

Date : 2025-02-10

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

**Internal code :** 25A27-PTH07

**Customer Identification :** Organic Lavender - Greece - L50119R

**Type :** Essential Oil

**Source :** *Lavandula angustifolia*

**Customer :** Plant Therapy

Checked and approved by:

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

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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

**✖ISO**

**Results :** See analysis summary (next page)

**Analyst :** Sylvain Mercier, M. Sc., Chimiste 2014-005

**Date :** 2025-01-30

## PHYSICOCHEMICAL DATA

**Refractive index :**  $1.461 \pm 0.0003$  (20 °C)

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

**Analyst :** Cindy Caron B. Sc.

**Date :** 2025-01-28

## 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
Isobutyral	0.01	Aliphatic aldehyde
2-Methyl-3-buten-2-ol	0.01	Aliphatic alcohol
Isovaleral	0.04	Aliphatic aldehyde
2-Methylbutyral	0.02	Aliphatic aldehyde
Isoamyl alcohol	0.01	Aliphatic alcohol
2-Methylbutanol	0.01	Aliphatic alcohol
Toluene	tr	Simple phenolic
Hexanal	tr	Aliphatic aldehyde
Butyl acetate	0.02	Aliphatic ester
Methyl hexyl ether	0.20	Aliphatic ether
(3Z)-Hexenol	0.03	Aliphatic alcohol
Hexanol	0.15	Aliphatic alcohol
Tricyclene	0.02	Monoterpene
$\alpha$ -Thujene	0.10	Monoterpene
$\alpha$ -Pinene	0.16	Monoterpene
$\alpha$ -Fenchene	tr	Monoterpene
Camphene	0.14	Monoterpene
5,5-Dimethyl-2(5H)-furanone	0.01	Aliphatic lactone
Butyl isobutyrate	0.02	Aliphatic ester
Sabinene	0.06	Monoterpene
$\beta$ -Pinene	0.05	Monoterpene
Octen-3-ol	0.29	Aliphatic alcohol
6-Methyl-5-hepten-2-one	0.01	Aliphatic ketone
Octan-3-one	1.82	Aliphatic ketone
Myrcene	0.69	Monoterpene
Octan-3-ol	0.46	Aliphatic alcohol
Butyl butyrate	0.13	Aliphatic ester
<i>cis</i> -Dehydroxylinalool oxide	0.01	Monoterpenic ether
Pseudolimonene	tr	Monoterpene
$\alpha$ -Phellandrene	0.04	Monoterpene
$\Delta^3$ -Carene	0.10	Monoterpene
$\alpha$ -Terpinene	0.05	Monoterpene
Hexyl acetate	0.71	Aliphatic ester
<i>meta</i> -Cymene	0.04	Monoterpene
<i>para</i> -Cymene	0.12	Monoterpene
Limonene	0.41	Monoterpene
$\beta$ -Phellandrene	0.47	Monoterpene
1,8-Cineole	0.80	Monoterpenic ether
(Z)- $\beta$ -Ocimene	3.10	Monoterpene
(E)- $\beta$ -Ocimene	2.43	Monoterpene

