

Date : 2024-09-20

CERTIFICATE OF ANALYSIS - GC PROFILING

SAMPLE IDENTIFICATION

Internal code : 24I06-NSO03

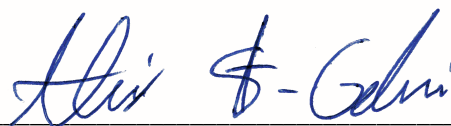
Customer Identification : Lime (CP) - Mexico - Lot No: 002229

Type : Essential Oil

Source : *Citrus latifolia*

Customer : Natural Sourcing LLC

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 : 2024-09-20

PHYSICOCHEMICAL DATA

Refractive index : 1.4776 ± 0.0003 (20 °C)

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

Analyst : Cindy Caron B. Sc.

Date : 2024-09-09

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
Heptanal	tr	Aliphatic aldehyde
Tricyclene	0.01	Monoterpene
α -Thujene	0.51	Monoterpene
α -Pinene	2.12	Monoterpene
α -Fenchene	0.01	Monoterpene
Camphene	0.07	Monoterpene
Sabinene	1.60	Monoterpene
β -Pinene	11.69	Monoterpene
6-Methyl-5-hepten-2-one	0.03	Aliphatic ketone
Myrcene	1.37	Monoterpene
α -Phellandrene	0.07	Monoterpene
Octanal	0.02	Aliphatic aldehyde
α -Terpinene	0.36	Monoterpene
<i>para</i> -Cymene	0.45	Monoterpene
β -Phellandrene	[0.38]	Monoterpene
Limonene	55.54	Monoterpene
1,8-Cineole	[0.38]	Monoterpenic ether
(<i>Z</i>)- β -Ocimene	0.05	Monoterpene
(<i>E</i>)- β -Ocimene	0.11	Monoterpene
γ -Terpinene	14.16	Monoterpene
<i>cis</i> -Sabinene hydrate	0.02	Monoterpenic alcohol
Terpinolene	0.68	Monoterpene
<i>trans</i> -Sabinene hydrate	0.01	Monoterpenic alcohol
Linalool	0.13	Monoterpenic alcohol
Nonanal	0.03	Aliphatic aldehyde
endo-Fenchol	0.02	Monoterpenic alcohol
<i>trans-para</i> -Mentha-2,8-dien-1-ol	0.02	Monoterpenic alcohol
<i>cis-para</i> -Mentha-2,8-dien-1-ol	0.01	Monoterpenic alcohol
Epoxyterpinolene	0.01	Monoterpenic ether
<i>cis</i> - β -Terpineol	0.01	Monoterpenic alcohol
Citronellal	0.02	Monoterpenic aldehyde
Borneol	0.02	Monoterpenic alcohol
α -Phellandren-8-ol	0.03	Monoterpenic alcohol
Terpinen-4-ol	0.36	Monoterpenic alcohol
<i>para</i> -Cymen-8-ol	0.01	Monoterpenic alcohol
α -Terpineol	0.61	Monoterpenic alcohol
Decanal	0.05	Aliphatic aldehyde
2,3-Epoxyneral?	0.02	Monoterpenic aldehyde
Nerol	0.14	Monoterpenic alcohol
Citronellol	0.06	Monoterpenic alcohol

