

## GC/MS BATCH NUMBER: CF0105

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**ESSENTIAL OIL:** CLARY SAGE  
**BOTANICAL NAME:** SALVIA SCLAREA  
**ORIGIN:** RUSSIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF CLARY SAGE OIL	%
LINALYL ACETATE	54.9
LINALOOL	23.5
$\alpha$ -TERPINEOL	3.6
GERANIOL	2.1
GERANYL ACETATE	1.9
LIMONENE	1.8
$\beta$ -CARYOPHYLLENE	1.4
GERMACRENE D	1.3
MYRCENE	1.3
NERYL ACETATE	1.0

Comments from Robert Tisserand: Pleasant, green-winey odor profile. Meets the AFNOR standard for Clary Sage oil except that sclareol is very slightly low - not a concern.

**Date :** August 12, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16H03-PTH5-1-DM

**Customer identification :** Clary Sage - CF010563R

**Type :** Essential oil

**Source :** *Salvia sclarea*

**Customer :** Plant Therapy


*ANALYSIS*

**Method :** PC-PA-001-15E06, "Analysis of the composition of a liquid essential oil by GC-FID" (in French).

**Analyst :** Sylvain Mercier, M. Sc., chimiste

**Analysis date :** 2016-08-12

Checked and approved by :



Alexis St-Gelais, M. Sc., chimiste 2013-174

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IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
<i>cis</i> -Hex-3-en-1-ol	2.48	864	0.14	0.14	1325	4.67	Aliphatic alcohol
<i>trans</i> -Hex-2-en-1-ol	2.67	879	0.05	0.06	1351	5.04	Aliphatic alcohol
Hexanol	2.71	882	0.06	0.05	1301	4.34	Aliphatic alcohol
$\alpha$ -Thujene	3.24	918	0.01	tr	961	0.93	Monoterpene
$\alpha$ -Pinene	3.35	924	0.14	0.13	948	0.87	Monoterpene
Camphene	3.63	941	0.07	0.06	1001	1.09	Monoterpene
Sabinene	4.06	967	0.20	0.19	1058	1.52	Monoterpene
$\beta$ -Pinene	4.12	971	0.18	0.17	1041	1.38	Monoterpene
Myrcene	4.41*	988	1.44	1.34	1118	2.01*	Monoterpene
<i>trans</i> -Dehydroxylinalool oxide	4.41*	988	[1.44]	0.07	1153	2.43	Monoterp. ether
Octen-3-ol	4.50	994	0.07	0.06	1402	5.79	Aliphatic alcohol
$\alpha$ -Phellandrene	4.71	1006	0.06	[1.34]	1118	2.01*	Monoterpene
para-Cymene	5.06	1025	0.02	0.08	1210	3.08	Monoterpene
Limonene	5.09	1027	1.79	1.74	1142	2.29	Monoterpene
$\beta$ -Phellandrene	5.12	1028	0.01	0.02	1151	2.41*	Monoterpene
1,8-Cineole	5.15	1030	0.01	[0.02]	1151	2.41*	Monoterp. ether
<i>cis</i> - $\beta$ -Ocimene	5.27	1037	0.42	0.48	1188	2.83*	Monoterpene
<i>trans</i> - $\beta$ -Ocimene	5.45	1047	0.94	0.85	1205	3.02	Monoterpene
$\gamma$ -Terpinene	5.63	1057	0.03	[0.48]	1188	2.83*	Monoterpene
<i>cis</i> -Linalool oxide (fur.)	5.93	1072	0.03	0.02	1381	5.48	Monoterp. alcohol
Terpinolene	6.11	1082	0.21	0.20	1225	3.30	Monoterpene
<i>trans</i> -Linalool oxide (fur.)	6.26	1090	0.08	0.05	1409	5.90	Monoterp. alcohol
Linalool	6.74	1110	23.52	22.63	1503	7.60	Monoterp. alcohol
Hotrienol	6.77	1112	0.13	0.24	1535	8.34*	Monoterp. alcohol
Borneol	8.55	1178	0.05	5.18	1631	11.33*	Monoterp. alcohol
Terpinen-4-ol	8.66	1182	0.06	1.30	1529	8.19*	Monoterp. alcohol
$\alpha$ -Terpineol	9.37	1204	3.61	[5.18]	1631	11.33*	Monoterp. alcohol
$\gamma$ -Terpineol	9.69	1211	0.15	[5.18]	1631	11.33*	Monoterp. alcohol
Nerol	10.69	1233	0.73	0.89	1737	16.01	Monoterp. alcohol
Linalyl acetate	11.51	1252	54.89	56.48	1516	7.85	Monoterp. ester
Geraniol	11.88	1260	2.07	2.03	1788	18.99	Monoterp. alcohol
Geranial	12.73	1278	0.07	0.06	1654	12.32	Monoterp. aldehyde
Bornyl acetate	13.29	1291	0.14	0.20	1525	8.07	Monoterp. ester
Geranyl formate	13.85	1301	0.09	0.10	1641	11.73	Monoterp. ester
$\alpha$ -Copaene	17.35	1355	0.31	0.26	1443	6.50	Sesquiterpene
Neryl acetate	17.63	1359	1.03	1.00	1665	12.78	Monoterp. ester
$\beta$ -Bourbonene	17.77	1361	0.12	0.09	1464	6.87	Sesquiterpene
$\beta$ -Elemene	18.58	1374	0.11	[0.24]	1535	8.34*	Sesquiterpene
Geranyl acetate	19.13	1382	1.94	1.97	1697	14.19	Monoterp. ester
$\beta$ -Caryophyllene	20.22*	1398	1.36	[1.30]	1529	8.19*	Sesquiterpene

$\beta$ -Copaene	20.22*	1398	[1.36]	0.35	1517	7.87	Sesquiterpene
$\alpha$ -Humulene	22.95	1431	0.06	0.03	1590	9.99	Sesquiterpene
Germacrene D	25.16	1458	1.34	[5.18]	1631	11.33*	Sesquiterpene
$\beta$ -Selinene	25.79	1465	0.12	0.11	1624	11.01	Sesquiterpene
Bicyclogermacrene	26.36	1471	0.19	0.14	1650	12.14	Sesquiterpene
$\delta$ -Cadinene	28.84	1502	0.10	0.08	1682	13.56	Sesquiterpene
Caryophyllene oxide	33.42	1565	0.16	0.16	1857	23.21	Sesquiterp. ether
Spathulenol	33.63	1568	0.06	0.04	2032	34.27	Sesquiterp. alcohol
$\beta$ -Eudesmol	37.63	1644	0.07	0.08	2109	37.21	Sesquiterp. alcohol
Sclareoxide	44.64	1857	0.09				Diterp. ether
Sclareol	53.01	2210	0.32	0.30	3044	55.76	Diterp. alcohol
<b>Total identified</b>			<b>98.85%</b>	<b>99.43%</b>			

\*: Two or more compounds are coeluting on this column

[xx]: Duplicate percentage due to coelutions, not taken account in the identified total

Note: no correction factor was applied

#### OTHER DATA

**Physical aspect :** Clear liquid

**Refractive index :** 1.4588  $\pm$  0.0003 (20 °C)

#### CONCLUSION

No adulterant, contaminant or diluent were detected using this method.

