

## GC/MS BATCH NUMBER: CC3100

---

**ESSENTIAL OIL:** CHAMOMILE ROMAN ORGANIC  
**BOTANICAL NAME:** CHAMAEMELUM NOBILE  
**ORIGIN:** HUNGARY

KEY CONSTITUENTS PRESENT IN THIS BATCH OF CHAMOMILE ROMAN ORGANIC OIL	%
3-METHYLAMYL ANGELATE	14.3
METHALLYL ANGELATE	13.5
$\alpha$ -PINENE	9.4
ISOAMYL ISOBUTYRATE	9.0
ISOBUTYL BUTYRATE	8.5
3-METHYLAMYL ISOBUTYRATE	6.8
ISOAMYL ANGELATE	5.7
trans-PINOCARVEOL	5.3
2-METHYLBUTYL ANGELATE	4.9
ISOBUTYL ANGELATE	3.2
PINOCARVONE	2.1
2-METHYLBUTYL ISOBUTYRATE	1.7
3-METHYLAMYL METHACRYLATE	1.4
ISOAMYL METHACRYLATE + 2- METHYLBUTYL METHACRYLATE	1.1

Comments from Robert Tisserand: Light, apple-pear odor profile. High in classic Roman chamomile esters. No red flags.

**Date :** July 6, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17G05-PTH5-1-DM

**Customer identification :** Organic Roman Chamomile - Hungary - CC3100610R

**Type :** Essential oil

**Source :** *Chamaemelum nobile*

**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 :** 2017-07-05

Checked and approved by :

---

Sylvain Mercier, M. Sc., chimiste 2014-005

*Note: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.*

*This report is digitally signed, it is only considered valid if the digital signature is intact.*

IDENTIFIED COMPOUNDS

Identification	Column: BP5			Column: WAX			Molecular Class
	R.T.	R.I.	%	%	R.I.	R.T.	
Ethanol	0.38	636	0.01	0.02	774	0.61	Aliphatic alcohol
2-Methylbutyral	0.66	672	0.05				Aliphatic aldehyde
Isopropyl formate	0.67	674	0.02				Aliphatic ester
Isoamyl alcohol	1.13	735	0.17	11.48	1149	2.71*	Aliphatic alcohol
2-Methylbutyl alcohol	1.16	738	0.21	[11.48]	1149	2.71*	Aliphatic alcohol
Butyric acid	1.58	793	0.14				Aliphatic acid
Hexanal	1.72	807	0.03	0.03	1019	1.38	Aliphatic aldehyde
Methyl angelate	1.96	825	0.05	0.03	1051	1.69	Aliphatic ester
Ethyl 2-methylbutyrate	2.27	849	0.03	0.07	985	1.21	Aliphatic ester
3-Methylpentanol	2.35	855	0.79	0.79	1267	4.30	Aliphatic alcohol
cis-Hex-3-en-1-ol	2.50	867	0.02	13.24	1320	5.06*	Aliphatic alcohol
Isoamyl acetate	2.67	879	0.04	0.04	1068	1.84	Aliphatic ester
2-Methylbutyl acetate	2.70*	882	0.30	0.46	1060	1.77*	Aliphatic ester
Hexanol	2.70*	882	[0.30]	0.16	1297	4.72	Aliphatic alcohol
Propyl methacrylate	2.73	884	0.09	[0.46]	1060	1.77*	Aliphatic ester
Ethyl angelate?	2.99	903	0.08				Aliphatic ester
Isobutyl isobutyrate	3.25*	919	0.54	0.48	1037	1.55	Aliphatic ester
Tricyclene	3.25*	919	[0.54]	0.03	921	0.94	Monoterpene
α-Pinene	3.45	931	9.38	9.32	947	1.04	Monoterpene
Prenyl acetate	3.53	935	0.60	0.55	1193	3.28*	Aliphatic ester
Isobutyl methacrylate	3.68	944	0.29	9.12	1110	2.24*	Aliphatic ester
Camphene	3.72	947	0.48	0.48	1000	1.28	Monoterpene
Thuja-2,4(10)-diene	3.78	950	0.01	[0.46]	1060	1.77*	Monoterpene
Isobutyl butyrate	3.99*	963	9.43	[9.12]	1110	2.24*	Aliphatic ester
Methallyl methacrylate	3.99*	963	[9.43]	0.91	1197	3.34*	Aliphatic ester
Sabinene	4.15	973	0.03	[0.46]	1060	1.77*	Monoterpene
β-Pinene	4.22	976	0.31	0.25	1042	1.60	Monoterpene
Isoamyl propionate	4.26	979	0.03				Aliphatic ester
Methallyl isobutyrate	4.45	990	0.52	0.51	1177	3.08	Aliphatic ester
Myrcene	4.49	993	0.03	[9.12]	1110	2.24*	Monoterpene
Propyl angelate	4.63	1001	0.63	[0.91]	1197	3.34*	Aliphatic ester
Isobutyl 2-methylbutyrate	4.77	1008	0.07	0.06	1140	2.60*	Aliphatic ester
Isoamyl isobutyrate	4.99	1020	8.94	[11.48]	1149	2.71*	Aliphatic ester
2-Methylbutyl isobutyrate	5.03	1023	1.67	[11.48]	1149	2.71*	Aliphatic ester
para-Cymene	5.15	1030	0.07	0.09	1208	3.48	Monoterpene
Limonene	5.19	1031	0.04	[0.06]	1140	2.60*	Monoterpene
β-Phellandrene	5.22	1033	0.09	[11.48]	1149	2.71*	Monoterpene
1,8-Cineole	5.25	1035	0.12	[11.48]	1149	2.71*	Monoterp. ether
Isoamyl methacrylate + 2-Methylbutyl methacrylate	5.49	1048	1.09	1.14	1223	3.65	Aliphatic ester
Isobutyl angelate	5.68	1058	3.20	3.46	1236	3.85*	Aliphatic ester

