PLANT THERAPY
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: F10105

ESSENTIAL OIL: FENNEL
BOTANICAL NAME: FOENICULUM VULGARE DULCE
ORIGIN: USA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF FENNEL OIL	%
(E)-ANETHOLE	77.3
FENCHONE	10.6
α-PINENE	3.9
METHYL CHAVICOL (ESTRAGOLE)	1.9
α-PHELLANDRENE	1.6
LIMONENE	1.2
MYRCENE	0.7
β-PINENE	0.3
γ-TERPINENE	0.3
(Z)-ANETHOLE	0.1
ANISALDEHYDE	0.2

Comments from Robert Tisserand: Excellent, fine fennel odor quality. 10 of 11 key ISO constituents are within range, with estragole (methyl chavicol) marginally low, which is good.

Date : September 9, 2016

SAMPLE IDENTIFICATION

Internal code : 16I06-PTH6-1-DM
Customer identification : Fennel - USA - F1010545R
Type : Essential oil
Source : *Foeniculum vulgare dulce*
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 : 2016-09-07

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.	
Tricyclene	3.16	913	0.01	tr	927	0.79	Monoterpene
α-Thujene	3.25	918	0.02	3.77	947	0.87*	Monoterpene
α-Pinene	3.36	925	3.87	[3.77]	947	0.87*	Monoterpene
Camphene	3.64	941	0.17	0.15	998	1.08	Monoterpene
Sabinene	4.07	968	0.13	0.12	1055	1.50	Monoterpene
β-Pinene	4.13	971	0.31	0.29	1039	1.36	Monoterpene
Myrcene	4.41	989	0.68	0.75	1115	1.98	Monoterpene
α-Phellandrene	4.69	1004	1.55	1.37	1108	1.92	Monoterpene
α-Terpinene	4.87	1014	0.02	0.04	1121	2.05	Monoterpene
para-Cymene	5.06	1025	0.24	0.24	1207	3.04	Monoterpene
Limonene	5.10	1027	1.22	1.02	1139	2.26	Monoterpene
β-Phellandrene	5.13	1029	0.35	0.66	1145	2.33*	Monoterpene
1,8-Cineole	5.16	1030	0.16	[0.66]	1145	2.33*	Monoterp. ether
cis-β-Ocimene	5.28	1037	0.06	0.31	1187	2.82*	Monoterpene
trans-β-Ocimene	5.46	1047	tr	tr	1201	2.99	Monoterpene
γ-Terpinene	5.64	1057	0.28	[0.31]	1187	2.82*	Monoterpene
cis-Sabinene hydrate	6.04	1078	0.02	0.02	1407	5.86	Monoterp. alcohol
Terpinolene	6.12	1083	0.08	0.07	1223	3.26	Monoterpene
Fenchone	6.31	1093	10.61	10.70	1321	4.62	Monoterp. ketone
trans-Sabinene hydrate	6.65*	1107	0.01	0.01	1492	7.41	Monoterp. alcohol
Linalool	6.65*	1107	[0.01]	0.01	1500	7.56	Monoterp. alcohol
Camphor	7.65	1144	0.22	0.23	1423	6.10	Monoterp. ketone
Terpinen-4-ol	8.69	1183	0.04	0.02	1527	8.13	Monoterp. alcohol
Methylchavicol	9.38	1204	1.86	1.82	1580	9.70	Phenylpropanoid
(*Z*)-Anethole	11.63	1255	0.10	0.09	1664	12.72	Phenylpropanoid
para-Anisaldehyde	12.34	1270	0.21	0.21	1892	25.59	Simple phenolic
(*E*)-Anethole	13.93	1302	77.29	77.68	1742	16.30	Phenylpropanoid
α-Copaene	17.41	1356	0.02	0.02	1438	6.39	Sesquiterpene
para-Acetonylanisole	19.84	1393	0.03	0.04	2033	34.32	Phenylpropanoid
β-Caryophyllene	20.26	1398	0.06	0.06	1531	8.21	Sesquiterpene
trans-α-Bergamotene	21.83	1417	0.04	0.03	1535	8.34	Sesquiterpene
Germacrene D	25.22	1458	0.06	0.04	1633	11.41	Sesquiterpene
Total identified			**99.72%**	**99.77%**			

