

**Date :** November 1, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17J30-PTH2-1-CC

**Customer identification :** Citronella - China - CE010478R

**Type :** Essential oil

**Source :** *Cymbopogon winterianus*

**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 :** 2017-10-31

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.	
Dimethyl sulfide	0.39	637	0.02				Sulfide
$\alpha$ -Thujene	3.31	920	0.01	0.01	952	1.17*	Monoterpene
$\alpha$ -Pinene	3.42	927	0.02	[0.01]	952	1.17*	Monoterpene
Sabinene	4.14	969	0.02	0.02	1056	1.99	Monoterpene
Myrcene	4.48	989	0.10	0.09	1117	2.57*	Monoterpene
6-Methyl-5-hepten-2-one	4.56	994	0.10	0.11	1276	4.79	Aliphatic ketone
$\alpha$ -Phellandrene	4.76	1005	0.02	0.01	1110	2.48	Monoterpene
$\alpha$ -Terpinene	4.95	1015	0.01	[0.09]	1117	2.57*	Monoterpene
Limonene	5.19	1028	4.20	4.19	1142	2.91*	Monoterpene
$\beta$ -Phellandrene	5.22	1030	0.05	[4.19]	1142	2.91*	Monoterpene
1,8-Cineole	5.24	1031	0.01	[4.19]	1142	2.91*	Monoterp. ether
<i>cis</i> - $\beta$ -Ocimene	5.36	1038	0.01	0.02	1190	3.53*	Monoterpene
$\gamma$ -Terpinene	5.74*	1059	0.08	[0.02]	1190	3.53*	Monoterpene
Bergamal	5.74*	1059	[0.08]	0.07	1295	5.05	Aliphatic aldehyde
Terpinolene	6.21	1084	0.08	0.07	1225	4.03	Monoterpene
Linalool	6.73	1107	0.94	2.33	1495	8.95*	Monoterp. alcohol
Isopulegol	7.88	1149	1.38	[2.33]	1495	8.95*	Monoterp. alcohol
Citronellal	8.17	1159	36.61	35.89	1424	7.26*	Monoterp. aldehyde
iso-Isopulegol	8.19	1160	0.19	[2.33]	1495	8.95*	Monoterp. alcohol
Rosefuran epoxide	8.48	1171	0.07	0.09	1540	10.48	Monoterp. ether
Borneol	8.71	1179	0.02	2.63	1623	13.82*	Monoterp. alcohol
Terpinen-4-ol	8.85	1184	0.03	1.63	1525	9.95*	Monoterp. alcohol
$\alpha$ -Terpineol	9.52	1204	0.06	[2.63]	1623	13.82*	Monoterp. alcohol
Decanal	9.84	1211	0.11	0.19	1439	7.61	Aliphatic aldehyde
Nerol	10.64	1229	0.18	0.19	1729	19.59	Monoterp. alcohol
Citronellol	11.07	1238	10.97	11.29	1711	18.44	Monoterp. alcohol
Neral	11.23	1242	0.40	0.38	1599	12.64	Monoterp. aldehyde
Geraniol	12.27	1265	20.59	20.97	1785	23.32*	Monoterp. alcohol
Geranial	12.79	1276	0.53	0.99	1647	15.05*	Monoterp. aldehyde
Geranyl formate	14.13	1303	0.02	0.03	1636	14.44	Monoterp. ester
Citronellic acid	17.16	1349	0.11	0.16	2177	41.93	Monoterp. acid
Citronellyl acetate	17.37	1352	2.12	2.21	1607	12.99	Monoterp. ester
$\alpha$ -Copaene	17.62	1356	0.18	[35.89]	1424	7.26*	Sesquiterpene
Eugenol	17.82	1359	1.11	1.09	2058	38.51	Phenylpropanoid
$\beta$ -Bourbonene	18.20	1365	0.09	0.09	1454	7.98	Sesquiterpene
$\beta$ -Cubebene	18.77	1373	0.02	0.03	1477	8.54	Sesquiterpene
$\beta$ -Elemene	19.05	1378	1.48	[1.63]	1525	9.95*	Sesquiterpene
Geranyl acetate	19.52	1385	2.83	2.85	1694	17.52	Monoterp. ester
<i>cis</i> -Muurolo-3,5-diene	23.08	1430	0.07	0.05	1554	11.01	Sesquiterpene
$\alpha$ -Humulene	23.51	1435	0.11	0.21	1585	12.14	Sesquiterpene
Germacrene D	25.79	1462	2.63	[2.63]	1623	13.82*	Sesquiterpene

