Frontier Analysis, Ltd

TECHNICAL SERVICE RESPONSE NO.: UT082

Subject: Analysis of Foliage and Soil Samples Related to the Sightings of Orange and Blue Orbs (Sutton Farm, York, Pennsylvania, July 18, 2013) MUFON Case: 50797

Date: March 17, 2014

Requested By: Julia Weiss
State Section Director
MUFON Pennsylvania

Bill Weber
Chief Investigator
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Background/Objective:

A resident of Sutton farm observed an orange orb almost land in a bean field. Two days later a nine foot circle appeared in the field with the foliage flattened out. No significant radiation was detected at this site. That same night the witness also observed a blue orb directly across from her house in a wooded area. It did not touch the ground, but hovered in the trees. A slightly elevated radiation reading was noted at this site. The object is to determine whether there are any anomalies in samples of soil and foliage gathered from the two sites.

Conclusions:

●The wooded area, blue orb site does have an anomaly. The soil contains burned vegetation. Its origin is unknown. Other substances common to soil are also detected such as: quartz, olivine-type mineral, another mineral, amide (animal derived material, maybe mold). Substances detected on the leaf foliage from this site consist of: insect droppings, calcium oxalate, mold, natural plant ester, possibly inorganic nitrate. It is unknown if the calcium oxalate, and possible inorganic nitrate, are abnormal at this site.

They are commonly found in nature. However, this analyst has also noted they are present in many samples in contact with UFOs.[1]

●No unusual anomalous materials are detected in the bean field orange orb site. Common materials are found in the soil such as: quartz, natural ester (like balsam), another mineral, olivine-type mineral, amide(animal derived material, maybe mold). The foliage contains usual substances which include: calcium carbonate, calcium barium carbonate, mold.

●A sampling protocol should be established for collection of soil and foliage samples that come into contact with orbs or UFOs. More site samples and control samples should have been collected. The soil and bean foliage samples from the bean field orange orb site (A) could be compared to the control samples from the edge of the field (B). However, the control samples could not be compared to the soil and foliage from the wooded area (C). Another control, at minimum, from the wooded area near the C site should have been collected.

Procedure:

Samples: All samples were received in self-sealing plastic bags on October 23, 2013. They consist of three soils and three foliage as follows:

Soil Samples:

●A-1 soil from the bean field, the orange orb site
●B-1 control soil from the edge of the bean field
●C-1 soil from a wooded area, the blue orb site

The bulk of the soil samples were ground to a fine consistency. Large particulates, e.g. stones etc. were screened out. Infrared spectra were first obtained from the well-mixed soil fines. Additional spectra were also acquired from interesting looking particulates. Some black particulates from the C-1 blue orb site were additionally examined under a microscope. The ground, well-mixed soil was also quantitatively examined for the amount of magnetic material by passing a magnet over the surface. Aliquots of the soil samples were then quantitatively extracted with distilled water. Infrared spectra were acquired from these extracts. Finally, the rest of the finely ground, well-mixed soils were sent to Brookside Laboratories for a soil audit. Following are photographs of the soil samples (as received).

[1] Technical Service Report: UT001: Analysis of Soil Samples Related to the Delphos, Kansas November 1971 CE2 Event; Technical Service Report: UT021: Identification of a White Substance that Formed Rings in Fields after Plowing (New Pine Creek, Oregon).

A-1 Soil
Orange Orb Site
Bean Field

B-2 Soil
Bean Field
Edge Control

C-2 Soil
Blue Orb Site
Wooded Area

Foliage Samples:

●A-2 bean foliage from the bean field, orange orb site
●B-2 control bean foliage from the edge of the bean field
●C-2 leaf foliage from a wooded area, the blue orb site.

Infrared spectra were obtained from visually different appearing areas of the foliage samples. The samples were then quantitatively extracted with methylene chloride. Infrared spectra were acquired from the extracts. Following are photographs of the foliage samples.

