
Analytical Report	
Title	**Lavender Bulgarian** Essential Oil Profile by GC-MS
Report No.	SE-37270-16
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 "Lavender Bulgarian lot 11168-a90".

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.

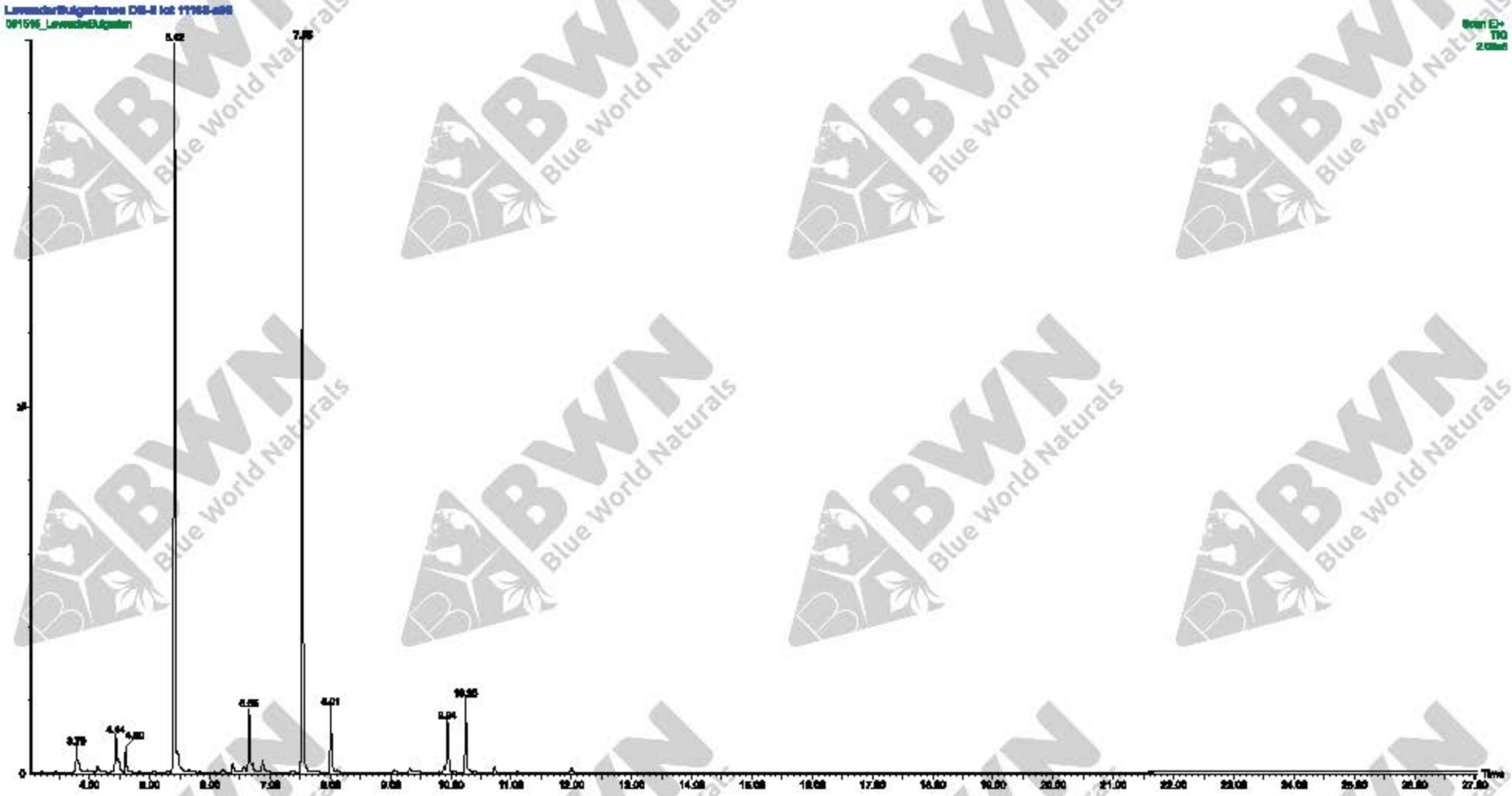
2. Appendix II lists library search results.

