PLANT THERAPY
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: G40105

ESSENTIAL OIL: GINGER ROOT C02
BOTANICAL NAME: ZINGIBER OFFICIANALIS
ORIGIN: NIGERIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF GINGER ROOT C02 OIL	%
a-ZINGIBERENE	11.0
[6]-GINGEROL	8.8
[6]-SHOGAOL	7.5
[10]-SHOGAOL	6.3
[11]-PARADOL	6.3
β-SESQUIPHELLANDRENE	5.2
[8]-SHOGAOL	4.0
ZINGERONE	2.6
β-BISABOLENE	2.5
(E,E)-a-FARNESENE	2.4
[7]-PARADOL	1.9
[8]-GINGEROL	1.9
ar-CURCUMENE	1.8
1-DEHYDRO-[10]- GINGERDIONE	1.7
a-SELINENE	1.3
DIACETOXY-[6]-GINGERDIOL	1.3
[13]-PARADOL	1.2
[10]-GINGEROL	1.2

Comments from Robert Tisserand: Rich, spicy, characteristic odor profile. Contains over 40% of gingerols and shogaols. These give fresh Ginger its pungency, and are not found in the distilled oil.

Date : October 5, 2017

SAMPLE IDENTIFICATION

Internal code : 17J04-PTH1-1-CC
Customer identification : Ginger Root CO2 - Nigeria - G4010577R
Type : Essential oil
Source : *Zingiber officinalis*
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 : Alexis St-Gelais, M. Sc., chimiste
Analysis date : 2017-10-04

Checked and approved by :

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.	
Hexanal	1.78	810	0.47	0.61	1016	1.70	Aliphatic aldehyde
2,4-Pentadienal?	2.15	838	0.20	0.28	1058	2.06	Aliphatic aldehyde
α-Pinene	3.41	926	0.06	0.07	935	1.17	Monoterpene
Camphene	3.70	943	0.18	0.22	987	1.47	Monoterpene
Myrcene	4.47	989	0.02	0.02	1109	2.60	Monoterpene
α-Phellandrene	4.75	1004	0.01	0.01	1102	2.50	Monoterpene
Octanal	4.89	1012	0.13	0.13	1232	4.24	Aliphatic aldehyde
para-Cymene	5.16*	1027	0.05	0.01	1221	4.07*	Monoterpene
Limonene	5.16*	1027	[0.05]	0.48	1140	3.00*	Monoterpene
β-Phellandrene	5.19	1029	0.18	[0.48]	1140	3.00*	Monoterpene
1,8-Cineole	5.22	1030	0.17	[0.48]	1140	3.00*	Monoterp. ether
Terpinolene	6.19	1083	0.01	[0.01]	1221	4.07*	Monoterpene
Rose furan	6.49	1099	0.02	0.01	1343	5.93	Monoterp. ether
Linalool	6.68	1106	0.06	0.05	1490	9.05	Monoterp. alcohol
Camphor	7.77	1145	0.01	0.11	1426	7.52*	Monoterp. ketone
Borneol	8.63*	1176	0.42	1.11	1614	13.90*	Monoterp. alcohol
Rosefuran epoxide	8.63*	1176	[0.42]	0.14	1529	10.45	Monoterp. ether
α-Terpineol	9.46	1203	0.19	[1.11]	1614	13.90*	Monoterp. alcohol
Decanal	9.83	1211	0.71	0.87	1434	7.71	Aliphatic aldehyde
Citronellol	10.81	1233	0.13	0.21	1701	18.52	Monoterp. alcohol
Neral	11.15	1240	0.35	0.66	1592	12.81	Monoterp. aldehyde
Geraniol	11.85	1256	0.14	0.23	1772	23.30	Monoterp. alcohol
Geranial	12.67	1274	0.59	0.83	1639	15.23*	Monoterp. aldehyde
2-Undecanone	13.85	1299	0.05	0.21	1554	11.37	Aliphatic ketone
α-Ylangene	17.00	1347	0.03	0.11	1411	7.18	Sesquiterpene
α-Copaene	17.69	1357	0.11	[0.11]	1426	7.52*	Sesquiterpene
β-Elemene	18.91	1375	0.10	0.23	1518	10.02*	Sesquiterpene
Sesquithujene	20.07	1393	0.04	0.11	1502	9.45	Sesquiterpene
β-Caryophyllene	20.57	1400	0.02	[0.23]	1518	10.02*	Sesquiterpene
trans-α-Bergamotene	21.74	1414	0.08	[0.23]	1518	10.02*	Sesquiterpene
9-epi-β-Caryophyllene	24.07	1442	0.07	2.92	1655	16.04*	Sesquiterpene
trans-β-Farnesene	24.50	1447	0.09	0.20	1607	13.52	Sesquiterpene
Germacrene D	25.62	1460	0.67	[1.11]	1614	13.90*	Sesquiterpene
β-Selinene	26.24	1467	0.11	[1.11]	1614	13.90*	Sesquiterpene
ar-Curcumene	26.64	1472	1.80	11.94	1691	17.99*	Sesquiterpene
α-Selinene	27.10	1478	1.33	[0.83]	1639	15.23*	Sesquiterpene
α-Zingiberene	28.08	1489	11.03	15.24	1651	15.83	Sesquiterpene
γ-Cadinene	28.48	1494	0.25	0.20	1668	16.77	Sesquiterpene
β-Bisabolene	28.95	1500	2.45	[2.92]	1655	16.04*	Sesquiterpene
(*E*,*E*)-α-Farnesene	29.19	1504	2.38	[11.94]	1691	17.99*	Sesquiterpene
β-Sesquiphellandrene	30.39	1520	5.16	[11.94]	1691	17.99*	Sesquiterpene

