



**PLANT THERAPY**  
100% PURE ESSENTIAL OILS

## GC/MS BATCH NUMBER: L90106

---

**ESSENTIAL OIL:** LEMONGRASS ORGANIC  
**BOTANICAL NAME:** CYMBOPOGON FLEXUOSUS  
**ORIGIN:** INDIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF LEMONGRASS ORGANIC OIL	%
GERANIAL	40.6
NERAL	31.9
GERANIOL	6.4
GERANYL ACETATE	4.2
β-CARYOPHYLLENE	2.1
6-METHYL-5-HEPTEN-2-ONE	1.4
CAMPHENE	1.2
(E)-ISOCITRAL	1.1
LINALOOL	1.1
γ-CADINENE	1.0

Comments from Robert Tisserand: Lively, fresh, green lemon odor quality. Six of seven key ISO constituents are within range, with limonene marginally low - not a concern.

**Date :** August 11, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17H10-PTH9-1-DM

**Customer identification :** Lemongrass Organic - India - L9010677R

**Type :** Essential oil

**Source :** *Cymbopogon flexuosus*

**Customer :** Plant Therapy

*ANALYSIS*

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

Identifications double-checked by GC-MS

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

**Analysis date :** 2017-08-11

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*Note: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.*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.	
2-Methyl-3-buten-2-ol	0.55	658	0.03	0.03	973	1.36	Aliphatic alcohol
Isoamyl alcohol	1.17	739	0.01	0.01	1154	3.19	Aliphatic alcohol
cis-Hex-3-en-1-ol	2.51	866	0.01	0.01	1330	5.72	Aliphatic alcohol
4-Heptanone	2.63	875	0.01	0.03	1067	2.13*	Aliphatic ketone
Tricyclene	3.23	915	0.14	0.15	924	1.13	Monoterpene
α-Pinene	3.42	927	0.20	0.19	949	1.24	Monoterpene
Camphene	3.71	944	1.16	1.16	997	1.55	Monoterpene
Sabinene	4.14	969	0.01	[0.03]	1067	2.13*	Monoterpene
Myrcene	4.49	989	0.10	0.07	1116	2.69	Monoterpene
6-Methyl-5-hepten-2-one	4.55	993	1.39	1.42	1283	4.99	Aliphatic ketone
6-Methyl-5-hepten-2-ol	4.76	1005	0.06	0.05	1425	7.48	Aliphatic alcohol
Octanal	4.88	1011	0.08	0.08	1235	4.29	Aliphatic aldehyde
Limonene	5.17	1027	0.25	0.24	1142	3.02	Monoterpene
β-Phellandrene	5.21	1029	0.04	0.04	1148	3.11*	Monoterpene
1,8-Cineole	5.24	1031	tr	[0.04]	1148	3.11*	Monoterp. ether
cis-β-Ocimene	5.36	1037	0.37	0.36	1193	3.65*	Monoterpene
trans-β-Ocimene	5.54	1047	0.22	0.21	1207	3.86	Monoterpene
γ-Terpinene	5.72	1057	0.02	[0.36]	1193	3.65*	Monoterpene
Bergamal	5.74	1058	0.02	0.01	1298	5.22	Aliphatic aldehyde
cis-Linalool oxide (fur.)	6.01	1073	0.01	0.02	1381	6.55	Monoterp. alcohol
4-Nonanone	6.07	1076	0.75	0.75	1276	4.88	Aliphatic ketone
Terpinolene	6.21	1084	0.06	0.06	1228	4.19	Monoterpene
trans-Linalool oxide (fur.)	6.33	1090	0.01	0.16	1407	7.09	Monoterp. alcohol
Rose furan	6.42	1095	0.10	0.09	1346	5.98*	Monoterp. ether
Perillene	6.54	1100	0.08	[0.09]	1346	5.98*	Monoterp. ether
Linalool	6.71	1107	1.08	1.02	1499	9.36	Monoterp. alcohol
cis-Chrysanthemal?	6.80	1110	0.03				Monoterp. aldehyde
Unknown (m/z = 81, 70 (71), 67 (57), 109 (47), 41 (43), 82 (42)... 137 (8), 152 (0))	7.53	1136	0.13				Oxygenated monoterpene
exo-Isocitral	7.73	1144	0.05	0.30	1432	7.65*	Monoterp. aldehyde
trans-Chrysanthemal	7.83	1147	0.25	[0.30]	1432	7.65*	Monoterp. aldehyde
Citronellal	7.97	1152	0.22	0.39	1417	7.32*	Monoterp. aldehyde
(Z)-Isocitral	8.26	1163	0.67	0.56	1484	8.91	Monoterp. aldehyde
Rosefuran epoxide	8.50	1172	0.16	0.15	1534	10.63	Monoterp. ether
Borneol	8.64	1177	0.21	0.68	1621	14.25*	Monoterp. alcohol
Terpinen-4-ol	8.81	1183	0.04	0.05	1529	10.44	Monoterp. alcohol
(E)-Isocitral	8.88	1185	1.10	0.78	1508	9.68	Monoterp. aldehyde
α-Terpineol	9.48	1204	0.15	0.17	1624	14.43	Monoterp. alcohol
Decanal	9.80	1211	0.15	0.12	1438	7.81	Aliphatic aldehyde