$\gamma$ -Terpinene	0.17	Monoterpene
<i>cis</i> -Sabinene hydrate	0.04	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (fur.)	0.10	Monoterpenic alcohol
Octanol	0.01	Aliphatic alcohol
Terpinolene	0.11	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	0.07	Monoterpenic alcohol
Rosefuran	0.04	Monoterpenic ether
Linalool	35.45	Monoterpenic alcohol
( <i>Z</i> )-6-Methyl-3,5-heptadien-2-one	0.05	Aliphatic ketone
$\beta$ -Thujone	0.05	Monoterpenic ketone
Octen-3-yl acetate	0.75	Aliphatic ester
Unknown	0.04	Unknown
Octan-3-yl acetate	0.12	Aliphatic ester
allo-Ocimene	0.07	Monoterpene
( <i>Z</i> )-Myroxide	0.02	Monoterpenic ether
Camphor	0.25	Monoterpenic ketone
( <i>E</i> )-Myroxide	0.01	Monoterpenic ether
<i>trans</i> -Verbenol	0.04	Monoterpenic alcohol
Unknown	0.03	Oxygenated monoterpene
Hexyl isobutyrate	0.09	Aliphatic ester
Nerol oxide	0.02	Aliphatic ether
Borneol	0.53	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (pyr.)	0.03	Monoterpenic alcohol
Lavandulol	1.25	Monoterpenic alcohol
(3 <i>E</i> ,5 <i>Z</i> )-Undeca-1,3,5-triene	0.10	Alkene
Terpinen-4-ol	2.78	Monoterpenic alcohol
Cryptone	0.28	Normonoterpenic ketone
<i>meta</i> -Cymen-8-ol	0.06	Monoterpenic alcohol
<i>para</i> -Cymen-8-ol	0.09	Monoterpenic alcohol
$\alpha$ -Terpineol	1.07	Monoterpenic alcohol
Hexyl butyrate	0.51	Aliphatic ester
Hodiendiol (2,6-dimethylocta-3,7-diene-2,6-diol)	0.02	Monoterpenic alcohol
Verbenone	0.02	Monoterpenic ketone
Unknown	0.01	Unknown
(3 <i>E</i> ,5 <i>E</i> )-2,6-Dimethylocta-3,5,7-trien-2-ol	0.02	Monoterpenic alcohol
Octyl acetate	0.02	Aliphatic ester
<i>trans</i> -Carveol	0.02	Monoterpenic alcohol
Bornyl formate	0.04	Monoterpenic ester
Nerol	0.18	Monoterpenic alcohol
Cuminal	0.01	Monoterpenic aldehyde
Hexyl 2-methylbutyrate	0.06	Aliphatic ester
Carvone	0.04	Monoterpenic ketone
Neral	0.03	Monoterpenic aldehyde
Hexyl isovalerate	0.02	Aliphatic ester

Linalyl acetate	25.17	Monoterpenic ester
Geraniol	0.44	Monoterpenic alcohol
Geranial	0.05	Monoterpenic aldehyde
2,6-Dimethyl-1,7-octadiene-3,6-diol	0.02	Monoterpenic alcohol
Bornyl acetate	0.10	Monoterpenic ester
Lavandulyl acetate	2.83	Monoterpenic ester
Hexyl tiglate	0.05	Aliphatic ester
Hodiendiol derivative	0.01	Oxygenated monoterpene
Unknown	0.01	Oxygenated monoterpene
Unknown	0.01	Oxygenated monoterpene
Neryl acetate	0.29	Monoterpenic ester
$\alpha$ -Copaene	0.02	Sesquiterpene
$\beta$ -Bourbonene	0.05	Sesquiterpene
Geranyl acetate	0.46	Monoterpenic ester
Hexyl hexanoate	0.17	Aliphatic ester
7-epi-Sesquithujene	0.13	Sesquiterpene
Sesquithujene	0.06	Sesquiterpene
$\beta$ -Caryophyllene	4.09	Sesquiterpene
<i>cis</i> - $\alpha$ -Bergamotene	0.11	Sesquiterpene
$\alpha$ -Santalene	0.44	Sesquiterpene
Lavandulyl isobutyrate	0.01	Monoterpenic ester
Coumarin	0.06	Coumarin
<i>trans</i> - $\alpha$ -Bergamotene	0.16	Sesquiterpene
Sesquisabinene A	0.07	Sesquiterpene
$\alpha$ -Humulene	0.14	Sesquiterpene
Lavandulyl butyrate?	0.14	Monoterpenic ester
( <i>E</i> )- $\beta$ -Farnesene	5.29	Sesquiterpene
Germacrene D	0.74	Sesquiterpene
<i>trans</i> - $\beta$ -Bergamotene	0.06	Sesquiterpene
Isodaucene	0.03	Sesquiterpene
$\beta$ -Bisabolene	0.02	Sesquiterpene
$\gamma$ -Cadinene	0.11	Sesquiterpene
Lavandulyl isovalerate	0.03	Monoterpenic ester
$\delta$ -Cadinene	0.02	Sesquiterpene
$\beta$ -Sesquiphellandrene	0.02	Sesquiterpene
Isocaryophyllene epoxide B	0.02	Sesquiterpenic ether
<i>cis</i> -Sesquisabinene hydrate	0.01	Sesquiterpenic alcohol
( <i>E</i> )-Nerolidol	0.02	Sesquiterpenic alcohol
Caryophyllene oxide isomer	0.03	Sesquiterpenic ether
Caryophyllene oxide	0.19	Sesquiterpenic ether
Caryophylladienol II	0.01	Sesquiterpenic alcohol
$\tau$ -Cadinol	0.07	Sesquiterpenic alcohol
(3 <i>Z</i> )-Caryophylla-3,8(13)-dien-5 $\beta$ -ol	0.01	Sesquiterpenic alcohol
Phytone	0.01	Terpenic ketone
Pentylcurcumene?	0.02	Diterpene

