

Date : 2026-01-29

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

**Internal code :** 26A06-PTH09

**Customer Identification :** Laurel Leaf - Greece - L10112R

**Type :** Essential Oil

**Source :** *Laurus nobilis*

**Customer :** Plant Therapy

Checked and approved by:

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

*Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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. The compliance status of the sample is provided to facilitate the reading of the report. The client remains ultimately responsible for reviewing the results presented within this report and to establish compliance of the tested batch against relevant quality criteria.*

*This report is an update of the version first issued on 2026-01-08 to make a correction in the sample identification section.*



Laboratoire  
**PhytoChemia**

## 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 :** Jean-Christophe Fortin, M. Sc.

**Date :** 2026-01-06

## PHYSICOCHEMICAL DATA

**Refractive index :**  $1.4707 \pm 0.0003$  (20 °C)

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

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

**Date :** 2026-01-06

## 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
2-Methylbutyral	0.01	Aliphatic aldehyde
2-Ethylfuran	tr	Furan
1-Methylpyrrole	tr	Pyrrole
Ethyl isobutyrate	0.01	Aliphatic ester
Toluene	0.01	Simple phenolic
Hexanal	0.02	Aliphatic aldehyde
(2E)-Hexenal	0.03	Aliphatic aldehyde
Ethyl 2-methylbutyrate	0.03	Aliphatic ester
Ethyl isovalerate	0.02	Aliphatic ester
(3Z)-Hexenol	0.03	Aliphatic alcohol
Isopropyl 2-methylbutyrate	0.01	Aliphatic ester
2-Heptanol	0.02	Aliphatic alcohol
Tricyclene	0.01	Monoterpene
Isobutyl isobutyrate	0.03	Aliphatic ester
$\alpha$ -Thujene	0.15	Monoterpene
$\alpha$ -Pinene	6.16	Monoterpene
Thujadiene isomer	0.02	Monoterpene
Camphene	0.27	Monoterpene
$\alpha$ -Fenchene	0.02	Monoterpene
Unknown	0.01	Unknown
$\beta$ -Pinene	3.60	Monoterpene
Sabinene	7.15	Monoterpene
Dehydro-1,8-cineole	0.03	Monoterpenic ether
Myrcene	0.45	Monoterpene
$\alpha$ -Phellandrene	0.25	Monoterpene
Pseudolimonene	0.02	Monoterpene
Isobutyl 2-methylbutyrate	0.05	Aliphatic ester
$\Delta^3$ -Carene	0.02	Monoterpene
(3Z)-Hexenyl acetate	tr	Aliphatic ester
$\alpha$ -Terpinene	0.37	Monoterpene
<i>para</i> -Cymene	1.80	Monoterpene
Limonene	2.61	Monoterpene
1,8-Cineole	37.15	Monoterpenic ether
(Z)- $\beta$ -Ocimene	0.09	Monoterpene
(E)- $\beta$ -Ocimene	0.13	Monoterpene
$\gamma$ -Terpinene	1.11	Monoterpene
<i>cis</i> -Sabinene hydrate	0.02	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (fur.)	0.02	Monoterpenic alcohol
<i>trans</i> -Linalool oxide (fur.)	0.01	Monoterpenic alcohol