Neral	1.03	Monoterpenic aldehyde
Geraniol	0.14	Monoterpenic alcohol
Geranial	1.56	Monoterpenic aldehyde
Unknown	0.01	Oxygenated monoterpene
Unknown	0.01	Unknown
Undecanal	0.02	Aliphatic aldehyde
δ -Elemene	0.08	Sesquiterpene
Citronellyl acetate	0.03	Monoterpenic ester
Neryl acetate	0.77	Monoterpenic ester
Geranyl acetate	0.27	Monoterpenic ester
β -Elemene	0.07	Sesquiterpene
Dodecanal	0.03	Aliphatic aldehyde
<i>cis</i> - α -Bergamotene	0.10	Sesquiterpene
β -Caryophyllene	0.44	Sesquiterpene
<i>trans</i> - α -Bergamotene	1.01	Sesquiterpene
α -Humulene	0.06	Sesquiterpene
(<i>E</i>)- β -Farnesene	0.10	Sesquiterpene
β -Santalene	0.01	Sesquiterpene
Germacrene D	0.06	Sesquiterpene
α -Selinene	0.02	Sesquiterpene
(<i>Z</i>)- α -Bisabolene	0.14	Sesquiterpene
β -Bisabolene	1.48	Sesquiterpene
(<i>3E,6E</i>)- α -Farnesene	0.16	Sesquiterpene
δ -Cadinene	0.01	Sesquiterpene
(<i>E</i>)- α -Bisabolene	0.05	Sesquiterpene
Germacrene B	0.11	Sesquiterpene
Caryophyllene oxide	0.01	Sesquiterpenic ether
Alismol	0.02	Sesquiterpenic alcohol
Unknown	0.06	Oxygenated sesquiterpene
Unknown	0.05	Oxygenated sesquiterpene
α -Bisabolol	0.07	Sesquiterpenic alcohol
Herniarin	0.01	Coumarin
Myristic acid	0.01	Aliphatic acid
Citropten	0.15	Furanocoumarin
Palmitic acid	0.03	Aliphatic acid
Bergapten	0.04	Furanocoumarin
Linoleic acid	0.02	Aliphatic acid
Isopimpinellin	0.02	Furanocoumarin
Consolidated total	99.06	