<b>Consolidated total</b>	<b>99.27</b>	
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tr: The compound has been detected below 0.005% of the total signal

Note: no correction factor was applied

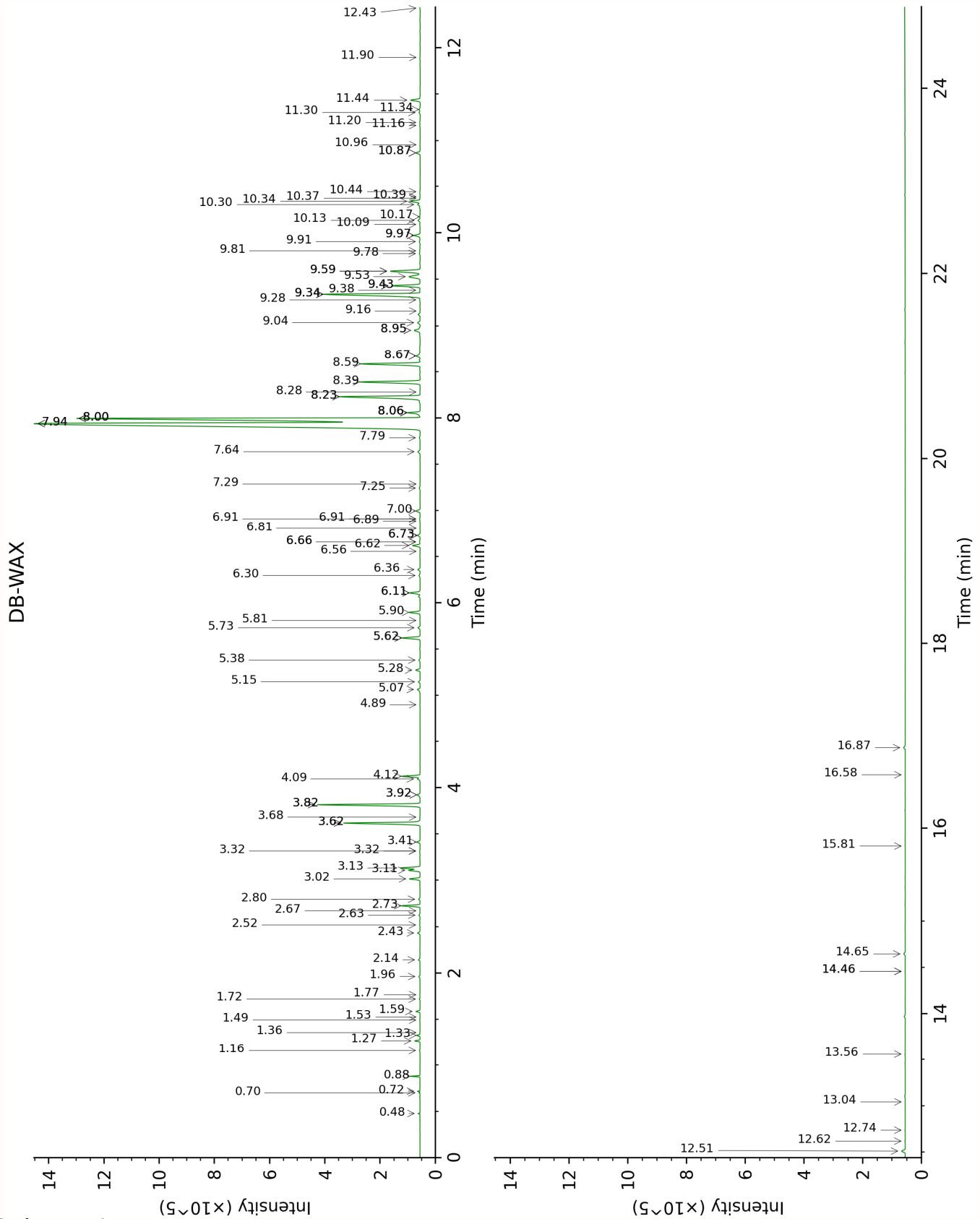
**About "consolidated" data:** The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