Terpinolene	0.10	Monoterpene
<i>para</i> -Cymenene	0.02	Monoterpene
2-Nonanone	0.04	Aliphatic ketone
<i>trans</i> -Sabinene hydrate	0.01	Monoterpenic alcohol
Linalool	8.32	Monoterpenic alcohol
Unknown	0.01	Unknown
Hotrienol	0.02	Monoterpenic alcohol
<i>cis-para</i> -Menth-2-en-1-ol	0.02	Monoterpenic alcohol
<i>trans</i> -Pinocarveol	0.07	Monoterpenic alcohol
<i>trans-para</i> -Menth-2-en-1-ol	0.02	Monoterpenic alcohol
<i>trans</i> -Verbenol	0.02	Monoterpenic alcohol
Sabinaketone	0.01	Normonoterpenic ketone
Nerol oxide	0.01	Aliphatic ether
Pinocarvone	0.02	Monoterpenic ketone
( <i>E</i> )-2,6-Dimethyl-1,5,7-octatrien-3-ol	0.01	Monoterpenic alcohol
Borneol	0.02	Monoterpenic alcohol
$\delta$ -Terpineol	0.09	Monoterpenic alcohol
Terpinen-4-ol	2.34	Monoterpenic alcohol
Thuj-3-en-10-al	0.01	Monoterpenic aldehyde
<i>para</i> -Cymen-8-ol	0.02	Monoterpenic alcohol
$\alpha$ -Terpineol	2.15	Monoterpenic alcohol
Myrtenal	0.02	Monoterpenic aldehyde
<i>cis</i> -Piperitol	0.01	Monoterpenic alcohol
Myrtenol	0.07	Monoterpenic alcohol
Methylchavicol	0.14	Phenylpropanoid
<i>trans</i> -Piperitol	0.01	Monoterpenic alcohol
<i>trans</i> -Carveol	0.01	Monoterpenic alcohol
<i>cis-para</i> -Mentha-1(7),8-dien-2-ol	0.01	Monoterpenic alcohol
Nerol	0.19	Monoterpenic alcohol
Citronellol	0.01	Monoterpenic alcohol
Carvone	0.02	Monoterpenic ketone
Geraniol	0.01	Monoterpenic alcohol
Linalyl acetate	0.10	Monoterpenic ester
Geranial	0.01	Monoterpenic aldehyde
4-Thujen-2 $\alpha$ -yl acetate	0.02	Monoterpenic ester
Bornyl acetate	0.58	Monoterpenic ester
<i>para</i> -Cymen-7-ol	0.01	Monoterpenic alcohol
2-Undecanone	0.01	Aliphatic ketone
Terpinen-4-yl acetate	0.07	Monoterpenic ester
Thymol	0.01	Monoterpenic alcohol
$\delta$ -Terpinyl acetate	0.13	Monoterpenic ester
Unknown	0.03	Unknown
<i>exo</i> -2-Hydroxycineole acetate	0.01	Monoterpenic ester
$\alpha$ -Cubebene	0.03	Sesquiterpene
$\alpha$ -Terpinyl acetate	13.88	Monoterpenic ester

Eugenol	2.37	Phenylpropanoid
Neryl acetate	0.07	Monoterpenic ester
$\alpha$ -Ylangene	0.02	Sesquiterpene
$\alpha$ -Copaene	0.01	Sesquiterpene
Geranyl acetate	0.01	Monoterpenic ester
$\beta$ -Cubebene	0.01	Sesquiterpene
$\beta$ -Elemene	0.09	Sesquiterpene
Methyleugenol	5.90	Phenylpropanoid
$\beta$ -Caryophyllene	0.29	Sesquiterpene
$\alpha$ -Guaiene	0.01	Sesquiterpene
6,9-Guaiadiene	0.05	Sesquiterpene
( <i>E</i> )-Cinnamyl acetate	0.01	Phenylpropanoid ester
$\alpha$ -Humulene	0.05	Sesquiterpene
Selina-4(15),7-diene	0.02	Sesquiterpene
allo-Aromadendrene	0.01	Sesquiterpene
<i>cis</i> -Muurolo-4(15),5-diene	0.01	Sesquiterpene
Unknown	0.02	Unknown
Germacrene D	0.02	Sesquiterpene
$\beta$ -Selinene	0.02	Sesquiterpene
$\alpha$ -Selinene	0.02	Sesquiterpene
Bicyclogermacrene	0.01	Sesquiterpene
Methyl ( <i>E</i> )-isoeugenol	0.08	Phenylpropanoid
(3 <i>Z</i> ,6 <i>E</i> )- $\alpha$ -Farnesene	0.01	Sesquiterpene
Germacrene A	0.02	Sesquiterpene
$\gamma$ -Cadinene	0.02	Sesquiterpene
$\beta$ -Bisabolene	0.02	Sesquiterpene
$\delta$ -Cadinene	0.06	Sesquiterpene
$\alpha$ -Calacorene	0.01	Sesquiterpene
( <i>E</i> )- $\alpha$ -Bisabolene	0.02	Sesquiterpene
Elemicin	0.01	Phenylpropanoid
Spathulenol	0.03	Sesquiterpenic alcohol
Germacrene D-4-ol	0.01	Sesquiterpenic alcohol
Caryophyllene oxide	0.06	Sesquiterpenic ether
Viridiflorol	0.01	Sesquiterpenic alcohol
Unknown	0.01	Oxygenated sesquiterpene
Ledol	0.01	Sesquiterpenic alcohol
Humulene epoxide II	0.01	Sesquiterpenic ether
Junenol	0.01	Sesquiterpenic alcohol
Caryophylladienol II	0.01	Sesquiterpenic alcohol
$\tau$ -Cadinol	0.01	Sesquiterpenic alcohol
$\beta$ -Eudesmol	0.02	Sesquiterpenic alcohol
$\alpha$ -Eudesmol	0.01	Sesquiterpenic alcohol
Germacra-4(15),5,10(14)-trien-1-ol isomer	0.01	Sesquiterpenic alcohol
<b>Consolidated total</b>	<b>99.93</b>	

