

## GC-MS Profiling Analysis Prepared for Jade Bloom, Inc

**Date:** February 2, 2018  
**Sample:** Pine Needle  
**Type:** Essential Oil  
**Source:** *Pinus sylvestris*  
**Batch:** 011749POS1

### ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
Toluene	tr	0.01	Simple phenolic
Hexanal	tr	0.02	Aliphatic aldehyde
Santene	0.07	0.07	Monoterpene
Tricyclene	0.12	0.12	Monoterpene
$\alpha$ -Thujene	0.03	0.04	Monoterpene
$\alpha$ -Pinene	52.68	52.69	Aliphatic alcohol
Camphene	1.18*	1.15	Monoterpene
$\alpha$ -Fenchene	[1.18]*	0.04	Monoterpene
Thuja-2,4(10)-diene	0.03	0.06*	Monoterpene
Unknown	0.01		Monoterpene
Sabinene	10.15*	[0.06]*	Monoterpene
$\beta$ -Pinene	[10.15]*	10.11	Monoterpene
Unknown	0.10	0.08	Monoterpene
Myrcene	5.13	5.15	Monoterpene
$\alpha$ -Phellandrene	0.34	0.31	Monoterpene
Pseudolimonene	0.08	0.12	Monoterpene
$\Delta$ 3-Carene	11.08	11.13	Monoterpene
$\alpha$ -Terpinene	0.36	0.35	Monoterpene
para-Cymene	1.08	1.08	Monoterpene
Limonene	9.76*	8.76	Monoterpene
$\beta$ -Phellandrene	[9.76]*	1.02	Monoterpene
1,8-Cineole	[9.76]*	0.03	Monoterpenic ether
(Z)- $\beta$ -Ocimene	0.01	0.01	Monoterpene
(E)- $\beta$ -Ocimene	0.01	0.01	Monoterpene
$\gamma$ -Terpinene	0.05	0.05	Monoterpene
Unknown	0.01	0.01	Oxygenated monoterpene
Terpinolene	0.59	0.57	Monoterpene
$\alpha$ -Pinene oxide	0.03	0.02	Monoterpenic ether
Linalool	0.03	0.03	Monoterpenic alcohol
endo-Fenchol	0.05	2.34*	Monoterpenic alcohol
$\alpha$ -Campholenal	0.01	0.01	Monoterpenic aldehyde
trans-Pinocarveol	0.06*	0.09*	Monoterpenic alcohol
1-Terpineol	[0.06]*	0.01	Monoterpenic alcohol
trans-Verbenol	0.05	0.05	Monoterpenic alcohol
Isoborneol	0.01	0.02	Monoterpenic alcohol
Borneol	0.09	0.66*	Monoterpenic alcohol
Terpinen-4-ol	0.03	0.04	Monoterpenic alcohol
para-Cymen-8-ol	0.02	0.03	Monoterpenic alcohol
$\alpha$ -Terpineol	0.57	[0.66]*	Monoterpenic alcohol
Myrtenol	0.03	0.03	Monoterpenic alcohol
Methylchavicol	0.03	0.03	Phenylpropanoid
Verbenone	0.03	0.02	Monoterpenic ketone
trans-Carveol	0.01	0.01	Monoterpenic alcohol
Thymol methyl ether	0.02	0.02	Monoterpenic ether
Bornyl acetate	0.76*	0.78	Monoterpenic ester
Isobornyl acetate	[0.76]*	0.03	Monoterpenic ester
$\alpha$ -Longipinene	0.08	0.14*	Sesquiterpene
$\alpha$ -Cubebene	0.05	[0.14]*	Sesquiterpene

Longicyclene	0.03	0.02	Sesquiterpene
$\alpha$ -Ylangene	0.01	0.02	Sesquiterpene
$\alpha$ -Copaene	0.11	0.12	Sesquiterpene
$\beta$ -Bourbonene	tr	0.01	Sesquiterpene
Geranyl acetate	0.03	0.03	Monoterpenic ester
$\beta$ -Longipinene	0.01	0.01	Sesquiterpene
Longifolene	0.75	0.77	Sesquiterpene
$\beta$ -Caryophyllene	2.26	[2.34]*	Sesquiterpene
$\alpha$ -Humulene	0.18	0.18	Sesquiterpene
<i>trans</i> -Cadina-1(6),4-diene	0.04	[0.09]*	Sesquiterpene
Germacrene D	0.01	0.01	Sesquiterpene
$\beta$ -Himachalene	0.01	[0.66]*	Sesquiterpene
$\alpha$ -Muurolene	0.03	0.03	Sesquiterpene
$\gamma$ -Cadinene	0.02	0.14*	Sesquiterpene
$\delta$ -Cadinene	0.18*	[0.14]*	Sesquiterpene
Zonarene	[0.18]*	0.04	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.02	0.02	Sesquiterpene
$\alpha$ -Elemol	0.05	0.04	Sesquiterpenic alcohol
Caryophyllene oxide isomer	0.12*	0.03	Sesquiterpenic ether
Caryophyllene oxide	[0.12]*	0.09	Sesquiterpenic ether
Longiborneol	0.01	0.01	Sesquiterpenic alcohol
Guaiol	0.03	0.04*	Sesquiterpenic alcohol
Humulene epoxide II	0.01	0.01	Sesquiterpenic ether
10-epi- $\gamma$ -Eudesmol	0.01	[0.04]*	Sesquiterpenic alcohol
1-epi-Cubenol	0.01	0.01	Sesquiterpenic alcohol
$\beta$ -Eudesmol	0.02	0.01	Sesquiterpenic alcohol
Bulnesol	0.05	0.04	Sesquiterpenic alcohol
meta-Camphorene	0.04	0.04	Diterpene
Beyerene	0.02		Diterpene
para-Camphorene	0.01	0.01	Diterpene
<b>Total identified</b>	<b>98.84%</b>	<b>98.98%</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

#### PHYSICO-CHEMICAL DATA

**Physical aspect:** Clear liquid

**Refractive index:** 1.4703  $\pm$  0.0003 (20 °C)

#### CONCLUSION

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

