



## Fir Balsam *Abies balsamea canadensis*

Batch No. CA-CAN05SC3  
 Organically Produced, Canada

### Monoterpenes 86.24%

santene	1.57
bornylene	0.01
tricyclene	0.95
$\alpha$ thujene	0.15
$\alpha$ pinene	13.87
camphene	6.30
$\alpha$ fenchene	0.06
Thuja-2,4(10)-diene	0.03
meta-cymene	0.03
$\beta$ pinene	32.12
myrcene	1.65
sabinene	0.10
2-carene	0.01
$\alpha$ phellandrene	0.16
pseudolimonene	0.01
$\Delta^3$ carene	13.99
$\alpha$ terpinene	0.15
para cymene	0.12
limonene	7.12
$\beta$ phellandrene	6.38
(E)- $\beta$ -Ocimene	0.01
$\gamma$ terpinene	0.27
meta-cymenene	0.01
terpinolene	1.07
isoterpinolene	0.04
para-cymenene	0.06

### Aldehydes 0.1%

$\alpha$ -Campholenal	0.02
myrtenal	0.04
phellandral	0.02
Isopimaral	0.02

### Monoterpenols 1.59%

linalool	0.05
endo-fenchol	0.07
trans-pinocarveol	0.06
borneol	0.39
terpinen-4-ol	0.20
$\alpha$ terpineol	0.58
myrtenol	0.03
thymol	0.04
trans-para-Menth-2-en-1-ol	0.02
camphene hydrate	0.07
meta-Mentha-4,6-dien-8-ol	0.02
isoborneol	0.01
para-Cymen-8-ol	0.02
Citronellol	0.03

### Ethers 0.04%

1,8 cineole	0.01
Thymol methyl ether	0.01
Caryophyllene oxide	0.02

### Phenols 0.02%

Toluene	0.01
methylchavicol	0.01

### Diterpinol 0.05%

(Z)-Abienol	0.02
abietol	0.03

### Other 0.1%

(3Z)-Hexenol	0.03
Hexanol	0.01
$\gamma$ -Campholenal	0.05
18-Norabieta-8,11,13-triene	0.01

### Sesquiterpenols 0.03%

(E)-Nerolidol	0.03
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### Sesquiterpenes 1.61%

$\alpha$ longipinene	0.06
$\alpha$ copaene	0.03
$\beta$ elemene	0.01
$\beta$ longipinene	0.01
longifolene	0.19
$\beta$ caryophyllene	0.46
trans- $\alpha$ bergamotene	0.02
$\alpha$ humulene	0.23
(E)- $\beta$ -Farnesene	0.04
$\gamma$ muurolene	0.01
$\beta$ selinene	0.02
$\alpha$ selinene	0.01
$\alpha$ muurolene	0.04
$\beta$ himachalene	0.01
$\delta$ amorphene	0.01
(Z)- $\alpha$ -Bisabolene	0.01
$\beta$ bisabolene	0.35
$\gamma$ cadinene	0.03
$\delta$ cadinene	0.02
$\alpha$ -Calacorene	0.01
(E)- $\alpha$ -Bisabolene	0.04

### Ketones 0.48%

fenchone	0.10
$\alpha$ -Thujone	0.01
camphor	0.12
pinocarvone	0.02
isopinocampnone	0.03
cryptone	0.03
verbenone	0.04
carvone	0.01
piperitone	0.10
2-Undecanone	0.02

### Esters 8.87%

(3Z)-Hexenyl acetate	0.02
endo-Fenchyl acetate	0.04
Isopulegyl acetate	0.02
bornyl acetate	8.66
isobornyl acetate	0.02
methyl myrtenate	0.01
myrtenyl acetate	0.01
citronellyl acetate	0.02
geranyl acetate	0.02
Ethyl $\alpha$ -linolenate	0.05

