

## GC/MS BATCH NUMBER: EE0100

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**ESSENTIAL OIL:** ELEMI  
**BOTANICAL NAME:** CANARIUM LUZONICUM  
**ORIGIN:** FRANCE

KEY CONSTITUENTS PRESENT IN THIS BATCH OF ELEMI OIL	%
LIMONENE	47.7
$\alpha$ -PHELLANDRENE	14.3
$\alpha$ -ELEMOL	11.9
ELEMICIN	5.5
SABINENE	4.8
$\alpha$ -TERPINEOL	2.1
para-Cymene	1.6
TERPINOLENE	1.1

Comments from Robert Tisserand: This Elemi oil has an excellent odor profile, and its constituents are in expected amounts. There are no indications of adulteration.

**Date :** September 6, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16I06-PTH11-1-DM

**Customer identification :** Elemi oil - EE010062R

**Type :** Essential oil

**Source :** *Canarium luzonicum*

**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 :** 2016-09-06

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.	
$\alpha$ -Thujene	3.25	918	0.12	0.14	953	0.89	Monoterpene
$\alpha$ -Pinene	3.35	924	0.38	0.36	946	0.86	Monoterpene
Camphene	3.64	941	0.01	0.01	998	1.08	Monoterpene
Sabinene	4.08	968	4.80	4.84	1057	1.51	Monoterpene
$\beta$ -Pinene	4.13	971	0.20	0.19	1039	1.36	Monoterpene
Myrcene	4.41	989	0.56	14.92	1117	2.00†	Monoterpene
$\alpha$ -Phellandrene	4.72*	1006	14.37	[14.92]	1114	1.96†	Monoterpene
$\Delta^3$ -Carene	4.72*	1006	[14.37]	0.03	1090	1.76	Monoterpene
$\alpha$ -Terpinene	4.88	1015	0.45	0.68	1123	2.07	Monoterpene
Limonene	5.19*	1032	51.91	47.70	1149	2.39	Monoterpene
1,8-Cineole	5.19*	1032	[51.91]	3.31	1151	2.41*	Monoterp. ether
para-Cymene	5.19*	1032	[51.91]	1.62	1209	3.07	Monoterpene
$\beta$ -Phellandrene	5.19*	1032	[51.91]	[3.31]	1151	2.41*	Monoterpene
cis- $\beta$ -Ocimene	5.29	1038	0.35	0.60	1188	2.84*	Monoterpene
trans- $\beta$ -Ocimene	5.47	1048	0.20	0.15	1203	3.00	Monoterpene
$\gamma$ -Terpinene	5.65	1058	0.34	[0.60]	1188	2.84*	Monoterpene
cis-Sabinene hydrate	6.01	1076	0.09	0.07	1408	5.87	Monoterp. alcohol
Terpinolene	6.12	1083	1.09	1.07	1224	3.28	Monoterpene
para-Cymenene	6.33	1095	0.05	0.03	1368	5.30	Monoterpene
Unknown (m/z = 95, 110 (41), 81 (21), 67 (19), 41 (16)... 152 (9))	8.32	1169	0.09				Oxygenated monoterpene
Unknown (m/z = 95, 110 (47), 81 (28), 79 (16), 41 (15)... 152 (10))	8.47	1175	0.13				Oxygenated monoterpene
Terpinen-4-ol	8.68	1183	0.59	0.72	1531	8.22*	Monoterp. alcohol
para-Cymen-8-ol	9.04	1196	0.03	0.04	1783	18.69	Monoterp. alcohol
$\alpha$ -Terpineol	9.39	1204	2.07	2.10	1628	11.16*	Monoterp. alcohol
$\gamma$ -Terpineol	9.50	1207	0.03	0.04	1635	11.44	Monoterp. alcohol
$\alpha$ -Phellandrene epoxide	9.69	1211	0.21	0.22	1720	15.18	Monoterpene
Piperitone	11.62	1254	0.12	[2.10]	1628	11.16*	Monoterp. ketone
Unknown (m/z = 111, 126 (95), 43 (81), 71 (50), 109 (41)...) )	15.91	1332	0.06				
$\alpha$ -Copaene	17.38	1355	0.11	0.11	1438	6.39	Sesquiterpene
$\beta$ -Elemene	18.62	1374	0.09	0.10	1528	8.17	Sesquiterpene
$\beta$ -Caryophyllene	20.23	1398	0.16	[0.72]	1531	8.22*	Sesquiterpene
Methyleugenol	21.39	1412	0.39	0.35	1934	28.47	Phenylpropanoid
$\alpha$ -Humulene	23.01	1432	0.10	0.08	1587	9.90	Sesquiterpene
Germacrene D	25.21	1458	0.11	[2.10]	1628	11.16*	Sesquiterpene
$\delta$ -Cadinene	28.91	1503	0.07	0.02	1668	12.93	Sesquiterpene

