

## GC/MS BATCH NUMBER: L70103

---

**ESSENTIAL OIL:** LEMON ORGANIC  
**BOTANICAL NAME:** CITRUS X LIMON  
**ORIGIN:** ARGENTINA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF LEMON ORGANIC OIL	%
LIMONENE	67.7
β-PINENE	11.4
γ-TERPINENE	8.3
SABINENE	1.9
α-PINENE	1.9
MYRCENE	1.5
GERANIAL	1.3
NERAL	0.8
β-BISABOLENE	0.5
α-THUJENE	0.4
NERYL ACETATE	0.4
p-CYMENE	0.3
GERANYL ACETATE	0.2
α-TERPINEOL	0.2

Comments from Robert Tisserand: A remarkably fresh oil with no hint of oxidation. All 13 key constituents conform to the ISO standard for US Coast type Lemon oil.

**Date :** December 22, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16L15-PTH13-1-DM

**Customer identification :** Organic Lemon – L7010358R

**Type :** Essential oil

**Source :** *Citrus x limon*

**Customer :** Plant Therapy

*ANALYSIS*

**Method :** PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

**Analyst :** Sylvain Mercier, M. Sc., chimiste

**Analysis date :** 2016-12-22

Checked and approved by :

---

Alexis St-Gelais, M. Sc., chimiste 2013-174

*Note: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.*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.*

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Tricyclene	3.20	915	0.01	0.01	928	0.79	Monoterpene
$\alpha$ -Thujene	3.28	920	0.40	0.63	954	0.89	Monoterpene
$\alpha$ -Pinene	3.39	926	1.87	1.71	947	0.87	Monoterpene
Camphene	3.68	944	0.06	0.05	997	1.08	Monoterpene
Sabinene	4.12	971	1.92	2.34	1056	1.50	Monoterpene
$\beta$ -Pinene	4.20	976	11.39	11.82	1042	1.39	Monoterpene
Myrcene	4.46	991	1.51	1.51	1115	1.97	Monoterpene
$\alpha$ -Phellandrene	4.73*	1007	0.04	0.02	1108	1.92	Monoterpene
$\Delta$ 3-Carene	4.73*	1007	[0.04]	0.01	1090	1.77	Monoterpene
Octanal	4.85	1014	0.09	0.11	1228	3.33	Aliphatic aldehyde
$\alpha$ -Terpinene	4.92	1017	0.18	0.21	1123	2.07	Monoterpene
Limonene	5.26*	1036	68.37	67.71	1151	2.41	Monoterpene
para-Cymene	5.26*	1036	[68.37]	0.28	1206	3.03	Monoterpene
1,8-Cineole	5.26*	1036	[68.37]	0.29	1152	2.42	Monoterp. ether
<i>cis</i> - $\beta$ -Ocimene	5.34	1041	0.06	8.08	1191	2.87*	Monoterpene
<i>trans</i> - $\beta$ -Ocimene	5.52	1051	0.13	0.16	1201	2.99	Monoterpene
$\gamma$ -Terpinene	5.73	1062	8.29	[8.08]	1191	2.87*	Monoterpene
<i>cis</i> -Sabinene hydrate	6.07	1080	0.06	0.04	1400	5.76*	Monoterp. alcohol
Terpinolene	6.17	1086	0.36	0.29	1224	3.27	Monoterpene
Linalool	6.72	1110	0.13	0.09	1482	7.22	Monoterp. alcohol
Nonanal	6.76	1111	0.11	0.10	1336	4.83	Aliphatic aldehyde
<i>cis</i> -Limonene oxide	7.31	1132	0.01	0.01	1368	5.30	Monoterp. ether
<i>trans</i> -Limonene oxide	7.44	1136	tr	[0.04]	1400	5.76*	Monoterp. ether
Citronellal	7.94	1155	0.07	0.06	1415	5.96	Monoterp. aldehyde
Borneol	8.70	1184	0.01	0.01	1605	10.47	Monoterp. alcohol
Terpinen-4-ol	8.80	1187	0.02	0.04	1524	8.03	Monoterp. alcohol
$\alpha$ -Terpineol	9.52	1207	0.19	0.19	1617	10.80	Monoterp. alcohol
Decanal	9.76	1212	0.04	0.03	1438	6.39	Aliphatic aldehyde
Nerol	10.68	1233	0.02	0.03	1719	15.15	Monoterp. alcohol
Neral	11.14	1244	0.77	0.73	1591	10.03	Monoterp. aldehyde
Geranial	12.68	1277	1.29	1.27	1644	11.87	Monoterp. aldehyde
Citronellyl acetate	17.19	1352	0.02	0.04	1599	10.28*	Monoterp. ester
Neryl acetate	17.84	1362	0.38	0.38	1654	12.32	Monoterp. ester
Geranyl acetate	19.33	1385	0.24	0.22	1685	13.66	Monoterp. ester
$\beta$ -Caryophyllene	20.49	1401	0.20	0.13	1529	8.20	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	22.05	1420	0.35	0.30	1537	8.42	Sesquiterpene
$\alpha$ -Humulene	23.29	1435	0.01	[0.04]	1599	10.28*	Sesquiterpene
<i>trans</i> - $\beta$ -Farnesene	24.45	1449	0.03	0.03	1625	11.05	Sesquiterpene
$\beta$ -Bisabolene	28.78	1501	0.53	0.51	1668	12.89	Sesquiterpene
$\alpha$ -Bisabolol	39.60	1691	0.03	0.02	2138	38.17	Sesquiterp. alcohol
Citropten	48.22	1997	0.06				Coumarin

