



**PLANT THERAPY**  
100% PURE ESSENTIAL OILS

## GC/MS BATCH NUMBER: V30104

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

KEY CONSTITUENTS PRESENT IN THIS BATCH OF VETIVER OIL	%
ISOVALENCENOL	9.09
OPLOPANONE	7.19
KHUSIMOL	6.58
VETISELINENOL	3.88
$\alpha$ -VETIVONE	3.44
$\beta$ -VETIVONE	2.89
$\beta$ -VETIVENENE	2.67
ZIZANOIC ACID	2.36
CYCLOCOPACAMPHAN-12-OL (epimer B)	2.27
ISOVALENCENOL ISOMER	1.87
(E)-ISOVALENCENAL	1.64
KHUSIOL	1.57
$\alpha$ -AMORPHENE	1.57
KHUSIMONE	1.53
CYCLOCOPACAMPHAN-12-OL (epimer A)	1.31
ZIZANOL	1.26
ZIZANAL	1.26
$\alpha$ -VETIVOL	1.26

EREMOPHILA-1(10),7(11)-DIENE	1.20
(Z)-ISOVALENCENAL	1.03

Comments from Robert Tisserand: Rich, full-bodied notes of wood, tobacco and earth. Four of the five key ISO constituents are within range for Haitian Vetiver oil.

**Date :** July 14, 2017

*SAMPLE IDENTIFICATION*

**Internal code :** 17G05-PTH8-1-DM

**Customer identification :** Vetiver - Haiti - V3010473R

**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).

**Analyst :** Alexis St-Gelais, M. Sc., chimiste 2013-174

**Analysis date :** 2017-07-06

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.	
12-Norisoziza-5-ene	16.93	1349	0.07	0.07	1444	7.05	Norsesquiterpene
$\alpha$ -Ylangene	17.04	1351	0.08	0.10	1418	6.57	Sesquiterpene
6-epi-Nigritene	18.27	1370	0.21	0.16	1490	8.14	Norsesquiterpene
Nigritene	18.81	1378	0.39	0.23	1507	8.55	Norsesquiterpene
Acora-3,7(14)-diene	20.20	1399	0.25				Sesquiterpene
$\beta$ -Funebrene?	20.66	1405	0.06	0.03	1501	8.38	Sesquiterpene
Aristolene	20.78	1406	0.17	0.26	1482	7.94	Sesquiterpene
6,9-Guaiadiene	22.64	1428	0.16	0.17	1534	9.18	Sesquiterpene
Prezizaene	22.83	1431	0.67	0.71	1614	12.05	Sesquiterpene
Khusimene	23.18	1435	0.63	0.69	1628	12.52	Sesquiterpene
Unknown (m/z = 105, 161 (72), 93 (69), 91 (65), 133 (63), 204 (43))	23.76	1442	0.40				Sesquiterpene
$\alpha$ -Amorphene	25.87	1467	1.57	1.51	1609	11.85	Sesquiterpene
$\beta$ -Vetispirene	26.39*	1474	2.23	0.85	1642	13.04	Sesquiterpene
<i>cis</i> -Eudesma-6,11-diene?	26.39*	1474	[2.23]				Sesquiterpene
$\gamma$ -Amorphene	26.95	1480	0.37	0.21	1675	14.72	Sesquiterpene
$\delta$ -Amorphene	27.87	1491	0.91	0.89	1646	13.22	Sesquiterpene
Nootkatene	28.21	1495	0.15	0.18	1697	15.83	Sesquiterpene
Spirovetiva-1(10),7(11)-diene	28.55	1500	0.18				Sesquiterpene
Eremophila-1(10),7(11)-diene	28.72	1502	1.20				Sesquiterpene
$\delta$ -Cadinene	29.41	1511	0.21	0.25	1670	14.45	Sesquiterpene
Selina-3,7(11)-diene	30.24	1523	0.84	0.50	1681	15.07	Sesquiterpene
$\alpha$ -Calacorene	30.47	1526	0.16	0.16	1802	21.99	Sesquiterpene
6S,10R-Dimethylbicyclo[4.4.0]decan-1-en-3-one	31.32	1538	0.34				Terpenic ketone
$\beta$ -Vetivenene	31.83	1545	2.67	2.42	1749	18.57	Sesquiterpene
$\alpha$ -Elemol	32.66	1557	0.95	1.00	1998	34.49	Sesquiterp. alcohol
<i>cis</i> -Eudesmen-6-ol?	33.13	1563	1.32				Sesquiterp. alcohol
Unknown (m/z = 59, 205 (63), 43 (59), 91 (54), 220 (44))	33.55	1569	0.48				Oxygenated sesquiterpene
Unknown (m/z = 202, 187 (94), 91 (78), 105 (52), 131 (50))	33.69	1571	0.35				Sesquiterpene
Khusimone	34.43	1581	1.53	1.13	2092	38.18	Norsesquiterp. ketone
Unknown (m/z = 187, 202 (69), 145 (28), 131 (23), 91 (20), 105 (20))	35.99	1606	0.90				Sesquiterpene

