



**PLANT THERAPY**  
100% PURE ESSENTIAL OILS

## GC/MS BATCH NUMBER: BN0102

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

KEY CONSTITUENTS PRESENT IN THIS BATCH OF BALSAM FIR OIL	%
$\beta$ -PINENE	30.5
$\alpha$ -PINENE	16.1
$\Delta$ 3-CARENE	15.5
BORNYL ACETATE	8.4
LIMONENE	8.2
1,8-CINEOLE	5.3
CAMPHENE	5.1
$\beta$ -PHELLANDRENE	4.2
MYRCENE	1.7
SANTENE	1.5

Comments from Robert Tisserand: Fresh, sweet fir odor profile, with constituents in expected amounts.

**Date :** January 27, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17A23-PTH5-1-DM

**Customer identification :** Balsam Fir - BN010269R

**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 :** 2017-01-26

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	869	0.05	0.05	1328	5.79	Aliphatic alcohol
Santene	2.56	874	1.48	1.49	888	1.00	Normonoterpene
Hexanol	2.72	887	0.01	0.02	1304	5.39	Aliphatic alcohol
Tricyclene	3.15	915	0.75	0.76	919	1.14	Monoterpene
$\alpha$ -Thujene	3.24	921	0.15	0.34	957	1.30	Monoterpene
$\alpha$ -Pinene	3.38	929	16.05	15.72	952	1.28	Monoterpene
Camphene	3.64*	946	5.06	5.05	996	1.57	Monoterpene
$\alpha$ -Fenchene	3.64*	946	[5.06]	0.08	985	1.50	Monoterpene
Thuja-2,4(10)-diene	3.72	951	0.06	0.19	1068	2.12*	Monoterpene
Sabinene	4.07	973	0.07	[0.19]	1068	2.12*	Monoterpene
$\beta$ -Pinene	4.18	979	30.49	30.94	1052	2.01	Monoterpene
Myrcene	4.41	994	1.72	1.75	1119	2.72	Monoterpene
$\Delta$ 3-Carene	4.72*	1010	15.62	15.50	1102	2.48	Monoterpene
$\alpha$ -Phellandrene	4.72*	1010	[15.62]	0.18	1112	2.62	Monoterpene
<i>cis</i> -Hex-3-en-1-yl acetate	4.81	1014	0.11	0.05	1273	4.90	Aliphatic ester
$\alpha$ -Terpinene	4.86	1017	0.21	0.17	1126	2.80	Monoterpene
Limonene	5.12*	1031	9.37	8.17	1146	3.08	Monoterpene
1,8-Cineole	5.12*	1031	[9.37]	5.30	1152	3.16*	Monoterp. ether
para-Cymene	5.12*	1031	[9.37]	0.25	1211	3.98	Monoterpene
$\beta$ -Phellandrene	5.15	1032	4.20	[5.30]	1152	3.16*	Monoterpene
<i>cis</i> - $\beta$ -Ocimene	5.28	1039	0.01	0.01	1182	3.56	Monoterpene
<i>trans</i> - $\beta$ -Ocimene	5.45	1048	0.01	0.01	1204	3.87	Monoterpene
$\gamma$ -Terpinene	5.64	1057	0.28	0.28	1192	3.69	Monoterpene
Isoterpinolene	6.03	1078	0.05	0.04	1221	4.13	Monoterpene
Terpinolene	6.11	1082	1.11	1.09	1226	4.20	Monoterpene
Fenchone	6.26	1090	0.10	0.10	1322	5.69	Monoterp. ketone
para-Cymenene	6.33	1093	0.08	0.08	1369	6.43	Monoterpene
Linalool	6.64	1106	0.08	0.07	1498	9.48	Monoterp. alcohol
Nonanal	6.74	1109	0.02	0.04	1347	6.08	Aliphatic aldehyde
endo-Fenchol	7.08	1122	0.08	0.06	1519	10.29	Monoterp. alcohol
<i>trans</i> -Pinocarveol	7.54	1139	0.14	0.12	1571	12.25	Monoterp. alcohol
Camphor	7.64	1143	0.29	0.28	1424	7.61	Monoterp. ketone
Camphene hydrate	7.93	1154	0.05	0.31	1515	10.12*	Monoterp. alcohol
Pinocarvone	8.09	1159	0.03	0.03	1476	8.89	Monoterp. ketone
<i>trans</i> - $\beta$ -Terpineol	8.48	1174	0.04	0.07	1619	14.52	Monoterp. alcohol
Borneol	8.56	1177	0.52	0.57	1617	14.43*	Monoterp. alcohol
Terpinen-4-ol	8.68	1181	0.32	0.25	1527	10.60	Monoterp. alcohol
Cryptone	9.04	1195	0.03	0.04	1565	12.02	Monoterp. ketone
Myrtenol	9.17	1198	0.07	0.07	1706	19.32	Monoterp. alcohol
$\alpha$ -Terpineol	9.37	1202	0.89	0.79	1622	14.67	Monoterp. alcohol
endo-Fenchyl acetate	9.70	1210	0.05	0.08	1401	7.05	Monoterp. ester

Thymol methyl ether	10.44	1226	0.03	0.05	1529	10.68	Monoterp. ether
Piperitone	11.60	1252	0.11	[0.57]	1617	14.43*	Monoterp. ketone
Bornyl acetate	12.78	1279	8.39	8.20	1507	9.80	Monoterp. ester
Thymol	15.46	1325	0.03	0.04	2108	40.77	Monoterp. alcohol
Citronellyl acetate	16.95	1348	0.03	0.03	1611	14.10	Monoterp. ester
Longifolene	19.26	1382	0.22	0.21	1486	9.10	Sesquiterpene
$\beta$ -Caryophyllene	20.19	1396	0.26	[0.31]	1515	10.12*	Sesquiterpene
$\alpha$ -Humulene	22.96	1429	0.12	0.11	1577	12.50	Sesquiterpene
<i>trans</i> - $\beta$ -Farnesene	24.10	1443	0.02	0.02	1624	14.77	Sesquiterpene
$\beta$ -Bisabolene	28.39	1494	0.27	0.26	1651	16.19	Sesquiterpene
$\delta$ -Cadinene	28.65	1498	0.01	0.01	1666	17.00	Sesquiterpene
<i>trans</i> - $\alpha$ -Bisabolene	31.42	1536	0.05	0.04	1699	18.87	Sesquiterpene
<i>cis</i> -Abienol	51.41	2130	0.03				Diterp. alcohol
<b>Total identified</b>			<b>99.22%</b>	<b>99.37%</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 :** 1.4733  $\pm$  0.0003 (20 °C)

#### CONCLUSION

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



