



PLANT THERAPY
100% PURE ESSENTIAL OILS

GC/MS BATCH NUMBER: V30103

ESSENTIAL OIL: VETIVER
BOTANICAL NAME: VETIVERIA ZIZANOIDES
ORIGIN: HAITI

KEY CONSTITUENTS PRESENT IN THIS BATCH OF VETIVER OIL	%
KHUSIMOL	14.7
ISOVALENCENOL	9.4
VETISELINENOL	3.9
α -VETIVONE	2.8
CYCLOCOPACAMPHA-12-OL (epimer A)	2.8
β -VETIVONE	2.7
KHUSIOL	2.2
β -VETIVENENE	2.1
ZIZANAL	1.9
CYCLOCOPACAMPHAN-12-OL (epimer B)	1.8
CIS-EUDES MEN-6-OL?	1.7
ISOVALENCENOL ISOMER	1.6
ZIZANOIC ACID	1.6
EUDESM-7(11)-EN-4-OL?	1.5
ZIZANOL	1.5
α -AMORPHENE	1.4
α -VETIVOL	1.3
β -VETISPIRENE	1.2

EREMOPHILA-1(10),7(11)- DIENE	1.0
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Comments from Robert Tisserand: Excellent rich, woody odor quality. Four of five key constituents conform to ISO for Haitian Vetiver, with one marginal - not a concern.

Date : March 10, 2017

SAMPLE IDENTIFICATION

Internal code : 17B21-PTH3-1-DM

Customer identification : Vetiver - Haiti - V30103612R

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 : 2017-02-23

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.	
12-Norisoziza-5-ene	16.78	1347	0.08	0.05	1436	7.56	Norsesquiterpene
α -Ylangene	17.02	1351	0.13	0.09	1418	7.10	Sesquiterpene
6-epi-Nigritene	17.94	1365	0.08	0.09	1488	8.78	Norsesquiterpene
Nigritene	18.66	1376	0.06	0.07	1500	9.07	Norsesquiterpene
Acora-3,7(14)-diene	19.88	1394	0.24				Sesquiterpene
β -Copaene	21.38	1413	0.18	0.12	1517	9.61	Sesquiterpene
6,9-Guaiadiene	22.31	1425	0.15	0.16	1538	10.40	Sesquiterpene
Prezizaene	22.47	1426	0.42	0.52	1619	13.52	Sesquiterpene
Khusimene	22.78	1430	0.52	0.44	1635	14.37	Sesquiterpene
Unknown (m/z = 145, 159 (66), 202 (64), 187 (43), 91 (34), 128 (31))	24.60	1452	0.34				Sesquiterpene
α -Amorphene	25.44	1462	1.40	1.53	1614	13.29	Sesquiterpene
β -Vetispirene	25.93	1468	1.16	1.06	1652	15.26	Sesquiterpene
<i>cis</i> -Eudesma-6,11-diene?	26.04	1469	0.72				Sesquiterpene
δ -Amorphene	27.42	1486	0.84	0.81	1640	14.61	Sesquiterpene
Eremophila-1(10),7(11)-diene	28.27	1496	1.04				Sesquiterpene
Spirovetiva-1(10),7(11)-diene	28.90	1504	0.24				Sesquiterpene
γ -Vetivenene	29.71	1516	0.12	0.10	1715	18.60	Sesquiterpene
β -Vetivenene	31.30	1538	2.07	1.92	1748	20.78	Sesquiterpene
α -Elemol	32.01	1548	0.78	0.88	2008	36.68	Sesquiterp. alcohol
<i>cis</i> -Eudesmen-6-ol?	32.54	1555	1.66				Sesquiterp. alcohol
Unknown (m/z = 59, 205 (63), 43 (59), 91 (54), 220 (44))	33.04	1562	0.38				Oxygenated sesquiterp.
Unknown (m/z = 202, 187 (94), 91 (78), 105 (52), 131 (50))	33.23	1565	0.64				Sesquiterpene
Khusimone	33.37	1567	0.41	0.44	2110	40.06	Norsesquiterp. ketone
Unknown (m/z = 187, 202 (69), 145 (28), 131 (23), 91 (20), 105 (20))	35.62	1598	0.98				Sesquiterpene
Unknown (m/z = 81, 161 (70), 43 (66), 105 (42), 41 (41)... 207 (31)...)	36.03	1606	2.47				Oxygenated sesquiterp.
Unknown (m/z = 81, 161 (59), 43 (56), 105 (39), 41 (35)... 207 (26), 204 (21)...)	36.13	1609	1.44				Oxygenated sesquiterp.

Unknown (m/z = 95, 121 (84), 161 (77), 43 (63), 79 (61), 91 (61), 105 (54), 93 (54), 204 (47)... 220 (8))	37.50	1642	1.68				Oxygenated sesquiterp.
Cyclocopacampha-12-ol (epimer A)	37.63	1646	2.77				Sesquiterp. alcohol
Cyclocopacamphan-12-ol (epimer B)	37.79	1650	1.84				Sesquiterp. alcohol
Zizanol	37.89	1652	1.49				Sesquiterp. alcohol
Zizanal	38.37	1664	1.88				Sesquiterp. aldehyde
Khusiol	38.58	1669	2.21				Sesquiterp. alcohol
Eudesm-7(11)-en-4-ol?	38.89	1676	1.51				Sesquiterp. alcohol
Unknown (m/z = 187, 159 (98), 91 (79), 131 (73), 105 (73), 133 (54)... 202 (29), 220 (14))	39.20	1684	2.78				Oxygenated sesquiterp.
Vetiselinol	40.16*	1710	4.52	3.88	2303	44.86	Sesquiterp. alcohol
Nootkatol	40.16*	1710	[4.52]				Sesquiterp. alcohol
α -Vetivol	40.60	1724	1.32				Sesquiterp. alcohol
Khusimol	40.88	1732	14.69	14.00	2378	46.50	Sesquiterp. alcohol
Isovalencenol	42.22	1775	9.40	10.16	2420	47.39*	Sesquiterp. alcohol
Isovalencenol isomer	42.45	1782	1.57	[10.16]	2420	47.39*	Sesquiterp. alcohol
(E)-Isovalencenal	42.72	1791	0.80				Sesquiterp. aldehyde
β -Vetivone	43.02	1800	2.66	3.06	2349	45.88	Sesquiterp. ketone
(Z)-Isovalencenal	43.17	1805	0.68				Sesquiterp. aldehyde
Zizanoic acid	43.27	1809	1.56	1.60	2884	56.02	Sesquiterp. acid
α -Vetivone	43.67	1824	2.84	4.53	2358	46.09	Sesquiterp. ketone
Total identified			64.04%	45.51%			

*: 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 : Yellow orange liquid

Refractive index : 1.5220 \pm 0.0003 (20 °C)

CONCLUSION

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



