

Analytical Report	
Title	Cidarwood Himalayan Essential Oil Profile by GC-MS
Report No.	SE-37270-5
Issue Date	August 31, 2015
Notebook reference	III-29-75
Contributors:	
Quote No.	
Requester	World Naturals LLC

Primary Aim

To identify GC amendable volatile organic compounds present in submitted **Cardamom** essential oil sample.

Samples

The sample arrived as clear liquid with characteristic odor labeled as "Cidarwood Himalayan lot 11024-a22".

Experimental:

1. Oil was dissolved in methanol to concentration of ~0.1%, 1 ul injected into the GC injector port.
2. GC conditions:
Injector temperature: 250 C
Initial oven temperature: 80 C
Ramp 10 C/min
Final temperature 220 C
Final temperature hold 5 min

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3. MS parameters

Ionization and ion polarity	EI+
Scan rate	2 scans/sec
Mass range	35-350 Da
Ion source temperature	150C
Transfer line temperature	280C

4. GC-MS analysis. Waters/Micromass Quatro GC mass spectrometer interfaced to a ThermoElectron Trace gas chromatograph was utilized for the analysis. 30m 0.25 mm ID DB-5 column was used to separate components. Carrier gas was helium at 1.1 ml/min with split ratio of 50.

5. Data treatment.

For each sample, a set of target components was identified with the aid of the AMDIS software¹. The components were identified using the NIST mass spectral library².

Deliverables

1. GC-MS chromatogram. GC-MS chromatogram is shown in Appendix I.

2. Appendix II lists library search results.

- RT Retention Time, time in minutes at which the compound elutes out of column
- CAS. CAS registry number or EPA number.
- Name. IUPAC or common name of identified compound.
- Area. Peak area of a component in %% to total ion count

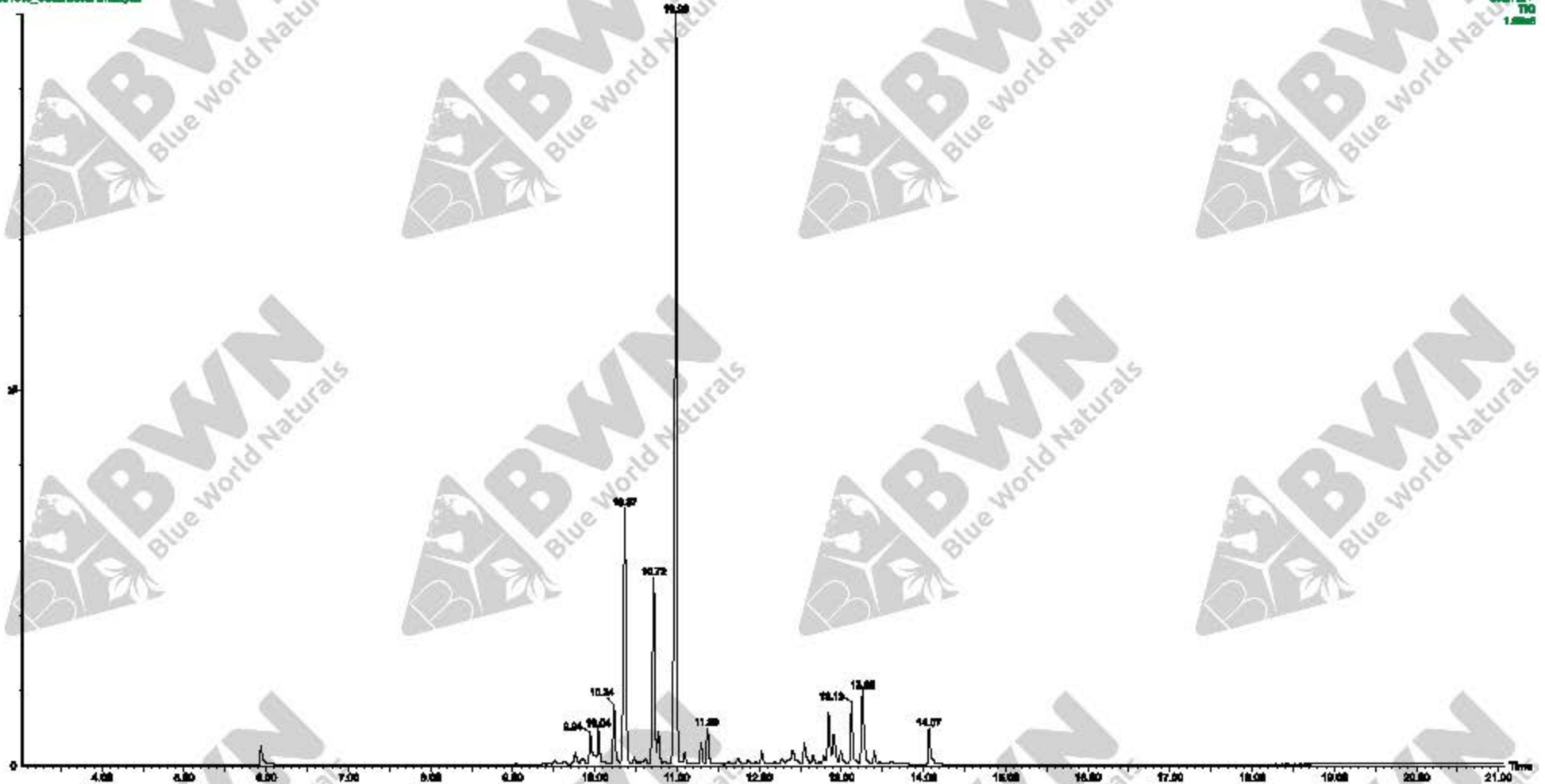
1 <http://chemdata.nist.gov/mass-spc/amdis/>

