
Analytical Report	
Title	**Clary Sage** Essential Oil Profile by GC-MS
Report No.	SE-37270-8
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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 "Clary Sage lot 11037-a21".

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.

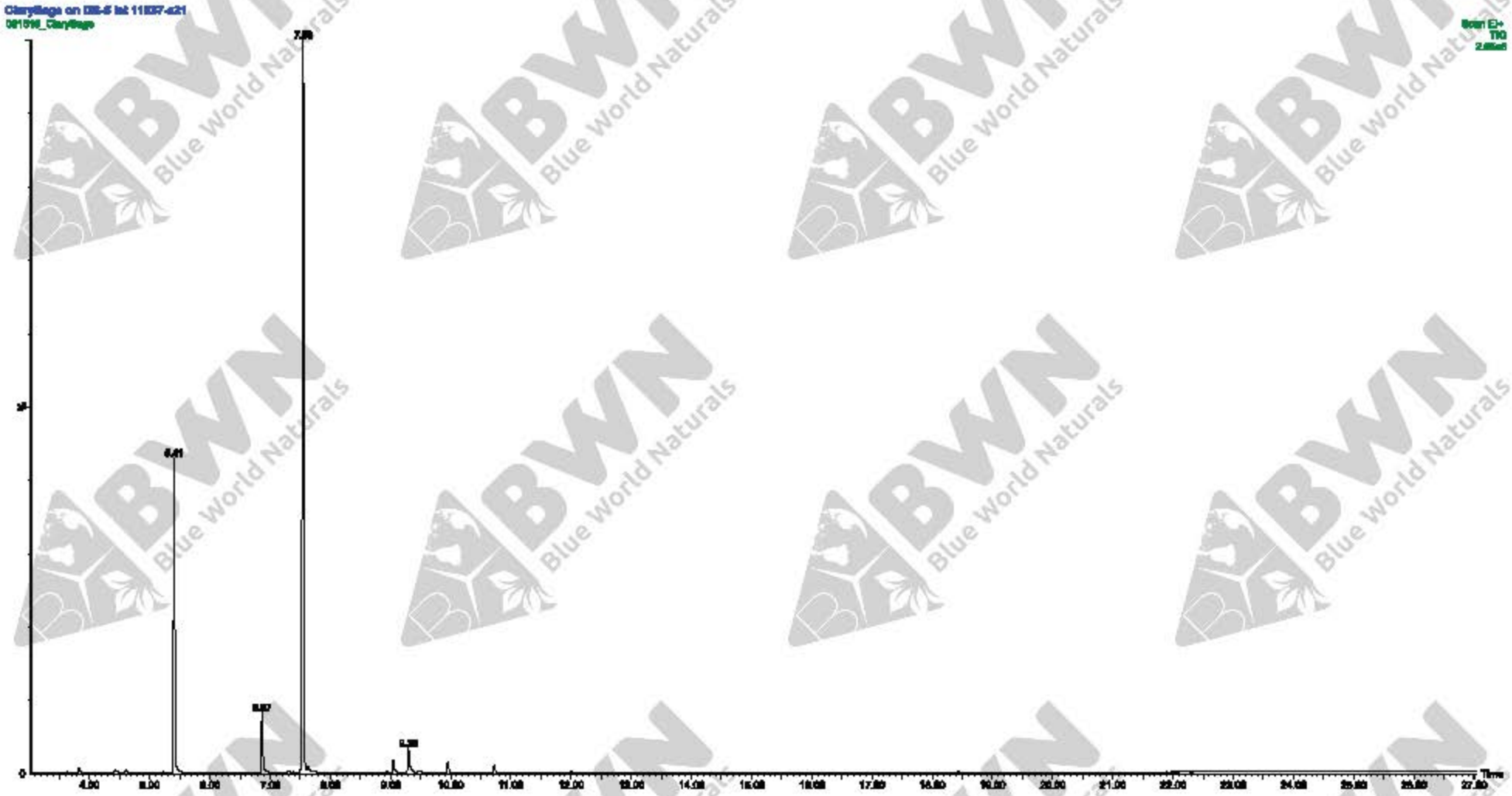
2. Appendix II lists library search results.

- 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
Clary Sage
GC-MS Chromatogram

Sample “Clary Sage”



APPENDIX II
Clary Sage
Identified Compounds

Clary Sage

CAS	Name	R.T.	Area
123353	ß-Myrcene	3.807	0.4
21284059	1,5-Cyclooctadiene, 3,4-dimethyl-	4.403	0.2
3779611	1,3,6-Octatriene, 3,7-dimethyl-, (E)-	4.43	0.1
3338554	1,3,6-Octatriene, 3,7-dimethyl-, (Z)-	4.59	0.3
586629	Cyclohexene, 1-methyl-4-(1-methylethylidene)-	5.204	0.1
78706	1,6-Octadien-3-ol, 3,7-dimethyl-	5.388	23.7
98-55-5	Terpineol	6.847	5.2
106252	2,6-Octadien-1-ol, 3,7-dimethyl-, (Z)- or isomer	7.287	0.2
106252	2,6-Octadien-1-ol, 3,7-dimethyl-, (Z)- or isomer	7.364	0.1
115-95-7	Bergamiol	7.533	63.0
106241	2,6-Octadien-1-ol, 3,7-dimethyl-, (E)- or isomer	7.608	0.5
42569595	4,8-Dioxatricyclo[5.1.0.0(3,5)]octane, 1-methyl-5-(1-methylethyl)-, (1α,3ß,5ß,7α)-	8.749	0.1
20777495	Cyclohexanol, 2-methyl-5-(1-methylethenyl)-, acetate, (1α,2ß,5α)-	8.926	0.1
98555	3-Cyclohexene-1-methanol, α,α4-trimethyl-	8.926	0.1
141128	2,6-Octadien-1-ol, 3,7-dimethyl-, acetate, (Z)-	9.028	1.1
16409442	2,6-Octadien-1-ol, 3,7-dimethyl-, acetate	9.282	2.4
17699148	α-Cubebene	9.324	0.2
5208593	Cyclobuta[1,2:3,4]dicyclopentene, decahydro-3a-methyl-6-methylene-1-(1-methylethyl)-	9.454	0.1
23986745	1,6-Cyclodecadiene, 1-methyl-5-methylene-8-(1-methylethyl)-, [s-(E,E)]-	9.489	0.1
118650	Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-,[1R-(1R*,4Z,9S*)]-	9.933	1.0
23986745	1,6-Cyclodecadiene, 1-methyl-5-methylene-8-(1-methylethyl)-, [s-(E,E)]-	10.707	0.6
74663835	1,5-Heptadiene, 2,5-dimethyl-3-methylene-	10.891	0.1
1139306	Caryophyllene oxide	11.988	0.2
473154	2-Naphthalenemethanol, decahydro-α,α,4a-trimethyl-8-methylene-, [2R-(2α,4aα,8aß)]-	12.83	0.1
142507	1,6,10-Dodecatrien-3-ol, 3,7,11-trimethyl-, [S-(Z)]- or isomer	15.301	0.1
142507	1,6,10-Dodecatrien-3-ol, 3,7,11-trimethyl-, [S-(Z)]- or isomer	18.407	0.1