

Date : 2024-05-06

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

**Internal code :** 24D22-PTH03

**Customer Identification :** Basil Linalool - Egypt - B10111R

**Type :** Essential Oil

**Source :** *Ocimum basilicum* ct. Linalool

**Customer :** Plant Therapy

Checked and approved by:

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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 :** Benoit Roger, Ph. D.

**Date :** 2024-05-02

## PHYSICOCHEMICAL DATA

**Refractive index :**  $1.4766 \pm 0.0003$  (20 °C)

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

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

**Date :** 2024-04-25

## 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
Isoamyl alcohol	0.01	Aliphatic alcohol
2-Methylbutanol	tr	Aliphatic alcohol
(2E)-Hexenal	tr	Aliphatic aldehyde
(3Z)-Hexenol	0.02	Aliphatic alcohol
$\alpha$ -Thujene	0.04	Monoterpene
$\alpha$ -Pinene	0.55	Monoterpene
Camphene	0.10	Monoterpene
Thuja-2,4(10)-diene	0.01	Monoterpene
Sabinene	0.51	Monoterpene
$\beta$ -Pinene	1.03	Monoterpene
Octen-3-ol	0.04	Aliphatic alcohol
Octan-3-one	0.03	Aliphatic ketone
Myrcene	0.98	Monoterpene
$\alpha$ -Phellandrene	0.01	Monoterpene
Pseudolimonene	0.01	Monoterpene
$\Delta^3$ -Carene	0.01	Monoterpene
(3Z)-Hexenyl acetate	0.03	Aliphatic ester
$\alpha$ -Terpinene	0.05	Monoterpene
<i>meta</i> -Cymene	0.01	Monoterpene
<i>para</i> -Cymene	0.18	Monoterpene
1,8-Cineole	9.45	Monoterpenic ether
Limonene	0.41	Monoterpene
(Z)- $\beta$ -Ocimene	0.04	Monoterpene
(E)- $\beta$ -Ocimene	0.41	Monoterpene
$\gamma$ -Terpinene	0.04	Monoterpene
<i>cis</i> -Sabinene hydrate	0.13	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (fur.)	0.06	Monoterpenic alcohol
Octanol	0.06	Aliphatic alcohol
Terpinolene	0.09	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	0.06	Monoterpenic alcohol
6,7-Epoxyterpinene	0.02	Monoterpenic ether
<i>trans</i> -Sabinene hydrate	0.03	Monoterpenic alcohol
Linalool	49.26	Monoterpenic alcohol
Phenylethyl alcohol	0.04	Simple phenolic
Octen-3-yl acetate	0.06	Aliphatic ester
<i>cis-para</i> -Menth-2-en-1-ol	0.01	Monoterpenic alcohol
(Z)-Myroxide	0.01	Monoterpenic ether
Camphor	0.52	Monoterpenic ketone
(E)-Myroxide	0.13	Monoterpenic ether
Isomenthone	0.01	Monoterpenic ketone

Borneol	0.12	Monoterpenic alcohol
δ-Terpineol	0.16	Monoterpenic alcohol
Terpinen-4-ol	0.50	Monoterpenic alcohol
<i>para</i> -Cymen-8-ol	0.05	Monoterpenic alcohol
α-Terpineol	0.94	Monoterpenic alcohol
Methylchavicol	0.80	Phenylpropanoid
(3 <i>E</i> ,5 <i>E</i> )-2,6-Dimethylocta-3,5,7-trien-2-ol	0.06	Monoterpenic alcohol
Octyl acetate	0.24	Aliphatic ester
Nerol	0.01	Monoterpenic alcohol
Citronellol	0.07	Monoterpenic alcohol
Unknown	0.02	Oxygenated monoterpene
Geraniol	0.12	Monoterpenic alcohol
Citronellyl formate	0.03	Monoterpenic ester
Bornyl acetate	1.02	Monoterpenic ester
<i>trans</i> -Pinocarvyl acetate	0.02	Monoterpenic ester
Geranyl formate	0.02	Monoterpenic ester
<i>exo</i> -2-Hydroxycineole acetate	0.13	Monoterpenic ester
α-Cubebene	0.11	Sesquiterpene
Eugenol	5.51	Phenylpropanoid
Neryl acetate	0.06	Monoterpenic ester
α-Copaene	0.17	Sesquiterpene
β-Bourbonene	0.26	Sesquiterpene
<i>cis</i> -β-Elemene	0.09	Sesquiterpene
Geranyl acetate	0.02	Monoterpenic ester
β-Cubebene	0.09	Sesquiterpene
β-Elemene	1.93	Sesquiterpene
Unknown	0.09	Unknown
Methyleugenol	0.15	Phenylpropanoid
α-Gurjunene	0.02	Sesquiterpene
β-Caryophyllene	0.37	Sesquiterpene
β-Copaene	0.06	Sesquiterpene
β-Gurjunene	0.05	Sesquiterpene
<i>trans</i> -α-Bergamotene	[5.85]	Sesquiterpene
α-Guaiene	[5.85]	Sesquiterpene
<i>cis</i> -Muuroala-3,5-diene	0.04	Sesquiterpene
<i>cis</i> -β-Bergamotene?	0.13	Sesquiterpene
Cadina-4,11-diene	0.01	Sesquiterpene
α-Humulene	0.72	Sesquiterpene
allo-Aromadendrene	0.07	Sesquiterpene
( <i>E</i> )-β-Farnesene	0.10	Sesquiterpene
<i>cis</i> -Muuroala-4(15),5-diene	0.50	Sesquiterpene
γ-Muurolene	0.05	Sesquiterpene
Germacrene D	2.48	Sesquiterpene
β-Selinene	0.11	Sesquiterpene
<i>trans</i> -β-Bergamotene	0.34	Sesquiterpene

