

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

**Date:** April 12, 2018

**Sample:** Marjoram

**Type:** Essential Oil

**Source:** *Origanum majorana* ct. Sabinene hydrate/terpinen-4-ol

**Batch:** 17020/8

### ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
2-Methyl-3-buten-2-ol	tr		Aliphatic alcohol
Isovaleral	tr	0.01	Aliphatic aldehyde
Isoamyl alcohol	tr	0.01*	Aliphatic alcohol
2-Methylbutanol	tr	[0.01]*	Aliphatic alcohol
Methyl 2-methylbutyrate	0.03	0.03*	Aliphatic ester
(2E)-Hexenal	0.02*	tr	Aliphatic aldehyde
Ethyl isovalerate	[0.02]*	tr	Aliphatic ester
(3Z)-Hexenol	0.02	0.01	Aliphatic alcohol
(2E)-Hexenol	0.01	0.01	Aliphatic alcohol
Hashishene	0.01	0.84*	Monoterpene
Tricyclene	tr	[0.03]*	Monoterpene
$\alpha$ -Thujene	0.61	0.61	Monoterpene
$\alpha$ -Pinene	0.83	[0.84]*	Monoterpene
Camphene	0.03*	0.03	Monoterpene
$\alpha$ -Fenchene	[0.03]*	tr	Monoterpene
Thuja-2,4(10)-diene	tr	8.10*	Monoterpene
$\beta$ -Pinene	8.56*	0.46	Monoterpene
Sabinene	[8.56]*	[8.10]*	Monoterpene
3-Methyl-3-cyclohexenone?	0.01	0.01	Aliphatic ketone
3-Methylpentyl acetate	0.01	12.95*	Aliphatic ester
Octan-3-one	0.04	0.03	Aliphatic ketone
Myrcene	2.10	2.10	Monoterpene
$\alpha$ -Phellandrene	0.36*	0.29	Monoterpene
Pseudolimonene	[0.36]*	0.06	Monoterpene
$\Delta^3$ -Carene	tr	tr	Monoterpene
(3Z)-Hexenyl acetate	0.01	0.01	Aliphatic ester
$\alpha$ -Terpinene	7.75	7.76	Monoterpene
Carvomenthene	0.01	0.01	Aliphatic alcohol
para-Cymene	1.65	1.68	Monoterpene
1,8-Cineole	3.95*	1.87*	Monoterpenic ether
$\beta$ -Phellandrene	[3.95]*	[1.87]*	Monoterpene
Limonene	[3.95]*	2.11	Monoterpene
(Z)- $\beta$ -Ocimene	0.03	[12.95]*	Monoterpene
(E)- $\beta$ -Ocimene	0.04	0.05	Monoterpene
$\gamma$ -Terpinene	12.92	[12.95]*	Monoterpene
cis-Sabinene hydrate	3.52	3.55	Monoterpenic alcohol
Terpinolene	2.92*	2.92	Monoterpene
para-Cymenene	[2.92]*	0.01	Monoterpene
trans-Sabinene hydrate	15.00	15.04*	Monoterpenic alcohol
Unknown	0.90*	0.01	Oxygenated monoterpene
Linalool	[0.90]*	0.86	Monoterpenic alcohol
Unknown	0.04	26.16*	Monoterpenic alcohol
$\alpha$ -Campholenal	1.50*	0.05*	Monoterpenic aldehyde
cis-para-Menth-2-en-1-ol	[1.50]*	1.52	Monoterpenic alcohol
4-Hydroxy-4-methylcyclohex-2-enone	0.01	0.01	Aliphatic alcohol
trans-Pinocarveol	0.09	0.09	Monoterpenic alcohol
trans-para-Menth-2-en-1-ol	0.86	0.88	Monoterpenic alcohol

