

# GC-MS Profiling Analysis

## Prepared for Jade Bloom, Inc

**Date:** September 26, 2018  
**Sample:** Melissa  
**Type:** Essential Oil  
**Source:** *Melissa officinalis*  
**Batch:** 180871262

### PHYSICOCHEMICAL DATA

**Physical aspect:** Light yellow liquid  
**Refractive index:** 1.4855 ± 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-Methyl-3-buten-2-ol	0.01	0.01	Aliphatic alcohol
Methylcyclopentane	0.01	0.01	Alkane
Isovaleral	0.14	0.14	Aliphatic aldehyde
2-Methylbutyral	0.07	0.08*	Aliphatic aldehyde
Penten-3-ol	tr	tr	Aliphatic alcohol
2-Ethylfuran	0.03	0.03	Furan
Isoamyl alcohol	0.03	0.01	Aliphatic alcohol
2-Methylbutanol	0.02	0.04	Aliphatic alcohol
Toluene	tr	tr	Simple phenolic
Hexanal	0.01	0.01	Aliphatic aldehyde
(2E)-Hexenal	0.05	0.05	Aliphatic aldehyde
(3Z)-Hexenal	0.06	0.07	Aliphatic alcohol
cis-1-Methyl-3-(1-methylethyl)-cyclopentane?	0.01	[0.08]*	Normonoterpene
trans-1-Methyl-3-(1-methylethyl)-cyclopentane?	tr		Normonoterpene
(2E)-Hexenal	0.02	0.01	Aliphatic alcohol
Hexanol	0.04	0.03	Aliphatic alcohol
2-Methylbutyric acid	0.01	4.54*	Aliphatic acid
trans-2,5-Diethyltetrahydrofuran	0.01	0.01	Furan
Heptanal	0.01	tr	Aliphatic aldehyde
α-Thujene	tr	tr	Monoterpene
α-Pinene	0.09	0.09	Monoterpene
Camphene	0.02	0.02	Monoterpene
Benzaldehyde	0.02	0.03	Simple phenolic
Ethyl isohexanoate	0.01		Aliphatic ester
Sabinene	0.06*	0.04	Monoterpene
β-Pinene	[0.06]*	0.02	Monoterpene
Octen-3-ol	0.38	0.40	Aliphatic alcohol
Octan-3-one	1.91*	1.03*	Aliphatic ketone
6-Methyl-5-hepten-2-one	[1.91]*	1.70	Aliphatic ketone
Myrcene	0.19	0.18	Monoterpene
6-Methyl-5-hepten-2-ol	0.02	0.01	Aliphatic alcohol
Octan-3-ol	0.04	0.06	Aliphatic alcohol
α-Phellandrene	0.02*	0.01	Monoterpene
Ethyl hexanoate	[0.02]*	0.13*	Aliphatic ester
Octanal	0.01	tr	Aliphatic aldehyde
Δ <sup>3</sup> -Carene	0.04*	tr	Monoterpene
(3Z)-Hexenyl acetate	[0.04]*	0.04	Aliphatic ester
α-Terpinene	0.01	0.01	Monoterpene
Hexyl acetate	0.01	0.01	Aliphatic ester
para-Cymene	0.01	0.01	Monoterpene
Limonene	0.42*	0.40	Monoterpene
1,8-Cineole	[0.42]*	0.01	Monoterpenic ether
Unknown	0.01	0.01	Unknown
Unknown	0.02	0.02	Unknown
Lavender lactone	tr	0.12	Aliphatic lactone
Benzyl alcohol	tr	tr	Simple phenolic

