



PLANT THERAPY  
100% PURE ESSENTIAL OILS

## GC/MS BATCH NUMBER: TK0104

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**ESSENTIAL OIL:** TURMERIC ORGANIC C02

**BOTANICAL NAME:** CURCUMA LONGA

**ORIGIN:** GERMANY

KEY CONSTITUENTS PRESENT IN THIS BATCH OF TURMERIC ORGANIC C02 OIL	%
$\beta$ -TURMERONE	35.5
$\alpha$ -TURMERONE	14.0
$\alpha$ r-TURMERONE	4.6
$\beta$ -SESQUIPHELLANDRENE	3.9
$\alpha$ -ZINGIBERENE	3.8
$\alpha$ r-CURCUMENE	2.1

Comments from Robert Tisserand: Beautifully radiant woody-rooty odor profile. Constituents are in expected amounts.

**Date :** April 20, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17D10-PTH15-1-DM

**Customer identification :** Turmeric CO2 organic - Germany - TK010473

**Type :** Essential oil

**Source :** *Curcuma longa*

**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 :** 2017-04-19

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.	
Toluene	1.31	758	0.01	0.01	950	1.19	Simple phenolic
$\alpha$ -Pinene	3.41	928	0.04	0.03	938	1.14	Monoterpene
$\beta$ -Pinene	4.19	975	0.01	0.01	1034	1.77	Monoterpene
Myrcene	4.46	991	0.03	0.03	1112	2.51	Monoterpene
$\alpha$ -Phellandrene	4.73*	1006	0.40	0.36	1105	2.42	Monoterpene
$\Delta$ 3-Carene	4.73*	1006	[0.40]	0.01	1082	2.24	Monoterpene
$\alpha$ -Terpinene	4.92	1017	0.02	0.02	1118	2.60	Monoterpene
para-Cymene	5.10	1027	0.22	0.22	1203	3.72	Monoterpene
Limonene	5.14	1029	0.06	0.06	1135	2.83	Monoterpene
$\beta$ -Phellandrene	5.17	1031	0.01	0.84	1142	2.90*	Monoterpene
1,8-Cineole	5.21	1032	0.84	[0.84]	1142	2.90*	Monoterp. ether
$\gamma$ -Terpinene	5.69	1059	0.02	0.02	1184	3.45	Monoterpene
Terpinolene	6.17	1085	0.28	0.27	1219	3.94	Monoterpene
para-Cymenene	6.36	1095	0.01	0.01	1361	6.11	Monoterpene
Linalool	6.61	1106	0.01	0.01	1488	8.78	Monoterp. alcohol
Terpinen-4-ol	8.67	1181	0.03	0.03	1523	9.81	Monoterp. alcohol
para-Methylacetophenone	9.03	1195	0.01	0.01	1667	16.01	Simple phenolic
para-Cymen-8-ol	9.12	1198	0.07	0.07	1782	22.96	Monoterp. alcohol
$\alpha$ -Terpineol	9.28	1202	0.07	0.04	1616	13.40	Monoterp. alcohol
$\beta$ -Elemene	18.74	1377	0.02	0.02	1517	9.61	Sesquiterpene
Sesquithujene	19.94	1395	0.07	0.07	1499	9.06	Sesquiterpene
$\beta$ -Caryophyllene	20.40	1402	0.96	0.98	1515	9.50	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	21.98	1421	0.02	0.02	1520	9.70	Sesquiterpene
<i>cis</i> - $\beta$ -Farnesene	22.67	1429	0.19	0.16	1584	12.10	Sesquiterpene
$\alpha$ -Humulene	23.14	1435	0.36	0.36	1573	11.70	Sesquiterpene
Thujopsadiene	23.88	1443	0.06	0.05	1589	12.24	Sesquiterpene
<i>trans</i> - $\beta$ -Farnesene	24.31	1449	0.19	0.18	1610	13.08	Sesquiterpene
$\gamma$ -Curcumene	25.81	1467	0.12	0.09	1618	13.51	Sesquiterpene
ar-Curcumene	26.35	1473	2.05	0.94	1691	17.31	Sesquiterpene
$\alpha$ -Zingiberene	27.68	1489	3.78	3.83	1648	15.05	Sesquiterpene
$\beta$ -Bisabolene	28.62*	1500	0.78	0.69	1652	15.24	Sesquiterpene
$\beta$ -Curcumene	28.62*	1500	[0.78]	0.06	1662	15.78	Sesquiterpene
$\beta$ -Sesquiphellandrene	30.05	1520	3.93	5.04	1690	17.24	Sesquiterpene
<i>trans</i> - $\alpha$ -Bisabolene	31.37	1539	0.06	0.08	1715	18.59	Sesquiterpene
<i>cis</i> -Sesquisabinene hydrate	32.78	1558	0.16				Sesquiterp. alcohol
Caryophyllene oxide	33.52*	1569	0.24	0.12	1841	27.07	Sesquiterp. ether
( <i>E</i> )-Nerolidol	33.52*	1569	[0.24]	0.11	2003	36.44	Sesquiterp. alcohol
ar-Dihydroturmerone	34.77	1586	0.14	0.22	2194	42.26	Sesquiterp. ketone
ar-Turmerol	34.98	1589	0.27				Sesquiterp. alcohol
Tumerone	36.64	1621	0.56				Sesquiterp. ketone
$\beta$ -Turmerone	38.88	1676	35.54	20.93	2143	40.96*	Sesquiterp. ketone

