

## GC/MS BATCH NUMBER: F30101

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**ESSENTIAL OIL:** FRANKINCENSE CARTERI ORGANIC  
**BOTANICAL NAME:** BOSWELLIA CARTERII  
**ORIGIN:** SOMALILAND

KEY CONSTITUENTS PRESENT IN THIS BATCH OF FRANKINCENSE CARTERI ORGANIC OIL	%
$\alpha$ -PINENE	59.1
$\beta$ -PINENE	6.6
LIMONENE	4.4
SABINENE	3.5
METHYL DECYL ETHER	3.1
MYRCENE	2.9
OCTYL ACETATE	2.2
$\alpha$ -THUJENE	2.2
p-CYMENE	1.5

Comments from Robert Tisserand: A great odor profile. This is an  $\alpha$ -pinene chemotype, the most common for this type of Frankincense oil.

**Date :** June 17, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16F13-PTH3-1-DM

**Customer identification :** Organic Frankincense Carteri - Somaliland - F0010163

**Type :** Essential oil

**Source :** *Boswellia carterii*

**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 :** 2016-06-17

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	1.27	749	0.08	60.62	968	0.98*	Simple phenolic
Tricyclene	3.15*	917	0.97	0.06	934	0.84	Monoterpene
Hashishene	3.15*	917	[0.97]	[60.62]	968	0.98*	Monoterpene
$\alpha$ -Thujene	3.26	923	2.16	[60.62]	968	0.98*	Monoterpene
$\alpha$ -Pinene	3.43	934	59.11	[60.62]	968	0.98*	Monoterpene
Unknown (m/z = 91, 92 (49), 65 (12)... 134? (2))	3.59	943	0.13	0.32	1073	1.67	Monoterpene
Camphene	3.64*	947	0.90	0.88	1009	1.17	Monoterpene
$\alpha$ -Fenchene	3.64*	947	[0.90]	0.01	1003	1.12	Monoterpene
Thuja-2,4(10)-diene	3.73	952	0.82	4.42	1065	1.62*	Monoterpene
Sabinene	4.08	973	3.51	[4.42]	1065	1.62*	Monoterpene
$\beta$ -Pinene	4.15	977	6.59	6.74	1049	1.48	Monoterpene
Myrcene	4.42	994	2.89	4.09	1122	2.12	Monoterpene
$\alpha$ -Phellandrene	4.67*	1009	0.67	0.30	1114	2.04	Monoterpene
$\Delta^3$ -Carene	4.67*	1009	[0.67]	0.14	1098	1.88	Monoterpene
Octanal	4.77	1014	0.04	0.04	1242	3.61	Aliphatic aldehyde
$\alpha$ -Terpinene	4.86	1019	0.19	0.25	1128	2.19	Monoterpene
meta-Cymene	4.95	1024	0.06	0.05	1134	2.27	Monoterpene
para-Cymene	5.07	1030	1.53	1.60	1215	3.22	Monoterpene
Limonene	5.10	1032	4.41	3.48	1147	2.41	Monoterpene
$\beta$ -Phellandrene	5.12	1033	0.17	0.65	1152	2.47	Monoterpene
1,8-Cineole	5.16	1036	0.37	0.20	1159	2.56	Monoterp. ether
<i>cis</i> - $\beta$ -Ocimene	5.28	1042	0.51	0.86	1194	2.96*	Monoterpene
<i>trans</i> - $\beta$ -Ocimene	5.45	1052	0.18	0.17	1210	3.15	Monoterpene
$\gamma$ -Terpinene	5.63	1062	0.28	[0.86]	1194	2.96*	Monoterpene
<i>cis</i> -Sabinene hydrate	5.94	1079	0.02	0.02	1415	6.08	Monoterp. alcohol
Isoterpinolene	6.10	1088	0.07	0.08	1230	3.43	Monoterpene
Terpinolene	6.20	1093	0.22	0.15	1226	3.37	Monoterpene
para-Cymenene	6.28	1097	0.07	0.09	1375	5.49	Monoterpene
Perillene	6.45	1105	0.06	0.05	1345	5.05	Monoterp. ether
Linalool	6.66	1113	0.13	0.12	1502	7.74	Monoterp. alcohol
$\alpha$ -Thujone	6.72	1115	0.05	0.03	1355	5.19	Monoterp. ketone
$\beta$ -Thujone	6.80	1119	0.05	0.03	1373	5.45	Monoterp. ketone
<i>cis</i> -para-Menth-2-en-1-ol	7.04	1128	0.16	0.58	1513	7.95*	Monoterp. alcohol
$\alpha$ -Campholenal	7.16	1132	0.45				Monoterp. aldehyde
<i>trans</i> -Pinocarveol	7.57	1147	0.62	0.75	1573	9.74*	Monoterp. alcohol
<i>trans</i> -para-Menth-2-en-1-ol	7.66	1151	0.20	[0.75]	1573	9.74*	Monoterp. alcohol
<i>trans</i> -Verbenol	7.80	1156	0.60	0.72	1605	10.75	Monoterp. alcohol
$\alpha$ -Phellandren-8-ol analog	7.90	1160	0.21				Monoterp. alcohol
Pinocarvone	8.01	1164	0.07	0.04	1486	7.42	Monoterp. ketone
$\alpha$ -Phellandren-8-ol	8.10	1167	0.19				Monoterp. alcohol