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

**Date:** June 15, 2018

**CERTIFICATE OF ANALYSIS - GC PROFILING**

**SAMPLE IDENTIFICATION**

**Internal code:** 18F06-NG-1-CC

**Customer identification:** HE Abies balsamea - B-ABBACAN0SSC3

**Type:** Essential oil

**Source :** *Abies balsamea* ct. Eastern / Low thymol

**Customer:** Nature's Gift

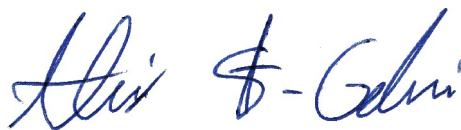
**ANALYSIS**

**Method:** PC-PA-014-17JI 9 - Analysis of the composition of an essential oil, or other volatile liquid, by FAST GC-FID (in French); identifications validated by GC-MS.

**Analyst:** Benoit Roger, Ph. D.

**Analysis date:** June 07, 2018

Checked and approved by:



Alexis St-Gelais, M.Sc., chimiste 2013-174

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*This report is digitally signed, it is only considered valid if the digital signature is intact.*

*PHYSICOCHEMICAL DATA*

**Physical aspect:** Clear liquid

**Refractive index:**  $1.4728 \pm 0.0003$  (20 °C)

*CONCLUSION*

No adulterant, contaminant or diluent has been detected using this method.

ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
2-Ethylfuran	tr	tr	Furan
Toluene	0.01	0.17*	Simple phenolic
Unknown	0.01	0.01	Unknown
Hexanal	tr	tr	Aliphatic aldehyde
(3Z)-Hexenol	0.03	0.03	Aliphatic alcohol
Hexanol	0.01	0.01	Aliphatic alcohol
Santene	1.57	1.58*	Monoterpene
Unknown	0.01	[0.17]*	Normonoterpene
Bornylene	0.01	[1.58]*	Monoterpene
Tricyclene	0.95	0.95	Monoterpene
$\alpha$ -Thujene	0.15	[0.17]*	Monoterpene
$\alpha$ -Pinene	13.87	13.87	Monoterpene
Camphene	6.38*	6.30	Monoterpene
$\alpha$ -Fenchene	[6.38]*	0.06	Monoterpene
Thuja-2,4(10)-diene	0.03	0.10*	Monoterpene
Benzaldehyde	tr	tr	Simple phenolic
meta-Cymene	0.03	1.68*	Monoterpene
$\beta$ -Pinene	32.14*	32.12	Monoterpene
Sabinene	[32.14]*	[0.10]*	Monoterpene
Unknown	0.01		Monoterpene
Myrcene	1.65	[1.68]*	Monoterpene
2-Carene	0.01	0.01	Monoterpene
$\alpha$ -Phellandrene	0.18*	0.16	Monoterpene
Pseudolimonene	[0.18]*	0.01	Monoterpene
(3Z)-Hexenyl acetate	14.02*	0.02	Aliphatic ester
$\Delta$ 3-Carene	[14.02]*	13.99	Monoterpene
$\alpha$ -Terpinene	0.15	0.15	Monoterpene
para-Cymene	0.12	0.13	Monoterpene
Limonene	13.47*	7.12	Monoterpene
$\beta$ -Phellandrene	[13.47]*	6.38*	Monoterpene
1,8-Cineole	[13.47]*	[6.38]*	Monoterpenic ether
(Z)- $\beta$ -Ocimene	tr	0.01	Monoterpene
(E)- $\beta$ -Ocimene	0.01	0.01	Monoterpene
$\gamma$ -Terpinene	0.27	0.28	Monoterpene
Unknown	tr	0.01	Oxygenated monoterpene
meta-Cymenene	0.01	0.01	Monoterpene
Fenchone	0.10	0.11	Aliphatic alcohol
Terpinolene	1.22*	1.07	Monoterpene
Isoterpinolene	[1.22]*	0.04	Monoterpene
$\gamma$ -Campholenal	[1.22]*	0.05	Aliphatic alcohol
para-Cymenene	[1.22]*	0.06	Monoterpene
Linalool	0.05	0.05	Monoterpenic alcohol
$\alpha$ -Thujone	0.01	0.01	Monoterpenic ketone
endo-Fenchol	0.07	0.08	Monoterpenic alcohol
cis-para-Menth-2-en-1-ol	0.02	0.02	Monoterpenic alcohol
$\alpha$ -Campholenal	0.02	0.03	Monoterpenic aldehyde
trans-Pinocarveol	0.06	0.09*	Monoterpenic alcohol
Camphor	0.14*	0.12*	Monoterpenic ketone