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

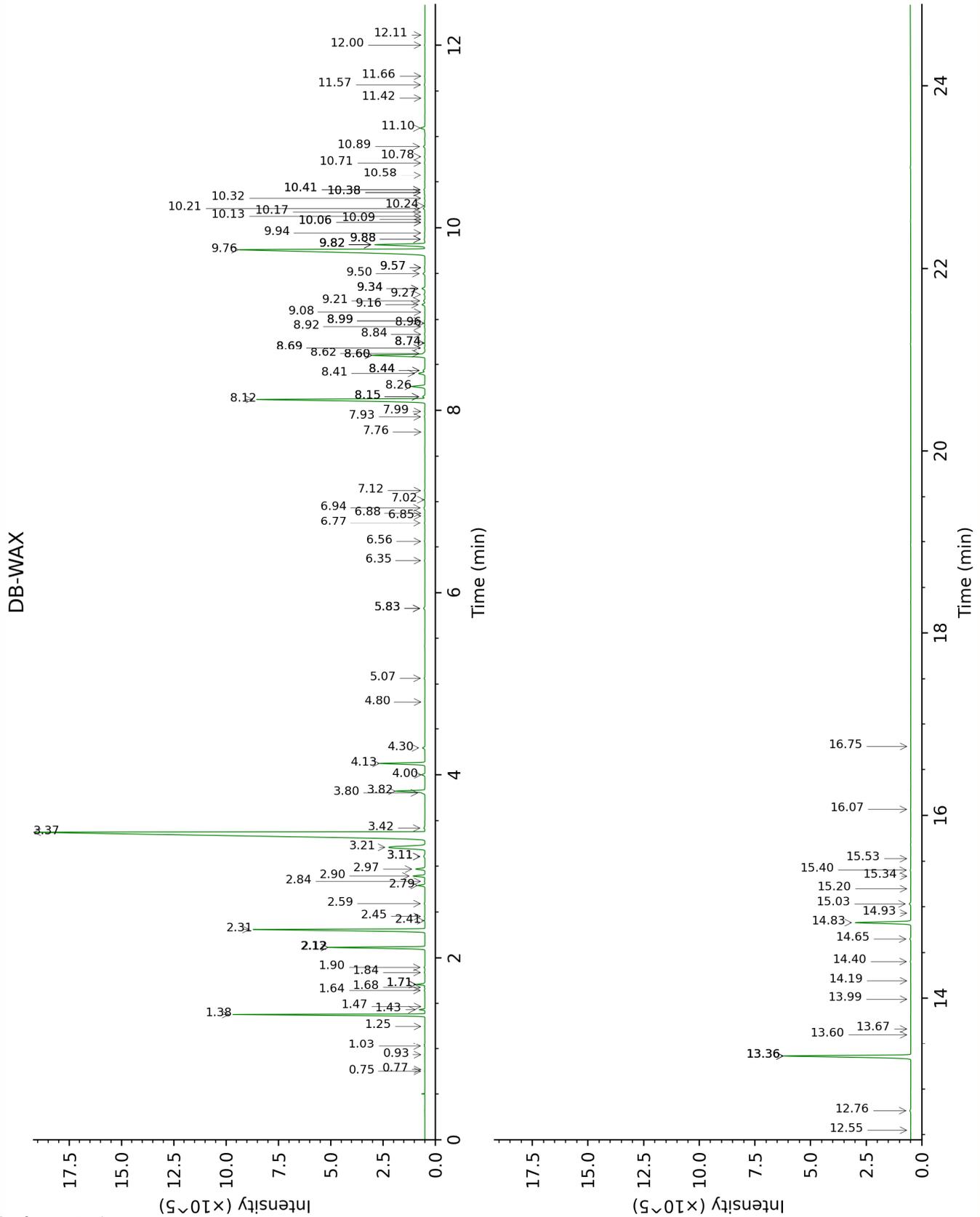
Note: no correction factor was applied

**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.





FULL ANALYSIS DATA

Isovaleral	Column DB-WAX			Column DB-5		
	0.77	888.4	tr	0.59	643.2	tr
2-Methylbutyral	0.75	881.4	tr	0.62	653.3	0.01
2-Ethylfuran	0.93	919.3	0.01	0.75	702.8	tr
1-Methylpyrrole	2.41	1095.8	0.01	0.94	732.7	tr
Ethyl isobutyrate	1.03	934.9	0.01	1.10	755.6	0.01
Toluene	1.47	1002.3	tr	1.13	759.4	0.01
Hexanal	1.90	1044.8	0.03	1.41	800.2	0.02
(2E)-Hexenal	3.42	1175.6	0.04	1.96	848.7	0.03
Ethyl 2-methylbutyrate	1.64	1019.8	0.02	1.97	849.9	0.03
Ethyl isovalerate	1.84	1039.3	0.02	2.01	853.5	0.02
(3Z)-Hexenol	5.83*	1350.7	[0.06]	2.04	855.6	0.03
Isopropyl 2-methylbutyrate	1.71*	1026.3	[0.28]	2.44	890.1	0.01
2-Heptanol	5.06	1298.4	0.03	2.62	904.8	0.02
Tricyclene	1.25	970.9	0.01	2.81*	917.7	[0.03]
Isobutyl isobutyrate	2.12*	1066.6	[3.47]	2.81*	917.7	[0.03]