Terpinen-4-ol	8.68	1189	0.79	0.76	1535	8.60	Monoterp. alcohol
$\alpha$ -Terpineol	9.17	1205	0.25	0.24	1631	11.71	Monoterp. alcohol
Methylchavicol	9.38	1210	0.25	0.32	1593	10.36	Phenylpropanoid
Decanal	9.47	1212	0.20	0.19	1443	6.61	Aliphatic aldehyde
Verbenone	9.70	1217	0.38	0.33	1603	10.67	Monoterp. ketone
Octyl acetate	9.82	1220	2.24	2.48	1433	6.42*	Aliphatic ester
Methyl decyl ether	10.24	1229	3.14	3.38	1334	4.89	Aliphatic ether
<i>trans</i> -Carveol	10.46	1234	0.10	0.09	1770	18.70	Monoterp. alcohol
Bornyl acetate	12.72	1285	0.27	[0.58]	1513	7.95*	Monoterp. ester
$\alpha$ -Copaene	17.32	1362	0.17	[2.48]	1433	6.42*	Sesquiterpene
$\beta$ -Bourbonene	17.75	1369	0.30	0.22	1465	7.04	Sesquiterpene
$\beta$ -Elemene	18.56	1381	0.06	0.32	1531	8.46*	Sesquiterpene
Geranyl acetate	19.14	1390	0.06	0.05	1697	14.70	Monoterp. ester
$\beta$ -Caryophyllene	20.17	1405	0.30	[0.32]	1531	8.46*	Sesquiterpene
6,9-Guaiadiene	22.15	1429	0.25	0.25	1547	8.97	Sesquiterpene
$\alpha$ -Humulene	22.92	1439	0.08	0.16	1583	10.05	Sesquiterpene
allo-Aromadendrene	23.18	1442	0.03	0.05	1562	9.44	Sesquiterpene
Germacrene D	24.97	1463	0.06	0.06	1622	11.30	Sesquiterpene
$\beta$ -Selinene	25.71	1472	0.03	0.04	1624	11.42	Sesquiterpene
$\gamma$ -Cadinene	28.14	1502	0.10	0.08	1677	13.77	Sesquiterpene
$\delta$ -Cadinene	28.82*	1511	0.17	0.11	1683	14.05	Sesquiterpene
<i>trans</i> -Calamenene	28.82*	1511	[0.17]	0.08	1729	16.25	Sesquiterpene
Viridiflorol	34.56	1589	0.07	0.06	1987	32.70	Sesquiterp. alcohol
<b>Total identified</b>	<b>97.91%</b>			<b>96.49%</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 :** faintly yellow liquid

**Refractive index :** 1,4640  $\pm$  0.0003 (20 °C)

#### CONCLUSION

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



