

Date : 2026-05-21

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

**Internal code :** 26C03-PTH03

**Customer Identification :** Bergamot - Italy - B30118

**Type :** Essential Oil

**Source :** *Citrus aurantium var. bergamia*

**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*Notes: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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 2026-03-05 to make a correction in the sample identification section.*

## 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 :** 2026-03-04

## PHYSICOCHEMICAL DATA

**Refractive index :**  $1.4642 \pm 0.0003$  (20 °C)

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

**Analyst :** Cassandra Baker

**Date :** 2026-03-03

## 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
Tricyclene	0.01	Monoterpene
$\alpha$ -Thujene	0.29	Monoterpene
$\alpha$ -Pinene	1.24	Monoterpene
Camphene	0.05	Monoterpene
$\beta$ -Pinene	6.86	Monoterpene
Sabinene	0.58	Monoterpene
Myrcene	0.62	Monoterpene
$\alpha$ -Phellandrene	0.02	Monoterpene
Octanal	0.02	Aliphatic aldehyde
$\alpha$ -Terpinene	0.08	Monoterpene
<i>para</i> -Cymene	0.72	Monoterpene
$\beta$ -Phellandrene	0.16	Monoterpene
Limonene	39.60	Monoterpene
1,8-Cineole	0.01	Monoterpenic ether
( <i>Z</i> )- $\beta$ -Ocimene	0.04	Monoterpene
( <i>E</i> )- $\beta$ -Ocimene	0.11	Monoterpene
$\gamma$ -Terpinene	6.73	Monoterpene
<i>cis</i> -Sabinene hydrate	0.03	Monoterpenic alcohol
<i>cis</i> -Linalool oxide (fur.)	0.06	Monoterpenic alcohol
Terpinolene	0.10	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	0.05	Monoterpenic alcohol
<i>trans</i> -Sabinene hydrate	0.01	Monoterpenic alcohol
Linalool	12.83	Monoterpenic alcohol
Nonanal	0.02	Aliphatic aldehyde
<i>cis</i> -Limonene oxide	0.02	Monoterpenic ether
<i>trans</i> -Limonene oxide	0.01	Monoterpenic ether
Camphor	0.02	Monoterpenic ketone
$\alpha$ -Terpineol	0.02	Monoterpenic alcohol
Nerol	0.02	Monoterpenic alcohol
Neral	0.28	Monoterpenic aldehyde
Linalyl acetate	27.33	Monoterpenic ester
Geraniol	0.02	Monoterpenic alcohol
Geranial	0.43	Monoterpenic aldehyde
( <i>trans</i> ?) -Linalool oxide acetate (fur.)?	0.06	Monoterpenic ester
Unknown	0.02	Unknown
Hodiendiol derivative	0.02	Oxygenated monoterpene
$\alpha$ -Terpinyl acetate	0.01	Monoterpenic ester
Unknown	0.03	Monoterpenic ester
Unknown	0.03	Oxygenated monoterpene
Neryl acetate	0.39	Monoterpenic ester

Geranyl acetate	0.39	Monoterpenic ester
$\beta$ -Caryophyllene	0.12	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	0.02	Sesquiterpene
Germacrene D	0.02	Sesquiterpene
( <i>Z</i> )- $\alpha$ -Bisabolene	0.01	Sesquiterpene
Hodiendiol derivative II	0.02	Oxygenated monoterpene
$\beta$ -Bisabolene	0.02	Sesquiterpene
<b>Consolidated total</b>	<b>99.55</b>	

