

Date : 2025-02-04

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 25A21-PTH02

Customer Identification : Laurel Leaf - Greece - L10110R

Type : Essential Oil

Source : *Laurus nobilis*

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

✳ISO

Results : See analysis summary (next page)

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

Date : 2025-02-04

PHYSICOCHEMICAL DATA

Refractive index : 1.4708 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2025-01-21

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-Methylbutyral	0.01	Aliphatic aldehyde
2-Ethylfuran	tr	Furan
3-Methyl-1-penten-3-ol	tr	Aliphatic alcohol
1-Methylpyrrole	0.02	Pyrrole
Ethyl isobutyrate	0.01	Aliphatic ester
Toluene	tr	Simple phenolic
Hexanal	0.05	Aliphatic aldehyde
Isopropyl butyrate	tr	Aliphatic ester
(2E)-Hexenal	0.01	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
Tricyclene	tr	Monoterpene
Isobutyl isobutyrate	0.02	Aliphatic ester
α -Thujene	0.18	Monoterpene
α -Pinene	6.29	Monoterpene
α -Fenchene	0.02	Monoterpene
Camphene	0.30	Monoterpene
β -Pinene	3.40	Monoterpene
Sabinene	7.50	Monoterpene
Dehydro-1,8-cineole	0.04	Monoterpenic ether
Myrcene	0.42	Monoterpene
Pseudolimonene	0.02	Monoterpene
α -Phellandrene	0.27	Monoterpene
Isobutyl 2-methylbutyrate	0.05	Aliphatic ester
(3Z)-Hexenyl acetate	tr	Aliphatic ester
Δ^3 -Carene	0.02	Monoterpene
α -Terpinene	0.36	Monoterpene
<i>para</i> -Cymene	1.41	Monoterpene
Limonene	2.63	Monoterpene
1,8-Cineole	37.16	Monoterpenic ether
(Z)- β -Ocimene	0.10	Monoterpene
(E)- β -Ocimene	0.14	Monoterpene
γ -Terpinene	1.24	Monoterpene
<i>cis</i> -Sabinene hydrate	0.03	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (fur.)	0.02	Monoterpenic alcohol
<i>para</i> -Cymenene	0.02	Monoterpene
Terpinolene	0.09	Monoterpene
2-Nonanone	0.04	Aliphatic ketone

<i>trans</i> -Sabinene hydrate	0.03	Monoterpenic alcohol
Linalool	8.36	Monoterpenic alcohol
Unknown	0.02	Unknown
Hotrienol	0.02	Monoterpenic alcohol
endo-Fenchol	0.01	Monoterpenic alcohol
<i>cis-para</i> -Menth-2-en-1-ol	0.02	Monoterpenic alcohol
<i>trans</i> -Pinocarveol	0.05	Monoterpenic alcohol
<i>trans-para</i> -Menth-2-en-1-ol	0.02	Monoterpenic alcohol
<i>trans</i> -Verbenol	0.02	Monoterpenic alcohol
Nerol oxide	tr	Aliphatic ether
Pinocarvone	0.03	Monoterpenic ketone
(<i>E</i>)-2,6-Dimethyl-1,5,7-octatrien-3-ol	0.01	Monoterpenic alcohol
Borneol	0.03	Monoterpenic alcohol
δ -Terpineol	0.09	Monoterpenic alcohol
Isopinocampone	tr	Monoterpenic ketone
Terpinen-4-ol	2.34	Monoterpenic alcohol
Thuj-3-en-10-al	0.01	Monoterpenic aldehyde
<i>para</i> -Cymen-8-ol	0.01	Monoterpenic alcohol
Myrtenal	0.03	Monoterpenic aldehyde
α -Terpineol	2.13	Monoterpenic alcohol
Myrtenol	0.05	Monoterpenic alcohol
Methylchavicol	0.12	Phenylpropanoid
Nerol	0.17	Monoterpenic alcohol
Linalyl acetate	0.07	Monoterpenic ester
Geraniol	0.05	Monoterpenic alcohol
Geranial	0.01	Monoterpenic aldehyde
4-Thujen-2 α -yl acetate	0.03	Monoterpenic ester
Bornyl acetate	0.62	Monoterpenic ester
<i>para</i> -Cymen-7-ol	0.01	Monoterpenic alcohol
2-Undecanone	0.07	Aliphatic ketone
<i>para</i> -Menth-5-en-1,2-diol isomer III	0.01	Monoterpenic alcohol
δ -Terpinyl acetate	0.15	Monoterpenic ester
Unknown	0.02	Unknown
exo-2-Hydroxycineole acetate	0.02	Monoterpenic ester
α -Cubebene	0.02	Sesquiterpene
α -Terpinyl acetate	13.13	Monoterpenic ester
Eugenol	2.43	Phenylpropanoid
Neryl acetate	0.09	Monoterpenic ester
Unknown	0.02	Sesquiterpene
α -Ylangene	0.03	Sesquiterpene
α -Copaene	0.02	Sesquiterpene
β -Elemene	0.09	Sesquiterpene
Methyleugenol	5.80	Phenylpropanoid
β -Caryophyllene	0.33	Sesquiterpene
Aromadendrene	0.01	Sesquiterpene