allo-Aromadendr-9-ene	0.08	Sesquiterpene
Viridiflorene	0.03	Sesquiterpene
Bicyclogermacrene	0.76	Sesquiterpene
(Z)- $\alpha$ -Bisabolene	0.66	Sesquiterpene
$\delta$ -Guaiene	1.07	Sesquiterpene
(Z)- $\gamma$ -Bisabolene	0.11	Sesquiterpene
$\gamma$ -Cadinene	2.41	Sesquiterpene
<i>trans</i> -Calamenene	0.29	Sesquiterpene
$\delta$ -Cadinene	0.14	Sesquiterpene
$\beta$ -Sesquiphellandrene	0.19	Sesquiterpene
10-epi-Cubebol?	0.11	Sesquiterpenic alcohol
$\alpha$ -Cadinene	0.06	Sesquiterpene
Maaliol	0.13	Sesquiterpenic alcohol
(E)-Nerolidol	0.12	Sesquiterpenic alcohol
Caryophyllene oxide	0.13	Sesquiterpenic ether
Spathulenol	0.15	Sesquiterpenic alcohol
Globulol	0.03	Sesquiterpenic alcohol
Viridiflorol	0.03	Sesquiterpenic alcohol
Humulene epoxide II	0.04	Sesquiterpenic ether
10-epi- $\gamma$ -Eudesmol	0.03	Sesquiterpenic alcohol
1,10-diepi-Cubenol	0.42	Sesquiterpenic alcohol
$\tau$ -Cadinol	2.27	Sesquiterpenic alcohol
$\beta$ -Eudesmol	0.09	Sesquiterpenic alcohol
$\alpha$ -Eudesmol	0.08	Sesquiterpenic alcohol
$\alpha$ -Cadinol	0.09	Sesquiterpenic alcohol
$\alpha$ -Bisabolol	0.13	Sesquiterpenic alcohol
Geranyl tiglate	0.06	Monoterpenic ester
Phytone	0.08	Terpenic ketone
Phytol	0.02	Diterpenic alcohol
<b>Consolidated total</b>	<b>97.96</b>	