(Z)- $\beta$ -Ocimene	0.16	[0.13]*	Monoterpene
(E)- $\beta$ -Ocimene	1.03	[1.03]*	Monoterpene
2,6-Dimethyl-5-heptenal (melonal)	0.03	0.03	Aliphatic aldehyde
$\gamma$ -Terpinene	0.01	0.01	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	0.01	0.03	Monoterpenic alcohol
Terpinolene	0.03*	0.01	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	[0.03]*	0.35	Monoterpenic alcohol
Rosefuran	0.16	0.17	Monoterpenic ether
Linalool	0.59	0.60*	Monoterpenic alcohol
Nonanal	0.14	0.15	Aliphatic aldehyde
<i>cis</i> -Rose oxide	0.06	0.06	Monoterpenic ether
Phenylethyl alcohol	tr	0.01	Simple phenolic
<i>trans</i> - <i>para</i> -Mentha-2,8-dien-1-ol	0.03*	0.04	Monoterpenic alcohol
Unknown	[0.03]*	0.03	Unknown
<i>trans</i> -Rose oxide	0.03	0.03	Monoterpenic ether
Melonol ?	0.01		Normonoterpene
<i>cis</i> - <i>para</i> -Mentha-2,8-dien-1-ol	0.33*	19.67*	Monoterpenic alcohol
Unknown	[0.33]*	0.25	Unknown
Isopulegol	0.08*	0.20*	Monoterpenic alcohol
neo-Isopulegol	[0.08]*	[0.20]*	Monoterpenic alcohol
exo-Isocitral	0.62*	0.09*	Monoterpenic aldehyde
<i>trans</i> -Chrysanthemal	[0.62]*	0.56	Monoterpenic aldehyde
<i>trans</i> -Chrysanthemol	5.49*	0.09	Monoterpenic alcohol
Citronellal	[5.49]*	5.10	Monoterpenic aldehyde
iso-Isopulegol	0.02	[0.60]*	Monoterpenic alcohol
(2E)-Nonenal	0.01	0.01	Aliphatic aldehyde
<i>cis</i> -Linalool oxide (pyr.)	0.61*	0.35*	Monoterpenic alcohol
Isoneral	[0.61]*	0.45	Monoterpenic aldehyde
$\alpha$ -Cyclogeraniol?	0.14*		Monoterpenic alcohol
Rosefuran oxide	[0.14]*	17.21*	Monoterpenic ether
Terpinen-4-ol	0.09*	0.12	Monoterpenic alcohol
Unknown	[0.09]*	0.17*	Oxygenated monoterpene
<i>trans</i> -Linalool oxide (pyr.)	0.90*	2.28*	Monoterpenic alcohol
Isogeraniol	[0.90]*	0.57*	Monoterpenic aldehyde
$\alpha$ -Terpineol	0.15	0.14	Monoterpenic alcohol
$\beta$ -Phellandren-8-ol	0.01	0.05	Monoterpenic alcohol
<i>trans</i> -Isopiperitenol	0.02	0.04	Monoterpenic alcohol
Unknown	0.04		Oxygenated monoterpene
Unknown	0.04		Oxygenated monoterpene
Nerol	0.72	0.78	Monoterpenic alcohol
Citronellol	0.74	0.77*	Monoterpenic alcohol
Neral	19.63	[19.67]*	Monoterpenic aldehyde
Piperitone	0.04	0.04	Monoterpenic ketone
Geraniol	1.57	1.58	Monoterpenic alcohol
Methyl citronellate	0.52	0.63	Monoterpenic ester
Geraniol	26.80	27.06	Monoterpenic aldehyde
Unknown	0.11		Unknown
Unknown	0.19	0.14	Oxygenated monoterpene
Thymol	0.05*	0.13*	Monoterpenic alcohol
Unknown	[0.05]*		Oxygenated monoterpene
Geranyl formate	0.01	[4.54]*	Monoterpenic ester
Carvacrol	tr	0.02	Monoterpenic alcohol