- 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
Lavender Bulgarian
GC-MS Chromatogram

Sample “Lavender Bulgarian”



APPENDIX II
Lavender Bulgarian
Identified Compounds

Lavender Bulgarian

CAS	Name	R.T.	Area
28634-89-1	Thujene	3.086	0.0
80-56-8	alpha-pinene	3.193	0.1
79925	Camphene	3.41	0.1
106683	3-Octanone	3.766	1.8
123353	ß-Myrcene	3.799	0.4
109217	Butanoic acid, butyl ester	3.896	0.0
589980	3-Octanol	3.949	0.1
142927	Acetic acid, hexyl ester	4.11	0.3
535773	Benzene, 1-methyl-3-(1-methylethyl)-	4.349	0.0
2437958	Bicyclo[3.1.1]hept-2-ene, 2,6,6-trimethyl-, (±)-	4.421	2.2
470826	Eucalyptol	4.469	0.7
3338554	1,3,6-Octatriene, 3,7-dimethyl-, (Z)-	4.581	1.1
99854	1,4-Cyclohexadiene, 1-methyl-4-(1-methylethyl)-	4.806	0.1
EPA-121974	cis-Linalooloxide	5.296	0.1
78706	1,6-Octadien-3-ol, 3,7-dimethyl-	5.397	38.7
32717310	Octen-1-ol, acetate	5.447	1.3
4864613	3-Octanol, acetate	5.637	0.1
644495	Propanoic acid, 2-methyl-, propyl ester	6.064	0.0
21368683	Bicyclo[2.2.1]heptan-2-one, 1,7,7-trimethyl-, (±)-	6.195	0.1
498168	4-Hexen-1-ol, 5-methyl-2-(1-methylethenyl)-, (R)-	6.355	0.6
124765	Isoborneol	6.545	0.4
562743	3-Cyclohexen-1-ol, 4-methyl-1-(1-methylethyl)-	6.631	3.3
2639636	Butanoic acid, hexyl ester	6.68	0.5
500027	2-Cyclohexen-1-one, 4-(1-methylethyl)-	6.813	0.1
EPA-157899	p-menth-1-en-8-ol	6.853	0.7
115-95-7	Acetic acid linalool ester	7.522	35.1
25905140	4-Hexen-1-ol, 5-methyl-2-(1-methylethenyl)-, acetate	7.987	3.6
5888335	2-Propenoic acid, 1,7,7-trimethylbicyclo[2.2.1]hept-2-yl ester, exo-	8.092	0.1
141128	2,6-Octadien-1-ol, 3,7-dimethyl-, acetate, (Z)-	9.043	0.2
16409442	2,6-Octadien-1-ol, 3,7-dimethyl-, acetate	9.3	0.3
495603	1,3-Cyclohexadiene, 5-(1,5-dimethyl-4-hexenyl)-2-methyl-, [S-(R*,S*)]-	9.429	0.1
26560145	1,3,6,10-Dodecatetraene, 3,7,11-trimethyl-, (Z,E)-	9.782	0.0
512618	Tricyclo[2.2.1.0(2,6)]heptane, 1,7-dimethyl-7-(4-methyl-3-pentenyl)-, (-)-	9.869	0.3
118650	Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-,[1R-(1R*,4Z,9S*)]-	9.927	3.2
EPA-293015	trans-α-Bergamotene	10.041	0.1
18794848	1,6,10-Dodecatriene, 7,11-dimethyl-3-methylene-, (E)-	10.227	3.4

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20307839	Cyclohexene, 3-(1,5-dimethyl-4-hexenyl)-6-methylene-, [S-(R*,S*)]-	10.285	0.1
502998	1,3,7-Octatriene, 3,7-dimethyl-	10.397	0.1
23986745	1,6-Cyclodecadiene, 1-methyl-5-methylene-8-(1-methylethyl)-, [s-(E,E)]-	10.708	0.3
1139306	Caryophyllene oxide	11.983	0.3