α-Thujene	1.43	999.0	0.15	2.94	926.4	0.15
α-Pinene	1.38	992.1	6.10	3.02	932.0	6.16
Thujadiene isomer	2.45	1099.5	0.02	3.20*	943.8	[0.31]
Camphene	1.71*	1026.3	[0.28]	3.20*	943.8	[0.31]
α-Fenchene	1.68	1023.2	0.02	3.20*	943.8	[0.31]
Unknown LANO VI [m/z 71, 67 (95), 113 (60), 43 (46), 55 (31)...]				3.41	957.7	0.01
β-Pinene	2.12*	1066.6	[3.47]	3.63*	972.4	[10.74]
Sabinene	2.31	1086.1	7.15	3.63*	972.4	[10.74]
Dehydro-1,8-cineole	3.11*	1151.1	[0.07]	3.86	987.9	0.03
Myrcene	2.90	1134.2	0.44	3.94	993.3	0.45
α-Phellandrene	2.79	1126.1	0.25	4.07*	1002.5	[0.29]
Pseudolimonene	2.84	1129.7	0.02	4.07*	1002.5	[0.29]
Isobutyl 2-methylbutyrate	3.11*	1151.1	[0.07]	4.13	1006.2	0.05
Δ <sup>3</sup> -Carene	2.59	1110.5	0.02	4.16*	1008.2	[0.04]
(3Z)-Hexenyl acetate	4.80	1278.6	tr	4.16*	1008.2	[0.04]
α-Terpinene	2.97	1140.2	0.36	4.27	1015.3	0.37
para-Cymene	4.13	1229.1	1.76	4.40†	1023.5	0.73
Limonene	3.21	1159.0	2.61	4.53*	1031.6	[39.45]
1,8-Cineole	3.37	1172.0	37.15	4.53*	1031.6	[39.45]

