

## GC/MS BATCH NUMBER: D80101

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**ESSENTIAL OIL:** DAVANA  
**BOTANICAL NAME:** ARTEMISIA PALLENS  
**ORIGIN:** INDIA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF DAVANA OIL	%
cis-DAVANONE	51.4
BICYCLOGERMACRENE	9.3
(E)-ETHYL-CINNAMATE	3.7
DAVANA ETHER II	2.5
ARTEDOUGLASIA OXIDE C	1.7
SPATHULENOL	1.7
β-SELINENE	1.6
GERMACRENE D	1.3
DAVANONE B	1.2
τ-CADINOL	1.1
GERANYL ACETATE	1.0

Comments from Robert Tisserand: Davana is a powerfully fruity oil, and this one smells like a rare liqueur. Has a good percentage of davanone, the main constituent.

**Date :** April 22, 2016

*SAMPLE IDENTIFICATION*

**Internal code :** 16D07-PTH5-1-LC

**Customer identification :** Davana - India - D8010161R

**Type :** Essential oil

**Source :** *Artemisia pallens*

**Customer :** Plant Therapy

*ANALYSIS*

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

**Analyst :** Alexis St-Gelais, M. Sc., chimiste

**Analysis date :** 2016-04-21

Checked and approved by :

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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.	
Isoamyl alcohol	1.06	719	0.03	0.06	1163	2.60*	Aliphatic alcohol
Ethyl isovalerate	2.23	847	0.01	0.01	1015	1.22	Aliphatic ester
Propyl 2-methylbutyrate	3.65	947	0.08	0.05	1088	1.79	Aliphatic ester
Propyl isovalerate	3.79	956	0.03	0.04	1107	1.96	Aliphatic ester
Sabinene	4.07	973	0.09	0.11	1069	1.65	Monoterpene
Myrcene	4.35	990	0.01	0.01	1120	2.10	Monoterpene
Unknown arbusculone derivative II	4.66	1008	0.03	[0.06]	1163	2.60*	Furan
Isoamyl isobutyrate	4.77*	1014	0.06	0.01	1155	2.51	Aliphatic ester
$\alpha$ -Terpinene	4.77*	1014	[0.06]	0.04	1125	2.16	Monoterpene
Unknown arbusculone derivative III	4.98	1025	0.10	0.10	1194	2.96	Furan
Limonene	5.02	1028	0.01	0.01	1147	2.42	Monoterpene
para-Cymene	5.04	1029	0.10	0.10	1211	3.16	Monoterpene
Lavender lactone	5.51*	1055	0.06	0.03	1610	10.85	Lactone
cis-Arbusculone	5.51*	1055	[0.06]	0.03	1380	5.56	Furan
trans-Arbusculone	5.88	1075	0.07	0.07	1435	6.46	Furan
Terpinolene	6.04	1084	0.02	0.02	1226	3.37	Monoterpene
Linalool	6.44	1105	0.36	0.37	1500	7.71	Monoterp. alcohol
Isoamyl 2-methylbutyrate	6.48	1107	0.20	0.18	1237	3.53	Aliphatic ester
Isoamyl isovalerate	6.53	1108	0.12	0.10	1254	3.76	Aliphatic ester
cis-para-Menth-2-en-1-ol	6.98	1125	0.02	0.02	1509	7.87	Monoterp. alcohol
trans-para-Menth-2-en-1-ol	7.46	1143	0.02	0.52	1563	9.46*	Monoterp. alcohol
Terpinen-4-ol	8.43	1179	0.24	0.10	1535	8.60	Monoterp. alcohol
nor-Davanone	10.03	1225	0.17	0.13	1584	10.09	Furan
Methyl hydrocinnamate	12.26	1275	0.02				Phenylpropanoid ester
Geranial	12.36	1277	0.02	0.02	1657	12.86	Monoterp. aldehyde
Methyl (Z)-cinnamate	13.95	1309	0.14	0.23	1828	22.25	Phenylpropanoid ester
Bicycloelemene	14.53	1318	0.11	0.09	1426	6.30	Sesquiterpene
Ethyl hydrocinnamate	16.49	1349	0.11				Phenylpropanoid ester
$\alpha$ -Ylangene	16.60	1351	0.07	0.07	1414	6.05	Sesquiterpene
Eugenol	17.07	1358	0.07	0.04	2069	36.57	Phenylpropanoid
$\beta$ -Elemene	18.22	1376	0.16	0.24	1528	8.36	Sesquiterpene
Geranyl acetate	18.42	1379	1.02	0.75	1693	14.54	Monoterp. ester
Ethyl (Z)-cinnamate	18.72*	1384	0.81	2.06	1891	26.63*	Phenylpropanoid ester
Davanafuran isomer	18.72*	1384	[0.81]				Furan
Methyl (E)-cinnamate	18.96	1387	0.77	0.69	1962	31.23	Phenylpropanoid ester
$\beta$ -Caryophyllene	19.84	1401	0.16	0.18	1524	8.26	Sesquiterpene
cis-threo-Davanafuran	20.49	1409	0.35				Furan
Aromadendrene	21.19	1418	0.29	0.46	1533	8.54	Sesquiterpene
$\alpha$ -Humulene	21.89	1426	0.03	0.02	1582	10.01	Sesquiterpene