A-2 Bean Foliage
Orange Orb Site
Bean Field

B-2 Bean Foliage
Control Field Edge

C-2 Leaf Foliage
Blue Orb Site
Wooded Area

All FT-IR (Fourier Transform-Infrared Spectra)[2] were acquired on the Thermo Electron Avatar 360 spectrometer using the Smart Herrick diamond sampling accessory. Microscope photographs were obtained using a Canon A520 digital camera interfaced to a Leica GZ6 stereomicroscope.

[2] **FT-IR (Fourier Transform Infrared Spectroscopy):** Infrared spectroscopy is used for the molecular structure identification and quantification of solids, liquids, and gases. An infrared spectrum is the result of light (in the 2 to 25 micron wavelength range) interacting with the vibrations of molecules. The particular set of vibrations of a molecule gives rise to specific spectral absorption bands, often referred to as the "fingerprint" spectrum.

Results:

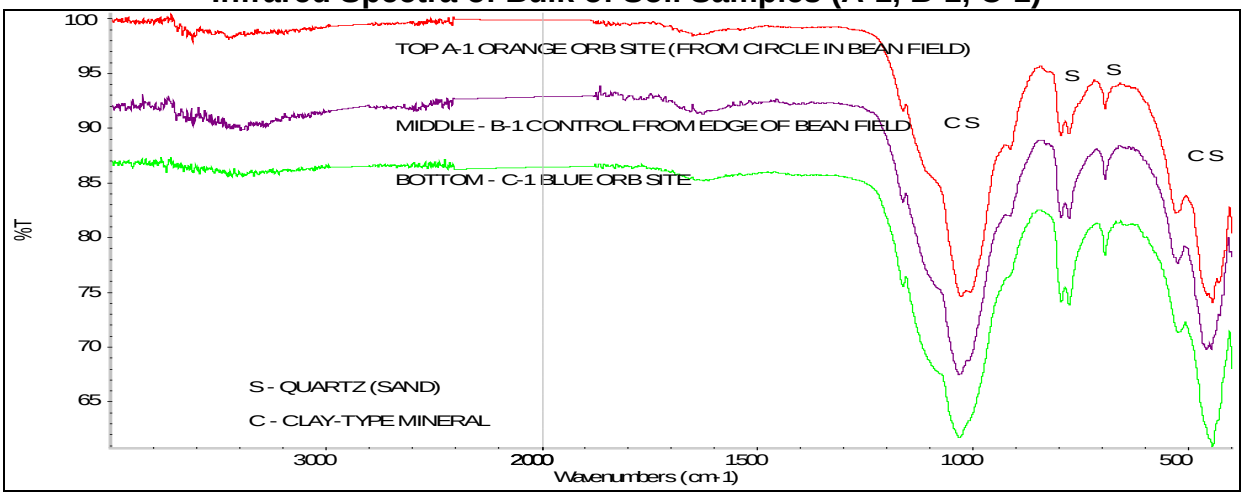
The detailed results of the individual tests done on the samples follow. These results are summarized in the conclusions section on the pages one and two of this report.