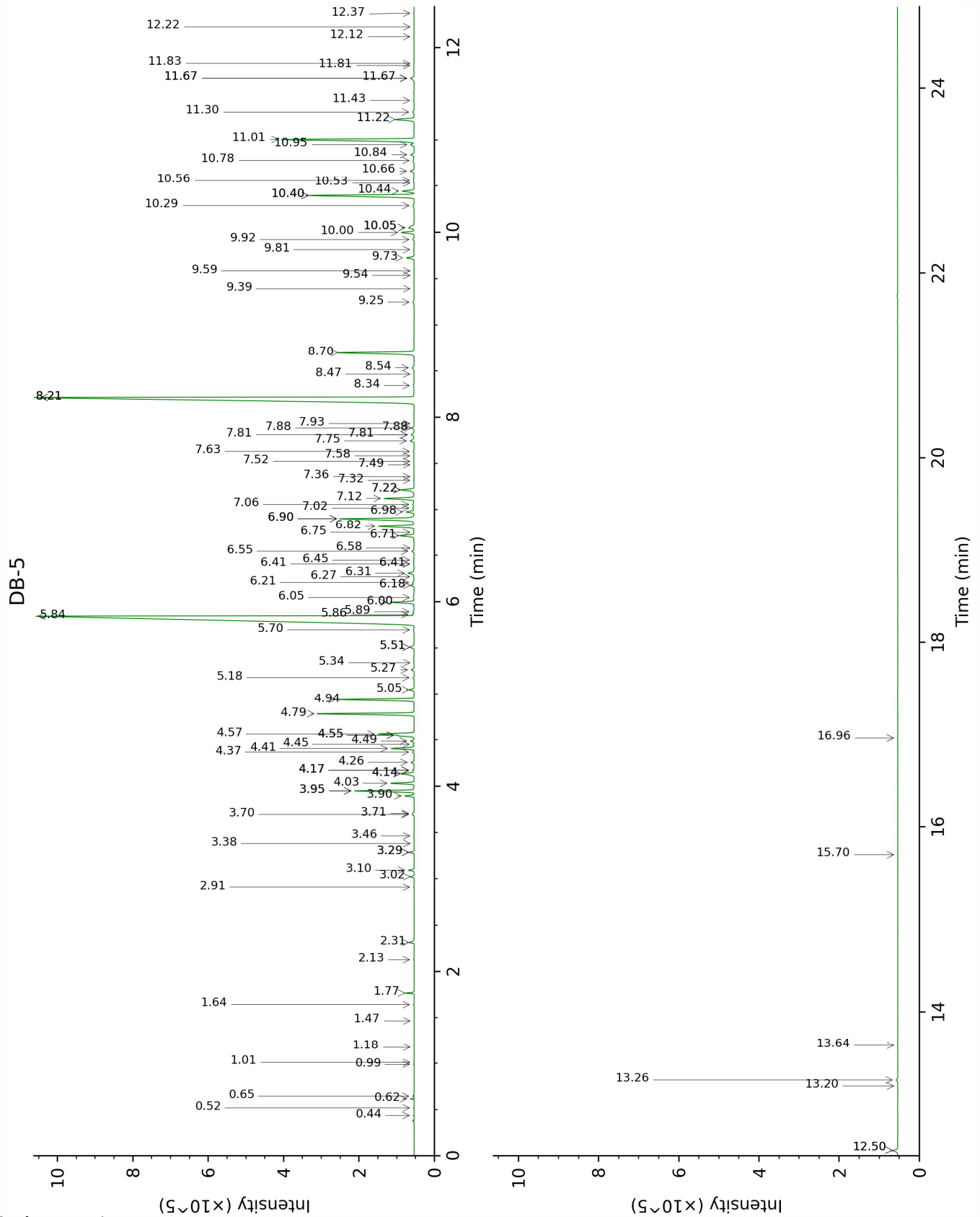
**Bracketed value ([xx]):** A bracketed percent value indicate that two or more compound percentage could not be solved due to coelution.