α -Guaiene	0.01	Sesquiterpene
6,9-Guaiadiene	0.01	Sesquiterpene
(<i>E</i>)-Cinnamyl acetate	0.06	Phenylpropanoid ester
α -Humulene	0.05	Sesquiterpene
Selina-4(15),7-diene	0.02	Sesquiterpene
<i>cis</i> -Muurolo-4(15),5-diene	0.01	Sesquiterpene
Germacrene D	0.02	Sesquiterpene
β -Selinene	0.03	Sesquiterpene
Viridiflorene	0.01	Sesquiterpene
α -Selinene	0.03	Sesquiterpene
Bicyclogermacrene	0.01	Sesquiterpene
(3 <i>Z</i> ,6 <i>E</i>)- α -Farnesene	0.02	Sesquiterpene
Methyl (<i>E</i>)-isoeugenol	0.10	Phenylpropanoid
γ -Cadinene	0.04	Sesquiterpene
δ -Cadinene	0.06	Sesquiterpene
α -Calacorene	0.01	Sesquiterpene
(<i>E</i>)- α -Bisabolene	0.03	Sesquiterpene
Elemicin	0.02	Phenylpropanoid
Spathulenol	0.04	Sesquiterpenic alcohol
Caryophyllene oxide	0.06	Sesquiterpenic ether
Viridiflorol	0.01	Sesquiterpenic alcohol
Ledol	0.01	Sesquiterpenic alcohol
Humulene epoxide II	0.01	Sesquiterpenic ether
Junenol	0.02	Sesquiterpenic alcohol
Eremoligenol?	0.01	Sesquiterpenic alcohol
Caryophylladienol II	0.02	Sesquiterpenic alcohol
τ -Cadinol	0.01	Sesquiterpenic alcohol
β -Eudesmol	0.03	Sesquiterpenic alcohol
α -Eudesmol	0.01	Sesquiterpenic alcohol
(<i>E</i>)-Isoelemicin	0.01	Phenylpropanoid
α -Cadinol	0.01	Sesquiterpenic alcohol
Unknown	0.01	Aliphatic ester
Consolidated total	99.41	