Soil Samples

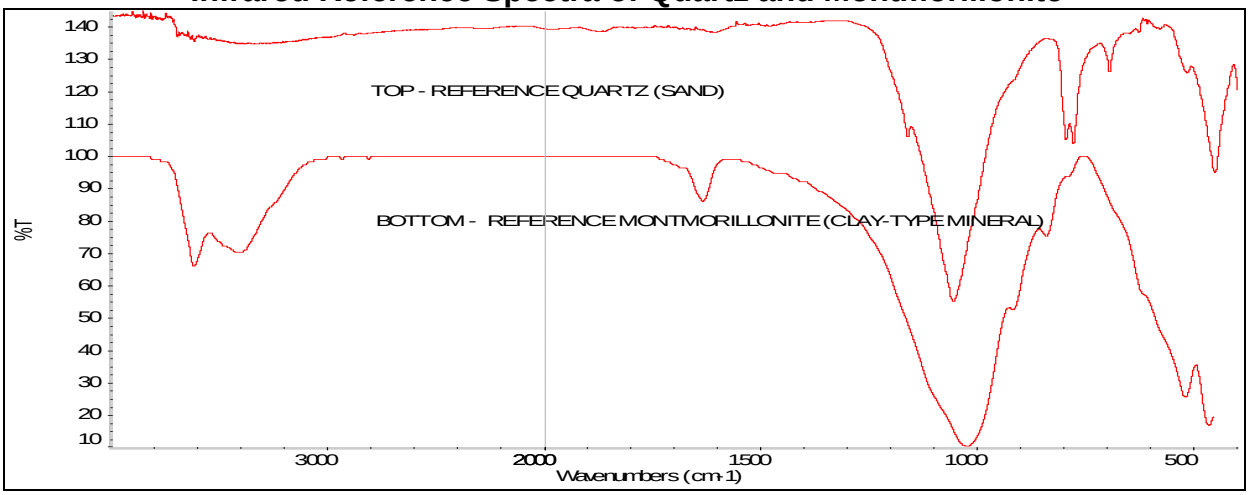
Infrared Analysis of Bulk of the Soils

Infrared analysis of the bulk well-mixed soil fines from each of the three samples (A-1, B-1, C-1) show they are primarily composed of quartz (sand) and a clay-like mineral similar to montmorillonite. No organic material is detected at this point. Also, nothing anomalous is detected. The spectra of these samples follow, along with references of quartz and montmorillonite (a clay-like mineral) for comparison.

Infrared Spectra of Bulk of Soil Samples (A-1, B-1, C-1)



Infrared Reference Spectra of Quartz and Montmorillonite



Infrared Analysis of Individual Particulates

Infrared analysis shows most all of these particulates, except for anomalous black particles found in the C-1 sample, consist of common substances found in soils. Infrared spectra of most of the particulates are not displayed[3]. A table follows which summarizes the substances identified. They are listed in order of their relative concentrations. A detailed analysis of the C-1 soil black particulates follows the table.

Soil Sample	Particle Appearance	Substance
A-1	White	Quartz, Natural Ester (Like Balsam)
	Normal Brown	Quartz, Another Mineral, Natural Ester (like Balsam
	Light Brown	Quartz
		Olivine-type Mineral
	Dark Brown	Quartz, Amide (Animal Derived Material, Maybe Mold)
	Dark Brown Crunchy	Quartz, Amide (Animal Derived Material, Maybe Mold)
B-1	Light Brown	Olivine-type Mineral
	Dark Brown	Amide (Animal Derived Material, Maybe Mold)
	Regular Brown	Quartz
	Cream Colored Hard	Quartz
C-1	White Crunchy Hard	Quartz
	White, Not Crunchy	Olivine-type Mineral;
	Dark Brown	Quartz, Another Mineral, Amide (Animal Derived Material, Maybe Mold)
	Black	Burned Vegetation, Quartz
	Black	Burned Vegetation, Trace Quartz
	Black	Burned Vegetation, Trace Quartz

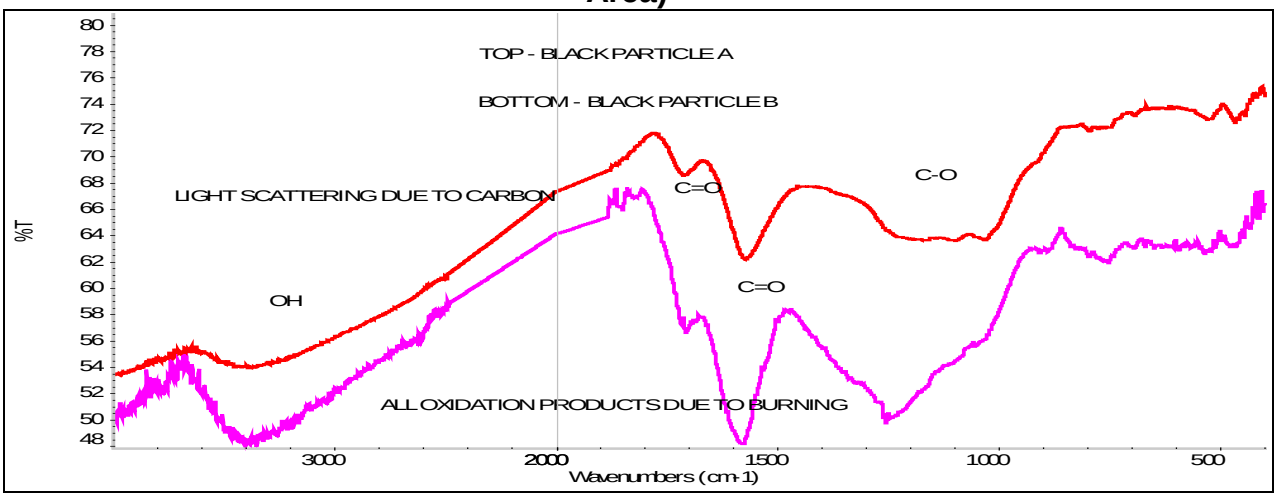
The analysis shows the black particles from the blue orb site (C-1) are unique to this sample. Following are microscopic pictures of these particulates. They appear to be burned vegetation.

