



PLANT THERAPY
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: V80100

ESSENTIAL OIL: VETIVER ORGANIC
BOTANICAL NAME: VETIVERIA ZIZANOIDES
ORIGIN: SRI LANKA

KEY CONSTITUENTS PRESENT IN THIS BATCH OF VETIVER ORGANIC OIL	%
β -VETIVENENE	6.6
KHUSIMOL	6.2
ZIZANOIC ACID	4.2
γ -VETIVENENE	3.5
β -VETISPIRENE	2.4
α -AMORPHENE	2.4
β -VETIVENENE ISOMER I	2.2
EPIZIZANOIC ACID	2.1
δ -AMORPHENE	2.0
NIGRITENE	1.9
β -VETIVONE	1.8
PREZIZAENE	1.8
KHUSIOL	1.7
ZIZANOL	1.7
α -VETIVONE	1.6
β -VETIVENENE ISOMER II	1.5
α -VETISPIRENE	1.4
ISOVALENCENOL	1.4

VETISELINENOL	1.4
(Z)-ISOVALENCENAL	1.1
EPI-ZIZANONE	1.1
KHUSIMENE	1.0
6-EPI-NIGRITENE	1.0
CYCLOCOPACAMPHA-12-ol (epimer A)	1.0
EREMOPHILA-1(10),7(11)- DIENE	1.0

Comments from Robert Tisserand: This is a "woodsmoke" type of Vetiver. Four of five key constituents meet the ISO standard for Indonesian Vetiver oil.

Date : November 25, 2016

SAMPLE IDENTIFICATION

Internal code : 16K10-PTH4-1-DM

Customer identification : Organic Vetiver - V8010063R

Type : Essential oil

Source : *Vetiveria zizanoides*

Customer : Plant Therapy

ANALYSIS

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

Identifications double-checked by GC-MS

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

Analysis date : 2016-11-11

Checked and approved by :

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

Note: This report may not be published, including online, without the written consent from Laboratoire PhytoChemia.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.	
para-Vinylguaiacol	15.15	1321	0.09	0.04	2119	37.52	Phenylpropanoid
2-Norprezizene	15.68	1329	0.08				Norsesquiterpene
12-Norisoziza-5-ene	16.60	1343	0.84	0.87	1438	6.40	Norsesquiterpene
Unknown (m/z = 119, 147 (97), 91 (87), 105 (76), 161 (74), 134 (61), 175 (58), 190 (55))	17.19	1352	0.29				Sesquiterpene
diepi- α -Cedrene	17.57	1358	0.13	0.17	1425	6.14	Sesquiterpene
6-epi-Nigritene	17.93	1364	1.03	1.16	1479	7.15	Norsesquiterpene
Nigritene	18.48	1372	1.85	2.35	1493	7.43	Norsesquiterpene
2-epi- α -Cedrene	19.81	1392	0.32	0.23	1489	7.34	Sesquiterpene
β -Cedrene	20.37	1400	0.19	0.13	1523	8.02	Sesquiterpene
Aristolene	20.72	1404	0.38	0.29	1459	6.79	Sesquiterpene
Prezizaene	22.43	1425	1.78	1.46	1615	10.72	Sesquiterpene
Khusimene	22.76	1429	1.04	1.74	1638	11.60	Sesquiterpene
(E)-Isoeugenol	24.58	1451	0.44	0.36	2236	40.84	Phenylpropanoid
Unknown (m/z = 145, 159 (66), 202 (64), 187 (43), 91 (34), 128 (31))	24.80	1453	0.42				Sesquiterpene
α -Amorphene	25.46	1461	2.36	2.27	1608	10.54	Sesquiterpene
α -Vetispirene	25.87	1466	1.44	1.08	1627	11.14	Sesquiterpene
β -Vetispirene	26.00	1468	2.43	1.91	1646	11.93	Sesquiterpene
Unknown (m/z = 189, 161 (100), 204 (86), 91 (71), 105 (64), 108 (54), 133 (51), 119 (50))	26.08	1469	1.59				Sesquiterpene
Eudesma-2,4(15),11-triene	26.55	1473	0.79	0.83	1642	11.75	Sesquiterpene
δ -Amorphene	27.44	1484	2.02	1.84	1648	12.03	Sesquiterpene
4-epi-Cubebol	27.78	1488	0.25	0.48	1802	19.81	Sesquiterp. alcohol
Nootkatene	28.11*	1492	0.62	0.48	1692	13.97	Sesquiterpene
Spirovetiva-1(10),7(11)-diene	28.11*	1492	[0.62]				Sesquiterpene
Eremophila-1(10),7(11)-diene	28.26	1494	1.01				Sesquiterpene
δ -Cadinene	28.95	1504	0.22	0.30	1673	13.13	Sesquiterpene
γ -Vetivenene	29.88	1516	3.46	3.88	1724	15.37	Sesquiterpene
α -Calacorene	30.32	1522	0.34	0.37	1798	19.54	Sesquiterpene
β -Vetivenene	31.51	1539	6.62	6.56	1745	16.51	Sesquiterpene
β -Vetivenene isomer I	32.57	1553	2.24	2.01	1778	18.39	Sesquiterpene
Unknown (m/z = 202, 187 (75), 145 (56), 159 (41), 131	33.36	1564	0.64				Sesquiterpene