(Z)- $\beta$ -Ocimene	3.80	1205.5	0.07	4.68	1041.0	0.09
(E)- $\beta$ -Ocimene	4.00	1220.0	0.13	4.83	1050.7	0.13
$\gamma$ -Terpinene	3.82	1206.9	1.13	4.95	1058.1	1.11
<i>cis</i> -Sabinene hydrate	6.94	1430.7	0.06	5.05	1064.8	0.02
<i>cis</i> -Linalool oxide (fur.)	6.56	1403.1	0.02	5.15	1071.2	0.02
<i>trans</i> -Linalool oxide (fur.)	6.88	1426.3	0.01	5.40*	1086.9	[0.14]
Terpinolene	4.30	1241.6	0.10	5.40*	1086.9	[0.14]
<i>para</i> -Cymenene	6.35	1388.0	0.02	5.40*	1086.9	[0.14]
2-Nonanone	5.83*	1350.7	[0.06]	5.51	1093.8	0.04
<i>trans</i> -Sabinene hydrate	7.99	1508.9	0.01	5.54	1095.9	0.01
Linalool	8.12	1519.0	8.29	5.68	1104.4	8.32
Unknown CASA I [m/z 43, 59 (37), 79 (33), 91 (32), 119 (31)...]	9.08	1592.9	0.01	5.70*	1106.2	[0.02]
Hotrienol	8.84	1574.3	0.02	5.70*	1106.2	[0.02]
<i>cis-para</i> -Menth-2-en-1-ol	8.15*	1521.3	[0.10]	5.90	1119.1	0.02
<i>trans</i> -Pinocarveol	9.20	1602.8	0.06	6.13	1134.0	0.07
<i>trans-para</i> -Menth-2-en-1-ol	8.99*	1585.6	[0.02]	6.19	1137.6	0.02
<i>trans</i> -Verbenol	9.57*	1631.9	[0.03]	6.26	1142.3	0.02
Sabinaketone	8.74*	1567.0	[0.01]	6.42	1152.5	0.01
Nerol oxide	6.85	1424.2	0.01	6.46	1155.3	0.01
Pinocarvone	7.93	1504.4	0.02	6.48	1157.0	0.02
(E)-2,6-Dimethyl-1,5,7-octatrien-3-ol	10.32	1692.8	0.02	6.53	1159.9	0.01
Borneol	9.82*	1652.0	[2.19]	6.56	1162.2	0.02
$\delta$ -Terpineol	9.50	1626.6	0.09	6.60	1164.8	0.09
Terpinen-4-ol	8.60*	1556.1	[2.35]	6.77	1175.7	2.34
Thuj-3-en-10-al	8.69*	1562.9	[0.03]	6.84	1180.4	0.01
<i>para</i> -Cymen-8-ol	11.57	1798.1	0.03	6.90	1183.9	0.02
$\alpha$ -Terpineol	9.82*	1652.0	[2.19]	6.99*	1190.0	[2.20]
Myrtenal	8.69*	1562.9	[0.03]	6.99*	1190.0	[2.20]
<i>cis</i> -Piperitol	9.57*	1631.9	[0.03]	7.06*	1194.6	[0.08]
Myrtenol	10.89	1741.0	0.07	7.06*	1194.6	[0.08]
Methylchavicol	9.34*	1613.5	[0.13]	7.10	1196.8	0.14
<i>trans</i> -Piperitol	10.41*	1700.6	[0.05]	7.25	1206.6	0.01
<i>trans</i> -Carveol	11.42	1785.6	0.01	7.41	1218.0	0.01
<i>cis-para</i> -Mentha-1(7),8-dien-2-ol	12.00	1836.4	0.01	7.54	1226.6	0.01

Nerol	11.10	1758.0	0.19	7.60	1230.4	0.19
Citronellol	10.78	1731.6	0.02	7.67	1235.7	0.01
Carvone	10.06*	1671.5	[0.01]	7.75	1241.2	0.02
Geraniol	11.66	1806.5	0.01	8.02	1259.3	0.01
Linalyl acetate	8.15*	1521.3	[0.10]	8.05	1261.3	0.10
Geranial	10.13	1677.0	0.01	8.18	1270.7	0.01
4-Thujen-2 $\alpha$ -yl acetate	8.92	1580.8	0.02	8.29	1278.1	0.02
Bornyl acetate	8.26	1530.0	0.58	8.42	1286.7	0.58
<i>para</i> -Cymen-7-ol	14.19	2037.4	0.01	8.48	1291.3	0.01
2-Undecanone	8.62	1557.6	0.06	8.55	1295.8	0.01
Terpinen-4-yl acetate	8.74*	1567.0	[0.01]	8.59	1298.6	0.07
Thymol	15.20	2136.0	0.02	8.64	1301.9	0.01
$\delta$ -Terpinyl acetate	9.16	1599.4	0.13	8.88	1315.7	0.13
Unknown LANO II [m/z 119, 43 (99), 93 (52), 59 (44), 91 (41), 134 (34)...]	9.88*	1656.8	[0.05]	8.99	1323.5	0.03
<i>exo</i> -2-Hydroxycineole acetate	10.09	1674.3	0.01	9.24	1341.4	0.01
$\alpha$ -Cubebene	6.77	1418.2	0.03	9.27	1343.6	0.03
$\alpha$ -Terpinyl acetate	9.76	1647.6	13.85	9.39	1352.1	13.88
Eugenol	14.83	2099.0	2.35	9.45	1356.4	2.37
Neryl acetate	10.21	1683.7	0.07	9.61	1367.4	0.07
$\alpha$ -Ylangene	7.02	1437.2	0.02	9.64	1369.5	0.02
$\alpha$ -Copaene	7.12	1444.6	0.02	9.70	1373.7	0.01
Geranyl acetate	10.58	1714.3	0.01	9.88*	1386.8	[0.01]
$\beta$ -Cubebene	7.76	1491.8	0.01	9.88*	1386.8	[0.01]
$\beta$ -Elemene	8.44*	1543.4	[0.09]	9.94	1390.7	0.09
Methyleugenol	13.36*	1959.2	[5.82]	10.17	1407.2	5.90
$\beta$ -Caryophyllene	8.41	1540.9	0.30	10.26	1414.5	0.29
$\alpha$ -Guaiene	8.44*	1543.4	[0.09]	10.56	1436.7	0.01
6,9-Guaiadiene	8.60*	1556.1	[2.35]	10.63	1441.8	0.05
( <i>E</i> )-Cinnamyl acetate	14.65	2081.4	0.04	10.68	1445.5	0.01
$\alpha$ -Humulene	9.27	1608.3	0.04	10.72	1448.7	0.05
Selina-4(15),7-diene	8.96	1583.6	0.02	10.77	1452.3	0.02
allo-Aromadendrene	8.99*	1585.6	[0.02]	10.81	1455.7	0.01
<i>cis</i> -Muurola-4(15),5-diene	9.34*	1613.5	[0.13]	10.88	1460.8	0.01
Unknown LANO I				11.02	1470.8	0.02