<i>trans</i> -para-Menth-2-en-1-ol	[0.14]*	0.02	Monoterpenic alcohol
Camphene hydrate	0.07	0.56*	Monoterpenic alcohol
meta-Mentha-4,6-dien-8-ol	0.02	0.26*	Monoterpenic alcohol
Isoborneol	0.01	0.01	Monoterpenic alcohol
Pinocamphone	0.02	0.02	Monoterpenic ketone
Myrtenyl methyl ether	0.02*	0.01	Monoterpenic ether
Pinocarvone	[0.02]*	0.03	Monoterpenic ketone
Borneol	0.39	0.99*	Monoterpenic alcohol
Isopinocamphone	0.03	0.03	Monoterpenic ketone
Terpinen-4-ol	0.20	0.18	Monoterpenic alcohol
Cryptone	0.03*	[0.09]*	Normonoterpenic ketone
meta-Cymen-8-ol	[0.03]*	tr	Monoterpenic alcohol
para-Cymen-8-ol	0.02	0.01	Monoterpenic alcohol
$\alpha$ -Terpineol	0.58	[0.99]*	Monoterpenic alcohol
Myrtenal	0.04	0.05	Monoterpenic aldehyde
Myrtenol	0.03	0.04	Monoterpenic alcohol
Methylchavicol	0.01	0.01	Phenylpropanoid
Verbenone	0.04	0.06*	Monoterpenic ketone
endo-Fenchyl acetate	0.04	0.03	Monoterpenic ester
Thymol methyl ether	0.01	[0.56]*	Monoterpenic ether
Citronellol	0.03	0.06*	Monoterpenic alcohol
Carvone	0.01	0.01	Monoterpenic ketone
Piperitone	0.10	0.12*	Monoterpenic ketone
Phellandral	0.02	0.07*	Monoterpenic aldehyde
Isopulegyl acetate	0.02		Monoterpenic ester
Bornyl acetate	8.80*	8.66	Monoterpenic ester
Isobornyl acetate	[8.80]*	0.02	Monoterpenic ester
2-Undecanone	0.02*	0.02	Aliphatic ketone
Methyl myrtenate	[0.02]*	0.01	Monoterpenic ester
<i>trans</i> -Pinocarvyl acetate	[0.02]*	tr	Monoterpenic ester
Thymol	0.04	0.03	Monoterpenic alcohol
Myrtenyl acetate	0.01	0.03*	Monoterpenic ester
$\alpha$ -Longipinene	0.06	0.06	Sesquiterpene
Citronellyl acetate	0.02	0.03	Monoterpenic ester
$\alpha$ -Copaene	0.03	[0.12]*	Sesquiterpene
Geranyl acetate	0.02	0.01	Monoterpenic ester
$\beta$ -Elemene	0.01	[0.56]*	Sesquiterpene
$\beta$ -Longipinene	0.01	0.02	Sesquiterpene
Longifolene	0.19	0.20	Sesquiterpene
$\beta$ -Caryophyllene	0.46	[0.56]*	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	0.02	[0.56]*	Sesquiterpene
$\alpha$ -Humulene	0.23	[0.26]*	Sesquiterpene
( <i>E</i> )- $\beta$ -Farnesene	0.04	[0.03]*	Sesquiterpene
$\gamma$ -Muuroolene	0.01	[0.06]*	Sesquiterpene
$\beta$ -Selinene	0.02	[0.12]*	Sesquiterpene
$\alpha$ -Selinene	0.01	[0.07]*	Sesquiterpene
$\alpha$ -Muuroolene	0.05*	0.04	Sesquiterpene
$\beta$ -Himachalene	[0.05]*	[0.12]*	Sesquiterpene
$\delta$ -Amorphene	0.05*	[0.07]*	Sesquiterpene
( <i>Z</i> )- $\alpha$ -Bisabolene	[0.05]*	0.01	Sesquiterpene
$\beta$ -Bisabolene	0.37*	0.35	Sesquiterpene
$\gamma$ -Cadinene	[0.37]*	0.03	Sesquiterpene

