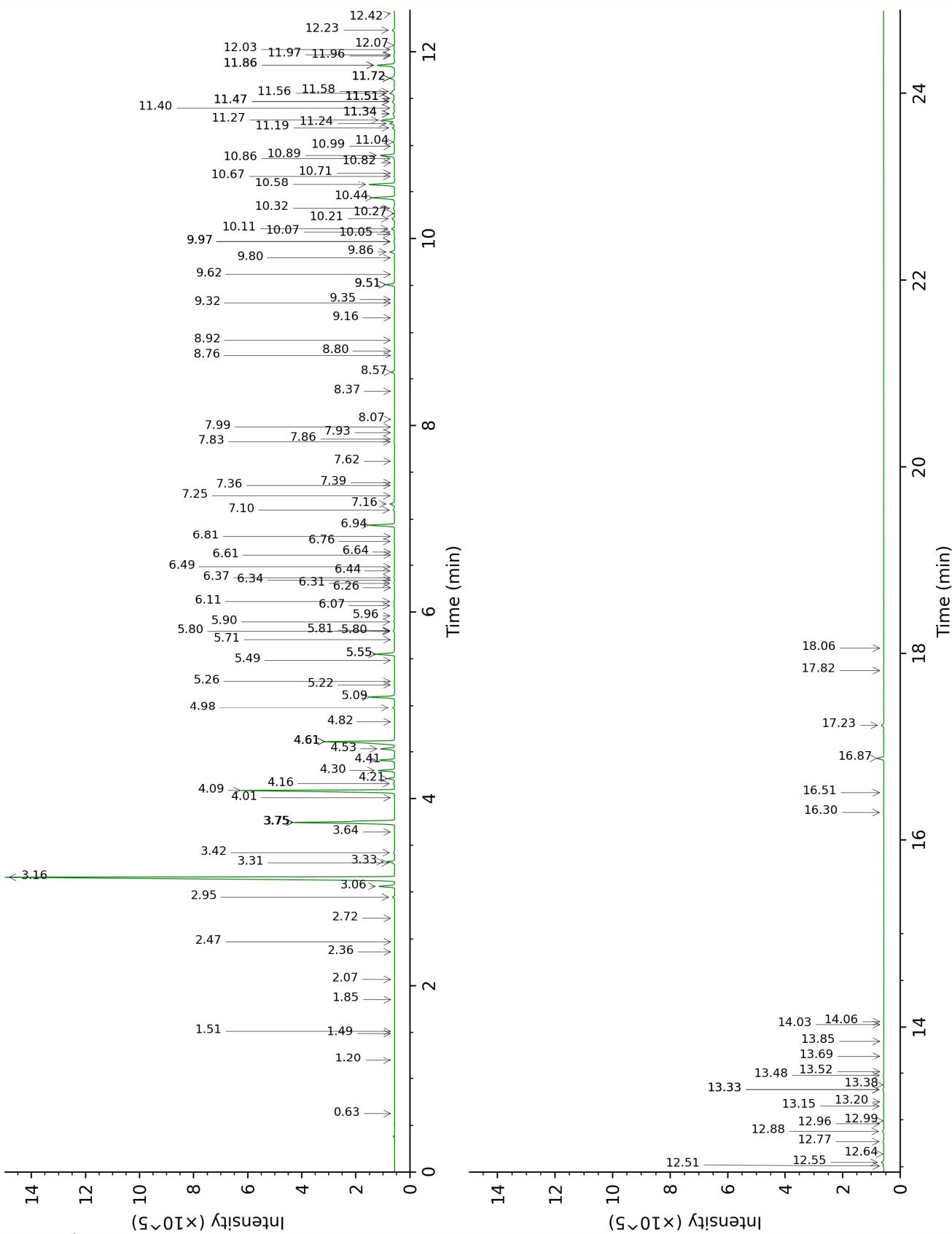
DB-WAX



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DB-5



FULL ANALYSIS DATA

Isovaleral	Column DB-WAX			Column DB-5		
				0.63	640.2	tr
Toluene	1.57*†	999.8	[1.42]	1.20	758.4	0.01
Hexanal	2.03	1043.3	0.01	1.49	799.1	0.01
Octane				1.51	802.4	tr
Unknown BOCA I [m/z 109, 67 (32), 81 (14), 41 (12), 124 (10)]	0.82	877.8	tr	1.85	831.0	0.01
(2E)-Hexenal	3.57	1171.4	0.02	2.07	848.9	0.01
Hexanol	5.63	1319.6	0.02	2.36	873.2	0.02
Santene	1.22	948.1	0.01	2.47	882.1	0.02
Bornylene	1.20	945.7	0.01	2.72	903.0	0.02
Tricyclene	1.38	972.7	0.15	2.95	918.0	0.15
α-Thujene	1.57*†	999.8	[1.42]	3.06	925.6	1.24
α-Pinene	1.52*†	995.3	[38.98]	3.16	932.0	39.41
α-Fenchene	1.79	1020.7	0.09	3.32*†	942.2	[0.09]
Camphene	1.86	1027.3	0.51	3.33*†	943.0	[0.53]
Thuja-2,4(10)-diene 3,7,7-	2.47*	1085.5	[7.22]	3.42	949.3	0.08
Trimethylcyclohepta- 1,3,5-triene	3.09*	1134.6	[12.59]	3.64	963.9	0.03
Sabinene	2.47*	1085.5	[7.22]	3.75*	970.7	[10.01]
β-Pinene	2.28	1067.1	2.81	3.75*	970.7	[10.01]
Octan-3-one	4.21*	1218.2	[0.19]	4.01	988.0	0.02
Myrcene	3.09*	1134.6	[12.59]	4.09	993.2	12.62
2-Carene	2.58	1095.7	0.12	4.16	998.0	0.10
α-Phellandrene	2.99	1126.7	0.48	4.22	1001.6	0.52
Δ3-Carene	2.78	1111.2	1.20	4.30	1007.1	1.20
α-Terpinene	3.17	1140.7	1.13	4.41	1014.0	1.13
para-Cymene	4.33	1226.9	1.09	4.53	1021.6	1.10
1,8-Cineole	3.50*	1165.9	[1.56]	4.61*	1026.4	[6.73]
Limonene	3.41	1158.9	5.15	4.61*	1026.4	[6.73]
β-Phellandrene	3.50*	1165.9	[1.56]	4.61*	1026.4	[6.73]
(Z)-β-Ocimene	4.04*	1206.1	[1.92]	4.82	1039.5	0.02
(E)-β-Ocimene	4.21*	1218.2	[0.19]	4.98	1049.2	0.18
γ-Terpinene	4.04*	1206.1	[1.92]	5.09	1056.6	1.95
cis-Sabinene hydrate	7.11	1426.6	0.06	5.22	1064.7	0.05
Unknown PIMA I [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91 (20), 152 (18)]	5.01	1275.8	0.04	5.26	1067.1	0.04
Fenchone	5.94	1342.2	0.04	5.48	1081.1	0.04

Terpinolene	4.52	1240.8	1.43	5.55*	1085.3	[1.57]
