

Date : November 22, 2017

SAMPLE IDENTIFICATION

**Internal code :** 17K21-GUR3-1-CC

**Customer identification :** Frankincense essential oil

**Type :** Essential oil

**Source :** *Boswellia serrata*

**Customer :** GuruNanda LLC.

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 :** Benoit Roger Ph. D.

**Analysis date :** 2017-11-22

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.	
Toluene	1.32	759	0.01	75.14	978	1.26*	Simple phenolic
Hashishene	3.22	915	0.18	[75.14]	978	1.26*	Monoterpene
$\alpha$ -Thujene	3.40	925	68.16	[75.14]	978	1.26*	Monoterpene
$\alpha$ -Pinene	3.46	929	5.86	[75.14]	978	1.26*	Monoterpene
Unknown (m/z = 91, 92 (49), 65 (12)... 134? (2))	3.65	940	0.61	5.76	1056	1.94*	Unknown
Camphene	3.71	944	0.08	[75.14]	978	1.26*	Monoterpene
Thuja-2,4(10)-diene	3.80	949	0.01	[5.76]	1056	1.94*	Monoterpene
Sabinene	4.15	970	5.23	[5.76]	1056	1.94*	Monoterpene
$\beta$ -Pinene	4.21	973	0.36	0.33	1040	1.76	Monoterpene
Myrcene	4.48	989	0.65	0.73	1117	2.50	Monoterpene
$\alpha$ -Phellandrene	4.77*	1006	4.65	1.21	1111	2.42*	Monoterpene
$\Delta^3$ -Carene	4.77*	1006	[4.65]	3.19	1081	2.24	Monoterpene
$\alpha$ -Terpinene	4.94	1015	0.50	0.57	1123	2.59	Monoterpene
meta-Cymene	5.04	1020	0.14	[1.21]	1111	2.42*	Monoterpene
para-Cymene	5.15	1026	1.71	1.85	1209	3.71	Monoterpene
Limonene	5.18*	1028	2.17	2.50	1141	2.82*	Monoterpene
$\beta$ -Phellandrene	5.18*	1028	[2.17]	[2.50]	1141	2.82*	Monoterpene
1,8-Cineole	5.21	1029	0.54	[2.50]	1141	2.82*	Monoterp. ether
cis- $\beta$ -Ocimene	5.35	1037	0.47	1.43	1189	3.44*	Monoterpene
trans- $\beta$ -Ocimene	5.53	1047	0.28	0.19	1204	3.63	Monoterpene
Lavender lactone	5.68	1055	0.07	0.10	1618	13.30*	Lactone
$\gamma$ -Terpinene	5.72	1057	1.01	[1.43]	1189	3.44*	Monoterpene
cis-Sabinene hydrate	6.06	1076	0.06	0.06	1405	6.71	Monoterp. alcohol
Terpinolene	6.20	1083	0.30	0.32	1223	3.93	Monoterpene
para-Cymenene	6.42	1095	0.02	0.29	1363	6.04*	Monoterpene
Perillene	6.55	1101	0.01	0.03	1343	5.74	Monoterp. ether
trans-Sabinene hydrate	6.70*	1106	0.15	0.07	1489	8.70	Monoterp. alcohol
Linalool	6.70*	1106	[0.15]	0.17	1493	8.77*	Monoterp. alcohol
$\beta$ -Thujone	7.01	1117	0.26	[0.29]	1363	6.04*	Monoterp. ketone
cis-para-Menth-2-en-1-ol	7.22	1125	0.06	[0.17]	1493	8.77*	Monoterp. alcohol
$\alpha$ -Campholenal	7.28	1127	0.03				Monoterp. aldehyde
trans-Pinocarveol	7.67	1142	0.07	0.07	1563	11.15	Monoterp. alcohol
trans-para-Menth-2-en-1-ol	7.75	1144	0.03	0.04	1553	10.78	Monoterp. alcohol
Pinocarvone	8.20	1161	0.03	0.04	1477	8.40	Monoterp. ketone
$\alpha$ -Phellandren-8-ol	8.44	1169	0.03				Monoterp. alcohol
Borneol	8.66	1177	0.13	0.33	1622	13.48*	Monoterp. alcohol
Terpinen-4-ol	8.82	1183	1.03	1.13	1526	9.81*	Monoterp. alcohol
Myrtenal	9.39	1202	0.05	[1.13]	1526	9.81*	Monoterp. aldehyde
Methylchavicol	9.53*	1205	2.17	2.07	1581	11.84	Phenylpropanoid