δ-Cadinene	0.02	0.02	Sesquiterpene
α-Calacorene	0.01	0.02	Sesquiterpene
(E)-α-Bisabolene	0.04	[0.06]*	Sesquiterpene
(E)-Nerolidol	0.03	0.02	Sesquiterpenic alcohol
Caryophyllene oxide	0.02	0.01	Sesquiterpenic ether
18-Norabieta-8,11,13-triene?	0.01		Norditerpene
(Z)-Abienol	0.02	0.02	Diterpenic alcohol
Ethyl α-linolenate?	0.05	0.03	Aliphatic ester
Isopimaral	0.02		Diterpenic aldehyde
Abietol?	0.03		Diterpenic alcohol
<b>Total identified</b>	<b>99.24%</b>	<b>99.07%</b>	

\*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

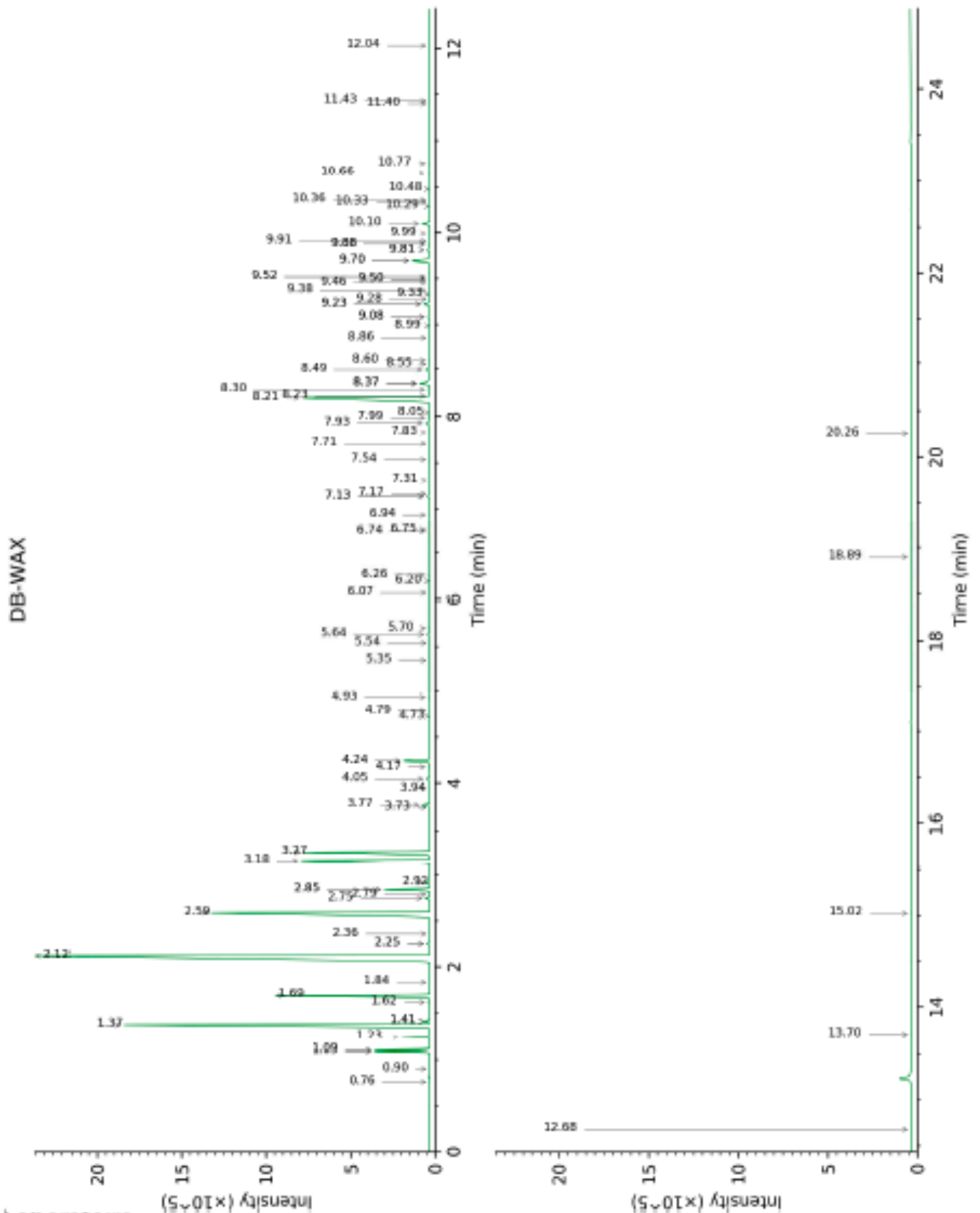
tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