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Organic Lavender - Greece - L50119R







FULL ANALYSIS DATA

Isobutyral	Column DB-WAX			Column DB-5		
	0.48	784.4	0.03	0.44	536.8	0.01
2-Methyl-3-buten-2-ol	1.49	1017.7	0.01	0.52	606.8	0.01
Isovaleral	0.72	888.9	0.05	0.62	641.0	0.04
2-Methylbutyral	0.70	882.1	0.02	0.65	651.3	0.02
Isoamyl alcohol	3.32*	1181.1	[0.03]	0.99	733.0	0.01
2-Methylbutanol	3.32*	1181.1	[0.03]	1.01	736.1	0.01
Toluene	1.36	1004.1	tr	1.18	759.6	tr
Hexanal	1.77	1045.4	tr	1.47	800.5	tr
Butyl acetate	1.72	1040.7	0.02	1.64	817.4	0.02
Methyl hexyl ether	0.88	924.0	0.21	1.77	827.9	0.20
(3Z)-Hexenol	5.62*	1351.2	[0.77]	2.13	857.9	0.03
Hexanol	5.28	1326.3	0.18	2.31	873.3	0.15
Tricyclene	1.16	971.5	0.02	2.91	919.5	0.02
$\alpha$ -Thujene	1.33	1000.6	0.10	3.02	927.0	0.10
$\alpha$ -Pinene	1.27	990.5	0.16	3.10	931.7	0.16
$\alpha$ -Fenchene	1.53	1021.1	tr	3.29*	944.5	[0.15]
Camphene	1.59	1027.2	0.14	3.29*	944.5	[0.15]
5,5-Dimethyl-2(5H)-furanone	8.28	1549.4	0.02	3.38	950.8	0.01
Butyl isobutyrate	2.52	1117.5	0.02	3.46	956.2	0.02
Sabinene	2.14	1083.7	0.06	3.70*†	971.6	[0.06]
$\beta$ -Pinene	1.96	1065.4	0.05	3.71*†	972.3	[0.04]
Octen-3-ol	6.62	1423.7	0.32	3.90	984.8	0.29
6-Methyl-5-hepten-2-one	4.90	1299.7	0.01	3.95*	988.4	[1.83]
Octan-3-one	3.82*	1219.7	[4.27]	3.95*	988.4	[1.83]
Myrcene	2.73	1134.0	0.69	4.03	993.9	0.69
Octan-3-ol	5.90	1371.1	0.46	4.14*	1000.7	[0.54]
Butyl butyrate	3.41	1188.8	0.13	4.14*	1000.7	[0.54]
<i>cis</i> -Dehydroxylinalool oxide	3.68	1209.7	0.01	4.17*	1003.1	[0.06]
Pseudolimonene	2.67	1129.7	tr	4.17*	1003.1	[0.06]
$\alpha$ -Phellandrene	2.63	1125.9	0.04	4.17*	1003.1	[0.06]
$\Delta$ 3-Carene	2.43	1110.7	0.10	4.26	1008.6	0.10
$\alpha$ -Terpinene	2.80	1139.6	0.06	4.37	1015.6	0.05
Hexyl acetate	4.12	1242.4	0.73	4.41	1018.1	0.71
<i>meta</i> -Cymene	3.92*	1227.5	[0.15]	4.45	1020.9	0.04
<i>para</i> -Cymene	3.92*	1227.5	[0.15]	4.49	1023.1	0.12
Limonene	3.02	1157.1	0.41	4.55*†	1027.0	[0.41]
$\beta$ -Phellandrene	3.11	1164.5	0.47	4.55*†	1027.0	[0.41]
1,8-Cineole	3.14	1166.5	0.80	4.56*†	1027.8	[1.26]