(48), 91 (38))							
β -Vetivenene isomer II	33.75	1569	1.46	1.41	1791	19.16	Sesquiterpene
Khusimone	34.10	1574	0.60	0.56	2103	37.00	Norsesquiterp. ketone
Unknown (m/z = 187, 202 (69), 145 (28), 131 (23), 91 (20), 105 (20))	35.57	1594	1.64				Sesquiterpene
Cyclocopacampha-12-ol (epimer A)	37.66	1645	1.02				Sesquiterp. alcohol
Cyclocopacampha-12-ol (epimer B)	37.70	1646	0.56				Sesquiterp. alcohol
epi-Zizanone	37.82	1649	1.05				Sesquiterp. ketone
Zizanol	38.00	1653	1.67				Sesquiterp. alcohol
Zizanal	38.10	1655	0.74				Sesquiterp. aldehyde
Khusiol	38.69	1670	1.71				Sesquiterp. alcohol
Khusimyl methyl ether?	39.00	1676	1.84				Sesquiterp. ether
Unknown (m/z = 189, 159 (93), 133 (38), 205 (27), 131 (27), 91 (26), 105 (22), 220 (20))	40.02	1703	3.06				Oxygenated sesquiterp.
Vetiselinol	40.38	1715	1.40	1.02	2282	41.96	Sesquiterp. alcohol
Khusimol	41.20	1740	6.24	6.12	2359	43.67	Sesquiterp. alcohol
Isovalencenol	42.35	1777	1.43	1.25	2402	44.55	Sesquiterp. alcohol
(E)-Isovalencenal	42.91	1794	0.79				Sesquiterp. aldehyde
β -Vetivone	43.13	1803	1.81	2.02	2333	43.10	Sesquiterp. ketone
(Z)-Isovalencenal	43.38	1811	1.13				Sesquiterp. aldehyde
Epizizanoic acid	43.66	1822	2.12	3.17	2800	51.86	Sesquiterp. acid
α -Vetivone	43.79	1826	1.60	1.64	2363	43.76	Sesquiterp. ketone
Zizanoic acid	44.43	1850	4.21	5.26	2874	53.07	Sesquiterp. acid
Total identified							
		63.35%		53.26%			

