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Fir Balsam

Abies balsamea canadensis

Batch No. CA-CAN04QAC
Organically Produced, Canada

Monoterpenes	85.03%
tricyclene	0.83
α thujene	0.15
α pinene	17.53
camphene	5.62
α fenchene	0.06
β pinene	34.75
myrcene	1.61
Δ 3 carene	14.01
α phellandrene	0.26
α terpinene	0.19
para cymene	0.10
limonene	7.07
β phellandrene	1.28
γ terpinene	0.29
isoterpinolene	0.04
terpinolene	1.19
para-cymenene	0.05

Monoterpenols	1.35%
linalool	0.03
endo-fenchone	0.06
trans-pinocarveol	0.10
borneol	0.23
terpinen-4-ol	0.16
α terpineol	0.67
myrtenol	0.05
thymol	0.05

Ethers	4.35%
1,8 cineole	4.35

Diterpinol	0.09%
cis-abienol	0.09

Sesquiterpenes	0.64%
α cubebene	0.03
β caryophyllene	0.15
longifolene	0.15
α humulene	0.08
β bisabolene	0.23

Ketones	0.28%
fenchone	0.06
camphor	0.13
pinocarvone	0.02
piperitone	0.07

Esters	5.79%
bornyl acetate	5.77
endo-fenchyl acetate	0.02

Other	%
Santene	1.81

Raw Material: Fir Balsam
INCI Name: Abies balsamea canadensis
Production Method: Steam distillation, needles

Date : May 13, 2016

SAMPLE IDENTIFICATION

Internal code :

Customer identification :

Type : Essential oil

Source : *Abies balsamea*

Customer : Nature's Gift

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 : 2016-05-13

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.	
Santene	2.55	874	1.81	1.81	907	0.73	Normonoterpene
Tricyclene	3.14	916	0.83	0.81	931	0.83	Monoterpene
α -Thujene	3.23	922	0.15	17.79	956	0.93*	Monoterpene
α -Pinene	3.36	930	17.53	[17.79]	956	0.93*	Monoterpene
Camphene	3.62*	946	5.76	5.62	1006	1.15	Monoterpene
α -Fenchene	3.62*	946	[5.76]	0.06	996	1.09	Monoterpene
β -Pinene	4.16	978	34.75	34.44	1051	1.50	Monoterpene
Myrcene	4.38	991	1.61	1.68	1119	2.09	Monoterpene
Δ^3 -Carene	4.68*	1009	14.07	14.01	1100	1.89	Monoterpene
α -Phellandrene	4.68*	1009	[14.07]	0.26	1112	2.01	Monoterpene
α -Terpinene	4.83	1017	0.19	0.19	1125	2.16	Monoterpene
para-Cymene	5.02	1028	0.10	0.13	1212	3.17	Monoterpene
Limonene	5.08*	1031	8.40	7.07	1145	2.40	Monoterpene
β -Phellandrene	5.08*	1031	[8.40]	5.63	1151	2.47*	Monoterpene
1,8-Cineole	5.11	1033	4.35	[5.63]	1151	2.47*	Monoterp. ether
γ -Terpinene	5.59	1060	0.29	0.28	1191	2.93	Monoterpene
Isoterpinolene	5.99	1082	0.04	0.03	1222	3.32	Monoterpene
Terpinolene	6.07	1086	1.19	1.14	1227	3.39	Monoterpene
Fenchone	6.21	1094	0.06	0.05	1322	4.72	Monoterp. ketone
para-Cymenene	6.24	1096	0.05	0.04	1372	5.44	Monoterpene
Linalool	6.48	1107	0.03	0.06	1499	7.67	Monoterp. alcohol
endo-Fenchol	6.88	1121	0.08	0.08	1520	8.14	Monoterp. alcohol
trans-Pinocarveol	7.35	1139	0.10	0.09	1570	9.66	Monoterp. alcohol
Camphor	7.55	1147	0.13	0.12	1425	6.28	Monoterp. ketone
Pinocarpone	7.91	1160	0.02	0.02	1480	7.31	Monoterp. ketone
Borneol	8.27	1174	0.23	0.22	1623	11.33	Monoterp. alcohol
Terpinen-4-ol	8.49	1182	0.16	0.22	1532	8.51	Monoterp. alcohol
α -Terpineol	9.07*	1203	0.76	0.67	1629	11.60	Monoterp. alcohol
Myrtenol	9.07*	1203	[0.76]	0.05	1711	15.27	Monoterp. alcohol
endo-Fenchyl acetate	9.55	1214	0.02	0.02	1407	5.94	Sesquiterpene
Piperitone	11.37	1255	0.07	0.06	1626	11.48	Monoterp. ketone
Bornyl acetate	12.61	1283	5.77	6.16	1511	7.92	Monoterp. ester
Thymol	13.74	1306	0.05	0.05	2111	38.03	Monoterp. alcohol
α -Cubebene	15.38	1332	0.03	0.03	1414	6.06	Sesquiterpene
Longifolene	19.08	1389	0.15	0.15	1493	7.56	Sesquiterpene
β -Caryophyllene	19.98	1403	0.15	0.22	1526	8.30	Sesquiterpene
α -Humulene	22.69	1436	0.08	0.08	1586	10.14	Sesquiterpene

β -Bisabolene	28.10	1501	0.23	0.24	1662	13.09	Sesquiterpene
cis-Abienol	51.10	2135	0.09	0.10	2672	50.51	Diterp. alcohol
Total identified	99.33%			99.68%			

*: 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 : 1.4728 ± 0.0003 (20 °C)

CHEMOTYPES

- High Δ^3 -carene (>10%; likely characteristic of Eastern Canada)^{1,2}
- Low thymol(<0.25%)¹

CONCLUSION

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

REFERENCES

- (1) Régimbal, J.-M.; Collin, G. Essential Oil Analysis of Balsam Fir *Abies Balsamea* (L.) Mill. *J. Essent. Oil Res.* **1994**, *6*, 229–238.
- (2) Hunt, R.; Rudloff, E. Von. Chemosystematic Studies in the Genus *Abies*. I. Leaf and Twig Oil Analysis of Alpine and Balsam Firs. *Can. J. Bot.* **1974**, *52*, 477–487.