para-Cymenene	6.57*	1386.9	[0.18]	5.55*	1085.3	[1.57]
trans-Sabinene hydrate	8.18	1505.8	0.03	5.71	1094.9	0.04
Perillene	6.39	1374.0	0.02	5.80*†	1100.5	[0.06]
α-Thujone	6.31	1368.0	0.04	5.80*†	1100.5	[0.06]
Linalool	8.34*	1518.0	[0.16]	5.81*†	1101.2	[0.12]
Verbenol analog?	8.54	1533.6	0.02	5.90	1106.9	0.08
endo-Fenchol	8.64	1540.7	0.22	5.96	1111.0	0.10
cis-para-Menth-2-en-1-ol	8.34*	1518.0	[0.16]	6.07	1118.0	0.09
α-Campholenal	7.25*	1436.7	[0.08]	6.11	1120.8	0.07
cis-Limonene oxide	6.57*	1386.9	[0.18]	6.26	1130.2	0.02
trans-Pinocarveol	9.40	1600.3	0.12	6.31	1133.1	0.09
trans-Limonene oxide	6.80	1403.8	0.03	6.34	1135.3	0.02
cis-Verbenol	9.56*	1613.2	[1.29]	6.37	1136.9	0.05
trans-Verbenol	9.75	1628.3	0.04	6.44	1141.7	0.06
Camphene hydrate	8.70*	1545.4	[2.12]	6.49	1144.5	0.04
Citronellal	7.25*	1436.7	[0.08]	6.61	1152.3	0.03
Pinocarvone	8.15*	1503.5	[0.22]	6.64	1154.5	0.02
Borneol	10.01*	1648.8	[0.42]	6.76	1161.7	0.06
α-Phellandren-8-ol	10.43	1682.5	0.09	6.81	1165.1	0.06
Terpinen-4-ol	8.81*	1553.8	[2.15]	6.94	1173.3	2.09
para-Cymen-8-ol	11.75	1793.6	0.15	7.10	1183.6	0.12
α-Terpineol	10.01*	1648.8	[0.42]	7.16	1187.7	0.40
Myrtenol	11.15	1743.2	0.03	7.25	1193.3	0.06
trans-Isopiperitenol	10.70*	1705.1	[1.61]	7.36	1200.3	0.05
Verbenone	9.84*	1635.5	[0.06]	7.39	1202.2	0.02
trans-Carveol	11.62	1782.4	0.03	7.62	1217.5	0.03
cis-Carveol	11.95	1811.1	0.02	7.83	1231.4	0.05
Citronellol	10.93*	1724.4	[0.23]	7.86	1233.3	0.07
Carvone	10.22*	1666.1	[0.19]	7.93	1237.9	0.04
Carvacrol methyl ether	8.86*	1557.9	[0.02]	7.99	1241.9	0.03
Piperitone	10.09*	1655.5	[0.07]	8.07	1247.4	0.03
Methyl citronellate	8.44	1525.5	0.06	8.37	1267.4	0.05
Bornyl acetate	8.49*	1529.8	[0.31]	8.57	1281.1	0.28
Unknown CUSE III [m/z 121, 93 (97), 43 (81), 136 (48), 107 (47), 108 (44)...]	8.81*	1553.8	[2.15]	8.76	1293.4	0.03
2-Undecanone	8.86*	1557.9	[0.02]	8.80	1296.6	0.02
Carvacrol	15.64*	2156.2	[0.59]	8.92	1304.4	0.05
Myrtenyl acetate	9.91	1640.8	0.05	9.16	1321.2	0.02