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FULL ANALYSIS DATA

Identification	Column DB-5			Column DB-WAX		
	R.T	R.I	%	R.T	R.I	%
2-Ethylfuran	0.74	696	tr	0.90	920	tr
Toluene	1.11	755	0.01	1.41*	1004	0.17
Unknown [m/z 56, 45 (99), 41 (24), 84 (24), 69 (19), 43 (17)...]	1.36	792	0.01	0.76	889	0.01
Hexanal	1.39	797	tr	1.84	1046	tr
(3Z)-Hexenol	2.02	854	0.03	5.70	1347	0.03
Hexanol	2.21	870	0.01	5.35	1322	0.01
Santene	2.34	881	1.57	1.09*	951	1.58
Unknown [m/z 79, 93 (66), 94 (52), 91 (39), 77 (37), 122 (31)]	2.52	897	0.01	1.41*	1004	[0.17]
Bornylene	2.58	902	0.01	1.09*	951	[1.58]
Tricyclene	2.80	917	0.95	1.23	974	0.95
$\alpha$ -Thujene	2.91	925	0.15	1.41*	1004	[0.17]
$\alpha$ -Pinene	3.01	931	13.87	1.37	997	13.87
Camphene	3.19*	943	6.38	1.69	1032	6.30
$\alpha$ -Fenchene	3.19*	943	[6.38]	1.62	1024	0.06
Thuja-2,4(10)-diene	3.27	949	0.03	2.25*	1087	0.10
Benzaldehyde	3.33	953	tr	7.31	1465	tr
meta-Cymene	3.52	966	0.03	2.85*	1136	1.68
$\beta$ -Pinene	3.65*	974	32.14	2.12	1074	32.12
Sabinene	3.65*	974	[32.14]	2.25*	1087	[0.10]
Unknown [m/z 91, 119(65), 109 (51), 134 (47)]	3.84	988	0.01			
Myrcene	3.92	992	1.65	2.85*	1136	[1.68]
2-Carene	3.99	998	0.01	2.36	1097	0.01
$\alpha$ -Phellandrene	4.05*	1001	0.18	2.75	1129	0.16
Pseudolimonene	4.05*	1001	[0.18]	2.79	1132	0.01
(3Z)-Hexenyl acetate	4.17*	1009	14.02	4.79	1281	0.02
$\Delta$ 3-Carene	4.17*	1009	[14.02]	2.59	1117	13.99
$\alpha$ -Terpinene	4.25	1014	0.15	2.92	1142	0.15
para-Cymene	4.37	1022	0.12	4.05	1228	0.13
Limonene	4.46*	1028	13.47	3.18	1162	7.12
$\beta$ -Phellandrene	4.46*	1028	[13.47]	3.27*	1169	6.38
1,8-Cineole	4.46*	1028	[13.47]	3.27*	1169	[6.38]
(Z)- $\beta$ -Ocimene	4.65	1039	tr	3.73	1205	0.01
(E)- $\beta$ -Ocimene	4.80	1049	0.01	3.94	1220	0.01
$\gamma$ -Terpinene	4.92	1056	0.27	3.76	1208	0.28
Unknown [m/z 79, 93 (60), 43 (40), 94 (35), 137 (33), 77 (26), 91	5.09	1068	tr	4.73	1277	0.01