(Z)-β-Ocimene	3.62*	1205.0	[3.28]	4.78	1041.6	3.10
(E)-β-Ocimene	3.82*	1219.7	[4.27]	4.94	1051.3	2.43
γ-Terpinene	3.62*	1205.0	[3.28]	5.05	1058.2	0.17
cis-Sabinene hydrate	6.73*	1431.8	[0.12]	5.18	1066.3	0.04
cis-Linalool oxide (fur.)	6.36	1404.4	0.10	5.27	1071.7	0.10
Octanol	8.00*†	1527.3	[21.34]	5.34	1076.5	0.01
Terpinolene	4.10	1240.3	0.11	5.51*	1087.0	[0.18]
trans-Linalool oxide (fur.)	6.73*	1431.8	[0.12]	5.51*	1087.0	[0.18]
Rosefuran	5.81	1364.8	0.01	5.70	1098.8	0.04
Linalool	7.94*†	1522.9	[39.11]	5.84	1108.0	35.45
(Z)-6-Methyl-3,5-heptadien-2-one	8.00*†	1527.3	[21.34]	5.86	1109.1	0.05
β-Thujone	6.11*	1386.2	[0.45]	5.89	1111.1	0.05
Octen-3-yl acetate	5.62*	1351.2	[0.77]	6.00	1117.6	0.75
Unknown LAAN I [m/z 82, 81 (72), 43 (64), 54 (32), 41 (20)...]	9.38	1636.7	0.03	6.05	1120.9	0.04
Octan-3-yl acetate	5.07	1311.2	0.15	6.18	1129.3	0.12
allo-Ocimene	5.38	1334.0	0.06	6.21	1131.2	0.07
(Z)-Myroxide	6.66*	1426.6	[0.03]	6.27	1135.3	0.02
Camphor	7.00	1452.0	0.20	6.31	1137.7	0.25
(E)-Myroxide	6.91*	1445.6	[0.02]	6.41*	1144.0	[0.04]
trans-Verbenol	9.34*	1633.2	[5.32]	6.41*	1144.0	[0.04]
Unknown CALU I [m/z 95, 43 (74), 109 (72), 82 (62), 110 (50)... 152 (14)]	6.81	1437.6	tr	6.45	1146.7	0.03
Hexyl isobutyrate	5.15	1317.1	0.07	6.55	1152.8	0.09
Nerol oxide	6.66*	1426.6	[0.03]	6.58	1155.0	0.02
Borneol	9.59*	1653.4	[1.58]	6.72	1163.5	0.53
cis-Linalool oxide (pyr.)	10.09	1694.1	0.03	6.75	1165.9	0.03
Lavandulol	9.43*	1640.6	[1.27]	6.82	1170.1	1.25
(3E,5Z)-Undeca-1,3,5-triene	5.73	1359.2	0.10	6.90*	1175.6	[2.93]
Terpinen-4-ol	8.39	1557.9	2.78	6.90*	1175.6	[2.93]
Cryptone	8.95*	1601.7	[0.36]	6.98	1180.3	0.28
meta-Cymen-8-ol	11.30	1797.0	0.05	7.02	1182.9	0.06
para-Cymen-8-ol	11.34	1799.8	0.07	7.06	1185.4	0.09
α-Terpineol	9.59*	1653.4	[1.58]	7.12	1189.6	1.07
Hexyl butyrate	6.11*	1386.2	[0.45]	7.22*	1195.6	[0.53]

Hodiendiol (2,6-dimethylocta-3,7-diene-2,6-diol)	12.62	1914.8	0.02	7.22*	1195.6	[0.53]
Verbenone	9.43*	1640.6	[1.27]	7.32	1202.1	0.02
Unknown SASC VII [m/z 43, 71 (66), 59 (52), 41 (47), 68 (46)...] (3E,5E)-2,6-Dimethylocta-3,5,7-trien-2-ol	7.29	1473.5	0.01	7.36	1204.7	0.01
Octyl acetate	6.89	1443.8	0.01	7.52	1215.7	0.02
<i>trans</i> -Carveol	11.20	1787.9	0.03	7.58	1219.6	0.02
Bornyl formate	7.79	1511.1	0.04	7.63	1222.8	0.04
Nerol	10.87*	1760.0	[0.20]	7.75	1230.5	0.18
Cuminal	10.37	1717.8	0.01	7.81*	1234.9	[0.13]
Hexyl 2-methylbutyrate	6.30	1399.7	0.06	7.81*	1234.9	[0.13]
Carvone	9.78	1668.7	0.04	7.88*	1239.8	[0.09]
Neral	9.28	1628.3	0.03	7.88*	1239.8	[0.09]
Hexyl isovalerate	6.56	1419.0	tr	7.93	1243.0	0.02
Linalyl acetate	8.00*†	1527.3	[21.34]	8.21*	1261.8	[25.61]
Geraniol	11.44	1808.8	0.44	8.21*	1261.8	[25.61]
Geranial	9.91	1679.2	0.05	8.34	1270.4	0.05
2,6-Dimethyl-1,7-octadiene-3,6-diol	14.46*	2089.2	[0.02]	8.47	1278.7	0.02
Bornyl acetate	8.06*	1532.1	[0.57]	8.54	1283.3	0.10
Lavandulyl acetate	8.59	1573.1	2.78	8.70	1294.3	2.83
Hexyl tiglate	8.67*	1579.7	[0.20]	9.25	1332.4	0.05
Hodiendiol derivative	12.74	1925.8	0.02	9.39	1342.6	0.01
Unknown SASC II [m/z 43, 79 (47), 71 (31), 94 (27), 81 (23), 41 (22)... 197 (0)]	10.87*	1760.0	[0.20]	9.54	1352.6	0.01
Unknown SASC III [m/z 43, 79 (46), 71 (30), 94 (25), 41 (23), 81 (21)... 197 (0)]	10.96	1767.5	0.01	9.58	1356.1	0.01
Neryl acetate	9.97*	1684.6	[0.31]	9.73	1366.0	0.29
$\alpha$ -Copaene	6.91*	1445.6	[0.02]	9.81	1372.2	0.02
$\beta$ -Bourbonene	7.25	1470.3	0.05	9.92	1379.9	0.05
Geranyl acetate	10.34	1715.0	0.46	10.00	1385.2	0.46
Hexyl hexanoate	8.67*	1579.7	[0.20]	10.05*	1388.8	[0.30]
7-epi-	7.64	1499.5	0.13	10.05*	1388.8	[0.30]