allo-Aromadendrene	22.81	1437	0.53	[0.52]	1563	9.46*	Sesquiterpene
Germacrene D	24.70	1460	1.26	1.11	1625	11.47	Sesquiterpene
$\beta$ -Selinene	25.30	1467	1.62	1.61	1630	11.68	Sesquiterpene
Ethyl ( <i>E</i> )-cinnamate	25.54*	1470	4.31	3.66	2016	34.44	Phenylpropanoid ester
$\alpha$ -Selinene	25.54*	1470	[4.31]	0.06	1637	11.97	Sesquiterpene
Viridiflorene	25.54*	1470	[4.31]	0.43	1621	11.24	Sesquiterpene
Bicyclogermacrene	26.09*	1477	9.45	9.33	1647	12.47*	Sesquiterpene
Davana ether I	26.09*	1477	[9.45]				Furan
$\alpha$ -Muurolene	26.76	1485	1.94	[9.33]	1647	12.47*	Sesquiterpene
$\gamma$ -Cadinene	27.67	1496	0.41	0.37	1670	13.47	Sesquiterpene
$\delta$ -Cadinene	27.84	1498	0.21	0.17	1676	13.73	Sesquiterpene
Davana ether II	28.50	1507	2.49				Furan
Artedouglasia oxide C	28.73	1510	1.72				Furan
Artedouglasia oxide A	29.82	1524	0.62				Furan
Davanone B isomer	31.99	1554	0.39				Furan
Davanone B	32.53	1562	1.22	[2.06]	1891	26.63*	Sesquiterp. ketone
Spathulenol	32.94	1567	1.71	1.69	2021	34.78	Sesquiterp. alcohol
( <i>E</i> )-Nerolidol	33.14	1570	0.35	0.37	1994	33.18	Sesquiterp. alcohol
Davanone D	33.40	1573	0.37				Sesquiterp. ketone
<i>cis</i> -Davanone	34.44	1588	51.36	52.64	1960	31.16	Sesquiterp. ketone
Unknown (m/z = 95, 67 (59), 93 (41), 41 (32), 109 (32)...) )	35.65	1605	0.62				
Isospathulenol	36.23	1619	0.44				Sesquiterp. alcohol
$\tau$ -Cadinol	36.77	1632	1.08	1.13	2074	36.75	Sesquiterp. alcohol
$\tau$ -Muurolol	36.94	1637	0.30	0.14	2089	37.28	Sesquiterp. alcohol
$\alpha$ -Muurolol	37.11	1640	0.49	0.45	2113	38.10	Sesquiterp. alcohol
Unknown (m/z = 95, 67 (59), 41 (43), 93 (40), 161 (38)... 204 (14), 219 (3), 234 (1)) )	37.21	1643	0.76				Oxygenated sesquiterp.
$\beta$ -Eudesmol	37.34	1646	0.25	0.21	2110	37.98	Sesquiterp. alcohol
$\alpha$ -Cadinol	37.49	1650	0.40	0.67	2126	38.57	Sesquiterp. alcohol
Unknown (m/z = 163, 43 (47), 121 (16)... 234 (6)) )	38.66	1678	1.27	0.89	2298	42.97	Oxygenated sesquiterp.
<b>Total identified</b>							<b>89.5% 81%</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