[3] These spectra will be kept on file.

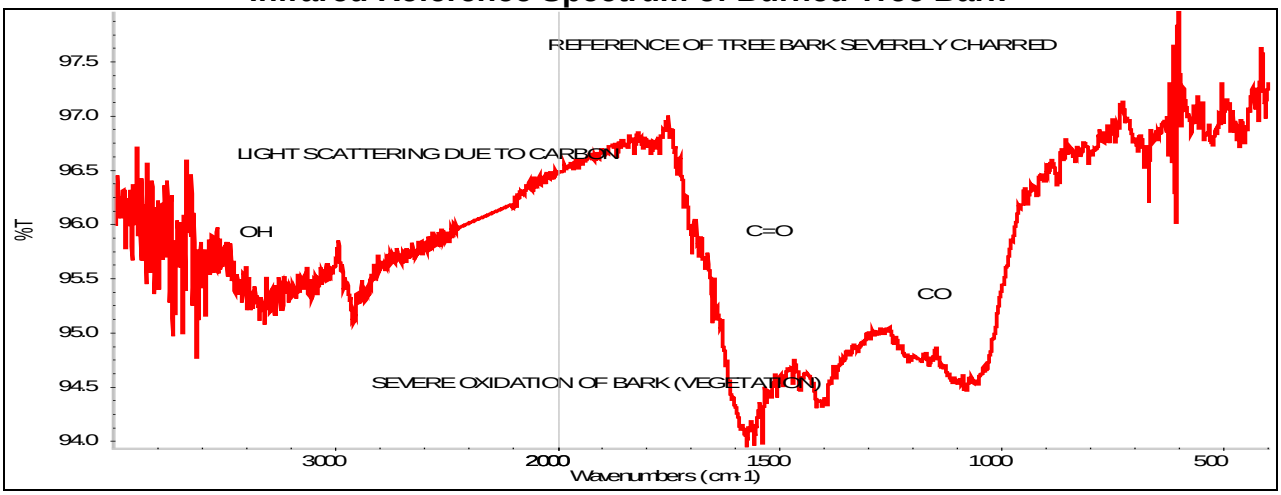
Microscope Photographs of Black Particulates from Sample C-1

Infrared analysis clearly identifies them as burned vegetation. The spectra show oxidized organic material, and indicates carbon. Following are two selected spectra of the particulates and also references of burned wood for comparison.

