

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

**Date:** April 24, 2018  
**Sample:** Aniseed  
**Type:** Essential Oil  
**Source:** *Pimpinella anisum*  
**Batch:** 87726-03/2

### ANALYSIS SUMMARY

Identification	DB-5 (%)	DB-WAX (%)	Classe
Isobutyral	0.01		Aliphatic aldehyde
Isovaleral	0.08	0.08	Aliphatic aldehyde
2-Methylbutyral	0.06	0.06	Aliphatic aldehyde
2-Methylbutyric acid	0.05		Aliphatic acid
$\alpha$ -Pinene	0.01	0.01	Monoterpene
Sabinene	tr*		Monoterpene
$\beta$ -Pinene	[tr]*	tr	Monoterpene
Myrcene	0.01	tr	Monoterpene
para-Cymene	0.02	0.01	Monoterpene
Limonene	0.05	0.05	Monoterpene
$\gamma$ -Terpinene	0.02	0.01	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	tr	tr	Monoterpenic alcohol
Fenchone	tr	tr	Aliphatic alcohol
<i>trans</i> -Linalool oxide (fur.)	0.01	0.01	Monoterpenic alcohol
Linalool	1.25	1.24	Monoterpenic alcohol
Geijerene	0.02		Terpene derivative
$\delta$ -Terpineol	0.01	0.01	Monoterpenic alcohol
$\alpha$ -Terpineol	1.21	1.32	Monoterpenic alcohol
Methylchavicol	2.72	2.74	Phenylpropanoid
Cuminal	0.02	0.05	Monoterpenic aldehyde
Carvone	0.03	0.02	Monoterpenic ketone
Carvacrol methyl ether	0.06	0.06	Monoterpenic ether
para-Anisaldehyde	0.34*	0.27	Simple phenolic
( <i>Z</i> )-Anethole	[0.34]*	0.15	Phenylpropanoid
( <i>E</i> )-Anethole	89.77	90.31	Phenylpropanoid
$\delta$ -Elemene	0.04	0.05	Sesquiterpene
$\alpha$ -Longipinene	0.02*	0.01	Sesquiterpene
Dehydro-ar-ionene	[0.02]*		Miscellaneous
6-Methoxy-3-methylbenzofuran	0.08		Furan
$\alpha$ -Ylangene	0.02	0.01	Sesquiterpene
para-Acetonylanisole	0.05	0.05	Phenylpropanoid
$\beta$ -Elemene	0.04	0.05*	Sesquiterpene
Isocaryophyllene	0.02	0.02	Sesquiterpene
$\beta$ -Caryophyllene	0.04	[0.05]*	Sesquiterpene
<i>trans</i> - $\alpha$ -Bergamotene	0.02	0.02	Sesquiterpene
$\alpha$ -Himachalene	0.10	0.09	Sesquiterpene
$\gamma$ -Himachalene	1.03	1.04	Sesquiterpene
ar-Curcumene	0.22	0.20	Sesquiterpene
$\alpha$ -Zingiberene	0.32*	0.25	Sesquiterpene
$\beta$ -Himachalene	[0.32]*	0.05	Sesquiterpene
$\beta$ -Bisabolene	0.18*	0.16	Sesquiterpene
$\gamma$ -Cadinene	[0.18]*	0.01	Sesquiterpene
$\delta$ -Cadinene	0.04	0.03	Sesquiterpene
Myristicin	0.06	0.04	Phenylpropanoid
$\alpha$ -Calacorene	0.01	0.01	Sesquiterpene
Spathulenol	0.02	0.01	Sesquiterpenic alcohol
Caryophyllene oxide	0.01	tr	Sesquiterpenic ether
Dill apiole	0.04	0.02	Phenylpropanoid

Isospathulenol	0.01	0.01	Sesquiterpenic alcohol
<i>trans</i> -Pseudoisoeugenyl 2-methylbutyrate	0.45	0.45	Phenolic ester
Epoxypseudoisoeugenyl 2-methylbutyrate	0.07	0.07	Phenolic ester
<b>Total identified</b>	<b>98.64%</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

#### PHYSICOCHEMICAL DATA

**Physical aspect:** Light yellow liquid

**Refractive index:** 1.5535 ± 0.0003 (20 °C)

#### COMPLIANCE WITH ISO 3475:2006 (PIMPINELLA ANISUM)

Compound	Min. %	Max. %	Observed %	Complies?
Methylchavicol	0.5	3	2.7	Yes
(Z)-Anethole	0.1	0.4	0.1	Yes
para-Anisaldehyde	0.1	1.4	0.3	Yes
(E)-Anethole	87	94	90	Yes
γ-Himachalene	1	5	1	Yes
<i>trans</i> -Pseudoisoeugenyl 2-methylbutyrate	0.3	2	0.5	Yes
Refractive index	1.552	1.561	1.554	Yes

#### CONCLUSION

No adulterant, contaminant or diluent has been detected using this method. The oil complies with the ISO standard for *P. anisum* essential oil.

