
Analytical Report	
Title	**Frankincense Egyptian** Essential Oil Profile by GC-MS
Report No.	SE-37270-11
Issue Date	August 31, 2015
Notebook reference	III-29-75
Contributors:	
Quote No.	
Requester	Blue 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 "Frankincense Egyptian lot 111260-a15".

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

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 software[1].The components were identified using the NIST mass spectral library[2].

Deliverables

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

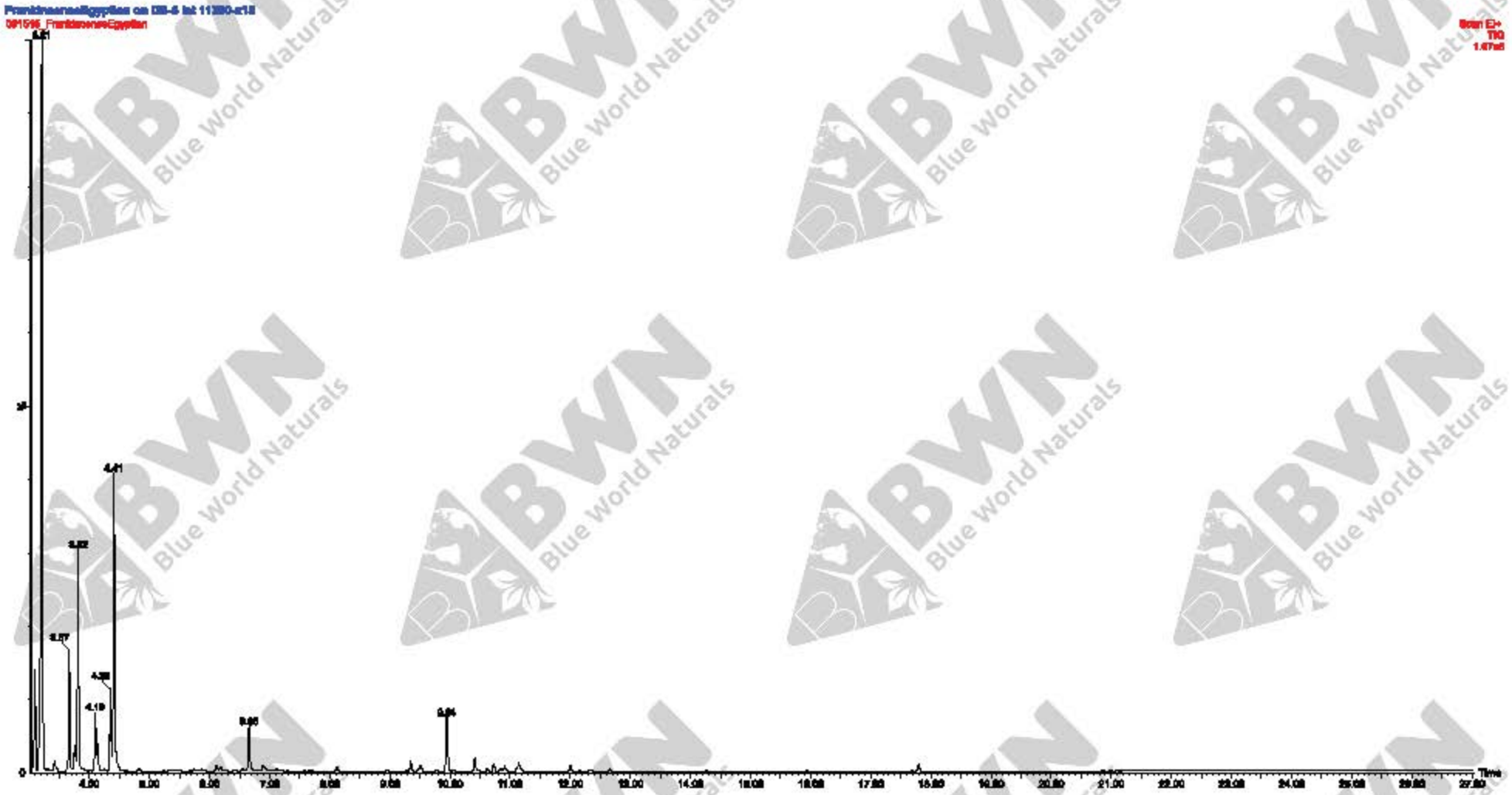
2. Appendix II lists library search results.