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

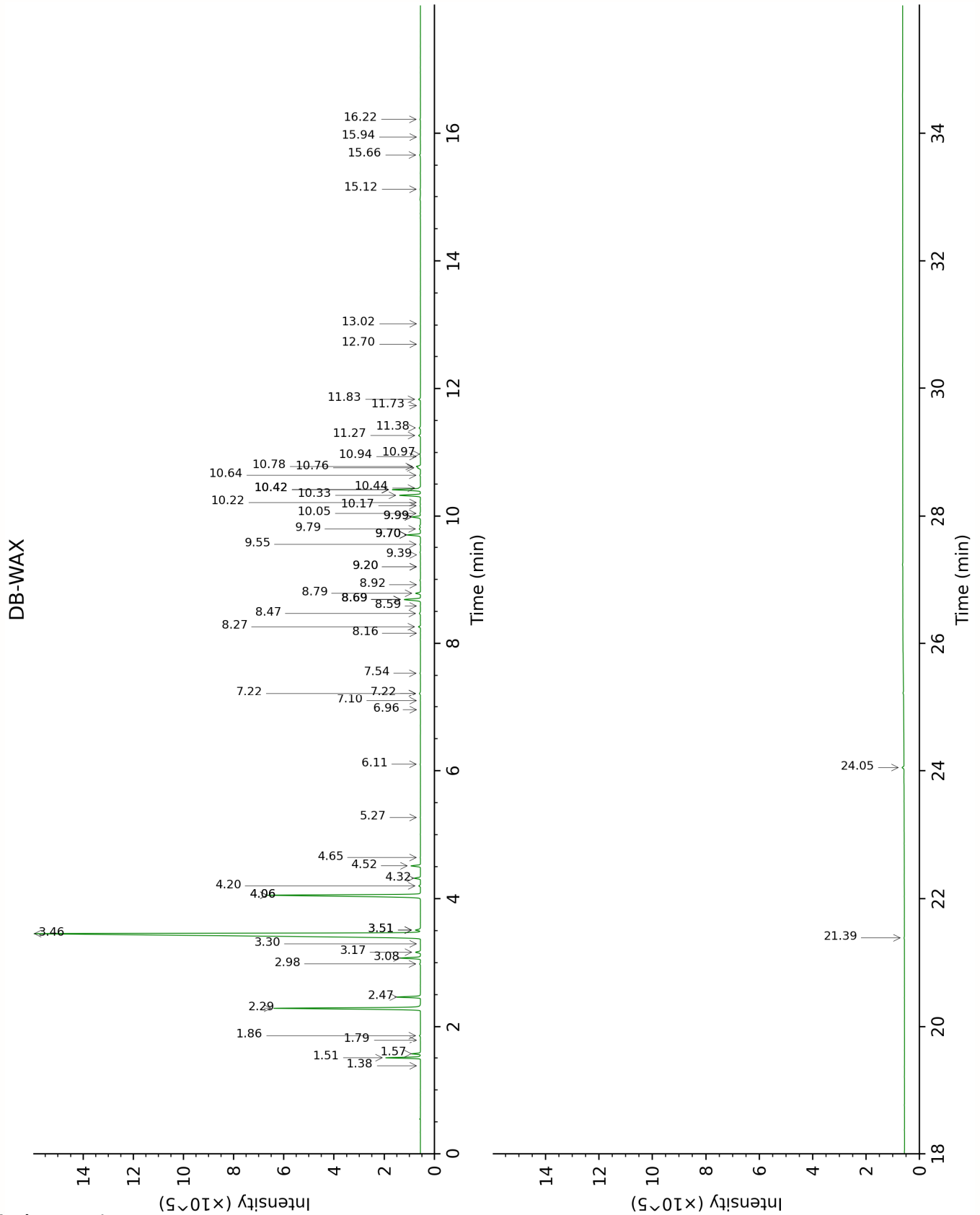
Note: no correction factor was applied

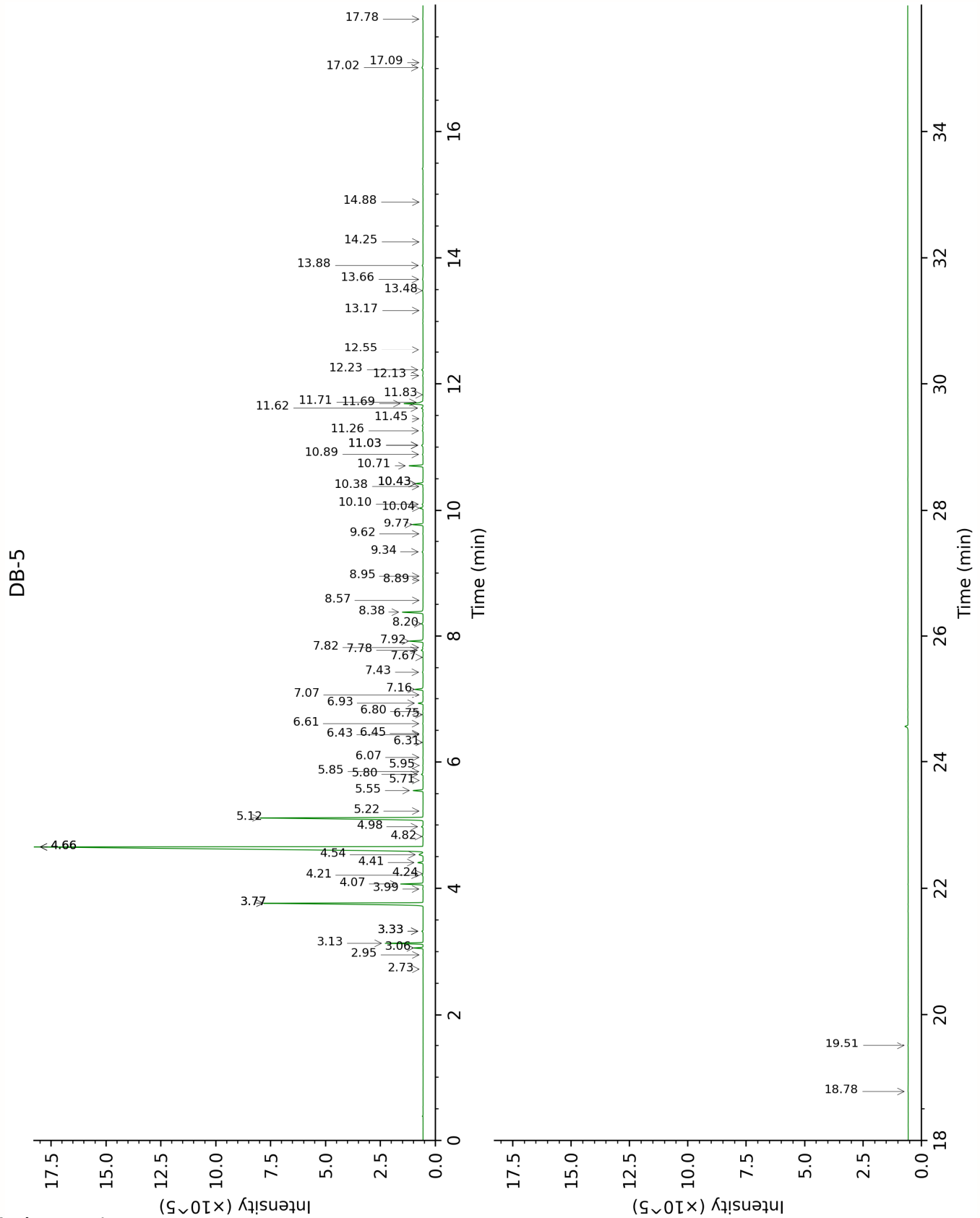
About "consolidated" data: The table above presents the breakdown of the sample volatile constituents after applying an algorithm to collapse data acquired from the multi-columns system of PhytoChemia into a single set of consolidated contents. In case of discrepancies between columns, the algorithm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