γ-Terpinene	5.71	1060	0.07	[0.55]	1193	3.28*	Monoterpene
Prenyl isobutyrate	5.78	1064	0.11	7.14	1260	4.20*	Aliphatic ester
Methallyl angelate	5.99	1075	13.47	[13.24]	1320	5.06*	Aliphatic ester
3-Methylamyl propionate?	6.11	1082	0.31	0.33	1249	4.04	Aliphatic ester
Butyl angelate	6.40	1097	0.27	0.30	1290	4.63*	Aliphatic ester
Isobutyl tiglate	6.46	1101	0.03	[0.30]	1290	4.63*	Aliphatic ester
Isoamyl 2-methylbutyrate	6.57	1105	0.16	[3.46]	1236	3.85*	Aliphatic ester
2-Methylbutyl 2-methylbutyrate	6.64	1107	0.14	[3.46]	1236	3.85*	Aliphatic ester
α-Thujone	6.79	1113	0.03	0.05	1359	5.66	Monoterp. ketone
Methallyl tiglate?	6.87	1115	0.18	0.16	1386	6.07	Aliphatic ester
3-Methylamyl isobutyrate	6.97*	1119	6.86	[7.14]	1260	4.20*	Aliphatic ester
β-Thujone	6.97*	1119	[6.86]	0.04	1373	5.87	Monoterp. ketone
α-Campholenal	7.24	1129	0.02				Monoterp. aldehyde
<i>trans</i> -Pinocarveol	7.68	1145	5.25	5.11	1565	10.24	Monoterp. alcohol
3-Methylamyl methacrylate	7.71	1146	1.42	1.26	1335	5.27	Aliphatic ester
Isoamyl angelate	7.83	1151	5.68	5.55	1340	5.36	Aliphatic ester
2-Methylbutyl angelate	7.94	1155	4.94	6.22	1344	5.43	Aliphatic ester
Camphene hydrate	8.07	1160	0.13	0.12	1522	8.88*	Monoterp. alcohol
<i>C. nobile</i> biomarker	8.17	1163	0.60	0.59	1404	6.35	Aliphatic ester
Isoborneol	8.25*	1166	2.31	0.12	1593	11.26	Monoterp. alcohol
Pinocarvone	8.25*	1166	[2.31]	2.13	1469	7.65	Monoterp. ketone
Borneol	8.63	1180	0.19	0.24	1607	11.77*	Monoterp. alcohol
Terpinen-4-ol	8.81	1187	0.03	[0.12]	1522	8.88*	Monoterp. alcohol
Isobutyl 3-hydroxy-2-methylenebutyrate	9.05	1195	0.05	0.06	1705	16.27	Aliphatic ester
Prenyl angelate	9.33	1203	0.75	14.41	1450	7.22*	Aliphatic ester
Myrtenol	9.45	1206	0.33	0.33	1700	16.00	Monoterp. alcohol
Myrtenal	9.51*	1207	0.89	0.72	1530	9.07	Monoterp. aldehyde
α-Terpineol	9.51*	1207	[0.89]	0.16	1612	11.97	Monoterp. alcohol
Verbenone	9.81	1214	0.06	[0.24]	1607	11.77*	Monoterp. ketone
2-Hydroxy-2-methylbut-3-enyl 2-methyl-(2Z)-butenoate + 3-Methylamyl angelate	11.35	1248	0.02	0.01	1436	6.86	Aliphatic esters
3-Methylamyl angelate	11.72	1256	14.29	[14.41]	1450	7.22*	Aliphatic ester
Isoamyl 3-hydroxy-2-methylenebutyrate	13.53	1297	0.07	0.07	1819	23.06	Aliphatic ester
3-Methylamyl tiglate	14.06	1306	0.06	0.13	1514	8.72	Aliphatic ester
Myrtenyl isobutyrate?	24.57	1452	0.05	0.07	1655	13.71	Aliphatic ester
Germacrene D	25.65	1465	0.02	[0.24]	1607	11.77*	Sesquiterpene
<b>Total identified</b>			<b>98.39%</b>	<b>98.04%</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*