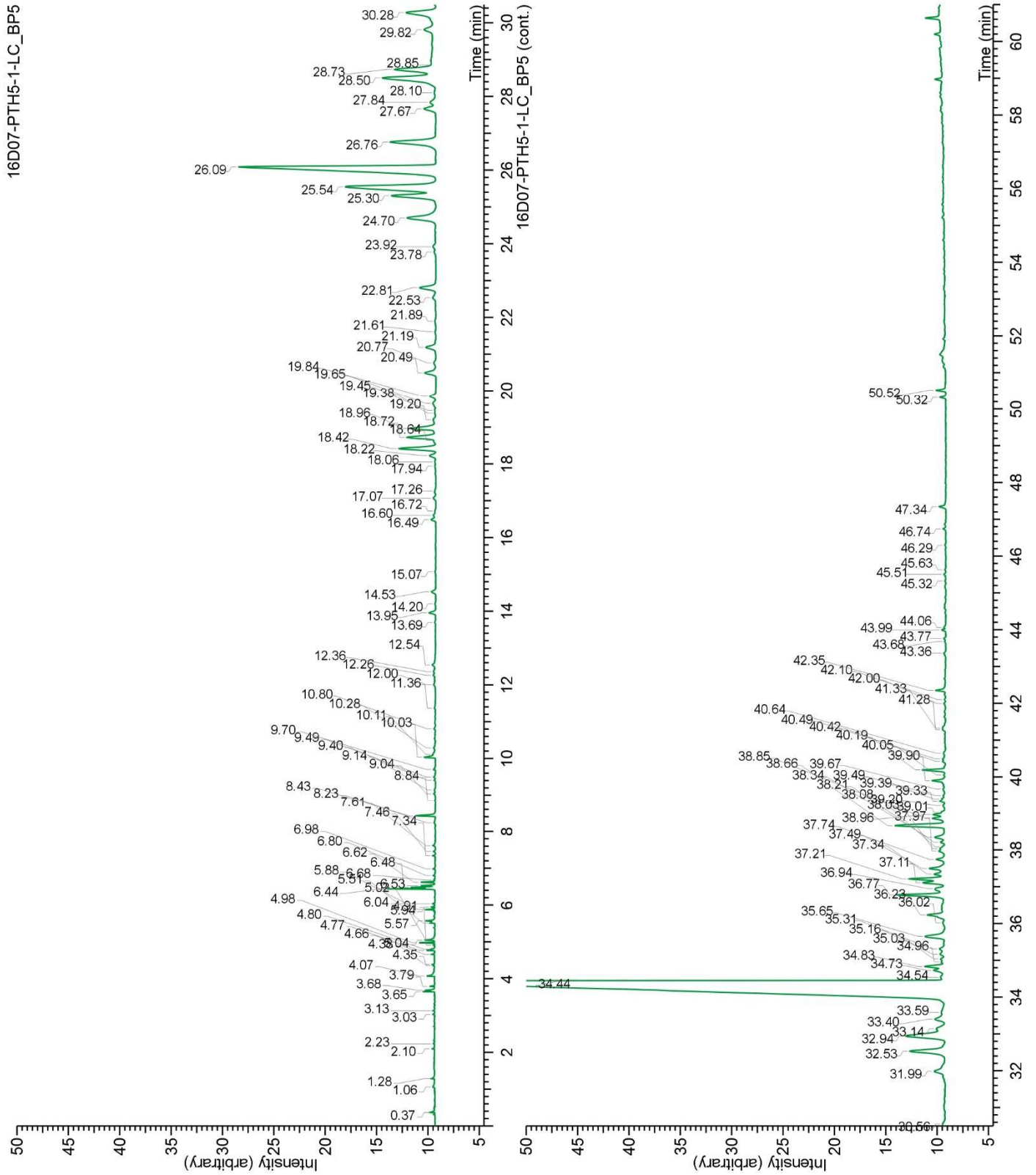
#### OTHER DATA

**Physical aspect :** Bright orange liquid

**Refractive index :** 1.4868  $\pm$  0.0003 (20 °C)

### CONCLUSION

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



16D07-PTH5-1-LC\_WAX