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

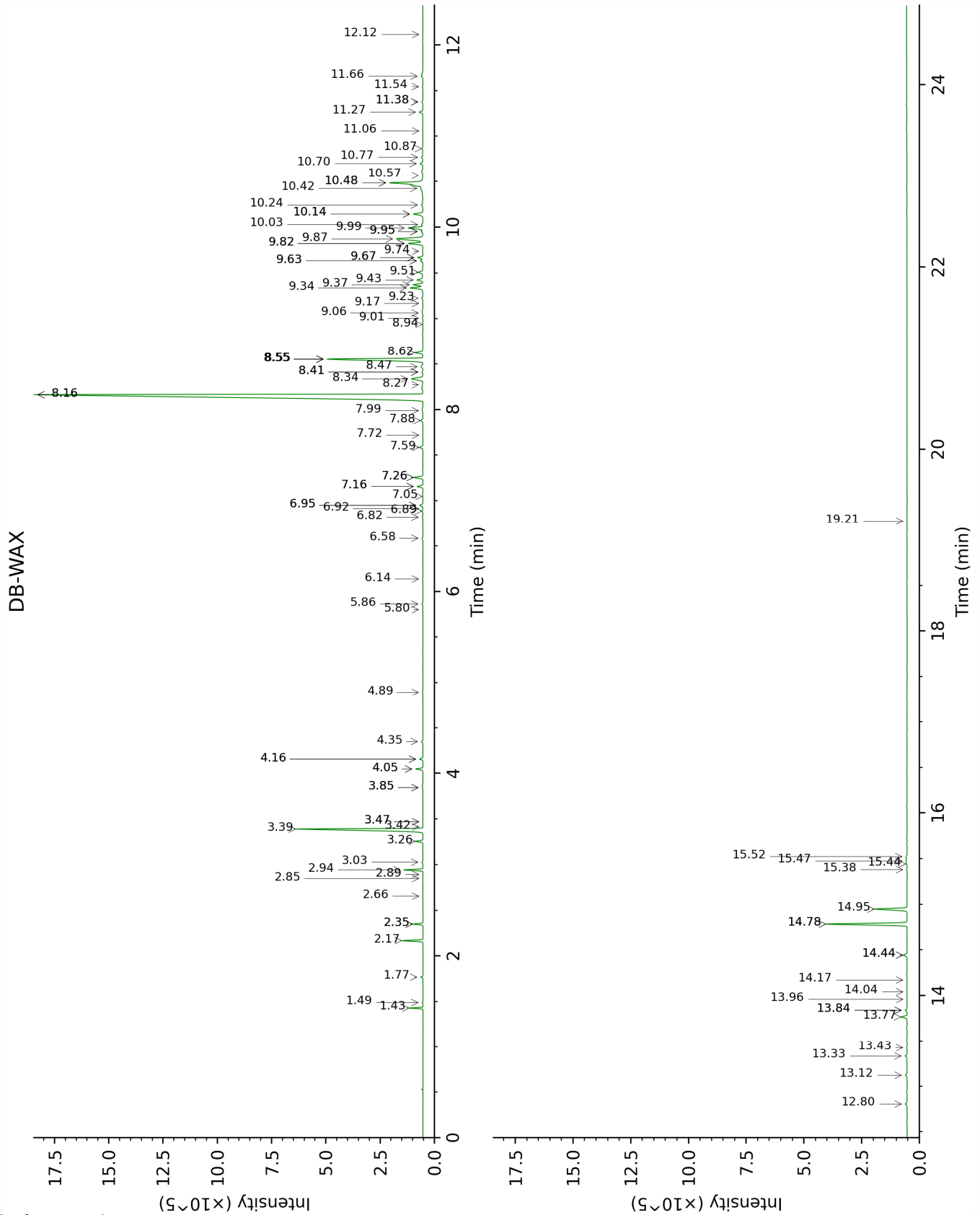
Note: no correction factor was applied

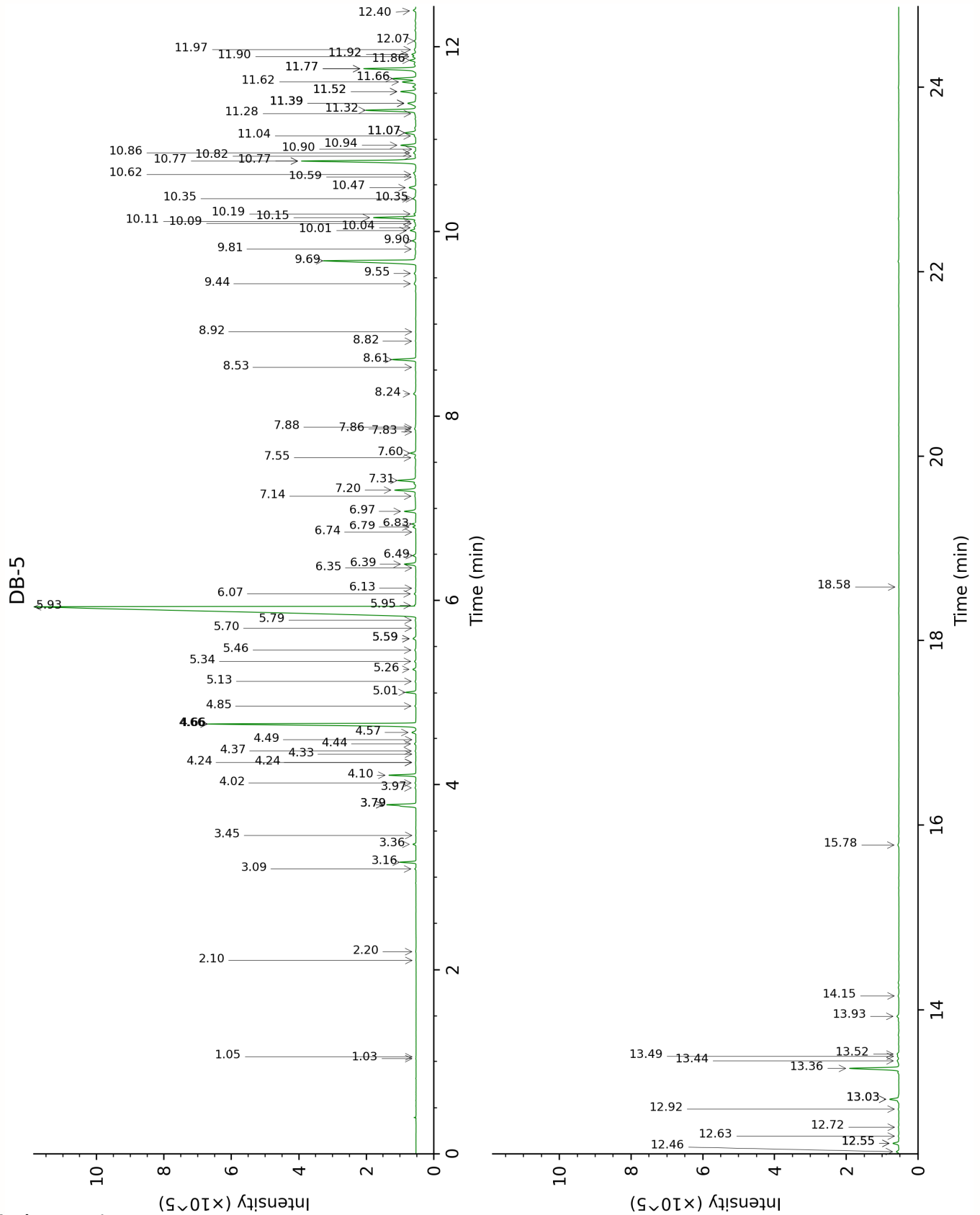
**About "consolidated" data:** The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

Isoamyl alcohol	Column DB-WAX			Column DB-5		
	3.47*	1174.9	[0.02]	1.03	733.5	0.01
2-Methylbutanol	3.47*	1174.9	[0.02]	1.05	736.2	tr
(2E)-Hexenal	3.42	1170.7	0.01	2.10	850.6	tr
(3Z)-Hexenol	5.80	1343.9	0.03	2.20	858.4	0.02
α-Thujene	1.49	1003.4	0.04	3.09	926.7	0.04
α-Pinene	1.43	994.4	0.54	3.16	931.5	0.55
Camphene	1.77	1031.8	0.10	3.36	944.3	0.10
Thuja-2,4(10)-diene	2.35*	1086.1	[0.48]	3.45	950.6	0.01
Sabinene	2.35*	1086.1	[0.48]	3.78*	972.5	[1.53]
β-Pinene	2.17	1069.2	1.03	3.78*	972.5	[1.53]
Octen-3-ol	6.82	1418.5	0.04	3.97	984.5	0.04
Octan-3-one	4.05*	1217.8	[0.43]	4.02	988.0	0.03
Myrcene	2.94	1135.2	0.97	4.10	993.5	0.98
α-Phellandrene	2.85	1128.1	0.01	4.24*	1002.6	[0.02]
Pseudolimonene	2.89	1131.4	0.01	4.24*	1002.6	[0.02]
Δ3-Carene	2.66	1113.5	0.01	4.33	1008.4	0.01