Heptanal	Column DB-WAX			Column DB-5		
	3.30	1151.7	0.01	2.72	903.3	tr
Tricyclene	1.38	974.9	0.01	2.95	918.2	0.01
α -Thujene	1.57	1001.3	0.52	3.06	925.5	0.51
α -Pinene	1.51	994.4	2.12	3.13	930.4	2.12
α -Fenchene	1.79	1022.6	0.01	3.32*	943.0	[0.09]
Camphene	1.86	1029.3	0.07	3.32*	943.0	[0.09]
Sabinene	2.47	1086.9	1.60	3.77*	972.3	[13.28]
β -Pinene	2.29	1070.2	11.69	3.77*	972.3	[13.28]
6-Methyl-5-hepten-2-one	5.27	1292.9	0.02	3.99	987.2	0.03
Myrcene	3.08	1135.0	1.39	4.07	992.4	1.37
α -Phellandrene	2.98	1128.0	0.06	4.21	1001.6	0.07
Octanal	4.65	1249.3	0.02	4.24	1003.2	0.02
α -Terpinene	3.17	1141.9	0.37	4.41	1014.2	0.36
<i>para</i> -Cymene	4.32	1226.7	0.45	4.54	1022.1	0.45
β -Phellandrene	3.51*	1168.0	[0.38]	4.66*	1029.7	[55.86]
Limonene	3.46	1163.7	55.54	4.66*	1029.7	[55.86]
1,8-Cineole	3.51*	1168.0	[0.38]	4.66*	1029.7	[55.86]
(Z)- β -Ocimene	4.06*	1208.1	[14.25]	4.82	1040.1	0.05
(E)- β -Ocimene	4.20	1218.3	0.12	4.98	1049.8	0.11
γ -Terpinene	4.06*	1208.1	[14.25]	5.12	1058.5	14.16
<i>cis</i> -Sabinene hydrate	7.10	1427.2	0.01	5.22	1065.3	0.02
Terpinolene	4.52	1240.2	0.69	5.55	1085.6	0.68
<i>trans</i> -Sabinene hydrate	8.16	1506.5	0.02	5.71	1095.7	0.01
Linalool	8.26	1514.3	0.14	5.80	1101.6	0.13
Nonanal	6.10	1355.0	0.03	5.85	1104.4	0.03
endo-Fenchol	8.59	1539.4	0.02	5.95	1110.6	0.02
<i>trans-para</i> -Mentha-2,8-dien-1-ol	9.20*	1586.7	[0.01]	6.07	1118.7	0.02
<i>cis-para</i> -Mentha-2,8-dien-1-ol	9.70*	1626.7	[1.07]	6.31	1133.9	0.01
Epoxyterpinolene	6.96	1416.7	0.01	6.43	1141.7	0.01
<i>cis</i> - β -Terpineol	9.20*	1586.7	[0.01]	6.45	1142.8	0.01
Citronellal	7.22*	1436.2	[0.09]	6.61	1152.9	0.02
Borneol	9.99*	1650.2	[0.66]	6.75	1162.0	0.02
α -Phellandren-8-ol	10.42*	1684.7	[2.27]	6.80	1165.0	0.03
Terpinen-4-ol	8.79	1554.7	0.37	6.93	1173.5	0.36
<i>para</i> -Cymen-8-ol	11.73	1795.4	0.01	7.07	1182.7	0.01
α -Terpineol	9.99*	1650.2	[0.66]	7.16	1188.2	0.61

