



**PLANT THERAPY**  
100% PURE ESSENTIAL OILS

## GC/MS BATCH NUMBER: BN0101

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**ESSENTIAL OIL:** BALSAM FIR  
**BOTANICAL NAME:** ABIES BALSAMEA  
**ORIGIN:** CANADA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF BALSAM FIR OIL	%
β-PINENE	30.4
Δ3-CARENE	15.5
α-PINENE	14.2
LIMONENE	7.6
BORNYL ACETATE	7.3
β-PHELLANDRENE	6.3
CAMPHENE	5.8
1,8-CINEOLE	4.6
SANTENE	1.8
TERPINOLENE	1.1

Comments from Robert Tisserand: A very good quality sweet, coniferous Balsam Fir oil.

**Date :** November 15, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16K10-PTH6-1-DM

**Customer identification :** Balsam Fir - Canada - BN010163R

**Type :** Essential oil

**Source :** *Abies balsamea*

**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 :** 2016-11-14

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.	
<i>cis</i> -Hex-3-en-1-ol	2.48	864	0.05	0.10	1311	4.48	Aliphatic alcohol
Santene	2.57	870	1.79	1.83	890	0.67	Normonoterpene
Hexanol	2.72	882	0.02	0.02	1290	4.18	Aliphatic alcohol
Tricyclene	3.16	913	0.86	0.84	922	0.76	Monoterpene
$\alpha$ -Thujene	3.25	918	0.16	0.59	948	0.87	Monoterpene
$\alpha$ -Pinene	3.39	926	14.16	14.11	945	0.86	Monoterpene
Camphene	3.66*	943	5.91	5.82	992	1.06	Monoterpene
$\alpha$ -Fenchene	3.66*	943	[5.91]	0.06	979	1.00	Monoterpene
Thuja-2,4(10)-diene	3.73	947	0.05	0.38	1051	1.46*	Monoterpene
Sabinene	4.08	969	0.08	[0.38]	1051	1.46*	Monoterpene
$\beta$ -Pinene	4.19	975	30.37	30.31	1041	1.38	Monoterpene
Myrcene	4.42	989	1.67	1.77	1111	1.94	Monoterpene
$\Delta$ 3-Carene	4.73*	1007	15.86	15.47	1088	1.76	Monoterpene
$\alpha$ -Phellandrene	4.73*	1007	[15.86]	0.27	1102	1.87	Monoterpene
$\alpha$ -Terpinene	4.87	1015	0.17	0.21	1117	2.00	Monoterpene
Limonene	5.14*	1029	9.41	7.57	1137	2.24	Monoterpene
$\beta$ -Phellandrene	5.14*	1029	[9.41]	6.34	1143	2.31*	Monoterpene
para-Cymene	5.14*	1029	[9.41]	0.21	1199	2.97*	Monoterpene
1,8-Cineole	5.16	1031	4.60	[6.34]	1143	2.31*	Monoterp. ether
<i>cis</i> - $\beta$ -Ocimene	5.30	1038	0.01	[0.21]	1199	2.97*	Monoterpene
<i>trans</i> - $\beta$ -Ocimene	5.46	1047	0.01	tr	1194	2.91	Monoterpene
$\gamma$ -Terpinene	5.65	1058	0.26	0.25	1181	2.75	Monoterpene
Isoterpinolene	6.04	1078	0.04	0.03	1213	3.12	Monoterpene
Terpinolene	6.12	1083	1.13	1.06	1218	3.19	Monoterpene
Fenchone	6.27	1091	0.22	0.31	1338	4.87	Monoterp. ketone
para-Cymenene	6.33	1095	0.06	0.07	1361	5.19	Monoterpene
Nonanal	6.65*	1107	0.43	0.06	1358	5.14	Aliphatic aldehyde
Linalool	6.65*	1107	[0.43]	0.27	1483	7.22	Monoterp. alcohol
endo-Fenchol	6.91	1117	0.07	0.05	1518	7.90	Monoterp. alcohol
<i>trans</i> -Pinocarveol	7.54	1140	0.11	0.13	1555	8.98	Monoterp. alcohol
Camphor	7.65	1144	0.30	0.28	1416	5.98	Monoterp. ketone
Camphene hydrate	7.93	1155	0.09	0.11	1511	7.75	Monoterp. alcohol
Pinocarvone	8.02	1158	0.02	0.03	1470	7.00	Monoterp. ketone
<i>trans</i> - $\beta$ -Terpineol	8.35	1170	0.02	0.02	1628	11.17	Monoterp. alcohol
Borneol	8.57	1179	0.62	0.63	1607	10.50*	Monoterp. alcohol
Terpinen-4-ol	8.68	1183	0.32	0.42	1523	8.00	Monoterp. alcohol
Cryptone	9.03	1196	0.05	0.04	1571	9.43	Monoterp. ketone
Myrtenol	9.18	1199	0.06	0.06	1692	13.98	Monoterp. alcohol
$\alpha$ -Terpineol	9.36	1203	0.76	0.93	1617	10.81*	Monoterp. alcohol
endo-Fenchyl acetate	9.72	1211	0.06	0.05	1407	5.86	Monoterp. ester
Thymol methyl ether	10.46	1228	0.03	0.04	1527	8.14	Monoterp. ether

Piperitone	11.60	1254	0.24	[0.93]	1617	10.81*	Monoterp. ketone
Bornyl acetate	12.80	1280	7.32	7.20	1497	7.50	Monoterp. ester
Thymol	14.88	1317	0.01	0.01	2120	37.58	Monoterp. alcohol
Citronellyl acetate	17.00	1349	0.04	[0.63]	1607	10.50*	Monoterp. ester
Longifolene	19.31	1385	0.21	0.17	1505	7.63	Sesquiterpene
$\beta$ -Caryophyllene	20.24	1398	0.27	0.14	1520	7.94	Sesquiterpene
$\alpha$ -Humulene	23.01	1432	0.13	0.10	1579	9.67	Sesquiterpene
<i>trans</i> - $\beta$ -Farnesene	24.16	1446	0.03	0.02	1635	11.43	Sesquiterpene
<i>cis</i> -Muurolo-4(14),5-diene	25.88	1466	0.05	[0.93]	1617	10.81*	Sesquiterpene
$\alpha$ -Muurolole	27.37	1483	0.01	0.01	1644	11.86	Sesquiterpene
$\beta$ -Bisabolene	28.46	1497	0.41	0.37	1657	12.45	Sesquiterpene
$\delta$ -Cadinene	28.91	1503	0.03	0.02	1671	13.05	Sesquiterpene
<i>trans</i> - $\alpha$ -Bisabolene	31.50	1538	0.05	0.05	1704	14.50	Sesquiterpene
<i>cis</i> -Abienol	51.40	2135	0.02	0.02	2684	49.88	Diterp. alcohol
<b>Total identified</b>			<b>98.65%</b>	<b>98.85%</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 :**  $1.4735 \pm 0.0003$  (20 °C)

#### CONCLUSION

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