Infrared Spectra of Two Black Particulates from C-1 (Soil from Blue Orb Wooded Area)



Infrared Reference Spectrum of Burned Tree Bark



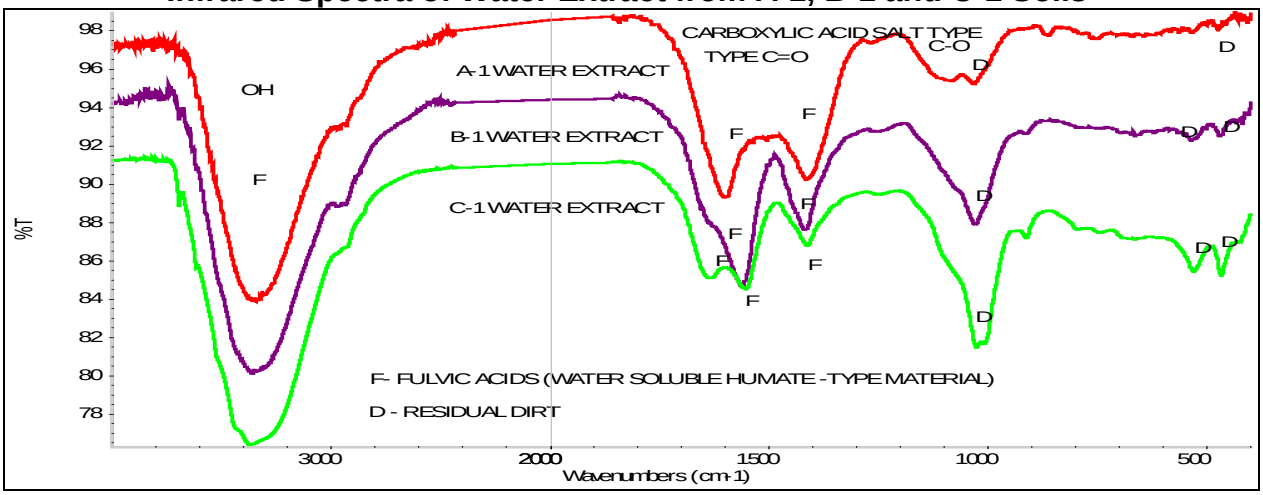
Analysis of Water Extracts

The amounts of water extractable materials are shown in the following table. It should be noted that samples A-1 and B-1 are from, or on the edge, of a field where beans are grown. So, one cannot compare the extract values of these soils to that from the C-1 blue orb site from a wooded area. A control near this site should have been obtained for a viable comparison. The values reported below for all are probably within experiment error. More samples should have been obtained for more accurate results.

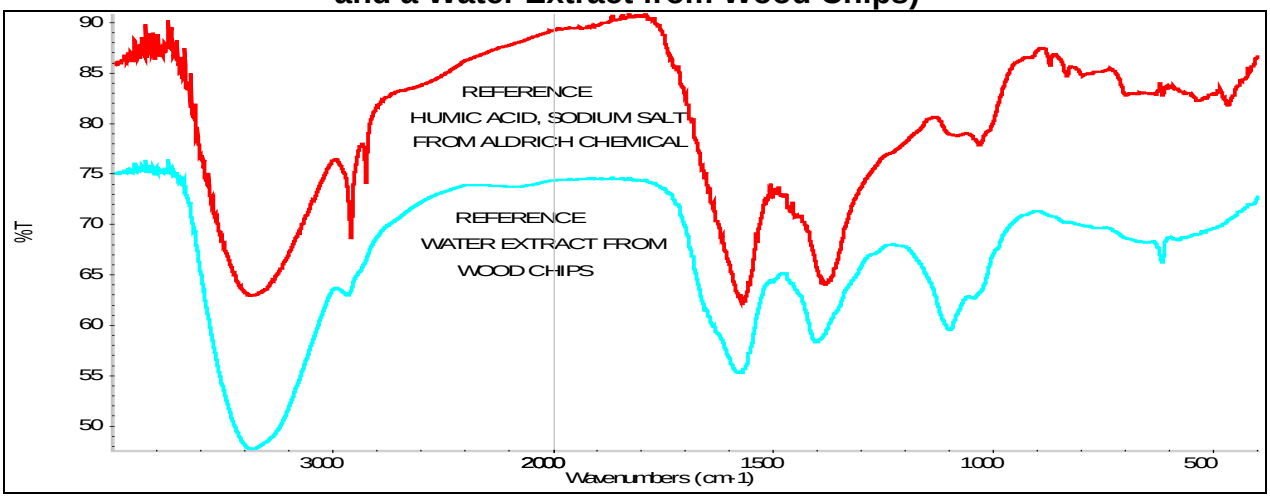
Soil Samples	Amount Extract (mg/g)
A-1 Orange, Orb Bean Field	6
B-1 Control, Edge of Bean Field	15
C-1 Blue Orb, Wooded Area	11

Infrared analysis does not detect any unusual anomalies in the water extracts. The spectra show all three extracts, expectedly, contain fulvic acids, i.e. water soluble humates. Residual colloidal dirt is also detected. Following are the spectra of the extracts followed by humate-type references for comparison.