α-Elemol	32.05	1544	0.35	0.41	1996	36.98	Sesquiterp. alcohol
cis-Sesquisabinene hydrate	33.13	1559	0.11				Sesquiterp. alcohol
(*E*)-Nerolidol	33.86	1569	0.32	0.32	1983	36.36	Sesquiterp. alcohol
trans-Sesquisabinene hydrate	35.08	1586	0.14				Sesquiterp. alcohol
(*cis*?)-Zingiberenol	36.49	1612	0.57	0.50	2008	37.42	Sesquiterp. alcohol
(*trans*?)-Zingiberenol	37.35	1633	0.30				Sesquiterp. alcohol
β-Eudesmol	37.90	1647	0.45	0.46	2113	40.70	Sesquiterp. alcohol
Zingerone	38.43	1660	2.60	3.52	2637	52.09	Simple phenolic
Shyobunol	39.59	1688	0.62	0.50	2202	43.02	Sesquiterp. alcohol
Cedr-8-en-13-ol?	39.83	1694	0.58	0.88	2253	44.21	Sesquiterp. alcohol
[5]-Paradol?	53.73	2235	0.54				Gingerol derivative
[6]-Shogaol	55.28	2310	7.46	7.54	3339	63.71	Gingerol derivative
[7]-Paradol	55.76	2334	1.91	0.47	3261	62.53	Gingerol derivative
[6]-Gingerol	57.28	2409	8.75				Gingerol derivative
Methyl [6]-gingerol	58.29	2461	0.30				Gingerol derivative
[8]-Shogaol	59.35	2516	4.01	3.81	3556	66.87	Gingerol derivative
Diacetoxy-[6]-gingerdiol	59.86	2544	1.27				Gingerol derivative
[8]-Gingerol	61.22	2618	1.88				Gingerol derivative
[10]-Shogaol	63.25	2733	6.33	5.49	3784	70.01	Gingerol derivative
[11]-Paradol	63.76	2762	2.94				Gingerol derivative
[10]-Gingerol	65.00	2835	1.19				Gingerol derivative
[13]-Paradol	68.51	3051	1.19				Gingerol derivative
1-Dehydro-[10]-gingerdione	69.25	3099	1.68				Gingerol derivative
[15]-Paradol	70.70	3194	0.72	0.59	4029	75.44	Gingerol derivative
1-Dehydro-[12]-gingerdione	72.80	3320	0.39				Gingerol derivative
Total identified			**76.47%**	**61.7%**			