(20), 152 (18)]						
meta-Cymenene	5.28	1079	0.01	6.20	1383	0.01
Fenchone	5.31	1082	0.10	5.64	1342	0.11
Terpinolene	5.38*	1085	1.22	4.24	1242	1.07
Isoterpinolene	5.38*	1085	[1.22]	4.17	1237	0.04
γ-Campholenal	5.38*	1085	[1.22]	4.93	1291	0.05
para-Cymenene	5.38*	1085	[1.22]	6.26	1387	0.06
Linalool	5.61	1100	0.05	7.99	1516	0.05
α-Thujone	5.63	1101	0.01	6.07	1374	0.01
endo-Fenchol	5.75	1109	0.07	8.30	1540	0.08
cis-para-Menth-2-en-1-ol	5.88	1118	0.02	8.05	1520	0.02
α-Campholenal	5.93	1121	0.02	6.94	1437	0.03
trans-Pinocarveol	6.11	1132	0.06	9.08*	1601	0.09
Camphor	6.16*	1136	0.14	7.13*	1452	0.12
trans-para-Menth-2-en-1-ol	6.16*	1136	[0.14]	8.86	1584	0.02
Camphene hydrate	6.24	1141	0.07	8.36*	1545	0.56
meta-Mentha-4,6-dien-8-ol	6.29	1144	0.02	9.23*	1613	0.26
Isoborneol	6.40	1151	0.01	9.33	1622	0.01
Pinocamphone	6.43	1153	0.02	7.17	1454	0.02
Myrtenyl methyl ether	6.46*	1155	0.02	5.54	1336	0.01
Pinocarvone	6.46*	1155	[0.02]	7.83	1504	0.03
Borneol	6.55	1161	0.39	9.70*	1651	0.99
Isopinocamphone	6.64	1166	0.03	7.54	1482	0.03
Terpinen-4-ol	6.74	1173	0.20	8.49	1555	0.18
Cryptone	6.83*	1179	0.03	9.08*	1601	[0.09]
meta-Cymen-8-ol	6.83*	1179	[0.03]	11.40	1794	tr
para-Cymen-8-ol	6.88	1182	0.02	11.43	1797	0.01
α-Terpineol	6.96	1187	0.58	9.70*	1651	[0.99]
Myrtenal	7.04	1192	0.04	8.60	1563	0.05
Myrtenol	7.07	1194	0.03	10.77	1740	0.04
Methylchavicol	7.11	1196	0.01	9.28	1617	0.01
Verbenone	7.18	1201	0.04	9.52*	1637	0.06
endo-Fenchyl acetate	7.41	1217	0.04	6.76	1424	0.03
Thymol methyl ether	7.62	1231	0.01	8.36*	1545	[0.56]
Citronellol	7.66	1234	0.03	10.66*	1731	0.06
Carvone	7.72	1238	0.01	9.91	1669	0.01
Piperitone	7.87	1248	0.10	9.81*	1660	0.12
Phellandral	8.16	1267	0.02	9.88*	1666	0.07
Isopulegyl acetate	8.28	1275	0.02			
Bornyl acetate	8.42*	1285	8.80	8.21	1533	8.66
Isobornylacetate	8.42*	1285	[8.80]	8.23	1535	0.02
2-Undecanone	8.57*	1294	0.02	8.56	1560	0.02
Methylmyrtenate	8.57*	1294	[0.02]	9.46	1632	0.01
trans-Pinocarvyl	8.57*	1294	[0.02]	8.99	1594	tr