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

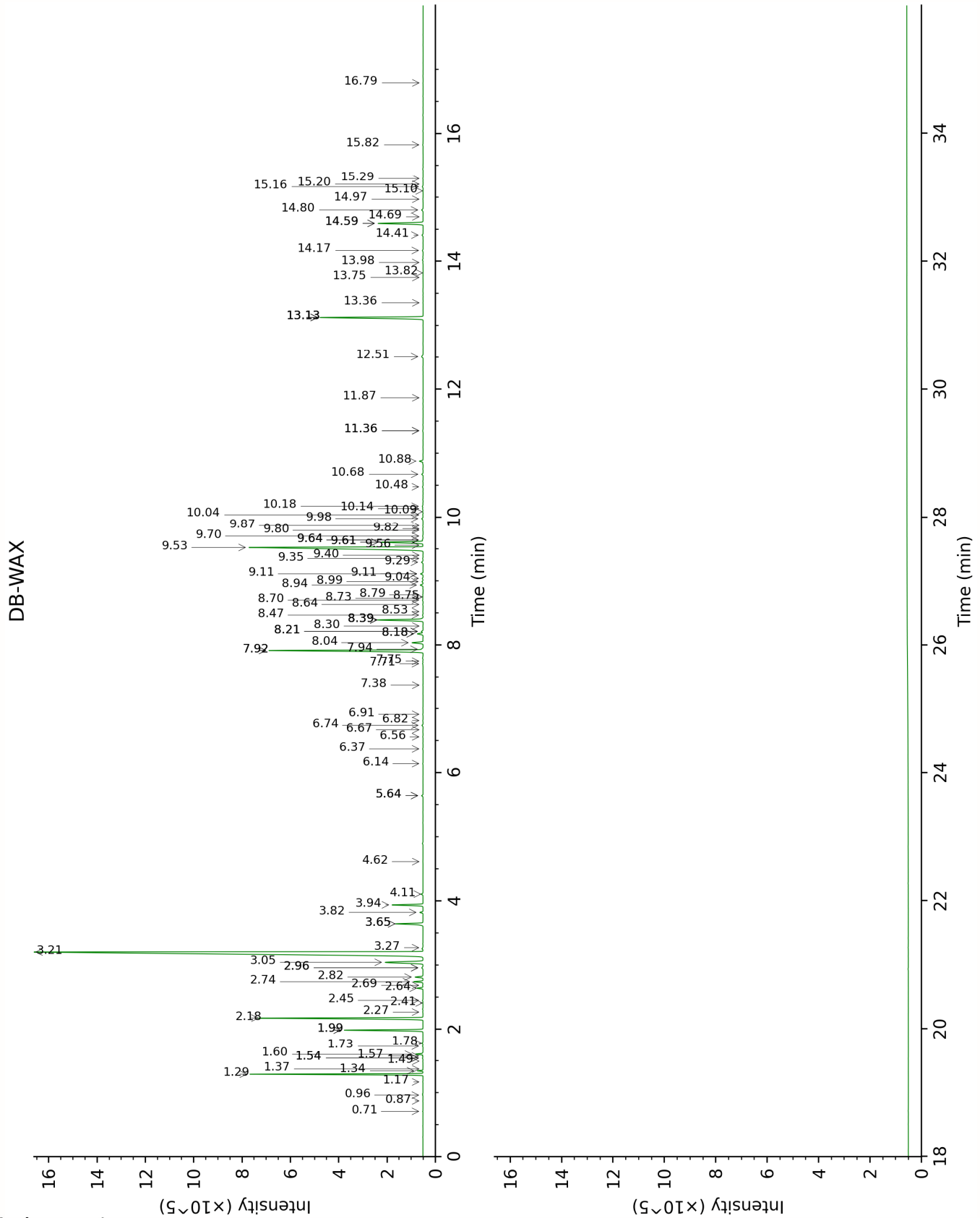
Note: no correction factor was applied

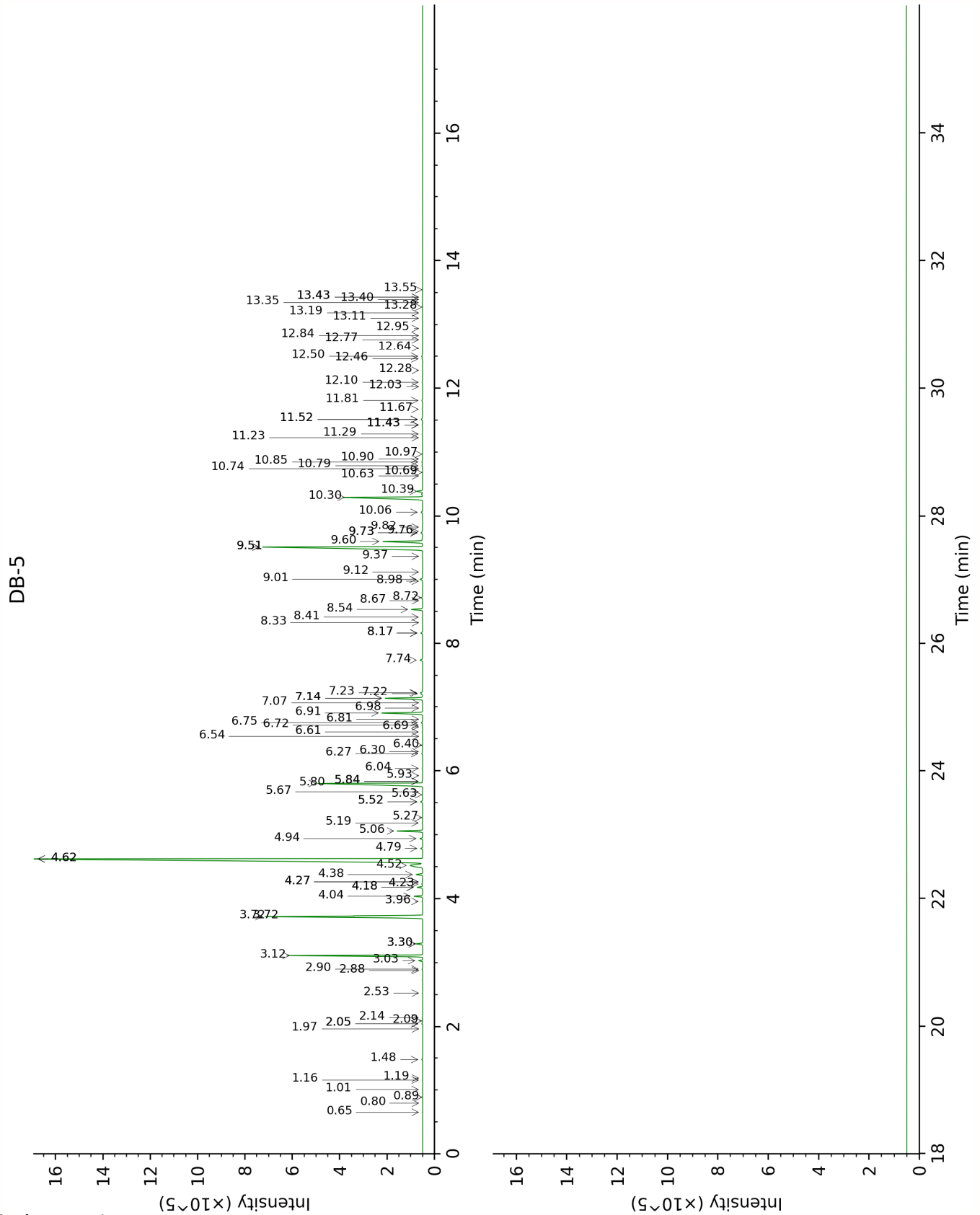
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