*: 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 : 1.5390 ± 0.0003 (20 °C)

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CONCLUSION

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

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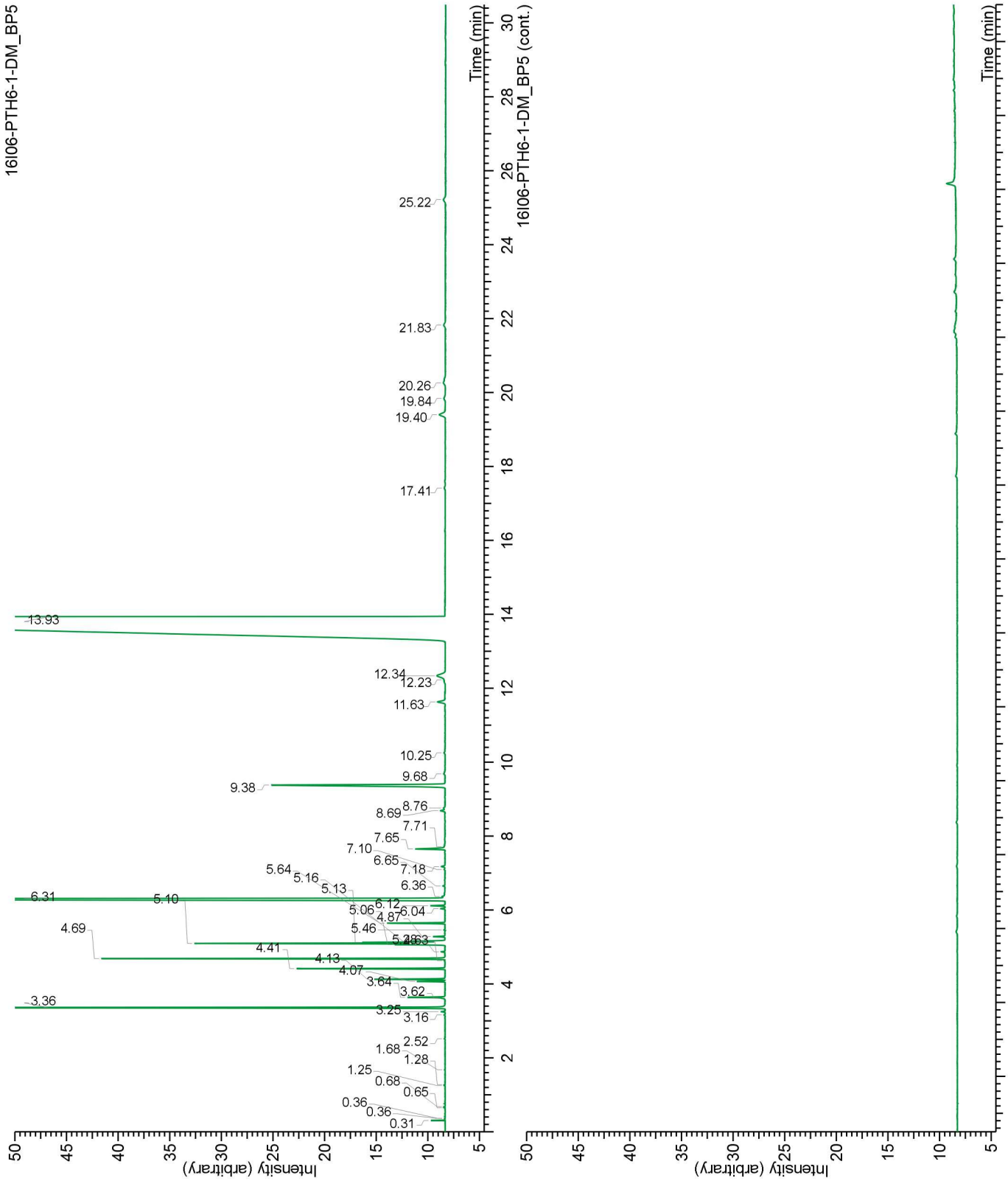