Nerol	10.71	1231	0.11	0.13	1731	20.58	Monoterp. alcohol
Citronellol	11.01	1237	0.08	0.09	1710	19.12	Monoterp. alcohol
Neral	11.42	1246	31.94	32.05	1607	13.50	Monoterp. aldehyde
Piperitone	11.86	1256	0.06	[0.68]	1621	14.25*	Monoterp. ketone
Geraniol	12.20	1263	6.37	6.44	1786	24.23	Monoterp. alcohol
Geranial	13.05	1282	40.62	40.72	1656	16.09	Monoterp. aldehyde
Unknown (m/z = 43, 69 (80), 41 (80), 109 (40)... 152 (5))	13.76	1297	0.12				
Geranyl formate	14.10	1303	0.03				Monoterp. ester
Cycloisosativene	17.04	1347	0.12	[0.39]	1417	7.32*	Sesquiterpene
$\alpha$ -Ylangene	17.16	1349	0.09	[0.39]	1417	7.32*	Sesquiterpene
$\alpha$ -Copaene	17.72	1357	0.04	[0.30]	1432	7.65*	Sesquiterpene
$\beta$ -Bourbonene	18.17	1364	0.05	0.05	1454	8.18	Sesquiterpene
$\beta$ -Cubebene	18.70	1372	0.06	0.07	1478	8.77	Sesquiterpene
$\beta$ -Elemene	18.96	1376	0.10	0.10	1523	10.22	Sesquiterpene
Geranyl acetate	19.47*	1384	4.24	4.15	1697	18.25	Monoterp. ester
Geranic acid	19.47*	1384	[4.24]	0.25	2266	44.52	Monoterp. acid
$\beta$ -Caryophyllene	20.66	1401	2.06	2.17	1521	10.13	Sesquiterpene
<i>cis</i> - $\beta$ -Farnesene	22.76	1426	0.05	0.04	1577	12.25	Sesquiterpene
$\alpha$ -Humulene	23.41	1434	0.20	0.25	1585	12.54	Sesquiterpene
( <i>E</i> )-Isoeugenol	25.09	1454	0.65	0.62	2240	43.89	Phenylpropanoid
Germacrene D	25.62	1460	0.34	[0.68]	1621	14.25*	Sesquiterpene
4-epi-Cubebol	27.51	1483	0.13	0.11	1801	25.21	Sesquiterp. alcohol
$\gamma$ -Cadinene	28.73	1497	1.04	1.09	1670	16.87	Sesquiterpene
Cubebol	29.27	1505	0.36	0.35	1848	28.78	Sesquiterp. alcohol
$\delta$ -Cadinene	29.35	1506	0.21	0.29	1676	17.17	Sesquiterpene
<i>trans</i> - $\gamma$ -Bisabolene	30.25	1518	0.08	0.06	1685	17.66	Sesquiterpene
$\alpha$ -Elemol	32.64	1552	0.06	0.05	1998	37.09	Sesquiterp. alcohol
Caryophyllene oxide	33.82*	1569	0.44	0.31	1845	28.53	Sesquiterp. ether
Geranyl butyrate	33.82*	1569	[0.44]	0.07	1829	27.35	Monoterp. ester
Geranylgeraniol isomer	51.27	2122	0.06				Diterp. alcohol
<b>Total identified</b>			<b>98.83%</b>	<b>98.82%</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 :** 1.4823  $\pm$  0.0003 (20 °C)

#### CONCLUSION

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