$\alpha$ -Elemol	32.69	1555	11.93	11.86	2011	33.06	Sesquiterp. alcohol
Elemicin	33.88	1571	5.52	5.58	2152	38.63	Phenylpropanoid
Guaiol	35.19	1589	0.19	0.16	2015	33.25	Sesquiterp. alcohol
$\gamma$ -Eudesmol	36.78	1624	0.50	0.50	2075	36.06	Sesquiterp. alcohol
$\alpha$ -Eudesmol	37.71*	1646	0.60	0.38	2121	37.61	Sesquiterp. alcohol
$\beta$ -Eudesmol	37.71*	1646	[0.60]	0.28	2120	37.57	Sesquiterp. alcohol
Bulnesol	38.40	1663	0.71				Sesquiterp. alcohol
Dimer of $\alpha$ -phellandrene III	42.12	1769	0.10				Diterpene
Cryptomeridiol isomer	42.46	1780	0.03				Sesquiterp. alcohol
Cryptomeridiol	43.57	1818	0.04				Sesquiterp. alcohol
<b>Total identified</b>			<b>98.62%</b>	<b>98.26%</b>			

\*: Two or more compounds are coeluting on this column

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

†: Peaks apexes were resolved, but peaks overlapped and were summed for analysis

Note: no correction factor was applied

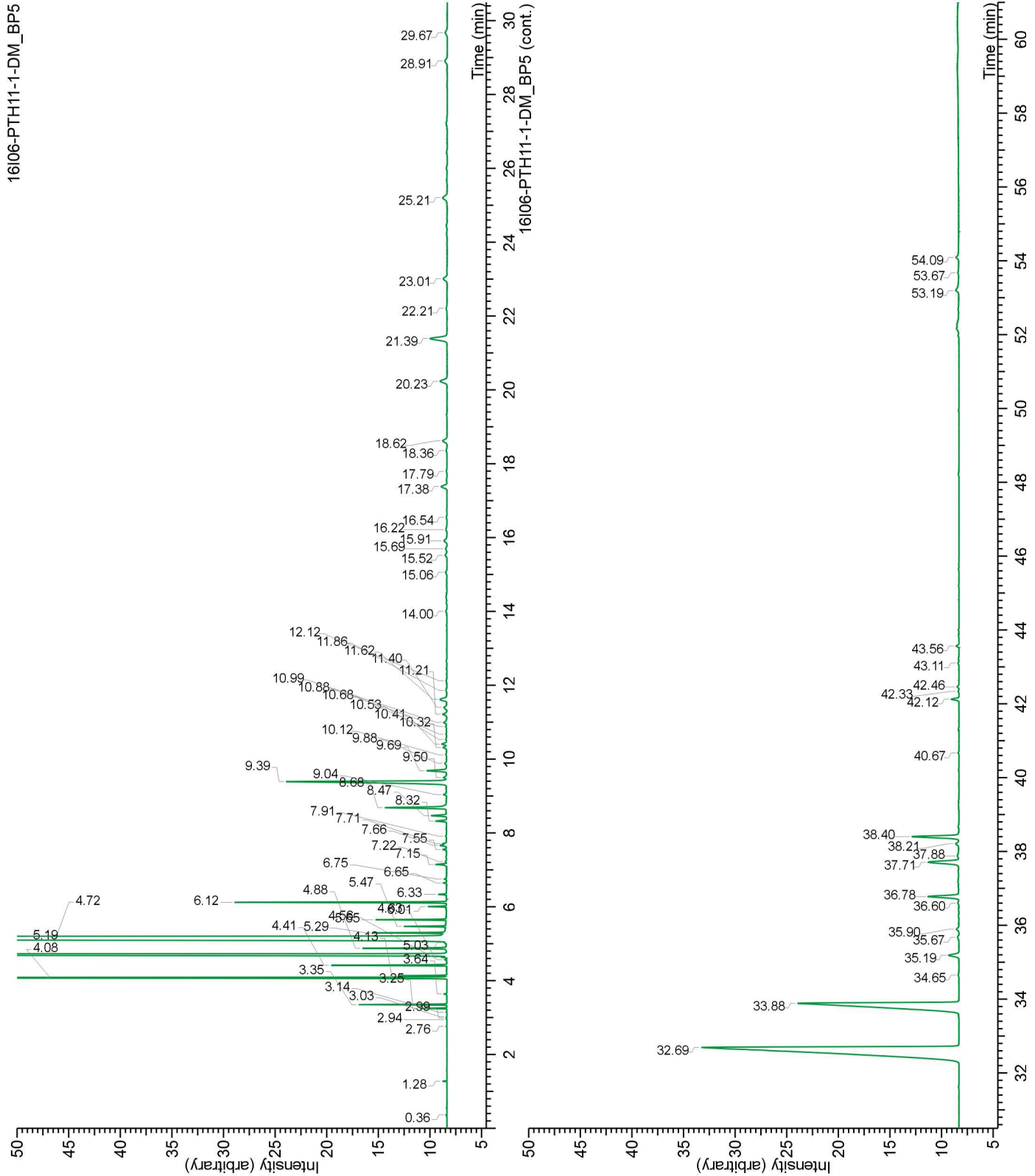
#### OTHER DATA

**Physical aspect :** Faintly yellow liquid

**Refractive index :**  $1.4795 \pm 0.0003$  (20 °C)

#### CONCLUSION

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



16106-PTH11-1-DM\_WAX