acetate						
Thymol	8.60	1296	0.04	15.02	2132	0.03
Myrtenyl acetate	8.97	1322	0.01	9.50*	1635	0.03
$\alpha$ -Longipinene	9.27	1343	0.06	6.74	1422	0.06
Citronellyl acetate	9.43	1355	0.02	9.38	1625	0.03
$\alpha$ -Copaene	9.59	1367	0.03	7.13*	1452	[0.12]
Geranyl acetate	9.82	1383	0.02	10.48	1715	0.01
$\beta$ -Elemene	9.85	1385	0.01	8.36*	1545	[0.56]
$\beta$ -Longipinene	9.90	1388	0.01	7.71	1495	0.02
Longifolene	10.00	1396	0.19	7.93	1511	0.20
$\beta$ -Caryophyllene	10.23	1412	0.46	8.36*	1545	[0.56]
<i>trans</i> - $\alpha$ - Bergamotene	10.51	1433	0.02	8.36*	1545	[0.56]
$\alpha$ -Humulene	10.68	1446	0.23	9.23*	1613	[0.26]
( <i>E</i> )- $\beta$ -Farnesene	10.84	1458	0.04	9.50*	1635	[0.03]
$\gamma$ -Muuroleone	11.01	1470	0.01	9.52*	1637	[0.06]
$\beta$ -Selinene	11.12	1478	0.02	9.81*	1660	[0.12]
$\alpha$ -Selinene	11.20	1485	0.01	9.88*	1666	[0.07]
$\alpha$ -Muuroleone	11.32*	1494	0.05	9.99	1675	0.04
$\beta$ -Himachalene	11.32*	1494	[0.05]	9.81*	1660	[0.12]
$\delta$ -Amorphene	11.43*	1502	0.05	9.88*	1666	[0.07]
( <i>Z</i> )- $\alpha$ -Bisabolene	11.43*	1502	[0.05]	10.29	1700	0.01
$\beta$ -Bisabolene	11.49*	1506	0.37	10.10	1684	0.35
$\gamma$ -Cadinene	11.49*	1506	[0.37]	10.33	1703	0.03
$\delta$ -Cadinene	11.66	1520	0.02	10.36	1705	0.02
$\alpha$ -Calacorene	11.86	1535	0.01	12.04	1850	0.02
( <i>E</i> )- $\alpha$ -Bisabolene	11.93	1541	0.04	10.66*	1731	[0.06]
( <i>E</i> )-Nerolidol	12.21	1563	0.03	13.70	2003	0.02
Caryophyllene oxide	12.33	1573	0.02	12.68	1908	0.01
18-Norabieta- 8,11,13-triene?	17.19	2000	0.01			
( <i>Z</i> )-Abienol	18.52	2134	0.02	20.26	2713	0.02
Ethyl $\alpha$ - linolenate?	18.82	2165	0.05	18.89	2550	0.03
Isopimaral	19.12	2196	0.02			
Abietol?	20.41	2336	0.03			
<b>Total identified</b>		<b>99.24%</b>			<b>99.07%</b>	
<b>Total reported</b>		<b>99.26%</b>			<b>99.08%</b>	

\*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

tr: The compound has been detected below 0.005% of total signal.

Note: no correction factor was applied

R.T.: Retention time (minutes)

R.I.: Retention index