Methyl geranate	0.50	0.58	Monoterpenic ester
Citronellic acid	0.13*	0.07*	Monoterpenic acid
Unknown	[0.13]*	0.18*	Unknown
Neric acid	0.06	0.09	Monoterpenic acid
Citronellyl acetate	0.02	[19.67]*	Monoterpenic ester
Eugenol	0.04	0.06	Phenylpropanoid
$\alpha$ -Ylangene	0.11*	0.02	Sesquiterpene
Neryl acetate	[0.11]*	0.12	Monoterpenic ester
$\alpha$ -Copaene	0.65	0.45	Sesquiterpene
Geranic acid	[0.65]	0.26	Aliphatic acid
$\beta$ -Bourbonene	0.27*	[0.09]*	Sesquiterpene
1,5-diepi- $\beta$ -Bourbonene	[0.27]*	0.03	Sesquiterpene
Geranyl acetate	2.21	[2.28]*	Monoterpenic ester
$\beta$ -Cubebene	0.23*	0.27	Sesquiterpene
$\beta$ -Elemene	[0.23]*	[17.21]*	Sesquiterpene
Isocaryophyllene	0.01	[0.57]*	Sesquiterpene
$\beta$ -Caryophyllene	16.89	[17.21]*	Sesquiterpene
$\beta$ -Copaene	0.09	0.02	Sesquiterpene
(Z)- $\beta$ -Farnesene?	0.02	tr	Sesquiterpene
Isogermacrene D	0.03	0.03	Sesquiterpene
$\alpha$ -Humulene	1.04	1.07	Sesquiterpene
allo-Aromadendrene	0.10	0.13	Sesquiterpene
(E)- $\beta$ -Farnesene	0.22	[19.67]*	Sesquiterpene
$\gamma$ -Muurolene	4.68*	[0.17]*	Sesquiterpene
Germacrene D	[4.68]*	[4.54]*	Sesquiterpene
$\alpha$ -Muurolene	0.51	0.17	Sesquiterpene
(3Z,6E)- $\alpha$ -Farnesene	0.15	0.11	Sesquiterpene
(3E,6E)- $\alpha$ -Farnesene	0.44*	[1.06]*	Sesquiterpene
$\gamma$ -Cadinene	[0.44]*	1.06	Sesquiterpene
$\delta$ -Cadinene	0.72	[1.06]*	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.03	[0.77]*	Sesquiterpene
$\alpha$ -Cadinene	0.07	0.08	Sesquiterpene
Isocaryophyllene epoxide B	0.07	0.08	Sesquiterpenic ether
Germacrene D-4-ol	0.18	0.18	Sesquiterpenic alcohol
Caryophyllene oxide	1.39	1.21	Sesquiterpenic ether
Fokienol	0.12*	[0.13]*	Terpenic alcohol
Humulene epoxide II	[0.12]*	0.05	Sesquiterpenic ether
Junenol	0.03*	0.11	Sesquiterpenic alcohol
10-epi-Cubenol	[0.03]*	0.01	Sesquiterpenic alcohol
1-epi-Cubenol	0.02	0.02	Sesquiterpenic alcohol
Caryophylladienol I	0.02	0.02	Sesquiterpenic alcohol
Caryophylladienol II	0.05	[0.07]*	Sesquiterpenic alcohol
$\tau$ -Cadinol	0.23*	0.10	Sesquiterpenic alcohol
$\tau$ -Muurolol	[0.23]*	[0.13]*	Sesquiterpenic alcohol
$\alpha$ -Muurolol	0.06	0.04	Sesquiterpenic alcohol
$\alpha$ -Cadinol	0.26	0.29	Sesquiterpenic alcohol
(3Z)-Caryophylla-3,8(13)-dien-5 $\beta$ -ol	0.05	0.05	Sesquiterpenic alcohol
Unknown	0.03*	0.02	Oxygenated sesquiterpene
Unknown	[0.03]*	0.01	Oxygenated sesquiterpene
Heptadecane	0.01	[0.35]*	Alkane
Eremophilone	0.01	0.01	Sesquiterpenic ketone
(2E,6E)-Farnesal	0.02	0.02	Sesquiterpenic aldehyde

Phytone	0.08	0.01	Terpenic ketone
<i>trans</i> -9-Nonadecene	0.01	[0.18]*	Alkene
Nonadecane	0.03	0.02	Alkane
Eicosane	0.02	0.02	Alkane
Heneicosane	0.04	0.02	Alkane
<b>Total identified</b>	<b>96.59%</b>	<b>96.03%</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