- 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/nistla.cfm

APPENDIX I
Frankincense Egyptian
GC-MS Chromatogram

Sample “Frankincense Egyptian"



APPENDIX II
Frankincense Egyptian
Identified Compounds

Frankincense Egyptian

CAS	Name	R.T.	Area
28634-89-1	Thujene	3.075	4.8
80-56-8	alpha-pinene	3.188	40.5
36262096	Bicyclo[3.1.0]hex-2-ene, 4-methylene-1-(1-methylethyl)-	3.3	0.1
79925	Camphene	3.404	0.7
538932	Benzene, (2-methylpropyl)-	3.442	0.1
3387415	Bicyclo[3.1.0]hexane, 4-methylene-1-(1-methylethyl)-	3.646	5.7
127913	ß-Pinene	3.742	1.4
123353	ß-Myrcene	3.794	9.9
99832	α-Phellandrene	4.08	2.9
2437958	Bicyclo[3.1.1]hept-2-ene, 2,6,6-trimethyl-, (±)-	4.12	1.3
99865	1,3-Cyclohexadiene, 1-methyl-4-(1-methylethyl)-	4.229	0.1
527844	Benzene, 1-methyl-2-(1-methylethyl)-	4.331	3.7
138863	Limonene	4.391	14.3
555102	ß-Phellandrene	4.428	0.7
470826	Eucalyptol	4.467	0.1
99854	1,4-Cyclohexadiene, 1-methyl-4-(1-methylethyl)-	4.802	0.2
586630	Cyclohexene, 3-methyl-6-(1-methylethylidene)-	5.207	0.1
546805	Thujone	5.728	0.1
4501580	3-Cyclopentene-1-acetaldehyde, 2,2,3-trimethyl-	5.855	0.1
4501580	3-Cyclopentene-1-acetaldehyde, 2,2,3-trimethyl-	5.855	0.1
547615	Bicyclo[3.1.1]heptan-3-ol, 6,6-dimethyl-2-methylene-, [1S-(1α,3α,5α)]-	6.102	0.4
18881044	Bicyclo[3.1.1]hept-3-en-2-ol, 4,6,6-trimethyl-, [1S-(1α,2ß,5α)]-	6.159	0.3
1686200	p-Mentha-1,5-dien-8-ol	6.231	0.0
562743	3-Cyclohexen-1-ol, 4-methyl-1-(1-methylethyl)-	6.634	2.8
EPA-157899	p-menth-1-en-8-ol	6.863	0.3
564943	Bicyclo[3.1.1]hept-2-ene-2-carboxaldehyde, 6,6-dimethyl-	6.9	0.2
1196016	Bicyclo[3.1.1]hept-3-en-2-one, 4,6,6-trimethyl-, (1S)-	7.104	0.1
92618898	Acetic acid, 1,7,7-trimethyl-bicyclo[2.2.1]hept-2-yl ester	8.097	0.3
5208491	4-Carene, (1S,3R,6R)-(-)-	8.934	0.1
3856255	Copaene	9.327	0.6
110823682	Cyclohexane, 1-ethenyl-1-methyl-2,4-bis(1-methylethenyl)-	9.493	0.4
489407	1H-Cycloprop[e]azulene, 1a,2,3,4,4a,5,6,7b-octahydro-1,1,4,7-tetramethyl-, [1aR-(1aα,4α,4aß,7bα)]-	9.761	0.1
118650	Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-,[1R-(1R*,4Z,9S*)]-	9.927	3.7
26560145	1,3,6,10-Dodecatetraene, 3,7,11-trimethyl-, (Z,E)-	10.043	0.1
6753986	α-Caryophyllene	10.394	0.9
109119917	Aromadendrene	10.452	0.1

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483750	Naphthalene, 1,2,4a,5,6,8a-hexahydro-4,7-dimethyl-1-(1-methylethyl)-	10.599	0.2
23986745	1,6-Cyclodecadiene, 1-methyl-5-methylene-8-(1-methylethyl)-, [s-(E,E)]-	10.707	0.4
473132	Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-4a,8-dimethyl-2-(1-methylethenyl)-, [2R-(2α,4aα,8aß)]-	10.821	0.1
22567175	Azulene, 1,2,3,3a,4,5,6,7-octahydro-1,4-dimethyl-7-(1-methylethenyl)-, [1R-(1α,3aß,4α,7ß)]-	10.899	0.3
23986745	1,6-Cyclodecadiene, 1-methyl-5-methylene-8-(1-methylethyl)-, [s-(E,E)]-	11.085	0.2
483761	Naphthalene, 1,2,3,5,6,8a-hexahydro-4,7-dimethyl-1-(1-methylethyl)-, (1S-cis)-	11.127	0.6
1139306	Caryophyllene oxide	11.984	0.3
5937111	.tau.-Cadinol	12.637	0.1
2867052	Bicyclo[3.1.0]hex-2-ene, 2-methyl-5-(1-methylethyl)-	14.251	0.0
3760143	1,5-Cyclooctadiene, 1,5-dimethyl-	15.92	0.1
7212444	1,6,10-Dodecatrien-3-ol, 3,7,11-trimethyl-	17.776	0.5