*: Two or more compounds are coeluting on this column

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

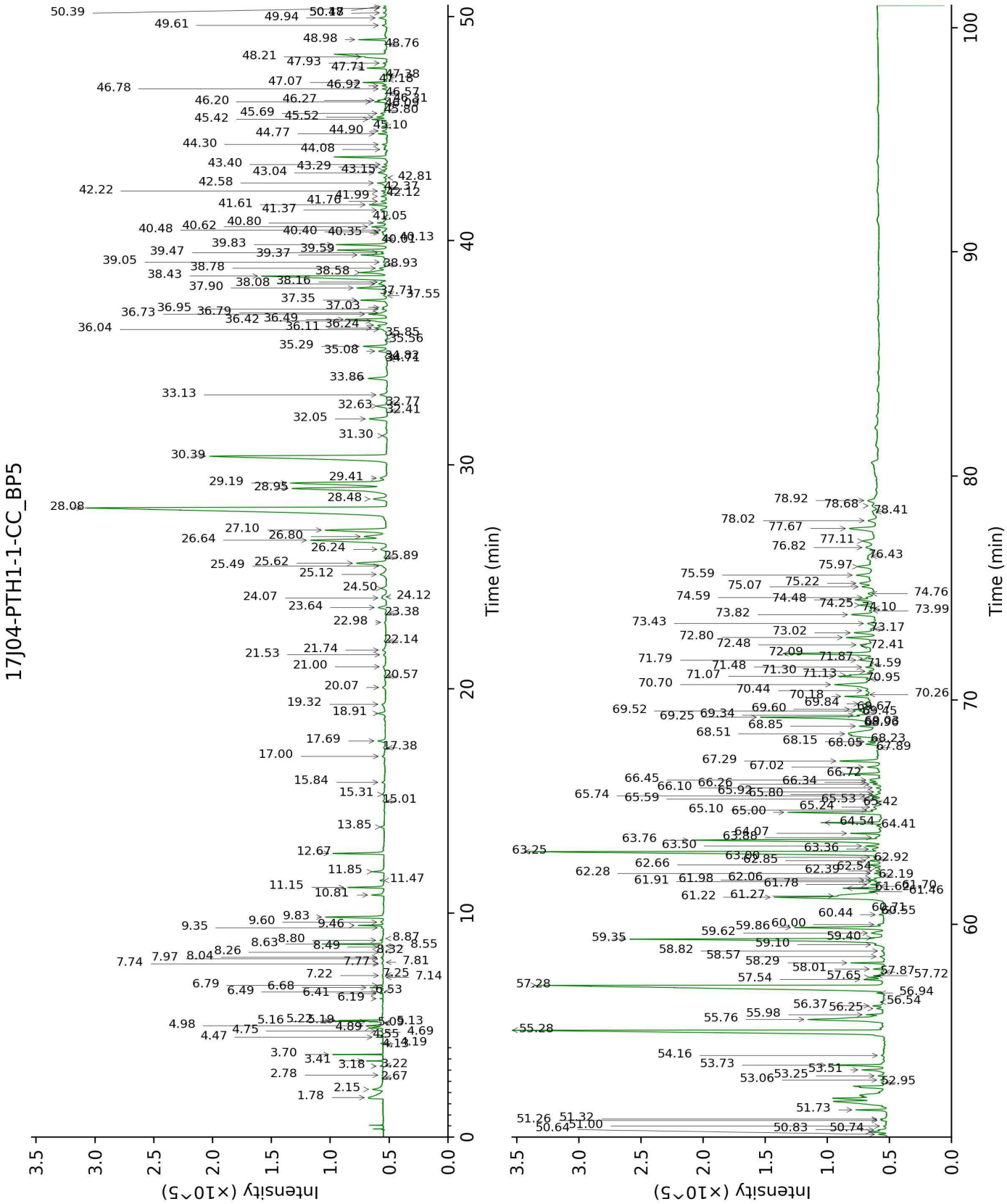
Note: no correction factor was applied

Other Data

Physical aspect : Bright orange liquid
Refractive index : 1.5065 ± 0.0003 (20 °C)