2 <http://www.nist.gov/srd/nist1a.cfm>

APPENDIX I
Cedarwood Himalayan
GC-MS Chromatogram

Sample "Cedarwood Himalayan"

Cedarwood Himalayan on DB-5 lot 11034-a22
081016_Cedarwood-2mg/ml



APPENDIX II
Cedarwood Himalayan
Identified Compounds

Cedarwood Himalayan

CAS	Name	R.T.	Area
6090091	4-Acetyl-1-methylcyclohexene	5.916	1.3
303797640	1-(1-Adamantyl)-1-phenylethanol	9.491	0.2
EPA-293042	β -Vatirene	9.611	0.2
EPA-185672	1-Methyl-6-(3-methylbuta-1,3-dienyl)-7-oxabicyclo[4.1.0]heptane	9.743	0.4
475207	1,4-Methanoazulene, decahydro-4,8,8-trimethyl-9-methylene-, [1S-(1 α ,3 α ,4 α ,8 α)]-	9.832	0.4
303797640	1-(1-Adamantyl)-1-phenylethanol	9.925	1.9
60909275	Himachala-2,4-diene	9.983	0.1
EPA-151097	(+)-2-Carene, 2-acetyl-	10.024	1.6
81955104	4,7-Methanobenzofuran, 2,2'-oxybis[octahydro-7,8,8-trimethyl-,	10.213	3.2
3853836	1H-Benzocycloheptene, 2,4a,5,6,7,8,9,9a-octahydro-3,5,5-trimethyl-9-methylene-, (4aS-cis)-	10.344	16.4
EPA-293042	Himachalene isomer	10.462	0.3
80923882	1H-Benzocycloheptene, 2,4a,5,6,7,8,9,9a-octahydro-3,5,5-trimethyl-9-methylene-	10.597	0.3
EPA-159394	Himachalene isomer	10.696	10.5
16728997	Naphthalene, 1,2,3,4,4a,7-hexahydro-1,6-dimethyl-4-(1-methylethyl)-	10.751	1.8
5989082	Himachalene isomer	10.97	43.3
156747454	Isolongifolene, 4,5,9,10-dehydro-	11.073	0.5
6753986	α -Caryophyllene	11.348	1.7
142507	1,6,10-Dodecatrien-3-ol, 3,7,11-trimethyl-, [S-(Z)]-	11.605	0.1
17874327	6-tert-Butyl-4-methylcoumarin	11.721	0.3
13744155	1H-Cyclopenta[1,3]cyclopropa[1,2]benzene, octahydro-7-methyl-3-methylene-4-(1-methylethyl)-	11.847	0.2
73992480	7-Methoxymethyl-2,7-dimethylcyclohepta-1,3,5-triene	12.011	0.6
27551753	1,4-Methanoazulen-9-ol, decahydro-1,5,5,8a-tetramethyl-, [1R-(1 α ...	12.256	0.3
EPA-197930	Pivalate, [1-nitro-3,4-dimethyl-3-cyclohexenyl)methyl] ester	12.384	0.4
EPA-222086	1,3-Bis-(2-cyclopropyl,2-methylcyclopropyl)-but-2-en-1-one	12.532	1.1
EPA-293015	trans- α -Bergamotene	12.636	0.3
EPA-154188	8-Nonenoic acid, 5,7-dimethylene-, methyl ester	12.768	0.4
515695	α -Bisabolol	12.827	2.4
502614	α -Farnesene	12.975	0.7
180315677	Tumerone	13.105	3.0
180315677	Tumerone	13.236	3.6
EPA-294644	Preg-4-en-3-one, 17 α -hydroxy-17 β -cyano-	13.381	0.5
68284242	Cycloheptane, 1,3,5-tris(methylene)-	13.571	0.1