Unknown (m/z = 81, 161 (59), 43 (56), 105 (39), 41 (35)... 207 (26), 204 (21)...	36.49	1618	2.44				Oxygenated sesquiterpene
Selin-6-en-4 $\alpha$ -ol?	36.57	1620	1.03	0.83	2048	36.63	Sesquiterp. alcohol
Unknown (m/z = 81, 161 (59), 43 (56), 105 (39), 41 (35)... 207 (26), 204 (21)...	36.80	1625	1.05				Oxygenated sesquiterpene
1-epi-Cubenol	36.96	1629	0.85	1.15	1955	32.57	Sesquiterp. alcohol
Unknown (m/z = 95, 121 (84), 161 (77), 43 (63), 79 (61), 91 (61), 105 (54), 93 (54), 204 (47)... 220 (8))	37.98	1654	2.47				Oxygenated sesquiterpene
Cyclocopacamphan-12-ol (epimer A)	38.07	1656	1.31				Sesquiterp. alcohol
Cyclocopacamphan-12-ol (epimer B)	38.22	1660	2.27				Sesquiterp. alcohol
Zizanol	38.81	1675	1.26				Sesquiterp. alcohol
Khusiol	39.00	1679	1.57				Sesquiterp. alcohol
Zizanal	39.19	1684	1.26				Sesquiterp. aldehyde
Selin-7(11)-en-4 $\alpha$ -ol	39.59*	1694	2.44	1.73	2178	40.72	Sesquiterp. alcohol
Unknown (m/z = 187, 159 (98), 91 (79), 131 (73), 105 (73), 133 (54)... 202 (29), 220 (14))	39.59*	1694	[2.44]				Oxygenated sesquiterpene
Unknown (m/z = 189, 204 (88), 43 (76), 161 (75), 91 (61), 105 (58)... 220 (9))	40.06	1707	1.25				Oxygenated sesquiterpene
Vetiselinol	40.54	1722	3.88	4.61	2283	43.36	Sesquiterp. alcohol
$\alpha$ -Vetivol	40.93	1734	1.26	10.47	2358	45.05*	Sesquiterp. alcohol
Khusimol	41.26	1744	6.58	[10.47]	2358	45.05*	Sesquiterp. alcohol
Oplopanone	41.37	1748	7.19				Sesquiterp. alcohol
Isovalencenol	42.60	1787	9.09	9.93	2400	45.96	Sesquiterp. alcohol
Isovalencenol isomer	42.83	1794	1.87	2.41	2420	46.37	Sesquiterp. alcohol
(E)-Isovalencenal	43.12	1803	1.64				Sesquiterp. aldehyde
$\beta$ -Vetivone	43.36	1812	2.89	3.42	2333	44.48	Sesquiterp. ketone
(Z)-Isovalencenal	43.58	1820	1.03				Sesquiterp. aldehyde
$\alpha$ -Vetivone	44.02*	1836	5.38	3.44	2362	45.14	Sesquiterp. ketone
Zizanoic acid	44.02*	1836	[5.38]	2.36	2850	54.41	Sesquiterp. acid
<b>Total identified</b>			<b>70.12%</b>	<b>51.87%</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*