(3Z)-Hexenyl acetate	4.89	1277.8	0.03	4.37	1010.5	0.03
α-Terpinene	3.03	1141.5	0.06	4.44	1015.3	0.05
meta-Cymene	4.16*	1225.5	[0.19]	4.49	1018.2	0.01
para-Cymene	4.16*	1225.5	[0.19]	4.57	1023.1	0.18
1,8-Cineole	3.39	1168.9	9.45	4.66*	1028.8	[10.12]
Limonene	3.26	1158.8	0.41	4.66*	1028.8	[10.12]
(Z)-β-Ocimene	3.84*	1203.2	[0.08]	4.85	1040.9	0.04
(E)-β-Ocimene	4.05*	1217.8	[0.43]	5.01	1050.6	0.41
γ-Terpinene	3.84*	1203.2	[0.08]	5.13	1058.1	0.04
cis-Sabinene hydrate	6.95*	1428.3	[0.22]	5.26	1066.2	0.13
cis-Linalool oxide (fur.)	6.58	1400.9	0.06	5.34	1071.6	0.06
Octanol	8.27	1528.3	0.06	5.46	1079.2	0.06
Terpinolene	4.35	1239.1	0.09	5.59*	1086.9	[0.15]
trans-Linalool oxide (fur.)	6.95*	1428.3	[0.22]	5.59*	1086.9	[0.15]
6,7-Epoxy-myrcene	6.14	1368.3	0.03	5.70	1094.1	0.02
trans-Sabinene hydrate	7.99	1506.3	0.04	5.79	1099.5	0.03
Linalool	8.16*	1519.8	[48.23]	5.93	1108.6	49.26
Phenylethyl alcohol	12.12	1847.1	0.02	5.95	1109.5	0.04
Octen-3-yl acetate	5.86	1348.3	0.07	6.07	1117.5	0.06
cis-para-Menth-2-en-1-ol	8.16*	1519.8	[48.23]	6.13	1121.4	0.01
(Z)-Myroxide	6.92	1425.5	0.02	6.35	1135.4	0.01