Oxypeucedanin	58.61	2488	0.11			Coumarin
<b>Total identified</b>			<b>99.36%</b>	<b>99.46%</b>		

\*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

Note: no correction factor was applied

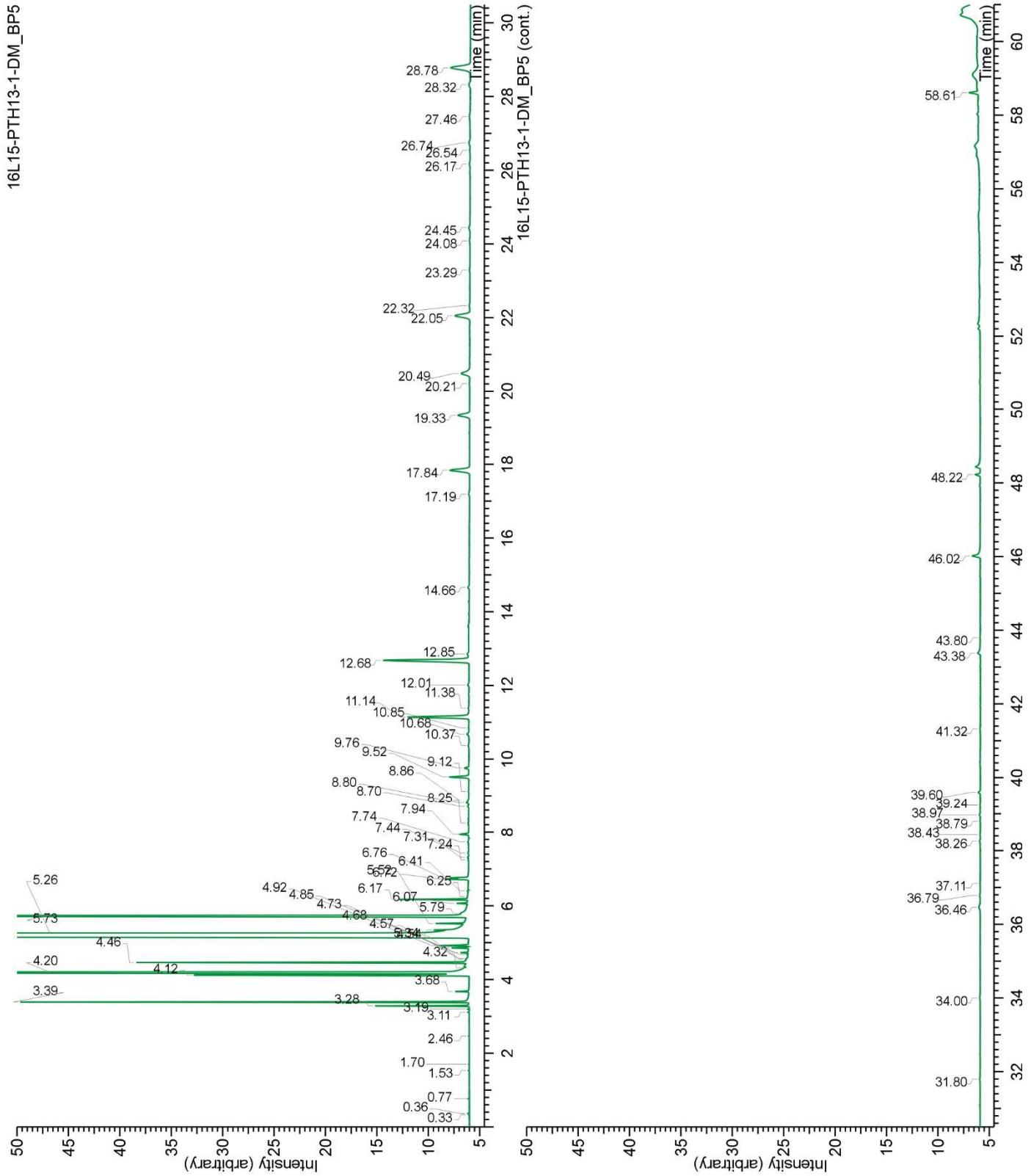
#### OTHER DATA

**Physical aspect :** Yellow liquid

**Refractive index :** 1.4728 ± 0.0003 (20 °C)

#### CONCLUSION

No adulterant, contaminant or diluent were detected using this method.



16L15-PTH13-1-DM\_WAX