[m/z 43, 67 (61), 79 (57), 81 (44), 54 (44)...]						
Germacrene D	9.82*	1652.0	[2.19]	11.09	1476.6	0.02
β-Selinene	9.88*	1656.8	[0.05]	11.15	1480.9	0.02
α-Selinene	9.94	1662.3	0.02	11.28	1490.8	0.02
Bicyclgermacrene	10.06*	1671.5	[0.01]	11.30	1491.8	0.01
Methyl (E)-isoeugenol	15.03	2119.5	0.08	11.36	1496.5	0.08
(3Z,6E)-α-Farnesene	10.24	1686.1	0.01	11.38*	1498.3	[0.03]
Germacrene A	10.38*	1698.0	[0.04]	11.38*	1498.3	[0.03]
γ-Cadinene	10.38*	1698.0	[0.04]	11.54*	1510.0	[0.04]
β-Bisabolene	10.17	1680.7	0.02	11.54*	1510.0	[0.04]
δ-Cadinene	10.41*	1700.6	[0.05]	11.68	1521.4	0.06
α-Calacorene	12.11	1846.1	0.01	11.88	1537.4	0.01
(E)-α-Bisabolene	10.71	1725.8	0.02	11.96	1543.7	0.02
Elemicin	15.53	2168.9	0.01	12.14	1557.5	0.01
Spathulenol	14.40	2057.7	0.03	12.31*	1571.1	[0.03]
Germacrene D-4-ol	13.67	1987.1	0.01	12.31*	1571.1	[0.03]
Caryophyllene oxide	12.76	1904.1	0.05	12.36	1575.0	0.06
Viridiflorol	13.99	2018.2	0.01	12.45	1582.0	0.01
Unknown LANO III [m/z 133, 93 (64), 43 (64), 177 (60), 107 (59), 91 (55)...220 (7)]	12.55	1884.6	0.01	12.53	1588.3	0.01
Ledol	13.36*	1959.2	[5.82]	12.62	1595.5	0.01
Humulene epoxide II	13.36*	1959.2	[5.82]	12.69	1600.9	0.01
Junenol	13.60	1981.2	0.01	12.80	1609.8	0.01
Caryophylladienol II	16.07	2224.2	0.02	13.03	1628.8	0.01
τ-Cadinol	14.93	2109.4	0.01	13.13	1637.4	0.01
β-Eudesmol	15.40	2156.3	0.03	13.19	1642.5	0.02
α-Eudesmol	15.34	2149.7	0.01	13.24	1646.2	0.01
Germacra-4(15),5,10(14)-trien-1-ol isomer	16.76	2296.0	0.01	13.63	1679.0	0.01
Total reported		99.39%			98.60%	

\*: 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, *Laurus nobilis*  
Internal code: 26A06-PTH09

Laurel Leaf - Greece - L10112R

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