



PLANT THERAPY

100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: F80103

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**ESSENTIAL OIL:** FRANKINCENSE FREREANA

**BOTANICAL NAME:** BOSWELIA FREREANA

**ORIGIN:** EAST AFRICA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF FRANKINCENSE FREREANA OIL	%
$\alpha$ -THUJENE	53.2
p-CYMENE	13.4
LIMONENE	12.0
$\alpha$ -PINENE	9.9
SABINENE	7.2
TERPINEN-4-OL	2.1
$\beta$ -PHELLANDRENE	1.9
$\beta$ -PINENE	1.9
1,8-CINEOLE	1.8
$\alpha$ -COPAENE	1.1

**Date :** January 11, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17A03-PTH8-1-DM

**Customer identification :** Frankincense Frereana - F8010363R

**Type :** Essential Oil

**Source :** *Boswellia frereana*

**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 :** 2017-01-09

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	1.28	762	0.02	63.82	967	1.40*	Simple phenolic
Tricyclene	3.16*	916	0.08	0.01	922	1.17	Monoterpene
Hashishene	3.16*	916	[0.08]	[63.82]	967	1.40*	Monoterpene
$\alpha$ -Thujene	3.33	927	53.16	[63.82]	967	1.40*	Monoterpene
$\alpha$ -Pinene	3.40	931	9.87	[63.82]	967	1.40*	Monoterpene
Unknown (m/z = 91, 92 (49), 65 (12)... 134? (2))	3.60	943	0.22	0.24	1081	2.27	Monoterpene
$\alpha$ -Fenchene	3.63	945	0.01	0.01	987	1.54	Monoterpene
Camphene	3.65	947	0.17	0.16	994	1.60	Monoterpene
Thuja-2,4(10)-diene	3.74	952	0.04	7.33	1072	2.19*	Monoterpene
Sabinene	4.10	975	7.20	[7.33]	1072	2.19*	Monoterpene
$\beta$ -Pinene	4.15	978	1.87	1.76	1046	1.99	Monoterpene
Myrcene	4.43*	995	0.76	0.74	1117	2.76*	Monoterpene
2-Carene	4.43*	995	[0.76]	0.10	1087	2.35	Monoterpene
$\alpha$ -Phellandrene	4.70*	1008	0.89	0.86	1111	2.67	Monoterpene
$\Delta$ 3-Carene	4.70*	1008	[0.89]	0.11	1096	2.48	Monoterpene
$\alpha$ -Terpinene	4.88	1018	0.10	0.09	1124	2.86	Monoterpene
meta-Cymene	4.98	1023	0.13	[0.74]	1117	2.76*	Monoterpene
para-Cymene	5.13*	1031	13.39	12.00	1214	4.10	Monoterpene
Limonene	5.13*	1031	[13.39]	3.34	1144	3.12*	Monoterpene
$\beta$ -Phellandrene	5.14	1032	1.88	[3.34]	1144	3.12*	Monoterpene
1,8-Cineole	5.19	1034	1.78	1.50	1150	3.20	Monoterp. ether
<i>cis</i> - $\beta$ -Ocimene	5.30	1040	0.10	0.06	1189	3.72	Monoterpene
<i>trans</i> - $\beta$ -Ocimene	5.48	1049	0.04	0.04	1205	3.95	Monoterpene
$\gamma$ -Terpinene	5.66	1059	0.62	0.56	1192	3.76	Monoterpene
<i>cis</i> -Sabinene hydrate	6.03	1078	0.01	0.01	1410	7.39	Monoterp. alcohol
Terpinolene	6.13	1083	0.06	0.08	1225	4.27	Monoterpene
para-Cymenene	6.36	1095	0.02	0.14	1368	6.50	Monoterpene
Linalool	6.68*	1107	0.05	0.03	1504	9.90	Monoterp. alcohol
<i>trans</i> -Sabinene hydrate	6.68*	1107	[0.05]	0.05	1498	9.69	Monoterp. alcohol
$\alpha$ -Thujone	6.79	1111	0.01	tr	1352	6.25	Monoterp. ketone
$\beta$ -Thujone	6.94	1117	0.15	0.14	1362	6.40	Monoterp. ketone
Dehydrosabinaketone	7.06	1121	0.02	0.02	1535	11.08	Normonoterp. ketone
<i>trans</i> -para-Mentha-2,8-dien-1-ol	7.19	1126	0.04	0.05	1556	11.87	Monoterp. alcohol
$\alpha$ -Campholenal	7.27	1129	0.01				Monoterp. aldehyde
<i>trans</i> -Pinocarveol	7.59	1141	0.07	0.05	1574	12.58	Monoterp. alcohol
<i>trans</i> -Sabinol	7.67	1144	0.06				Monoterp. alcohol
<i>trans</i> -Verbenol	7.81	1149	0.05	0.04	1600	13.75	Monoterp. alcohol
$\alpha$ -Phellandren-8-ol analog	7.94	1154	0.03				Monoterp. alcohol
Umbellulone	8.43	1172	0.02	0.02	1550	11.65	Monoterp. ketone