4-epi-Cubebol	27.68	1485	0.07	0.06	1802	24.48	Sesquiterp. alcohol
α-Muurolene	27.80	1486	0.40	[0.99]	1647	15.05*	Sesquiterpene
cis-α-Bisabolene	27.93	1488	0.77	0.74	1665	16.01	Sesquiterpene
γ-Cadinene	28.83	1498	0.48	0.43	1670	16.29	Sesquiterpene
δ-Cadinene	29.53	1508	1.97	2.05	1678	16.67	Sesquiterpene
Citronellyl butyrate	30.98	1529	0.12	[20.97]	1785	23.32*	Monoterp. ester
α-Elemol	32.87	1555	2.89	3.02	1994	36.24	Sesquiterp. alcohol
Germacrene D-4-ol	34.07	1572	0.64	0.79	1955	34.45*	Sesquiterp. alcohol
1,10-diepi-Cubenol	36.66	1616	0.11	[0.79]	1955	34.45*	Sesquiterp. alcohol
γ-Eudesmol	37.06	1626	0.38	0.39	2067	38.79	Sesquiterp. alcohol
τ-Cadinol	37.64	1640	0.31	0.41	2071	38.93	Sesquiterp. alcohol
τ-Muurolol	37.76	1643	0.39	0.41	2086	39.41	Sesquiterp. alcohol
α-Muurolol	37.88	1646	0.09	0.09	2100	39.85	Sesquiterp. alcohol
β-Eudesmol	38.01	1649	0.64	0.68	2110	40.14	Sesquiterp. alcohol
α-Cadinol	38.22	1654	0.82	0.82	2125	40.57	Sesquiterp. alcohol
Intermedeol	38.70	1666	0.78	0.62	2155	41.36	Sesquiterp. alcohol
<b>Total identified</b>			<b>98.44%</b>	<b>98.40%</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

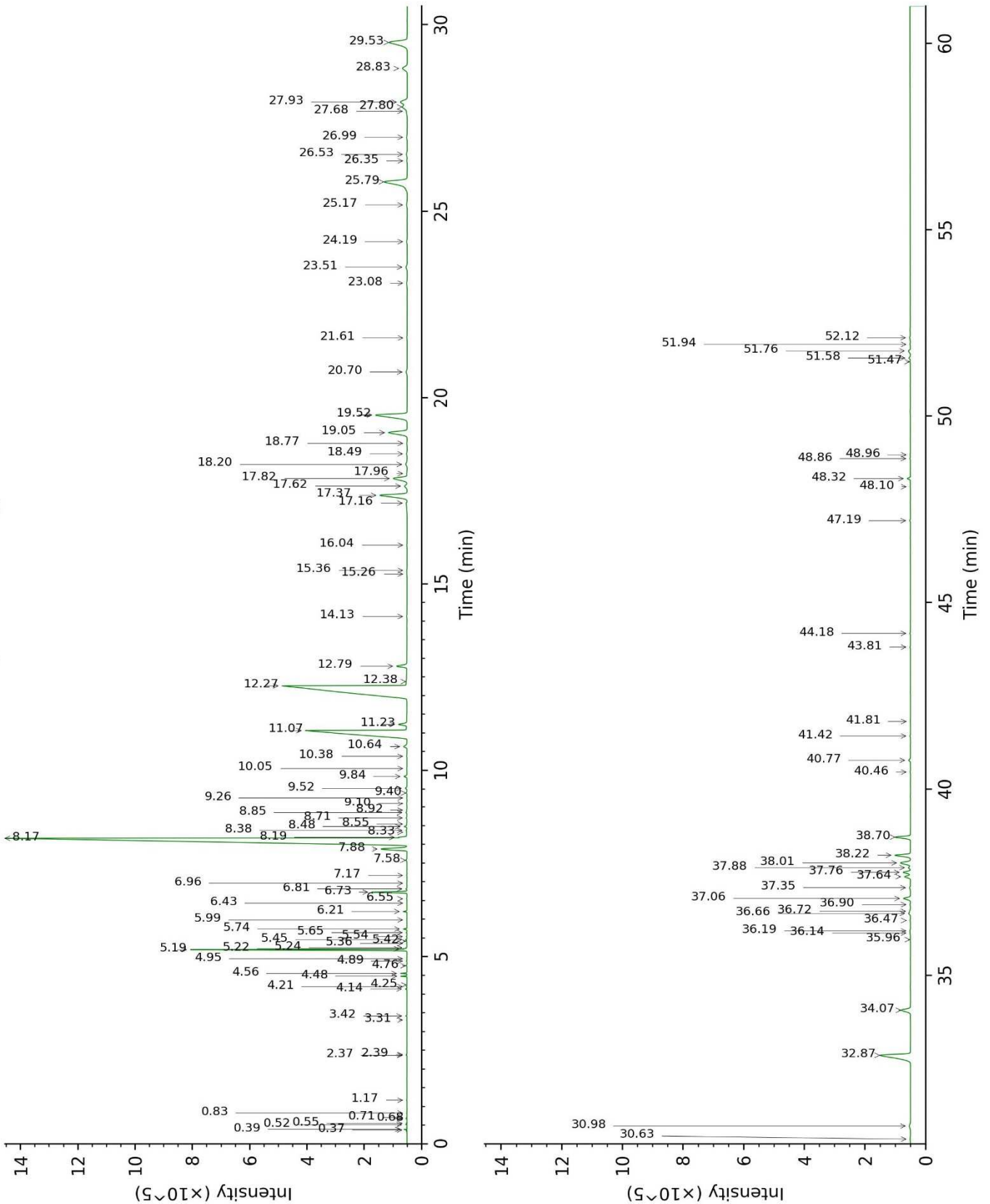
**Physical aspect :** Faintly yellow liquid

**Refractive index :** 1.4688 ± 0.0003 (20 °C)

#### CONCLUSION

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

17J30-PTH2-1-CC\_BP5



17J30-PTH2-1-CC\_WAX