ar-Turmerone	38.93	1677	4.62	18.74	2070	38.82	Sesquiterp. ketone
Germacrone	39.02	1680	0.48	0.36	2078	39.02	Sesquiterp. ketone
Unknown (m/z = 120, 91 (37), 85 (36), 41 (34), 77 (28), 119 (27), 93 (27)...) (xx)	39.41	1689	0.64				
(E)-γ-Atlantone	39.65	1695	0.28	14.68	2124	40.47*	Sesquiterp. ketone
α-Turmerone	40.02	1705	14.04	[14.68]	2124	40.47*	Sesquiterp. ketone
(Z)-α-Atlantone	40.24	1712	0.22	[20.93]	2143	40.96*	Sesquiterp. ketone
Curcuphenol	40.42	1718	0.10	0.13	2579	50.53	Sesquiterp. alcohol
(6R,7R)-Bisabolone	40.69	1726	0.24				Sesquiterp. ketone
(6S,7R)-Bisabolone	41.23	1743	0.86	0.83	2180	41.92	Sesquiterp. ketone
<i>C. longa</i> biomarker I	41.44	1750	0.68	0.53	2284	44.44	Oxygenated sesquiterp.
Unknown (m/z = 83, 55 (20), 53 (6), 91 (6)) (xx)	41.71	1759	0.76				
ar-Turmerol analogue?	41.86	1763	0.96	0.89	2418	47.35	Sesquiterp. alcohol
(E)-α-Atlantone	42.21	1774	0.75	1.38	2202	42.48	Sesquiterp. ketone
<i>C. longa</i> biomarker II	43.26	1808	0.89	0.85	2549	49.97	Oxygenated sesquiterp.
<i>C. longa</i> biomarker III	45.44	1888	0.70	0.63	2738	53.46	Oxygenated sesquiterp.
Unknown (m/z = 83, 135 (75), 118 (44), 55 (29), 91 (27), 232 (21)) (xx)	45.56	1893	0.42				
Unknown (m/z = 83, 137 (72), 110 (60), 55 (37), 109 (26)...) (xx)	45.89	1905	0.56				
Unknown (m/z = 83, 149 (65), 135 (53), 55 (30), 214 (27)... 232? (11)) (xx)	47.12	1955	0.64				
<i>C. longa</i> biomarker IV	48.26	2000	0.50	0.47	3102	59.59	Oxygenated sesquiterp.
<b>Total identified</b>			<b>76.96%</b>	<b>75.49%</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 :** Bright yellow liquid

**Refractive index :** 1.5128 ± 0.0003 (20 °C)

#### CONCLUSION

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