2-Methylbutyral	Column DB-WAX			Column DB-5		
	0.71	885.0	0.01	0.65	653.3	0.01
2-Ethylfuran	0.87	922.6	0.01	0.80	703.7	tr
3-Methyl-1-penten-3-ol	2.41	1108.9	tr	0.89	718.4	tr
1-Methylpyrrole	2.27	1096.4	0.01	1.01	735.4	0.02
Ethyl isobutyrate	0.96	937.9	0.01	1.16	756.4	0.01
Toluene	1.37	1005.3	tr	1.19	760.8	tr
Hexanal	1.78	1047.0	0.05	1.48	801.9	0.05
Isopropyl butyrate	1.49	1017.6	0.01	1.97	844.5	tr
(2E)-Hexenal	3.27	1177.6	0.01	2.05*	851.2	[0.04]
Ethyl 2-methylbutyrate	1.54*	1022.5	[0.02]	2.05*	851.2	[0.04]
Ethyl isovalerate	1.73	1041.6	0.02	2.09	854.9	0.02
(3Z)-Hexenol	5.64*	1352.8	[0.07]	2.14	859.0	0.03
Isopropyl 2-methylbutyrate	1.58	1025.9	0.02	2.53	891.1	0.01
Tricyclene	1.17	973.1	0.01	2.88	917.5	tr
Isobutyl isobutyrate	1.99*	1067.8	[3.37]	2.90	919.0	0.02
α -Thujene	1.34	1002.5	0.18	3.03	927.7	0.18
α -Pinene	1.29	993.9	6.23	3.12	933.1	6.29
α -Fenchene	1.54*	1022.5	[0.02]	3.30*	945.2	[0.33]
Camphene	1.60	1028.8	0.30	3.30*	945.2	[0.33]
β -Pinene	1.99*	1067.8	[3.37]	3.72*	973.4	[10.90]
Sabinene	2.18	1086.9	7.50	3.72*	973.4	[10.90]
Dehydro-1,8-cineole	2.96*	1152.5	[0.07]	3.96	989.0	0.04
Myrcene	2.74	1135.3	0.41	4.04	994.5	0.42
Pseudolimonene	2.69	1130.8	0.02	4.18*	1003.7	[0.28]
α -Phellandrene	2.64	1127.3	0.27	4.18*	1003.7	[0.28]
Isobutyl 2-methylbutyrate	2.96*	1152.5	[0.07]	4.23	1006.9	0.05
(3Z)-Hexenyl acetate	4.62	1278.9	tr	4.27*	1009.1	[0.03]
Δ^3 -Carene	2.45	1112.1	0.02	4.27*	1009.1	[0.03]
α -Terpinene	2.82	1141.1	0.36	4.38	1016.2	0.36
<i>para</i> -Cymene	3.94	1228.8	1.41	4.52	1025.2	1.41
Limonene	3.05	1159.4	2.63	4.62*	1031.5	[39.94]
1,8-Cineole	3.21	1172.2	37.16	4.62*	1031.5	[39.94]
(Z)- β -Ocimene	3.65*	1207.0	[1.35]	4.79	1041.8	0.10
(E)- β -Ocimene	3.82	1220.2	0.14	4.94	1051.5	0.14
γ -Terpinene	3.65*	1207.0	[1.35]	5.06	1058.9	1.24
<i>cis</i> -Sabinene	6.74	1432.7	0.06	5.19	1066.8	0.03