Conclusion

No adulterant, contaminant or diluent were detected using this method.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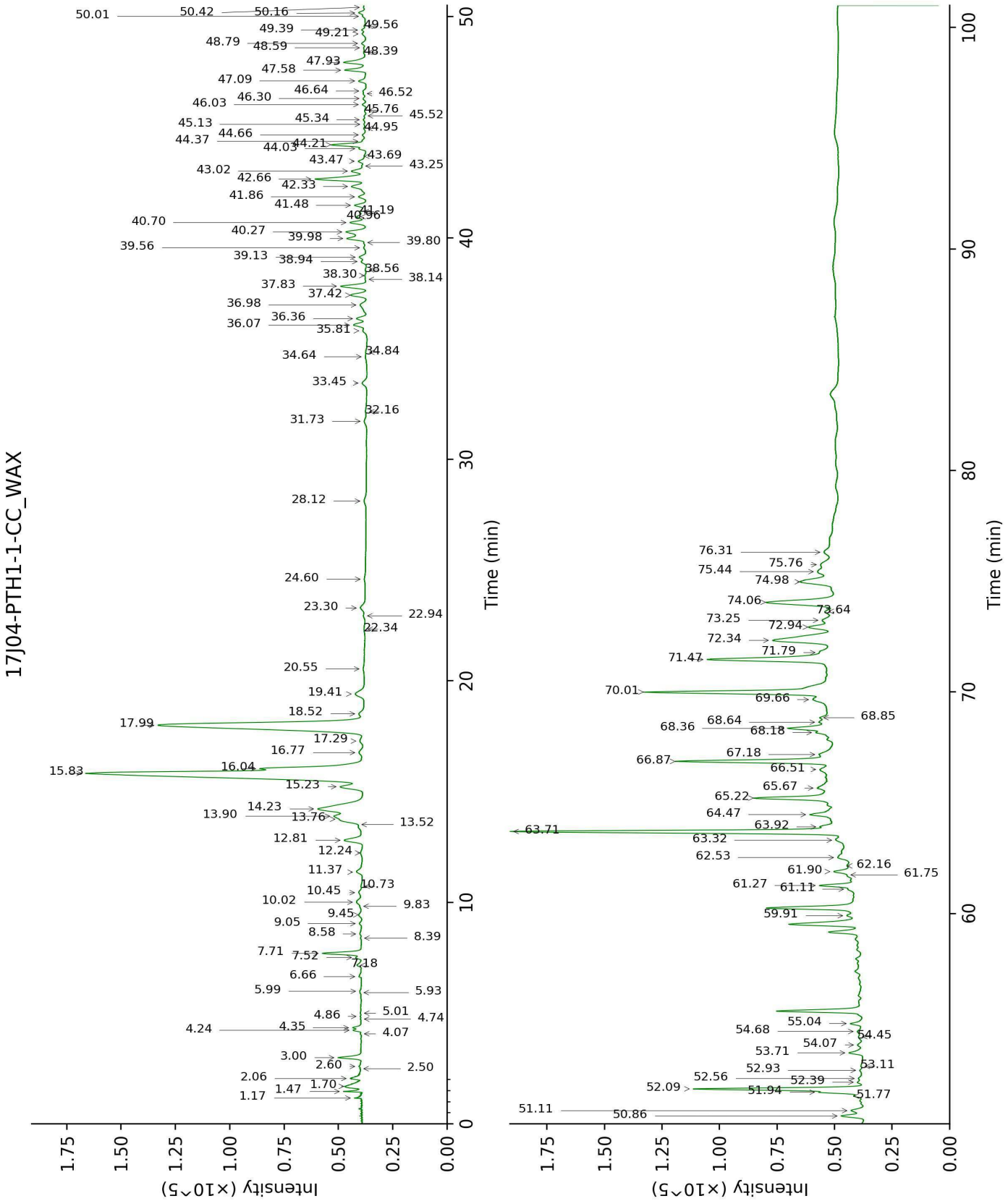
Intensity (×10^5)
Time (min)
Intensity (×10^5)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