Sesquithujene						
Sesquithujene	7.94*†	1522.9	[39.11]	10.29	1405.7	0.06
β-Caryophyllene	8.23*	1545.5	[4.24]	10.40*	1413.8	[4.19]
cis-α-Bergamotene	8.06*	1532.1	[0.57]	10.40*	1413.8	[4.19]
α-Santalene	8.06*	1532.1	[0.57]	10.44	1417.3	0.44
Lavandulyl isobutyrate	9.16	1618.5	0.01	10.53	1423.8	0.01
Coumarin	16.87	2338.5	0.09	10.56	1425.8	0.06
trans-α-Bergamotene	8.23*	1545.5	[4.24]	10.66	1433.8	0.16
Sesquisabinene A	8.95*	1601.7	[0.36]	10.78	1442.3	0.07
α-Humulene	9.04	1608.4	0.13	10.84	1447.1	0.14
Lavandulyl butyrate?	10.30	1712.0	0.12	10.95	1455.1	0.14
(E)-β-Farnesene	9.34*	1633.2	[5.32]	11.01	1459.3	5.29
Germacrene D	9.53	1648.5	0.74	11.22	1475.3	0.74
trans-β-Bergamotene	9.34*	1633.2	[5.32]	11.30	1481.3	0.06
Isodaucene	9.81	1671.1	0.03	11.43	1490.6	0.03
β-Bisabolene	9.97*	1684.6	[0.31]	11.67*	1508.7	[0.18]
γ-Cadinene	10.14	1697.7	0.11	11.67*	1508.7	[0.18]
Lavandulyl isovalerate	10.44	1723.8	0.03	11.67*	1508.7	[0.18]
δ-Cadinene	10.17	1700.9	0.03	11.81	1519.5	0.02
β-Sesquiphellandrene	10.39	1719.3	0.01	11.83	1521.3	0.02
Isocaryophyllene epoxide B	11.90	1849.8	0.01	12.12	1543.9	0.02
cis-Sesquisabinene hydrate	13.04	1954.1	0.01	12.22	1552.3	0.01
(E)-Nerolidol	13.56	2002.2	0.02	12.37	1563.9	0.02
Caryophyllene oxide isomer	12.43	1897.6	0.03	12.50*	1573.7	[0.22]
Caryophyllene oxide	12.51	1904.8	0.19	12.50*	1573.7	[0.22]
Caryophylladienol II	15.81	2225.9	0.01	13.20	1629.7	0.01
τ-Cadinol	14.65	2107.8	0.07	13.26	1635.1	0.07
(3Z)-Caryophylla-3,8(13)-dien-5β-ol	16.58	2306.8	0.01	13.64	1666.3	0.01
Phytone	14.46*	2089.2	[0.02]	15.70	1845.2	0.01
Pentylcurcumene?				16.96	1962.5	0.02
Total reported		98.61%			99.37%	

\*: 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

Essential Oil, *Lavandula angustifolia*  
Internal code: 25A27-PTH07

Organic Lavender - Greece - L50119R

Report prepared for:  
Plant Therapy

†: 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