Epoxyterpinolene	0.01	0.02	Monoterpenic ether
1,4-Dimethyl-4-acetylcyclohexene	0.05*	0.01	Monoterpenic ketone
Unknown	[0.05]*	0.03	Unknown
Pinocarvone	0.01	[15.04]*	Monoterpenic ketone
Isomenthone	0.03	[0.05]*	Monoterpenic ketone
Borneol	0.01	3.23*	Monoterpenic alcohol
δ-Terpineol	0.04	0.01	Monoterpenic alcohol
Terpinen-4-ol	23.89	[26.16]*	Monoterpenic alcohol
Cryptone	0.08	0.04	Normonoterpenic ketone
para-Cymen-8-ol	0.07	0.14	Monoterpenic alcohol
α-Terpineol	3.17	[3.23]*	Monoterpenic alcohol
cis-Piperitol	0.44*	0.32*	Monoterpenic alcohol
trans-Dihydrocarvone	[0.44]*	0.06	Monoterpenic ketone
Methylchavicol	[0.44]*	0.10*	Phenylpropanoid
Unknown	0.06	0.06*	Unknown
trans-Piperitol	0.48	0.48	Monoterpenic alcohol
trans-Carveol	0.02	0.04	Monoterpenic alcohol
Nerol	0.04	[0.06]*	Monoterpenic alcohol
Unknown	0.17*	0.02	Oxygenated monoterpene
Citronellol	[0.17]*	0.18	Monoterpenic alcohol
Carvone	0.02*	0.01	Monoterpenic ketone
Neral	[0.02]*	[0.32]*	Monoterpenic aldehyde
trans-Sabinene hydrate acetate	0.19	0.17	Monoterpenic ester
Geraniol	1.78*	0.02	Monoterpenic alcohol
Linalyl acetate	[1.78]*	1.60	Monoterpenic ester
Geranial	0.08	1.05*	Monoterpenic aldehyde
Citronellyl formate	0.04	0.04	Monoterpenic ester
Unknown	tr	0.01	Unknown
Bornyl acetate	0.02	0.01	Monoterpenic ester
cis-Ascaridole glycol?	0.04	0.01	Monoterpenic alcohol
Terpinen-4-yl acetate	0.07*	0.07	Monoterpenic ester
Thymol analogue I	[0.07]*	0.01	Monoterpenic alcohol
Thymol	0.03	0.01	Monoterpenic alcohol
Thymol analogue II	0.04	0.02	Monoterpenic alcohol
Unknown	0.02		Monoterpenic alcohol
Unknown	0.09	0.01	Monoterpenic alcohol
Bicycloelemene	0.02	0.02	Sesquiterpene
Eugenol	0.02	0.08	Phenylpropanoid
Neryl acetate	0.03	0.03	Monoterpenic ester
Geranyl acetate	0.05	0.09	Monoterpenic ester
β-Caryophyllene	2.19	[26.16]*	Sesquiterpene
Aromadendrene	0.03	[26.16]*	Sesquiterpene
trans-α-Bergamotene	0.01	[26.16]*	Sesquiterpene
α-Humulene	0.11	[0.10]*	Sesquiterpene
allo-Aromadendrene	0.01	0.02	Sesquiterpene
Germacrene D	0.03	[3.23]*	Sesquiterpene
(1S,2S,4S)-para-Menthane-1,2,4-triol	tr		Monoterpenic alcohol
Viridiflorene	1.07*	0.02	Sesquiterpene
Bicyclgermacrene	[1.07]*	[1.05]*	Sesquiterpene
γ-Cadinene	0.05*	0.02	Sesquiterpene
(3E,6E)-α-Farnesene	[0.05]*	0.03	Sesquiterpene
δ-Cadinene	0.02	0.01	Sesquiterpene



Isocaryophyllene epoxide B	0.01	0.01	Sesquiterpenic ether
Spathulenol	0.05	0.06	Sesquiterpenic alcohol
Caryophyllene oxide	0.07	0.06	Sesquiterpenic ether
Viridiflorol	0.01	tr	Sesquiterpenic alcohol
10-epi- $\gamma$ -Eudesmol	0.05	0.05	Sesquiterpenic alcohol
Isospathulenol	0.06	0.06	Sesquiterpenic alcohol
$\tau$ -Cadinol	0.03	0.02	Sesquiterpenic alcohol
$\alpha$ -Cadinol	0.01	0.01	Sesquiterpenic alcohol
Unknown	0.02	0.01	Diterpene
<b>Total identified</b>	<b>98.53%</b>	<b>98.46%</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

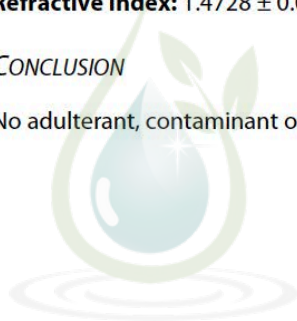
#### PHYSICOCHEMICAL DATA

**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.



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