α-Terpineol	9.53*	1205	[2.17]	0.12	1631	13.96	Monoterp. alcohol
Myrtenol	9.53*	1205	[2.17]	0.11	1708	17.98	Monoterp. alcohol
Verbenone	9.75	1210	0.01	[0.10]	1618	13.30*	Monoterp. ketone
Octyl acetate	9.97	1214	0.03	0.01	1425	7.17	Aliphatic ester
Linalyl acetate	11.48	1248	0.03	0.10	1507	9.11*	Monoterp. ester
Bornyl acetate	12.90	1279	0.03	[0.10]	1507	9.11*	Monoterp. ester
α-Terpinyl acetate	16.65	1341	0.04	[0.10]	1618	13.30*	Monoterp. ester
α-Copaene	17.69	1357	0.10	0.16	1432	7.35	Sesquiterpene
β-Bourbonene	18.13	1364	0.66	0.68	1454	7.86	Sesquiterpene
β-Elemene	19.16	1379	0.11	[1.13]	1526	9.81*	Sesquiterpene
β-Caryophyllene	20.62	1401	0.08	0.07	1521	9.59	Sesquiterpene
β-Copaene	21.51	1411	0.07	[1.13]	1526	9.81*	Sesquiterpene
Methyleugenol	21.63	1413	0.15	0.16	1929	33.01	Phenylpropanoid
<i>trans</i> -α-Bergamotene	22.15	1419	0.04	[1.13]	1526	9.81*	Sesquiterpene
6,9-Guaiadiene	22.56	1424	0.05	0.03	1538	10.23	Sesquiterpene
γ-Murolene	25.63	1460	0.16	[0.33]	1622	13.48*	Sesquiterpene
Germacrene D	25.70	1461	0.15	[0.33]	1622	13.48*	Sesquiterpene
γ-Cadinene	28.69	1497	0.02	0.07	1665	15.75*	Sesquiterpene
δ-Cadinene	29.34	1506	0.03	0.02	1674	16.25	Sesquiterpene
Kessane	29.56	1509	0.06	[0.07]	1665	15.75*	Sesquiterp. ether
Elemicin	33.85	1569	0.03	0.06	2137	40.78	Phenylpropanoid
Dimer of α-phellandrene II	42.31	1771	0.05	0.06	1849	27.46	Diterpene
(3E)-Cembrene A	46.66	1928	0.04	0.03	2133	40.66	Diterpene
Serratol	51.43	2130	0.13	0.14	2577	50.47	Diterp. alcohol
<b>Total identified</b>				<b>99.18%</b>	<b>99.44%</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

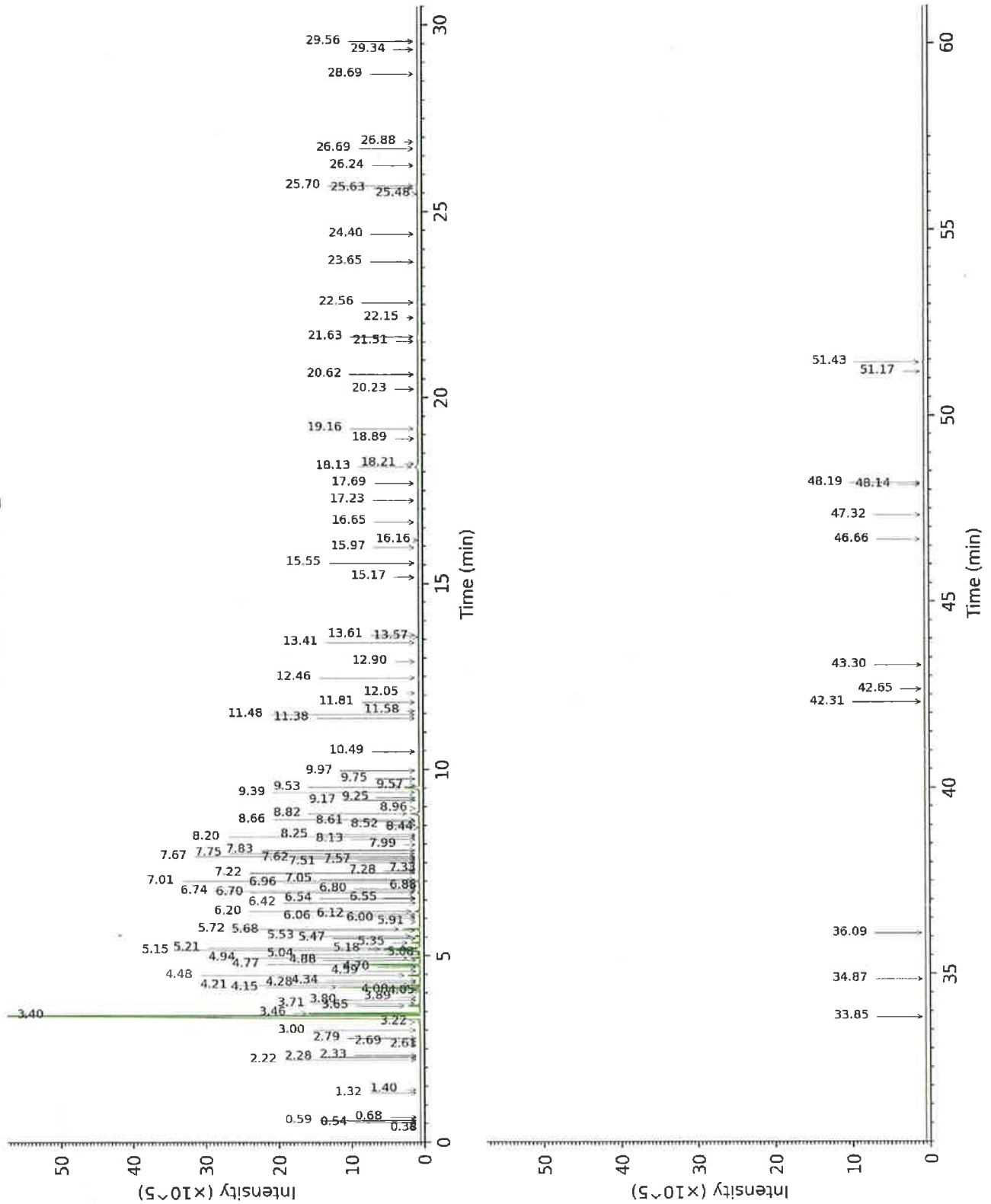
**Physical aspect :** Clear liquid

**Refractive index :** 1.4605 ± 0.0003 (20 °C)

#### CONCLUSION

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

17K21-GUR3-1-CC\_BP5



17K21-GUR3-1-CC\_WAX