*: 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

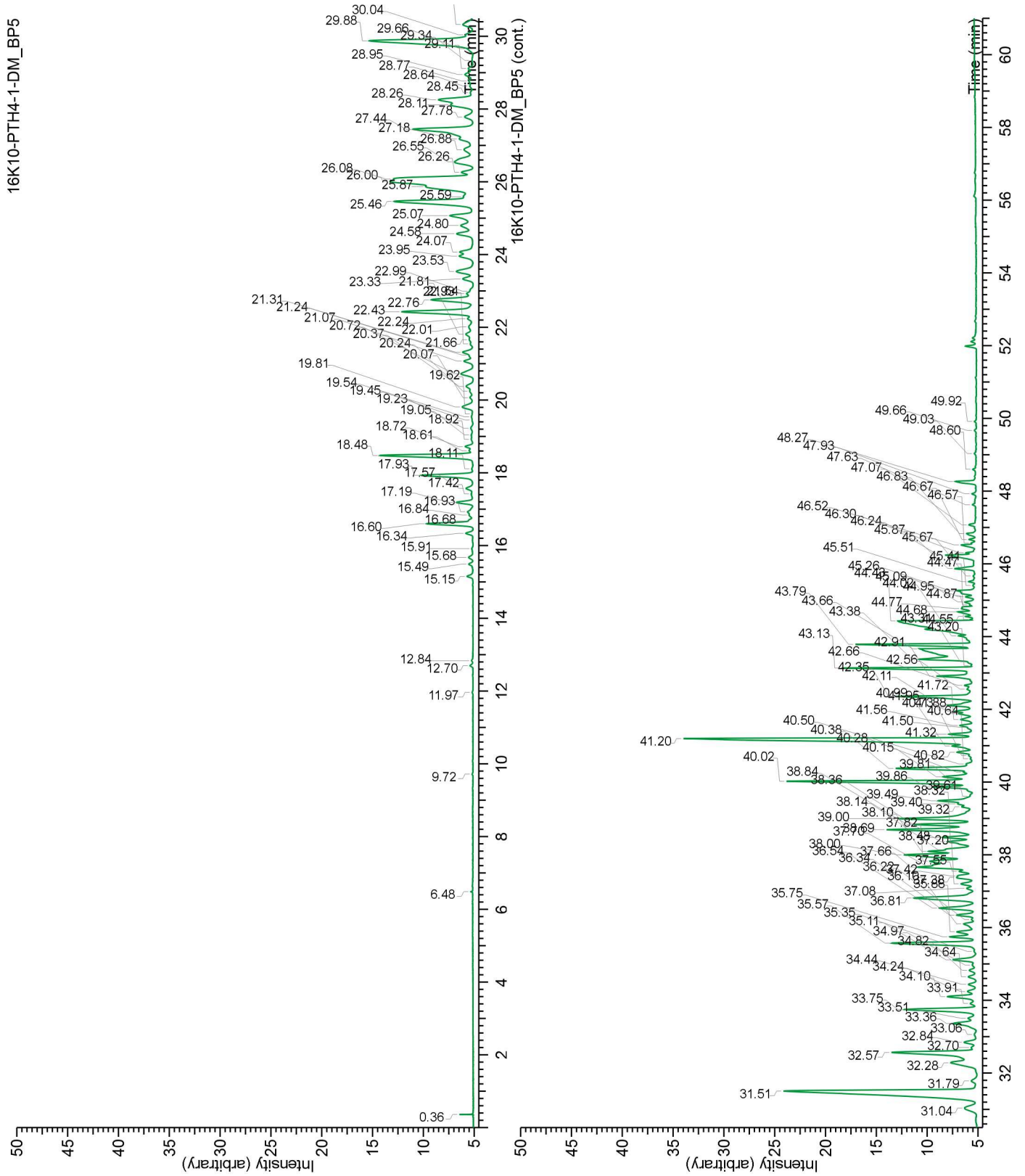
OTHER DATA

Physical aspect : Brownish liquid

Refractive index : 1.5255 \pm 0.0003 (20 °C)

CONCLUSION

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



16K10-PTH4-1-DM_WAX