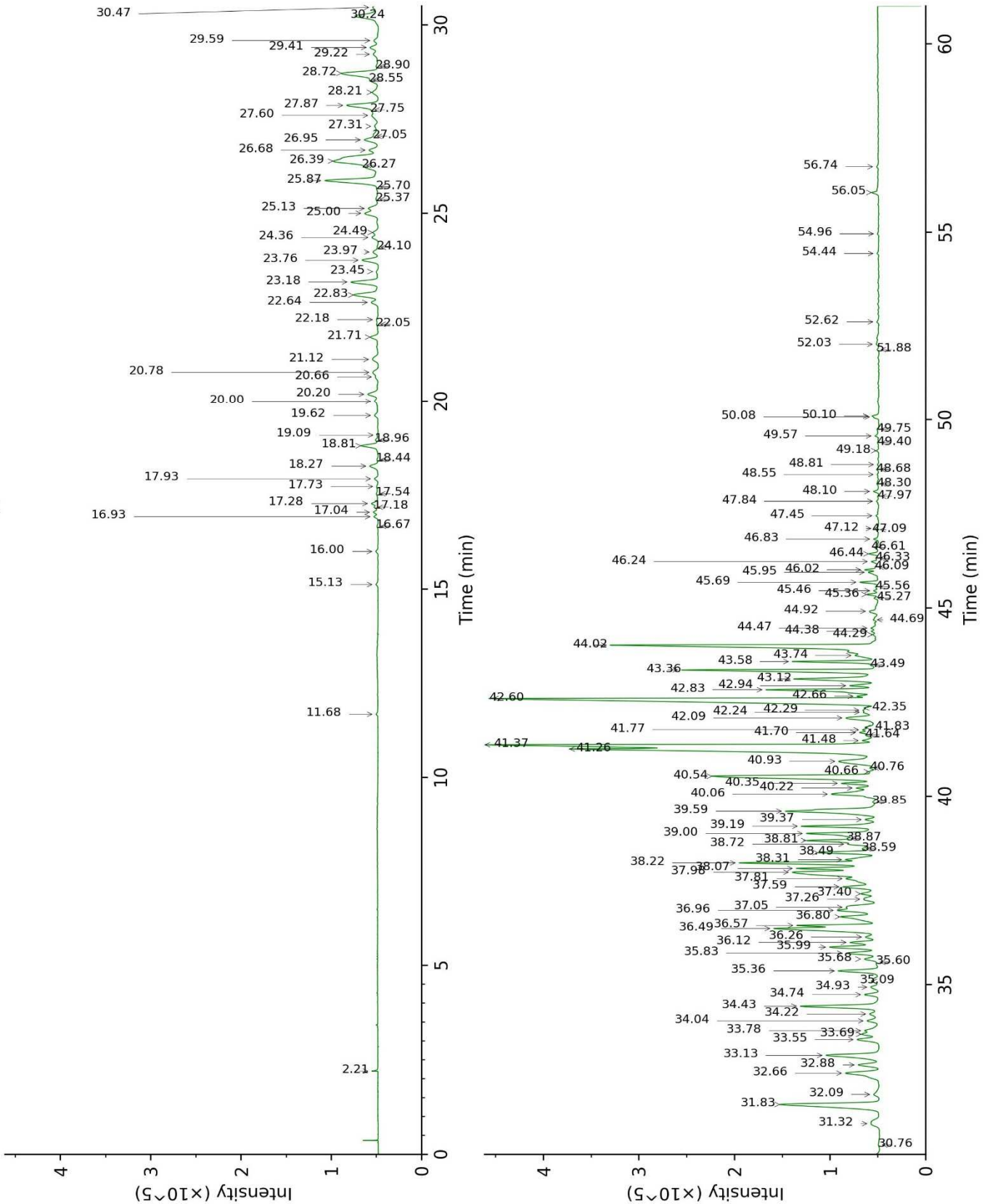
**Physical aspect :** Orange yellow liquid

**Refractive index :**  $1.5225 \pm 0.0003$  (20 °C)

*CONCLUSION*

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

17G05-PTH8-1-DM\_BP5



17G05-PTH8-1-DM\_WAX