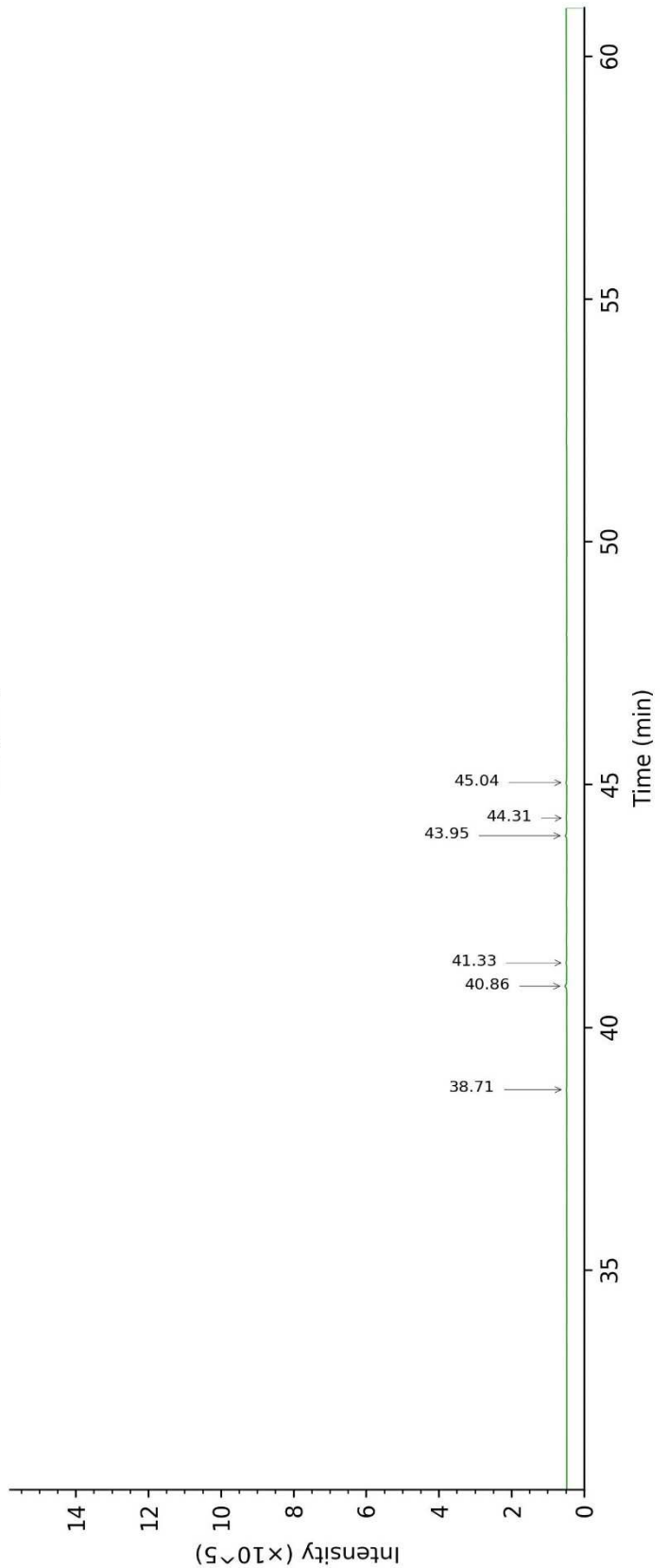
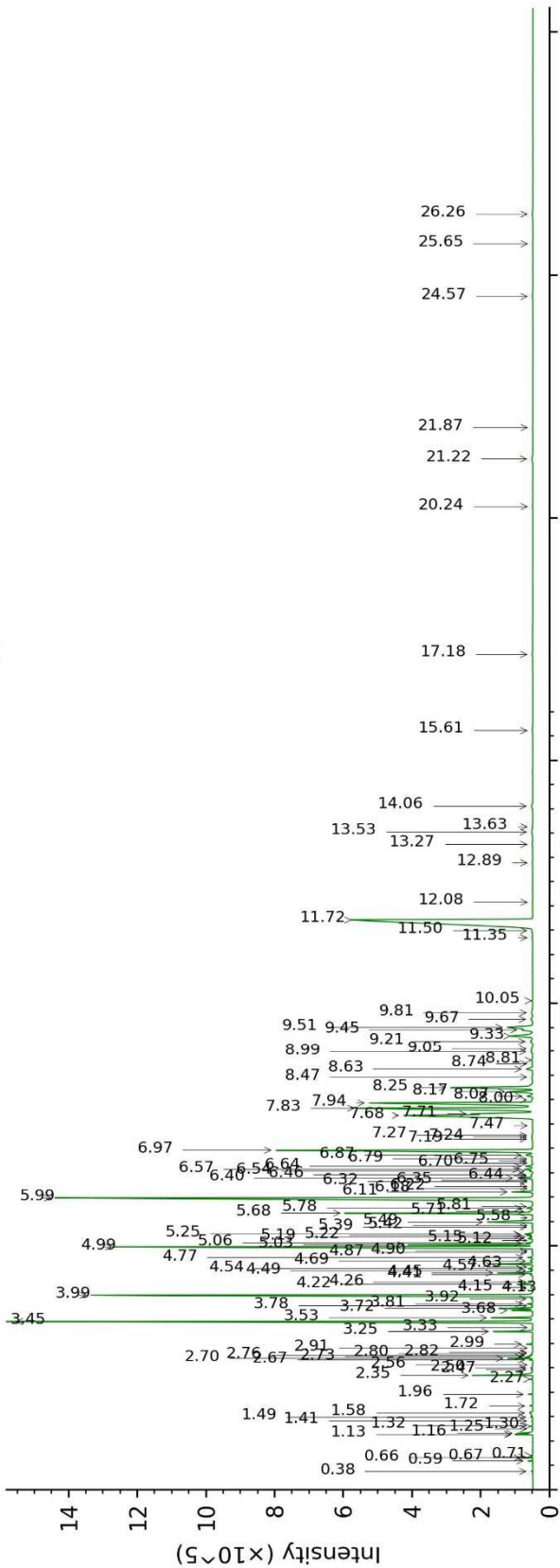
**Physical aspect :** Clear liquid

**Refractive index :**  $1.4373 \pm 0.0003$  (20 °C)

*CONCLUSION*

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

17G05-PTH5-1-DM\_BP5



17G05-PTH5-1-DM\_WAX