hydrate						
<i>cis</i> -Linalool oxide (fur.)	6.37	1405.4	0.02	5.27	1072.0	0.02
<i>para</i> -Cymenene	6.14	1388.8	0.02	5.52*	1087.4	[0.13]
Terpinolene	4.11	1241.3	0.09	5.52*	1087.4	[0.13]
2-Nonanone	5.64*	1352.8	[0.07]	5.63	1094.4	0.04
<i>trans</i> -Sabinene hydrate	7.75	1508.2	0.02	5.67	1097.2	0.03
Linalool	7.92*	1521.2	[8.35]	5.80	1105.4	8.36
Unknown CASA I [m/z 43, 59 (37), 79 (33), 91 (32), 119 (31)...]	8.79	1588.7	0.02	5.84*	1107.5	[0.05]
Hotrienol	8.64	1576.9	0.02	5.84*	1107.5	[0.05]
endo-Fenchol	8.18*	1541.4	[0.32]	5.93	1113.2	0.01
<i>cis-para</i> -Menth-2-en-1-ol	7.92*	1521.2	[8.35]	6.04	1120.4	0.02
<i>trans</i> -Pinocarveol	8.99	1604.8	0.06	6.27	1135.2	0.05
<i>trans-para</i> -Menth-2-en-1-ol	8.73	1584.3	0.02	6.30	1137.2	0.02
<i>trans</i> -Verbenol	9.35	1634.1	0.03	6.40	1143.6	0.02
Nerol oxide	6.67	1427.5	0.01	6.54	1152.3	tr
Pinocarvone	7.71	1505.2	0.03	6.61	1156.7	0.03
(<i>E</i>)-2,6-Dimethyl-1,5,7-octatrien-3-ol	10.09	1694.2	0.02	6.69	1161.8	0.01
Borneol	9.61*	1654.8	[2.15]	6.72	1163.6	0.03
δ -Terpineol	9.29	1629.4	0.09	6.75	1166.0	0.09
Isopinocampone	7.38	1480.1	0.01	6.81	1169.4	tr
Terpinen-4-ol	8.40*	1558.2	[2.40]	6.91	1175.7	2.34
Thuj-3-en-10-al	8.52	1568.3	0.02	6.98	1180.5	0.01
<i>para</i> -Cymen-8-ol	11.36*	1801.6	[0.03]	7.06	1185.9	0.01
Myrtenal	8.47	1564.0	0.03	7.14*	1190.4	[2.16]
α -Terpineol	9.61*	1654.8	[2.15]	7.14*	1190.4	[2.16]
Myrtenol	10.68	1743.7	0.07	7.22	1195.6	0.05
Methylchavicol	9.11*	1614.7	[0.13]	7.23	1196.5	0.12
Nerol	10.88	1761.2	0.19	7.74	1230.2	0.17
Linalyl acetate	7.94	1522.7	0.07	8.17*	1258.6	[0.11]
Geraniol	11.36*	1801.6	[0.03]	8.17*	1258.6	[0.11]
Geranial	9.87	1676.2	0.02	8.33	1269.4	0.01
4-Thujen-2 α -yl acetate	8.70	1582.2	0.03	8.42	1275.2	0.03
Bornyl acetate	8.04	1530.6	0.60	8.54	1283.2	0.62
<i>para</i> -Cymen-7-ol	13.98	2043.3	0.02	8.67	1292.4	0.01
2-Undecanone	8.40*	1558.2	[2.40]	8.72	1295.6	0.07
<i>para</i> -Menth-5-en-	14.97	2140.1	0.02	8.98	1313.2	0.01

