

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

**Date:** February 22, 2018

**Sample:** Ravensara

**Type:** Essential Oil

**Source:** *Ravensara aromatica*

**Batch:** 11-21917

Identification	DB-5 (%)	DB-WAX (%)	Classe
Ethanol	0.01	0.01	Aliphatic alcohol
Isovaleral	0.01	0.01	Aliphatic aldehyde
2-Methylbutyral	0.01	0.01	Aliphatic aldehyde
Penten-3-ol	tr		Aliphatic alcohol
2-Ethylfuran	0.01	0.01	Furan
Isoamyl alcohol	0.01	tr*	Aliphatic alcohol
2-Methylbutanol	tr	[tr]*	Aliphatic alcohol
Toluene	tr	tr	Simple phenolic
Methyl 2-methylbutyrate	tr	tr	Aliphatic ester
Hexanal	0.01	0.01	Aliphatic aldehyde
(3Z)-Hexenol	0.03	0.03*	Aliphatic alcohol
Hexanol	0.01	0.01	Aliphatic alcohol
2-Heptanone	tr	tr	Aliphatic ketone
Bornylene	tr	tr	Monoterpene
2-Heptanol	0.01	0.01	Aliphatic alcohol
Tricyclene	0.01	0.01	Monoterpene
$\alpha$ -Thujene	0.73	0.74	Monoterpene
$\alpha$ -Pinene	3.81	3.83	Monoterpene
Camphene	1.13*	1.04	Monoterpene
$\alpha$ -Fenchene	[1.13]*	0.09	Monoterpene
Sabinene	10.25*	8.26	Monoterpene
$\beta$ -Pinene	[10.25]*	2.06	Monoterpene
Myrcene	4.18	4.22	Monoterpene
2-Carene	0.02	0.02	Monoterpene
$\alpha$ -Phellandrene	3.41	3.45	Monoterpene
$\Delta$ 3-Carene	5.87	5.91	Monoterpene
Pseudolimonene	0.91	0.90	Monoterpene
$\alpha$ -Terpinene	0.83	0.81	Monoterpene
ortho-Cymene	0.12	0.10	Simple phenolic
para-Cymene	0.37	0.35	Monoterpene
Limonene	19.20*	16.85	Monoterpene
$\beta$ -Phellandrene	[19.20]*	1.89	Monoterpene
1,8-Cineole	[19.20]*	0.52	Monoterpenic ether
(Z)- $\beta$ -Ocimene	1.64	1.70*	Monoterpene
2-Heptyl acetate	0.06	0.08*	Aliphatic ester
(E)- $\beta$ -Ocimene	0.20	0.20	Monoterpene
Unknown	0.04	[1.70]*	Monoterpene
$\gamma$ -Terpinene	1.05	1.03	Monoterpene
cis-Sabinene hydrate	0.06	0.12*	Monoterpenic alcohol
cis-Linalool oxide (fur.)	0.02	0.02	Monoterpenic alcohol
Isoterpinolene	0.02	[0.08]*	Monoterpene
Terpinolene	0.52*	0.50	Monoterpene
para-Cymenene	[0.52]*	0.01	Monoterpene
trans-Linalool oxide (fur.)	[0.52]*	[0.12]*	Monoterpenic alcohol
2-Nonanone	0.01	[0.03]*	Aliphatic ketone
trans-Sabinene hydrate	0.06	0.06	Monoterpenic alcohol
Linalool	4.79	4.77	Monoterpenic alcohol
(3E)-2,7-Dimethyl-3,6-octadien-2-ol	0.01	0.04	Monoterpenic alcohol