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

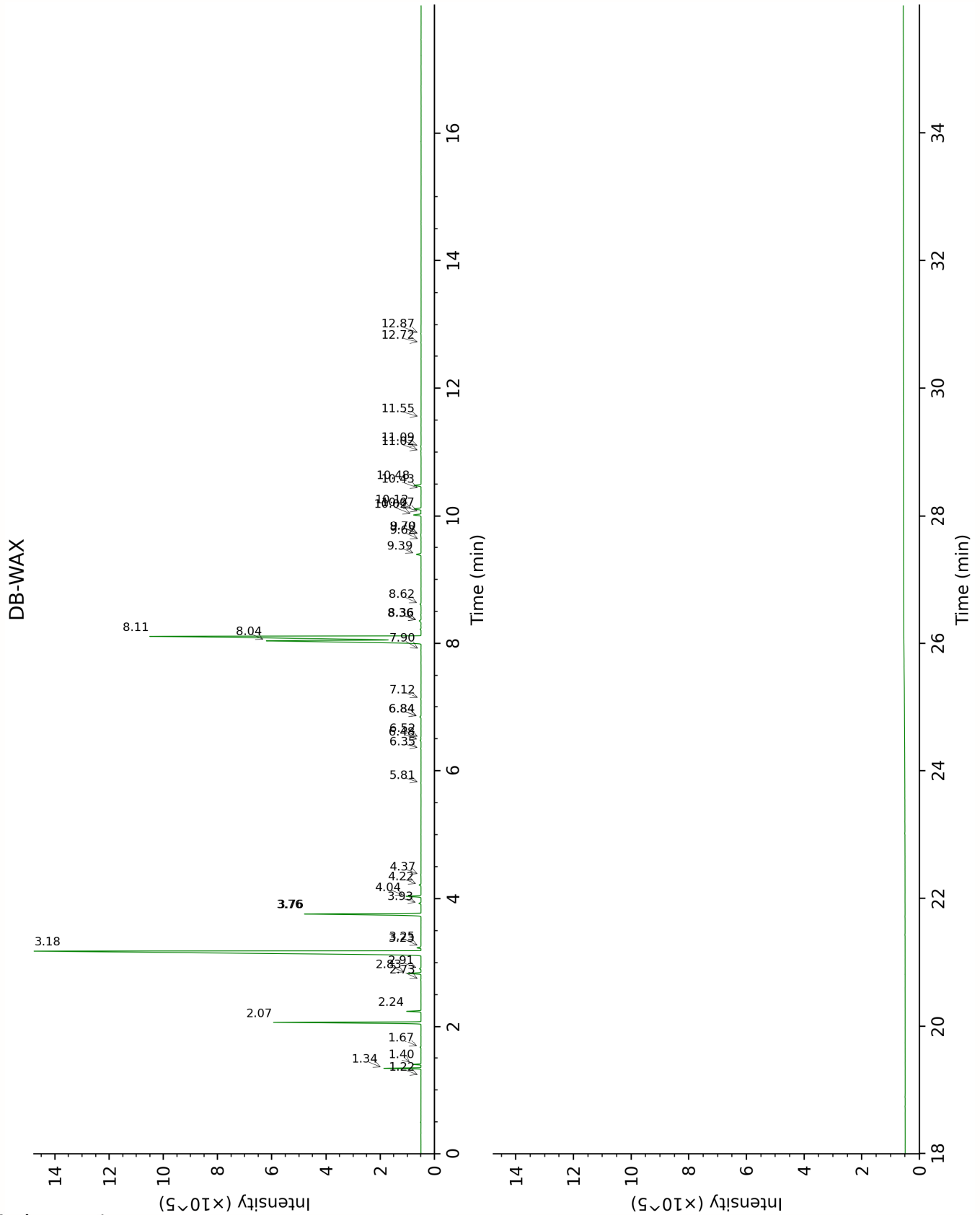
Note: no correction factor was applied