Camphor	7.26*	1451.3	[0.63]	6.39	1138.1	0.52
(E)-Myroxide	7.16*	1443.8	[0.37]	6.49	1144.0	0.13
Isomenthone	7.05	1435.7	0.02	6.74	1160.1	0.01
Borneol	9.82*	1651.8	[1.08]	6.80	1163.7	0.12
δ-Terpineol	9.51	1626.0	0.39	6.83	1165.8	0.16
Terpinen-4-ol	8.62	1556.1	0.57	6.97	1175.0	0.50
para-Cymen-8-ol	11.54	1796.7	0.04	7.14	1185.5	0.05
α-Terpineol	9.82*	1651.8	[1.08]	7.20	1189.7	0.94
Methylchavicol	9.34	1612.0	0.88	7.31	1196.3	0.80
(3E,5E)-2,6-Dimethylocta-3,5,7-trien-2-ol	11.38*	1782.4	[0.08]	7.55	1212.2	0.06
Octyl acetate	7.16*	1443.8	[0.37]	7.60	1215.6	0.24
Nerol	11.06	1755.2	0.02	7.83	1230.9	0.01
Citronellol	10.77	1730.4	0.11	7.86	1233.1	0.07
Unknown CIAU II [m/z 137, 152 (28), 43 (25), 91 (24), 109 (23), 119 (19)]	11.38*	1782.4	[0.08]	7.88	1234.4	0.02
Geraniol	11.66	1806.5	0.13	8.24	1258.5	0.12
Citronellyl formate	8.94	1580.8	0.02	8.53	1277.6	0.03
Bornyl acetate	8.34	1533.4	1.08	8.61	1283.3	1.02
trans-Pinocarvyl acetate	9.17	1598.7	0.03	8.82	1297.0	0.02
Geranyl formate	9.95*	1662.5	[0.13]	8.92	1303.8	0.02
exo-2-Hydroxycineole acetate	10.14*	1678.1	[0.74]	9.44	1340.2	0.13
α-Cubebene	6.89	1423.5	0.06	9.55	1348.0	0.11
Eugenol	14.78*	2096.3	[5.48]	9.68	1357.6	5.51
Neryl acetate	10.24	1686.2	0.13	9.81	1366.5	0.06
α-Copaene	7.26*	1451.3	[0.63]	9.90	1372.8	0.17
β-Bourbonene	7.59	1476.0	0.24	10.01	1380.6	0.26
cis-β-Elemene	8.41*	1539.3	[0.07]	10.04	1382.7	0.09
Geranyl acetate	10.57	1713.1	0.02	10.09	1386.0	0.02
β-Cubebene	7.88	1498.2	0.16	10.11	1387.5	0.09
β-Elemene	8.55*	1550.4	[7.75]	10.15	1390.4	1.93
Unknown OCSA I [m/z 161, 105 (83), 119 (69), 81 (34), 91 (29), 93 (28)...204]				10.19	1393.2	0.09
Methyleugenol	13.33	1957.7	0.15	10.35*	1404.8	[0.17]
α-Gurjunene	7.72	1486.1	0.02	10.35*	1404.8	[0.17]
β-Caryophyllene	8.55*	1550.4	[7.75]	10.47	1413.5	0.37
β-Copaene	8.47	1543.9	0.22	10.59	1422.0	0.06