Unknown	0.04		Monoterpene
<i>cis</i> -para-Menth-2-en-1-ol	0.09	0.08	Monoterpenic alcohol
allo-Ocimene	0.04	0.04	Monoterpene
<i>cis</i> -para-Mentha-2,8-dien-1-ol	0.01	0.04	Monoterpenic alcohol
<i>trans</i> -para-Menth-2-en-1-ol	0.05	0.08*	Monoterpenic alcohol
Borneol	0.24	8.50*	Monoterpenic alcohol
Terpinen-4-ol	1.92	1.93*	Monoterpenic alcohol
$\alpha$ -Terpineol	0.35	[8.50]*	Monoterpenic alcohol
Methylchavicol	2.62	[3.89]	Phenylpropanoid
$\alpha$ -Phellandrene epoxide	0.02	0.02*	Monoterpenic ether
<i>trans</i> -Piperitol	0.04	0.63*	Monoterpenic alcohol
<i>trans</i> -Carveol	tr	0.01	Monoterpenic alcohol
Nerol	0.02	[0.02]*	Monoterpenic alcohol
Carvone	0.01	0.26*	Monoterpenic ketone
Piperitone	0.02	0.09	Monoterpenic ketone
Bornyl acetate	0.24	0.23	Monoterpenic ester
Dihydroedulan I	0.10	1.53*	Terpenic ether
$\delta$ -Elemene isomer	0.04	[0.12]*	Sesquiterpene
$\delta$ -Elemene	0.86	0.85*	Sesquiterpene
$\alpha$ -Cubebene	0.62	0.52	Sesquiterpene
Eugenol	0.16	0.19	Phenylpropanoid
Cyclosativene I	0.01	[0.85]*	Sesquiterpene
Cyclosativene II	0.10*	0.01	Sesquiterpene
$\alpha$ -Ylangene	[0.10]*	0.10	Sesquiterpene
Neryl acetate	[0.10]*	0.02	Monoterpenic ester
$\alpha$ -Copaene	1.55	[1.53]*	Sesquiterpene
$\beta$ -Bourbonene	0.08	0.08	Sesquiterpene
$\beta$ -Cubebene	0.62	0.62	Sesquiterpene
$\beta$ -Elemene	0.93	6.56*	Sesquiterpene
Methyleugenol	5.07	5.05*	Phenylpropanoid
$\beta$ -Caryophyllene	5.87	[6.56]*	Sesquiterpene
$\beta$ -Copaene	0.12	0.10	Sesquiterpene
$\gamma$ -Elemene	0.04	0.51*	Sesquiterpene
Aromadendrene	0.03	[1.93]*	Sesquiterpene
6,9-Guaiadiene	0.09*	[1.93]*	Sesquiterpene
$\alpha$ -Guaiene	[0.09]*	[6.56]*	Sesquiterpene
Isogermacrene D	0.02	[0.08]*	Sesquiterpene
<i>trans</i> -Muurolo-3,5-diene	0.16	0.17	Sesquiterpene
$\alpha$ -Humulene	1.25	3.89*	Sesquiterpene
allo-Aromadendrene	0.45	[0.51]*	Sesquiterpene
<i>cis</i> -Muurolo-4(15),5-diene	0.17	[3.89]*	Sesquiterpene
<i>trans</i> -Cadin-1(6),4-diene	0.15	0.12	Sesquiterpene
Germacrene D	8.50*	[8.50]*	Sesquiterpene
$\gamma$ -Muurolole	[8.50]*	0.53	Sesquiterpene
$\beta$ -Selinene	0.17	0.15	Sesquiterpene
$\delta$ -Selinene	0.29	0.10	Sesquiterpene
epi-Cubebol	0.81*	0.13	Sesquiterpenic alcohol
$\gamma$ -Amorphene	[0.81]*	[8.50]*	Sesquiterpene
Bicyclgermacrene	[0.81]*	0.47	Sesquiterpene
$\alpha$ -Muurolole	0.26	[0.26]*	Sesquiterpene
$\delta$ -Amorphene	0.38	0.25	Sesquiterpene
$\gamma$ -Cadinene	0.36	[0.63]*	Sesquiterpene

7-epi- $\alpha$ -Selinene	0.08	1.37*	Sesquiterpene
$\delta$ -Cadinene	1.44*	[1.37]*	Sesquiterpene
Zonarene	[1.44]*	[1.37]*	Sesquiterpene
<i>trans</i> -Calamenene	[1.44]*	0.05	Sesquiterpene
<i>trans</i> -Cadina-1,4-diene	0.15	0.15	Sesquiterpene
$\alpha$ -Cadinene	0.07	0.06	Sesquiterpene
$\alpha$ -Calacorene	0.01	0.02	Sesquiterpene
$\alpha$ -Elemol	1.06*	0.85	Sesquiterpenic alcohol
Germacrene B	[1.06]*	0.22	Sesquiterpene
Elemicin	0.12	0.19*	Phenylpropanoid
Palustrol	0.03	0.03	Sesquiterpenic alcohol
( <i>E</i> )-Nerolidol	0.01	0.10	Sesquiterpenic alcohol
Germacrene D-4-ol	0.04	0.08	Sesquiterpenic alcohol
Caryophyllene oxide	0.08	0.07	Sesquiterpenic ether
Globulol	0.02	0.03	Sesquiterpenic alcohol
Unknown	0.03	0.01	Oxygenated sesquiterpene
Guaiol	0.14	0.14	Sesquiterpenic alcohol
Eudesm-5-en-11-ol	0.04	0.06	Sesquiterpenic alcohol
Methoxyeugenol	tr	0.01	Phenylpropanoid
10-epi-Cubenol	0.06*		Sesquiterpenic alcohol
Junenol	[0.06]*	0.03	Sesquiterpenic alcohol
1,10-diepi-Cubenol	0.09*	[5.05]*	Sesquiterpenic alcohol
Unknown	[0.09]*	0.01	Oxygenated sesquiterpene
$\gamma$ -Eudesmol	0.19	0.14	Sesquiterpenic alcohol
$\tau$ -Cadinol	0.23*	0.08	Sesquiterpenic alcohol
$\tau$ -Muurolol	[0.23]*	0.10	Sesquiterpenic alcohol
$\alpha$ -Muurolol	0.17*	0.05	Sesquiterpenic alcohol
$\beta$ -Eudesmol	[0.17]*	[0.19]*	Sesquiterpenic alcohol
$\alpha$ -Eudesmol	0.18	0.16*	Sesquiterpenic alcohol
Bulnesol	0.14	0.13	Sesquiterpenic alcohol
Germacra-4(15),5,10(14)-trien-1 $\alpha$ -ol	0.02		Sesquiterpenic alcohol
Shyobunol	0.01	0.01	Sesquiterpenic alcohol
Mint sulfide?	0.01		Sesquiterpenic sulfide
meta-Camphorene	0.01	[0.16]*	Diterpene
<b>Total identified</b>	<b>98.72%</b>	<b>97.71%</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:** Faintly yellow liquid

**Refractive index:** 1.4833  $\pm$  0.0003 (20 °C)

#### CONCLUSION

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