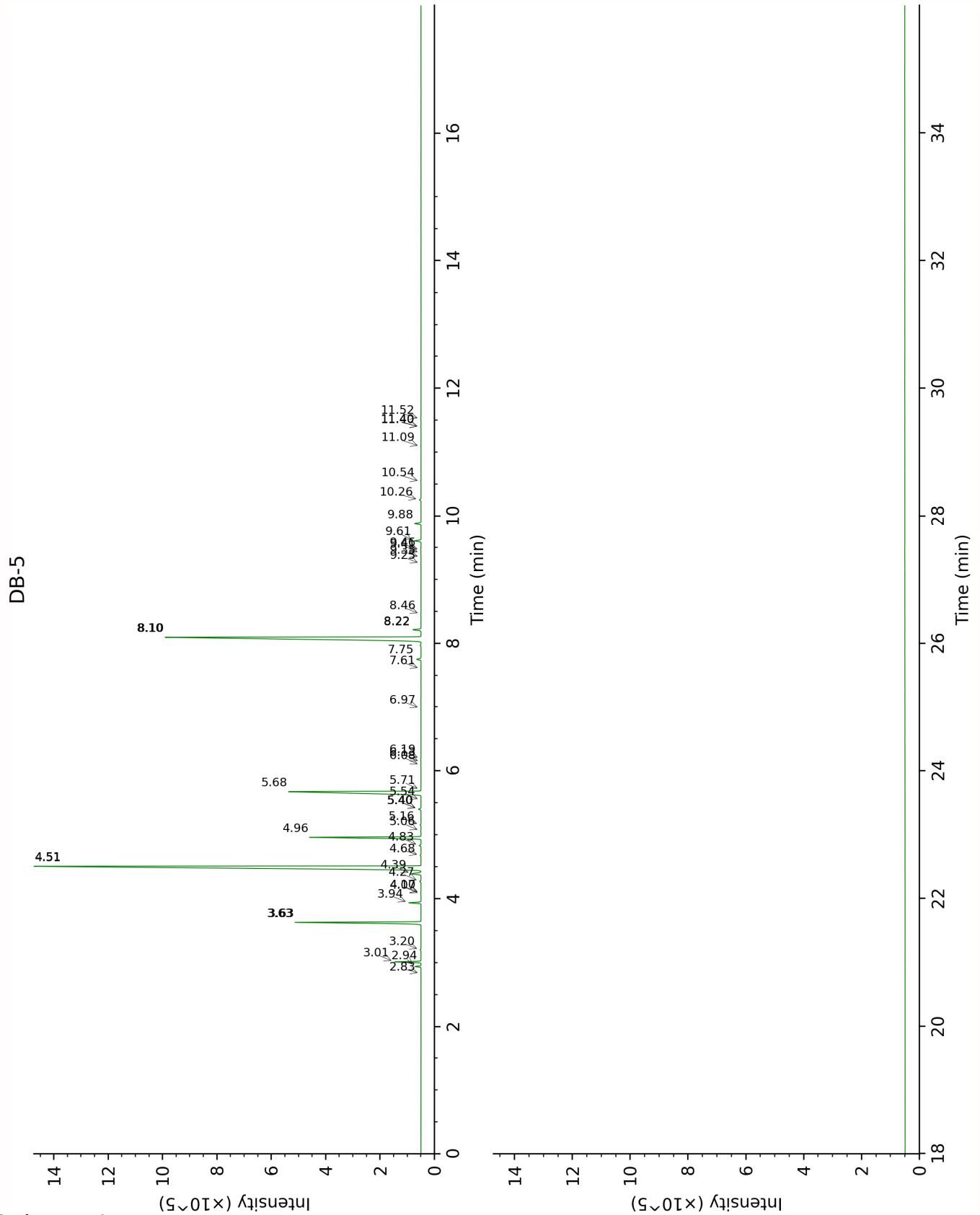
**About "consolidated" data:** The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