Decanal	7.54	1459.6	0.05	7.43	1205.6	0.05
2,3-Epoxyneral?				7.67	1221.4	0.02
Nerol	11.27	1755.9	0.15	7.78	1228.9	0.14
Citronellol	10.98	1731.3	0.05	7.82	1231.8	0.06
Neral	9.70*	1626.7	[1.07]	7.92	1238.6	1.03
Geraniol	11.83	1804.2	0.16	8.20	1256.9	0.14
Geranial	10.33	1677.6	1.61	8.38	1269.3	1.56
Unknown CIAU V [m/z 95, 67 (45), 41 (42), 110 (42), 43 (41), 59 (36)]	12.70	1881.1	0.01	8.57	1281.7	0.01
Unknown CICA VI [m/z 112, 97 (93), 83 (60), 43 (46), 41 (20), 69 (19)...]				8.89	1302.9	0.01
Undecanal	8.92	1565.0	0.02	8.95	1307.5	0.02
δ -Elemene	7.22*	1436.2	[0.09]	9.34	1334.7	0.08
Citronellyl acetate	9.70*	1626.7	[1.07]	9.62	1354.8	0.03
Neryl acetate	10.42*	1684.7	[2.27]	9.77	1365.2	0.77
Geranyl acetate	10.76*†	1713.1	[0.18]	10.04	1384.2	0.27
β -Elemene	8.69*	1547.2	[1.49]	10.10	1388.5	0.07
Dodecanal	10.22	1668.4	0.03	10.38	1408.7	0.03
<i>cis</i> - α - Bergamotene	8.47	1530.3	0.10	10.43*	1412.2	[0.53]
β -Caryophyllene	8.69*	1547.2	[1.49]	10.43*	1412.2	[0.53]
<i>trans</i> - α - Bergamotene	8.69*	1547.2	[1.49]	10.71	1433.1	1.01
α -Humulene	9.55	1614.8	0.05	10.89	1446.4	0.06
(<i>E</i>)- β -Farnesene	9.79	1634.2	0.10	11.03*	1457.2	[0.14]
β -Santalene	9.39	1601.4	0.01	11.03*	1457.2	[0.14]
Germacrene D	10.05	1654.7	0.06	11.26	1474.3	0.06
α -Selinene	10.17	1664.5	0.04	11.45	1488.5	0.02
(<i>Z</i>)- α -Bisabolene	10.44	1686.7	0.08	11.62	1501.0	0.14
β -Bisabolene	10.42*	1684.7	[2.27]	11.69*†	1506.5	[1.50]
(3 <i>E</i> ,6 <i>E</i>)- α - Farnesene	10.78*†	1714.9	[0.34]	11.71*†	1508.0	[0.14]
δ -Cadinene	10.64	1703.2	0.06	11.83	1517.4	0.01
(<i>E</i>)- α -Bisabolene	10.94	1728.0	0.03	12.13	1541.1	0.05
Germacrene B	11.38	1765.9	0.12	12.23	1548.4	0.11
Caryophyllene oxide	13.02	1910.0	0.01	12.55	1573.7	0.01
Alismol	15.94	2190.6	0.01	13.17	1623.7	0.02
Unknown CILI I [m/z 94, 43 (89),	15.12	2108.3	0.03	13.48	1649.6	0.06

41 (67), 122 (46), 69 (41)...222]						
Unknown CILI II [m/z 69, 95 (100), 41 (89), 109 (68), 67 (61)...222]	16.22	2219.3	0.05	13.66	1664.2	0.05
α -Bisabolol	15.66	2162.6	0.09	13.88	1682.3	0.07
Herniarin	21.39	2809.5	0.03	14.25	1713.4	0.01
Myristic acid				14.88	1767.8	0.01
Citropten	24.05	3163.8	0.17	17.02	1962.9	0.15
Palmitic acid				17.10	1970.5	0.03
Bergapten				17.78	2037.3	0.04
Linoleic acid				18.78	2137.6	0.02
Isopimpinellin				19.51	2213.7	0.02
Total reported		99.16%			99.01%	

*: 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