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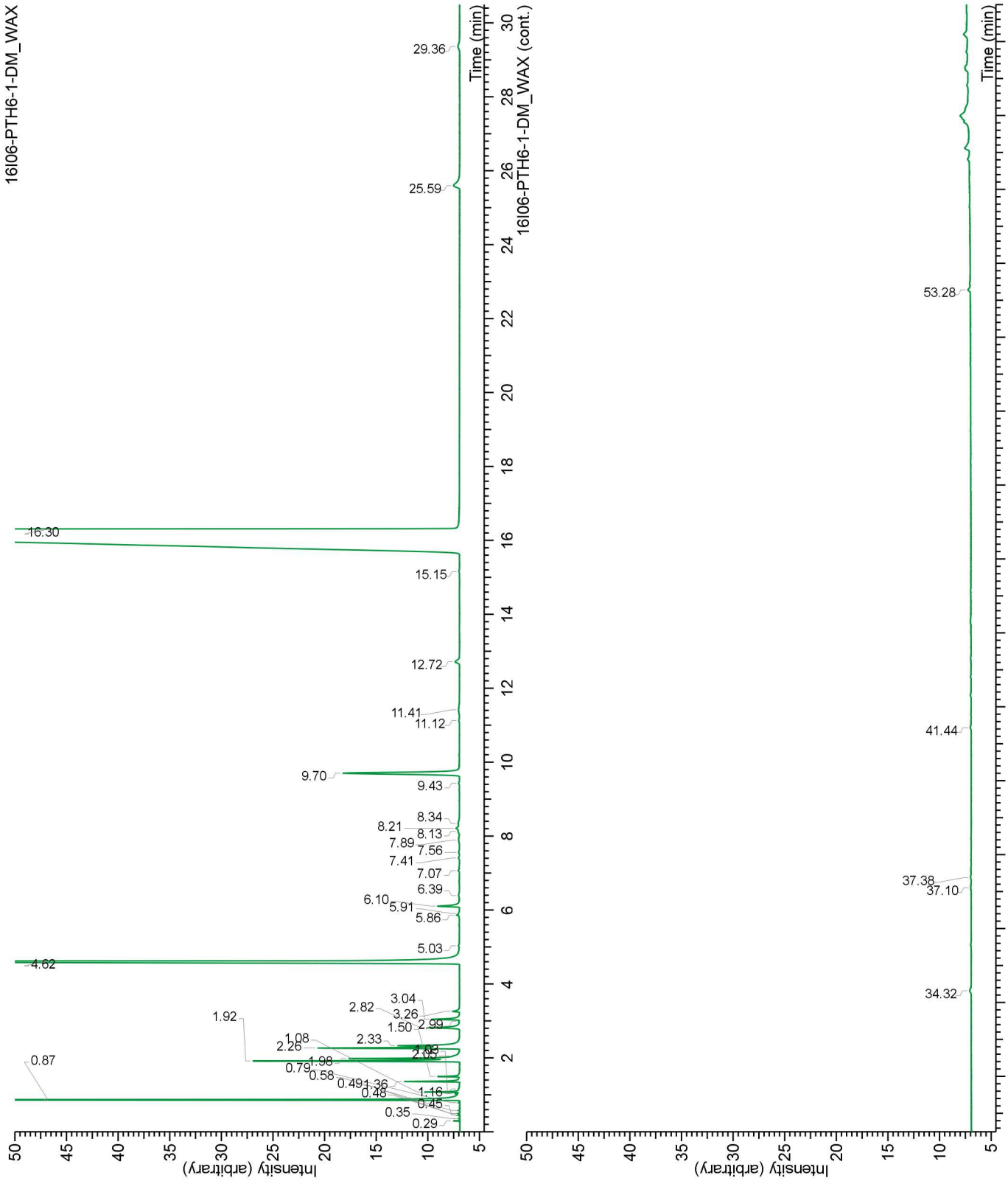

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