Infrared Spectra of Water Extract from A-1, B-1 and C-1 Soils



Infrared Reference Spectra of Humate-Type Substances (Humic Acid, Sodium Salt and a Water Extract from Wood Chips)



Analysis for Magnetic Material

This analysis was done because some analysts (W. C. Levengood and certain crop circle researchers) have reported an increase in magnetic material (meteoric dust) at sites near, or in contact with, orbs or UFOs. I have not observed this increase in the soils that I have examined. However, I continue to look at this parameter. No increase in magnetic material was detected in either of the orb sites. The following table shows the results.

Soil Samples	Magnetic Material (mg/g)
A-1 Orange, Orb Bean Field	11
B-1 Control, Edge of Bean Field	17
C-1 Blue Orb, Wooded Area	17

Soil Audit Analysis

A soil assay done by Brookside Laboratories does not appear to show anything unusual. Only the data of A-1 and B-2 control should be compared to each other. As previously indicated a second control (at minimum) should have been provided for the C-1 sample. The most notable values observed in the data are those reported for the anions, exchangeable cations, as well as base saturation percent for calcium and magnesium. They are higher in A-1 than the those for the B-1 control. The definition for these parameters can be found on the http://al-labs-plains.com/soil.html website. These higher values might be due to the condition of the soil (as prepared for planting) and the fact it may have more fertilizers and other chemicals than the control. The soil audit follows.

lb/A

BROOKSIDE LABORATORIES, INC.

71606-1

SOIL AUDIT AND INVENTORY REPORT

Name Frontier Analysis LTD. City Chagrin Falls State OH

Independent Consultant Brookside Consultants of Ohio, Inc. Date 01/28/2014

Sample Location YORK, PA			A1 SOIL	B1 SOIL	C1 SOIL			
Sample Identification			CIRCLE	CONTROL	ORB			
Lab Number			0880-1	0881-1	0882-1			
Total Exchange Capacity (ME/100 g)			13.95	14.38	12.38			
pH (H_2O 1:1)			6.9	5.5	4.7			
Organic Matter (humus) %			5.84	9.92	10.86			
Estimated Nitrogen Release		lb/A	104	125	125			
ANIONS	SOLUBLE SULFUR*	ppm	13	17	19			
ANIONS / PHOSPHORUS	MEHLICH III	lb/A P as P_2O_5	1470	664	321			
		ppm of P	321	145	70			
	BRAY II	lb/A P as P_2O_5	3096	1191	202			
		ppm of P	676	260	44			
	OLSEN	lb/A P as P_2O_5						
		ppm of P						
EXCHANGEABLE CATIONS	CALCIUM*	lb/A	3894	2648	1494			
		ppm	1947	1324	747			
	MAGNESIUM*	lb/A	682	500	228			
		ppm	341	250	114			
	POTASSIUM*	lb/A	354	284	240			
		ppm	177	142	120			
	SODIUM*	lb/A	40	36	38			
		ppm	20	18	19			
BASE SATURATION PERCENT								
Calcium		%	69.78	46.04	30.17			
Magnesium		%	20.37	14.49	7.67			
Potassium		%	3.25	2.53	2.49			
Sodium		%	0.62	0.54	0.67			
Other Bases		%	4.50	6.40	8.00			
Hydrogen		%	1.50	30.00	51.00			
EXTRACTABLE MINORS								
Boron* (ppm)			0.71	0.50	0.41			
Iron* (ppm)			132	224	152			
Manganese* (ppm)			155	95	110			
Copper* (ppm)			14.03	5.20	18.12			
Zinc* (ppm)			19.88	10.85	19.41			
Aluminum* (ppm)			787	797	995			
OTHER TESTS	Soluble Salts (mmhos/cm)							
	Chlorides (ppm)							
	NO_3-N (ppm)		25.5	34.6	27.3			
	NH_4-N (ppm)		9.4	15.0	14.9			

