



**PLANT THERAPY**  
100% PURE ESSENTIAL OILS

## GC/MS BATCH NUMBER: L80103

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

KEY CONSTITUENTS PRESENT IN THIS BATCH OF LEMONGRASS OIL	%
GERANIAL	40.0
NERAL	30.7
GERANIOL	7.6
GERANYL ACETATE	4.3
$\beta$ -CARYOPHYLLENE	1.8
6-METHYL-5-HEPTEN-2-ONE	1.2
(E)-ISOCITRAL	1.1
$\gamma$ -CADINENE	1.1
LINALOOL	1.0

Comments from Robert Tisserand: Excellent odor profile. Six of seven constituents are within the ISO standard, with limonene slight low - not a concern.

**Date :** June 14, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16F08-PTH4-1-SM

**Customer identification :** Lemongrass - India - L8010363

**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).

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

**Analysis date :** 2016-06-14

Checked and approved by :

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

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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Isovaleral	0.52	567	0.03	0.01	784	0.51	Aliphatic aldehyde
cis-Hex-3-en-1-ol	2.43	863	0.01	0.02	1348	5.09	Aliphatic alcohol
4-Heptanone	2.56	875	0.02	0.02	1060	1.58	Aliphatic ketone
Tricyclene	3.15	917	0.10	0.10	927	0.81	Monoterpene
α-Pinene	3.34	928	0.16	0.15	947	0.89	Monoterpene
Camphene	3.62	945	0.86	0.84	1003	1.12	Monoterpene
Sabinene	4.04	971	0.01	tr	1057	1.55	Monoterpene
β-Pinene	4.11	975	0.01	tr	1040	1.41	Monoterpene
Myrcene	4.38*	992	0.10	0.06	1116	2.05	Monoterpene
Dehydro-1,8-cineole	4.38*	992	[0.10]	0.03	1128	2.20	Monoterp. ether
6-Methyl-5-hepten-2-one	4.43	994	1.21	1.25	1278	4.09	Aliphatic ketone
Octanal	4.76	1014	0.06	0.06	1233	3.47	Aliphatic aldehyde
Limonene	5.06	1030	0.28	0.26	1140	2.33	Monoterpene
1,8-Cineole	5.09	1031	0.03	0.03	1145	2.40	Monoterp. ether
cis-β-Ocimene	5.24	1040	0.33	0.33	1187	2.88	Monoterpene
trans-β-Ocimene	5.42	1050	0.20	0.19	1203	3.07	Monoterpene
Bergamal	5.62	1061	0.02	0.02	1293	4.31	Aliphatic aldehyde
cis-Linalool oxide (fur.)	5.88	1076	0.01	0.01	1380	5.56	Monoterp. alcohol
4-Nonanone	5.95	1079	0.92	0.90	1274	4.04	Aliphatic ketone
Terpinolene	6.07	1086	0.05	0.05	1224	3.35	Monoterpene
trans-Linalool oxide (fur.)	6.18	1092	0.02	0.01	1414	6.06	Monoterp. alcohol
Rose furan	6.28	1098	0.11	0.10	1347	5.07*	Monoterp. ether
Perillene	6.39	1103	0.06	0.07	1343	5.02	Monoterp. ether
Linalool	6.50	1107	1.04	1.06	1496	7.62	Monoterp. alcohol
Nonanal	6.56	1109	0.11	[0.10]	1347	5.07*	Aliphatic aldehyde
Unknown (m/z = 81, 70 (71), 67 (57), 109 (47), 41 (43), 82 (42)... 137 (8), 152 (0))	7.33	1138	0.13				Oxygenated monoterpene
exo-Isocitral	7.53	1146	0.05	0.14	1422	6.22*	Monoterp. aldehyde
trans-Chrysanthemal	7.62	1149	0.25	0.21	1430	6.36	Monoterp. aldehyde
Citronellal	7.77	1155	0.26	0.23	1418	6.15	Monoterp. aldehyde
(Z)-Isocitral	8.04	1165	0.66	0.57	1478	7.27	Monoterp. aldehyde
Rosefuran epoxide	8.26	1173	0.14	0.17	1532	8.49*	Monoterp. ether
Borneol	8.30	1175	0.20	0.43	1626	11.50*	Monoterp. alcohol
Terpinen-4-ol	8.56	1184	0.06	[0.17]	1532	8.49*	Monoterp. alcohol
(E)-Isocitral	8.63	1187	1.07	0.89	1506	7.82	Monoterp. aldehyde
α-Terpineol	9.11	1204	0.16	[0.43]	1626	11.50*	Monoterp. alcohol
Decanal	9.53	1213	0.12	0.10	1440	6.54	Aliphatic aldehyde
Nerol	10.28	1230	0.18	0.20	1730	16.34	Monoterp. alcohol
Citronellol	10.59	1237	0.13	0.11	1709	15.20	Monoterp. alcohol

Neral	11.04	1247	30.67	31.29	1608	10.83	Monoterp. aldehyde
Piperitone	11.47	1257	0.33	[0.43]	1626	11.50*	Monoterp. ketone
Geraniol	11.72	1263	7.56	8.17	1783	19.51	Monoterp. alcohol
Geranial	12.61	1283	40.02	40.90	1658	12.89	Monoterp. aldehyde
Geranyl formate	13.69	1305	0.03	0.03	1636	11.95	Monoterp. ester
Cycloisositivene	16.57	1351	0.09	[0.14]	1422	6.22*	Sesquiterpene
β-Bourbonene	17.24	1361	0.02	0.03	1455	6.84	Sesquiterpene
Neryl acetate	17.40	1363	0.02	0.02	1661	13.07	Monoterp. ester
Sativene	17.64	1367	0.04	0.04	1449	6.73	Sesquiterpene
Geranic acid	18.17	1375	0.27	0.27	2252	41.91	Monoterp. acid
β-Elemene	18.41	1379	0.06	1.81	1526	8.31*	Sesquiterpene
Geranyl acetate	18.94	1387	4.34	4.42	1693	14.51*	Monoterp. ester
β-Caryophyllene	20.08	1404	1.82	[1.81]	1526	8.31*	Sesquiterpene
α-Humulene	22.76	1437	0.19	0.20	1588	10.22	Sesquiterpene
(E)-Isoeugenol	24.00	1452	0.47	0.47	2229	41.38	Phenylpropanoid
Germacrene D	24.93	1463	0.21	0.18	1621	11.26	Sesquiterpene
4-epi-Cubebol	26.63	1484	0.12	0.10	1803	20.65	Sesquiterp. alcohol
γ-Cadinene	27.95	1499	1.05	0.93	1670	13.47	Sesquiterpene
δ-Cadinene	28.33	1504	0.24	0.22	1676	13.72	Sesquiterpene
Cubebol	28.59	1508	0.30	0.26	1851	23.84	Sesquiterp. alcohol
trans-γ-Bisabolene	29.52	1520	0.14	[4.42]	1693	14.51*	Sesquiterpene
α-Elemol	31.31	1545	0.03	0.04	1996	33.30	Sesquiterp. alcohol
Caryophyllene oxide	33.18*	1570	0.65	0.42	1846	23.45	Sesquiterp. ether
Geranyl butyrate	33.18*	1570	[0.65]	0.09	1829	22.32	Monoterp. ester
<b>Total identified</b>			<b>97.70%</b>	<b>98.51%</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 :** Light yellow liquid

**Refractive index :** 1.4835 ± 0.0003 (20 °C)

#### CONCLUSION

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