Terpinyl acetate analog	9.80	1632.3	0.11	9.32	1332.3	0.02
Bicycloelemene	7.32	1441.7	0.05	9.35	1334.9	0.03
α -Cubebene	7.05	1422.2	0.64	9.51*	1346.0	[0.73]
α -Terpinyl acetate	9.95	1644.5	0.15	9.51*	1346.0	[0.73]
Citronellyl acetate	9.69	1623.2	0.08	9.62	1353.7	0.03
α -Ylangene	7.25*	1436.7	[0.08]	9.80	1366.1	0.05
α -Copaene	7.43	1449.7	0.44	9.86	1370.5	0.42
<i>trans</i> -Myrtanyl acetate	10.52	1690.1	0.04	9.97*	1378.3	[0.07]
<i>cis</i> - β -Elemene	8.49*	1529.8	[0.31]	9.97*	1378.3	[0.07]
Geranyl acetate	10.79	1713.0	0.04	10.05	1383.7	0.03
β -Cubebene	8.05	1495.4	0.09	10.07	1385.4	0.05
β -Elemene	8.70*	1545.4	[2.12]	10.11	1387.9	0.27
Longifolene	8.15*	1503.5	[0.22]	10.21	1395.4	0.25
α -Gurjunene	7.90	1484.3	0.02	10.27	1399.3	0.02
α -Cedrene	8.28	1513.5	0.20	10.32	1403.4	0.14
β -Caryophyllene	8.70*	1545.4	[2.12]	10.44	1411.7	2.00
<i>cis</i> -Thujopsene	8.95	1564.9	2.23	10.58	1422.2	2.20
γ -Elemene	9.31	1592.3	0.04	10.67	1429.0	0.05
Aromadendrene	8.81*	1553.8	[2.15]	10.71	1431.6	0.03
α -Himachalene	9.18	1582.8	0.05	10.82	1439.9	0.03
<i>trans</i> -Muurola-3,5-diene	9.15	1580.3	0.07	10.86	1443.2	0.05
α -Humulene	9.56*	1613.2	[1.29]	10.90	1445.7	1.28
allo-Aromadendrene	9.26	1588.4	0.04	10.99	1452.9	0.02
(<i>E</i>)- β -Farnesene	9.87*	1637.4	[0.53]	11.04	1456.4	0.14
<i>trans</i> -Cadina-1(6),4-diene	9.52	1609.9	0.14	11.19	1467.6	0.20
γ -Muurolene	9.87*	1637.4	[0.53]	11.24	1471.1	0.42
Germacrene D	10.06	1653.1	1.19	11.27	1473.8	1.20
β -Selinene	10.15	1660.4	0.12	11.34*	1478.8	[0.20]
ar-Curcumene	10.90	1722.2	0.04	11.34*	1478.8	[0.20]
γ -Amorphene	10.09*	1655.5	[0.07]	11.40	1483.3	0.09
Bicyclogermacrene	10.31*	1673.4	[0.59]	11.47*	1488.5	[0.29]
α -Selinene	10.22*	1666.1	[0.19]	11.47*	1488.5	[0.29]
epi-Cubebol	12.23	1835.8	0.02	11.50*	1491.0	[0.09]
β -Alaskene	9.84*	1635.5	[0.06]	11.50*	1491.0	[0.09]
α -Chamigrene	10.35	1676.3	0.06	11.50*	1491.0	[0.09]
α -Muurolene	10.31*	1673.4	[0.59]	11.56	1495.0	0.48
Cuparene	11.33	1758.1	0.15	11.58	1496.5	0.18
Cubebol	12.79	1885.4	0.03	11.72*	1507.3	[0.51]
α -Alaskene	10.18	1662.6	0.14	11.72*	1507.3	[0.51]
γ -Cadinene	10.68	1703.2	0.38	11.72*	1507.3	[0.51]
<i>trans</i> -Calamenene	11.50	1772.9	0.09	11.86*	1518.2	[1.66]