* Mehlich III Extractable

Foliage Samples

Infrared Analysis of Different Visually Appearing Surface Areas

This analysis was done on areas of the foliage (bean plants with beans and leafs) that visually appeared different. No unusual materials were detected. The substances identified were extraneous materials normally found on plant foliage. The infrared spectra are not shown.[4] The following table lists the materials detected in order of their relative concentrations.

Foliage Sample	Area Appearance	Substance
A-2	Shiny	Calcium Carbonate, Calcium Barium Carbonate, Mold
	White	Mold, Calcium carbonate, Calcium Barium Carbonate
	Light Tan	Calcium Carbonate, Calcium Barium Carbonate
	Dark	Amide (Mold), Calcium Carbonate, Calcium Barium Carbonate
B-2	White	Natural Ester (Oil from Vegetation), Amide (Mold) inorganic carbonate
	Dull	Inorganic carbonate; amide (mold)
	Shiny	Amide (Mold)
C-2	Black	Insect Droppings
	White	Calcium Oxalate
	Light Tan	Amide (Mold)
	Dark	Calcium Oxalate; Natural Plant Ester, Possible Inorganic Nitrate.

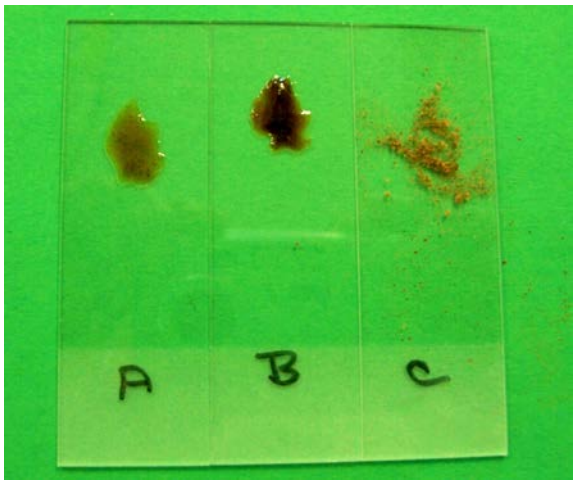
Methylene Chloride Extractions

The amounts of extractable materials for all three samples are approximately the same. The values follow.

Foliage Samples	Amount Extract (mg/g)
A-2 Orange Orb (Beans)	95
B-2 Control (Beans)	82
C-2 Blue Orb (Leafs)	92

The following photographs shows the A-1 and B-1 extracts are semi-liquids. That of C-1 is a solid.

[4] They will be kept on file.