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FULL ANALYSIS DATA

Tricyclene	Column DB-WAX			Column DB-5		
	1.22	970.6	tr	2.83	918.9	0.01
$\alpha$ -Thujene	1.40	999.9	0.28	2.94	926.3	0.29
$\alpha$ -Pinene	1.34	990.0	1.23	3.01	931.1	1.24
Camphene	1.67	1026.6	0.04	3.20	943.8	0.05
$\beta$ -Pinene	2.07	1066.1	6.86	3.63*	972.6	[7.46]
Sabinene	2.24	1083.3	0.58	3.63*	972.6	[7.46]
Myrcene	2.84	1133.5	0.62	3.94	993.2	0.62
$\alpha$ -Phellandrene	2.73	1125.4	0.02	4.07	1002.3	0.02
Octanal	4.37	1251.4	0.02	4.10	1003.8	0.02
$\alpha$ -Terpinene	2.91	1139.2	0.08	4.27	1015.0	0.08
<i>para</i> -Cymene	4.04	1226.8	0.72	4.39	1022.6	0.72
$\beta$ -Phellandrene	3.23	1164.9	0.16	4.51*	1030.0	[39.90]
Limonene	3.18	1160.9	39.60	4.51*	1030.0	[39.90]
1,8-Cineole	3.25	1166.2	0.01	4.51*	1030.0	[39.90]
( <i>Z</i> )- $\beta$ -Ocimene	3.76*	1206.5	[6.76]	4.68	1040.8	0.04
( <i>E</i> )- $\beta$ -Ocimene	3.93	1218.7	0.11	4.83	1050.6	0.11
$\gamma$ -Terpinene	3.76*	1206.5	[6.76]	4.96	1058.7	6.73
<i>cis</i> -Sabinene hydrate	6.84*	1428.2	[0.08]	5.06	1064.9	0.03
<i>cis</i> -Linalool oxide (fur.)	6.48	1400.7	0.05	5.16	1071.1	0.06
Terpinolene	4.22	1239.9	0.10	5.40*	1086.8	[0.15]
<i>trans</i> -Linalool oxide (fur.)	6.84*	1428.2	[0.08]	5.40*	1086.8	[0.15]
<i>trans</i> -Sabinene hydrate	7.90	1507.3	0.01	5.54	1095.8	0.01
Linalool	8.04*†	1518.6	[13.38]	5.68	1104.2	12.83
Nonanal	5.81	1352.5	0.01	5.70	1106.1	0.02
<i>cis</i> -Limonene oxide	6.35	1391.6	0.02	6.08	1130.6	0.02
<i>trans</i> -Limonene oxide	6.52	1403.8	0.02	6.13	1133.9	0.01
Camphor	7.12	1449.0	0.02	6.19	1137.4	0.02
$\alpha$ -Terpineol	9.70*	1650.0	[0.04]	6.98	1188.4	0.02
Nerol	11.02	1759.8	0.02	7.60	1230.5	0.02
Neral	9.40	1625.0	0.28	7.76	1240.7	0.28
Linalyl acetate	8.11*†	1524.1	[27.00]	8.10*	1264.2	[27.35]
Geraniol	11.55	1805.2	0.02	8.10*	1264.2	[27.35]
Geranial	10.02	1676.1	0.43	8.22*	1272.3	[0.49]
( <i>trans</i> ?) -Linalool oxide acetate (fur.)?	8.62	1563.3	0.06	8.22*	1272.3	[0.49]
Unknown MISC				8.46	1288.9	0.02

VI [m/z 43, 121 (74), 93 (42), 95 (38), 107 (29), 41 (29), 136 (28)...]						
Hodiendiol derivative	12.87	1923.2	0.02	9.25	1340.8	0.02
$\alpha$ -Terpinyl acetate	9.62	1643.0	0.01	9.35	1347.9	0.01
Unknown MISC VII [m/z 43, 121 (52), 93 (48), 79 (33), 41 (30), 136 (26), 81 (25)...]				9.41	1352.4	0.03
Unknown SASC III [m/z 43, 79 (46), 71 (30), 94 (25), 41 (23), 81 (21)... 197 (0)]	11.09	1766.2	0.03	9.46	1355.8	0.03
Neryl acetate	10.12	1683.8	0.40	9.61	1366.3	0.39
Geranyl acetate	10.48	1714.3	0.39	9.88	1385.5	0.39
$\beta$ -Caryophyllene	8.36*	1542.9	[0.13]	10.26	1413.2	0.12
<i>trans</i> - $\alpha$ -Bergamotene	8.36*	1542.9	[0.13]	10.54	1434.5	0.02
Germacrene D	9.70*	1650.0	[0.04]	11.09	1475.5	0.02
( <i>Z</i> )- $\alpha$ -Bisabolene	10.43	1709.7	0.01	11.40*	1498.5	[0.03]
Hodiendiol derivative II	12.72	1910.0	0.02	11.40*	1498.5	[0.03]
$\beta$ -Bisabolene	10.07	1679.7	0.02	11.52	1507.9	0.02
Total reported		99.66%			99.70%	

\*: 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