Essential Oil, <i>Juniperus communis</i> Internal code: 24H16-PTH07				Report prepared for: Plant Therapy	
Organic Juniper Berry - Greece - J50108R					
δ-Cadinene	10.70*	1705.1	[1.61]	11.86*	1518.2 [1.66]
trans-Cadina-1,4-diene	10.93*	1724.4	[0.23]	11.96	1525.9 0.07
Selina-4(15),7(11)-diene	10.93*	1724.4	[0.23]	11.97	1526.9 0.03
α-Cadinene	11.07	1736.2	0.12	12.03	1531.3 0.09
Selina-3,7(11)-diene	10.93*	1724.4	[0.23]	12.07	1534.9 0.08
Germacrene B	11.40	1763.7	0.22	12.23	1547.6 0.24
Caryophyllenyl alcohol	13.94	1990.9	0.05	12.42	1562.2 0.05
Spathulenol	14.64	2057.4	0.08	12.51	1569.0 0.05
Caryophyllene oxide	13.04	1907.5	0.22	12.55	1572.1 0.22
allo-Cedrol	14.49*	2042.9	[0.06]	12.64	1579.1 0.02
α-Cedrol	14.49*	2042.9	[0.06]	12.77	1589.5 0.09
Humulene epoxide II	13.63	1961.9	0.12	12.88	1598.1 0.12
1,10-diepi-Cubenol	14.02*	1998.3	[0.13]	12.96	1604.6 0.03
Junenol	13.88	1984.8	0.02	12.99	1607.3 0.03
1-epi-Cubenol	14.02*	1998.3	[0.13]	13.15	1620.2 0.08
β-Acorenol	15.17	2109.2	0.05	13.20	1623.9 0.02
τ-Cadinol	15.14	2106.2	0.05	13.33*	1634.8 [0.12]
τ-Muurolol	15.30	2122.1	0.06	13.33*	1634.8 [0.12]
α-Muurolol	15.43	2135.3	0.03	13.38	1639.1 0.04
α-Cadinol	15.72	2164.1	0.10	13.48	1647.3 0.10
Cedrenol analog	16.68	2262.2	0.02	13.52	1650.7 0.02
(3Z)-Caryophylla-3,8(13)-dien-5β-ol	17.05	2301.8	0.03	13.69	1664.7 0.03
Shyobunol	16.58	2252.2	0.02	13.85	1677.9 0.02
Mayurone?				14.03	1692.7 0.02
Thujopsenal	16.09*	2201.3	[0.22]	14.06	1695.2 0.02
5-Ethenyl-1,5-bis(4-methyl-3-penten-1-yl)-cyclohexene?				16.30	1892.6 0.05
4-Ethenyl-1,4-bis(4-methyl-3-penten-1-yl)-cyclohexene?				16.51	1912.4 0.03
meta-Camphorene	15.64*	2156.2	[0.59]	16.87	1947.1 0.59
para-Camphorene	16.09*	2201.3	[0.22]	17.23	1980.5 0.22
ar-Abietatriene	18.01	2404.8	0.02	17.82	2038.4 0.02
7,13-Abietadiene	17.64	2364.5	0.05	18.06	2062.1 0.03
Total reported		98.35%			99.17%

*: 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.

Essential Oil, *Juniperus communis*
Internal code: 24H16-PTH07

Organic Juniper Berry - Greece - J50108R

Report prepared for:
Plant Therapy

Note: no correction factor was applied
R.T.: Retention time (minutes)
R.I.: Retention index

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Plus que des analyses... des conseils

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