<i>cis</i> -Sabinol	8.68	1181	0.06				Monoterp. alcohol
Terpinen-4-ol	8.76	1184	2.06	2.06	1530	10.88*	Monoterp. alcohol
Myrtenal	9.23	1199	0.03	0.03	1532	10.98	Monoterp. aldehyde
$\alpha$ -Terpineol	9.44*	1204	0.52	0.47	1624	15.05*	Monoterp. alcohol
$\beta$ -Phellandren-8-ol	9.44*	1204	[0.52]	0.03	1708	19.82	Monoterp. alcohol
Methylchavicol	9.44*	1204	[0.52]	0.03	1593	13.38	Phenylpropanoid
Verbenone	9.82	1213	0.16	0.13	1603	13.94	Monoterp. ketone
Methyl decyl ether	10.25	1222	0.33	0.31	1314	5.64	Aliphatic ether
Methyl ( <i>E</i> )-2-decenyl ether	11.28	1245	0.02				Aliphatic ether
Linalyl acetate	11.45	1249	0.01	0.01	1506	9.97	Monoterp. ester
Bornyl acetate	12.76	1278	0.04	0.05	1517	10.39	Monoterp. ester
Methyl undecyl ether	15.75	1330	0.04	0.05	1438	8.08	Aliphatic ether
$\alpha$ -Copaene	17.47	1356	1.05	1.00	1426	7.78	Sesquiterpene
$\beta$ -Bourbonene	17.87	1362	0.06	0.06	1447	8.29	Sesquiterpene
$\beta$ -Cubebene	18.43	1369	0.08	0.08	1472	8.91	Sesquiterpene
$\beta$ -Elemene	18.70	1373	0.04	[2.06]	1530	10.88*	Sesquiterpene
$\beta$ -Caryophyllene	20.34	1398	0.67	0.63	1514	10.29	Sesquiterpene
Aromadendrene	21.89	1416	0.02	0.03	1544	11.42	Sesquiterpene
$\alpha$ -Humulene	23.11	1431	0.12	0.11	1578	12.73	Sesquiterpene
$\gamma$ -Muuroolene	25.18	1456	0.08	0.12	1613	14.46	Sesquiterpene
Germacrene D	25.32	1458	0.11	[0.47]	1624	15.05*	Sesquiterpene
$\beta$ -Selinene	26.10	1467	0.02	0.01	1631	15.37	Sesquiterpene
$\gamma$ -Cadinene	28.39	1494	0.07	0.07	1662	17.05	Sesquiterpene
$\delta$ -Cadinene	29.05	1503	0.29	0.25	1669	17.41	Sesquiterpene
Caryophyllene oxide	33.62	1566	0.10	0.08	1844	29.37	Sesquiterp. ether
Viridiflorol	34.73	1582	0.05	0.04	1975	36.57	Sesquiterp. alcohol
$\tau$ -Cadinol	37.46	1638	0.05	0.13	2068	39.75	Sesquiterp. alcohol
(3 <i>E</i> )-Cembrene A	46.55	1926	0.01	0.01	2135	41.64	Diterpene
Incensole	51.35	2127	0.04	0.03	2577	51.32	Diterp. alcohol
<b>Total identified</b>			<b>98.84%</b>	<b>98.94%</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 :** Clear liquid

**Refractive index :** 1.4620  $\pm$  0.0003 (20 °C)

#### CONCLUSION

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