1,2-diol isomer III						
δ-Terpinyl acetate	8.94	1600.5	0.15	9.01	1315.3	0.15
Unknown LANO II [m/z 119, 43 (99), 93 (52), 59 (44), 91 (41), 134 (34)...]	9.64*	1657.6	[0.05]	9.12	1323.3	0.02
exo-2- Hydroxycineole acetate	9.82	1672.0	0.02	9.36	1340.6	0.02
α-Cubebene	6.56	1419.3	0.02	9.51*	1350.8	[13.32]
α-Terpinyl acetate	9.52	1648.1	13.13	9.51*	1350.8	[13.32]
Eugenol	14.59*	2102.3	[2.43]	9.60	1356.9	2.43
Neryl acetate	9.98	1685.4	0.09	9.73*	1366.5	[0.10]
Unknown ENKR II [m/z 189, 91 (89), 82 (78), 109 (72), 93 (68), 67 (63), 161 (59)... 204 (tr)]				9.73*	1366.5	[0.10]
α-Ylangene	6.82	1438.3	0.02	9.76	1368.1	0.03
α-Copaene	6.91	1445.5	0.02	9.82	1372.8	0.02
β-Elementene	8.22*	1544.2	[0.10]	10.06	1389.9	0.09
Methyleugenol	13.13*	1962.3	[5.73]	10.30	1406.5	5.80
β-Caryophyllene	8.18*	1541.4	[0.32]	10.39	1413.5	0.33
Aromadendrene	8.30	1550.8	0.01	10.63	1431.3	0.01
α-Guaiene	8.22*	1544.2	[0.10]	10.69	1435.4	0.01
6,9-Guaiadiene	8.40*	1558.2	[2.40]	10.74	1439.7	0.01
(E)-Cinnamyl acetate	14.41	2084.4	0.07	10.79	1443.2	0.06
α-Humulene	9.04	1608.9	0.04	10.85	1447.6	0.05
Selina-4(15),7- diene	8.75	1586.1	0.01	10.90	1451.1	0.02
cis-Muurola- 4(15),5-diene	9.11*	1614.7	[0.13]	10.97	1456.7	0.01
Germacrene D	9.56	1651.1	0.01	11.23	1475.8	0.02
β-Selinene	9.64*	1657.6	[0.05]	11.29	1480.2	0.03
Viridiflorene	9.40	1638.3	0.01	11.43*	1490.6	[0.04]
α-Selinene	9.70	1662.6	0.03	11.43*	1490.6	[0.04]
Bicyclogermacrene	9.80	1670.2	0.01	11.43*	1490.6	[0.04]
(3Z,6E)-α- Farnesene	10.04	1690.3	0.02	11.52*	1497.1	[0.12]
Methyl (E)- isoeugenol	14.80	2123.2	0.10	11.52*	1497.1	[0.12]
γ-Cadinene	10.14	1698.2	0.05	11.67	1509.1	0.04
δ-Cadinene	10.18	1701.3	0.05	11.81	1519.9	0.06
α-Calacorene	11.87	1847.3	0.01	12.03	1537.0	0.01

(E)- α -Bisabolene	10.48	1727.1	0.03	12.10	1542.3	0.03
Elemicin	15.29	2172.5	0.02	12.28	1556.9	0.02
Spathulenol	14.17	2061.4	0.04	12.46	1571.0	0.04
Caryophyllene oxide	12.51	1904.9	0.12	12.50	1574.2	0.06
Viridiflorol	13.75	2020.8	0.01	12.64	1584.7	0.01
Ledol	13.13*	1962.3	[5.73]	12.77	1595.2	0.01
Humulene epoxide II	13.13*	1962.3	[5.73]	12.84	1600.3	0.01
Junenol	13.36	1983.4	0.01	12.95	1609.1	0.02
Eremoligenol?	14.59*	2102.3	[2.43]	13.11	1622.4	0.01
Caryophylladienol II	15.82	2227.5	0.03	13.19	1629.2	0.02
τ -Cadinol	14.69	2112.5	0.01	13.28	1636.8	0.01
β -Eudesmol	15.16	2159.7	0.05	13.35	1642.6	0.03
α -Eudesmol	15.10	2153.1	0.01	13.40	1646.5	0.01
(E)-Isoelemicin	16.79	2329.9	0.01	13.43*	1649.5	[0.02]
α -Cadinol	15.20	2163.7	0.01	13.43*	1649.5	[0.02]
Unknown HULU VI [m/z 79, 43 (66), 67 (59), 80 (56), 41 (41), 81 (37), 55 (29)...]	13.82	2027.7	0.01	13.55	1659.0	0.01
Total reported	99.19%			99.74%		

*: 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