β-Gurjunene	8.41*	1539.3	[0.07]	10.62	1424.7	0.05
<i>trans</i> -α-Bergamotene	8.55*	1550.4	[7.75]	10.77*	1435.5	[5.85]
α-Guaiene	8.55*	1550.4	[7.75]	10.77*	1435.5	[5.85]
<i>cis</i> -Muurolo-3,5-diene	9.01	1586.0	0.03	10.82	1439.4	0.04
<i>cis</i> -β-Bergamotene?				10.86	1442.0	0.13
Cadina-4,11-diene	9.23	1603.2	0.10	10.90	1445.1	0.01
α-Humulene	9.37	1614.9	0.69	10.94	1448.2	0.72
allo-Aromadendrene	9.06	1590.6	0.06	11.04	1455.7	0.07
( <i>E</i> )-β-Farnesene	9.63*	1636.3	[0.18]	11.07*	1458.2	[0.61]
<i>cis</i> -Muurolo-4(15),5-diene	9.42	1619.2	0.50	11.07*	1458.2	[0.61]
γ-Muurolole	9.67*	1639.2	[0.39]	11.28	1473.7	0.05
Germacrene D	9.87	1656.0	2.49	11.32	1476.4	2.48
β-Selinene	9.95*	1662.5	[0.13]	11.39*	1482.0	[0.52]
<i>trans</i> -β-Bergamotene	9.67*	1639.2	[0.39]	11.39*	1482.0	[0.52]
allo-Aromadendr-9-ene	9.63*	1636.3	[0.18]	11.39*	1482.0	[0.52]
Viridiflorene	9.74	1644.8	0.03	11.52*	1491.4	[0.79]
Bicyclogermacrene	10.14*	1678.1	[0.74]	11.52*	1491.4	[0.79]
( <i>Z</i> )-α-Bisabolene	10.42*†	1701.1	[0.30]	11.62	1499.2	0.66
δ-Guaiene	9.99	1665.7	1.11	11.66	1501.9	1.07
( <i>Z</i> )-γ-Bisabolene	10.03	1668.7	0.11	11.77*	1510.0	[2.52]
γ-Cadinene	10.48*†	1706.1	[3.32]	11.77*	1510.0	[2.52]
<i>trans</i> -Calamenene	11.27	1772.8	0.26	11.86	1517.1	0.29
δ-Cadinene	10.48*†	1706.1	[3.32]	11.90	1520.3	0.14
β-Sesquiphellandrene	10.70	1724.5	0.20	11.92	1522.1	0.19
10-epi-Cubebol?	13.84*	2005.2	[0.13]	11.97	1526.2	0.11
α-Cadinene	10.87	1738.5	0.09	12.07	1533.6	0.06
Maaliol	13.12	1938.0	0.15	12.40	1559.5	0.13
( <i>E</i> )-Nerolidol	13.84*	2005.2	[0.13]	12.46	1564.4	0.12
Caryophyllene oxide	12.80	1908.7	0.13	12.55*	1571.5	[0.29]
Spathulenol	14.44*	2063.3	[0.29]	12.55*	1571.5	[0.29]
Globulol	13.96	2016.4	0.02	12.63	1577.7	0.03
Viridiflorol	14.04	2024.4	0.02	12.72	1585.2	0.03
Humulene epoxide II	13.42	1966.4	0.04	12.92	1600.6	0.04
10-epi-γ-Eudesmol	14.17	2036.9	0.03	13.03*	1609.1	[0.43]
1,10-diepi-Cubenol	13.77	1998.2	0.42	13.03*	1609.1	[0.43]
τ-Cadinol	14.95	2112.2	2.23	13.36	1636.7	2.27

$\beta$ -Eudesmol	15.44	2162.2	0.07	13.44	1643.5	0.09
$\alpha$ -Eudesmol	15.38	2155.9	0.04	13.49	1647.5	0.08
$\alpha$ -Cadinol	15.52	2170.3	0.13	13.52	1649.5	0.09
$\alpha$ -Bisabolol	15.48	2165.4	0.12	13.93	1683.9	0.13
Geranyl tiglate	14.44*	2063.3	[0.29]	14.15	1702.1	0.06
Phytone	14.78*	2096.3	[5.48]	15.78	1845.1	0.08
Phytol	19.21	2571.1	0.02	18.58	2113.1	0.02
Total reported		97.14%			98.20%	

\*: 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