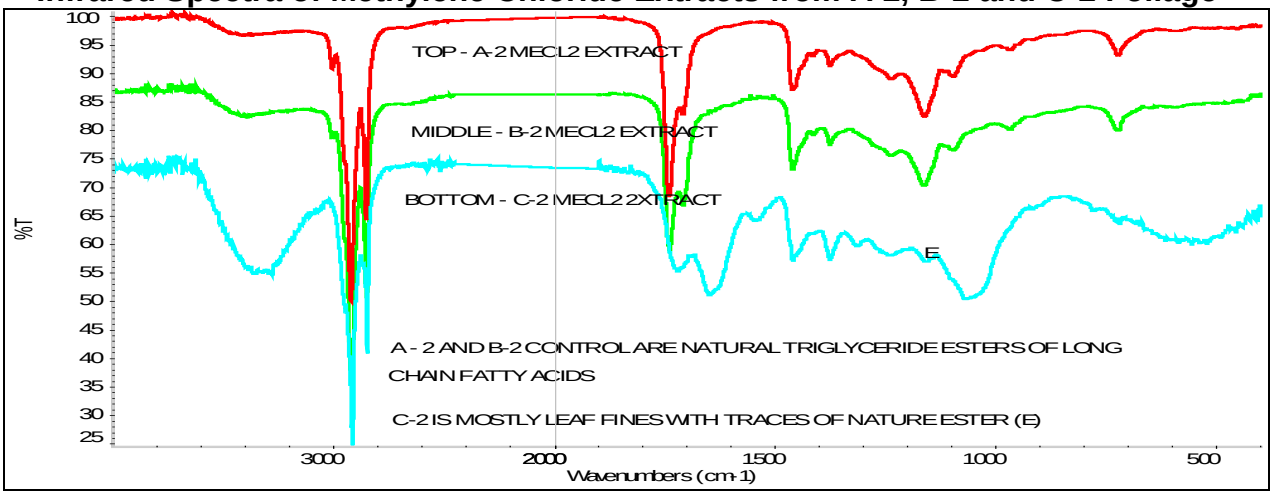


Visual Appearance of the Extracts

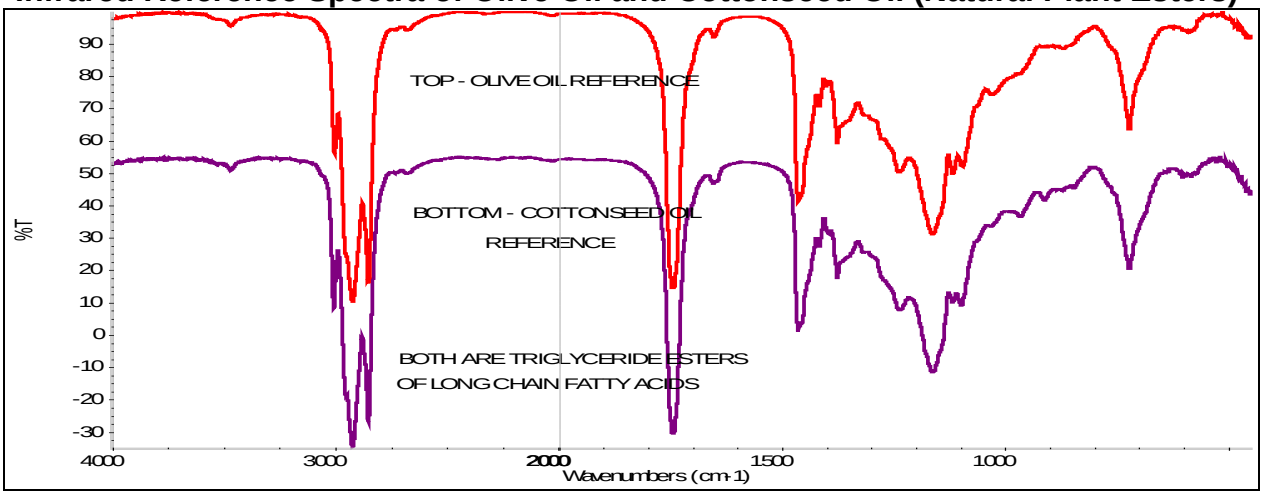
Infrared analysis of the extracts show A-2 and B-2 are the same natural esters. More specifically, they are triglyceride esters of long chain fatty acids. No significant differences are observed between the bean foliage samples A-2 and B-2 Control.

As in the other tests, the C-2 foliage should not be compared to the control bean foliage sample B-2, because the foliage is composed of leafs. The spectrum shows that C-2 extract does contain a trace of natural ester, along with residual leaves that were very fine from the grinding process in the sample preparation. The fines were difficult to separate from the extract. Following are the spectra of the extracts along with references of natural fatty acid esters (olive oil, cottonseed oil) for comparison

Infrared Spectra of Methylene Chloride Extracts from A-2, B-2 and C-2 Foliage



Infrared Reference Spectra of Olive Oil and Cottonseed Oil (Natural Plant Esters)



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Phyllis A. Budinger