



OBSERVING APHIDS



This is an observation project that should teach you some basic concepts behind scouting. In this project you will learn about milkweed aphids, and about some of the predators and parasites that feed on this aphid. Hopefully, you will become a little more intrigued by the wonders of nature that occur in your own yard. While at times you may find the observations excessive, science always finds a way to overdo the basic observations of life. This experiment will help you understand what to look for when scouting for bugs. It will also help to determine the places you should look, not to mention blaze the path to becoming an aphid expert.

FIRST A LITTLE BIT ON OUR VICTIM



The milkweed aphid, also known as the oleander aphid (*Aphis nerii*) is a common pest of many ornamental plants. The bright yellow aphid can be found on milkweeds (such as butterfly weed), oleander, and the wax plant. The life cycle varies considerably, depending on the presence of cold winters.

Development can be rapid, 10 to 12 days for a single generation. Each female is capable of producing 70-80 offspring; that's a lot of aphids in a very short time. While some of these young hatch from eggs, most are born live. In fact, all milkweed aphids you see in your garden will be female, since males are not needed to reproduce. Cultural controls are often the best way to control this aphid. For example, by reducing the amount of watering, fertilizer, and pruning, you also reduce the number of young tender shoots (aphid's favorite food). Natural biological control can also be an effective means for control. Hopefully you will get to see some biocontrol in action!!

THE EXPERIMENT

You will be given a milkweed plant that is hopefully infested with aphids. Make sure that your plant receives some water and love throughout the week.

On this plant you are going to rate particular areas of the plant based on aphid infestation using this ratings system:



- 0= no aphids present
- 1= low infestation
- 2=medium infestation
- 3=high infestation

This is a very subjective numbering system, but the most important factor is that people stay consistent with their own rating system. Before rating a plant it is always a good idea to look for areas of low and high infestation so you know what these levels of infestation will look like. Also, remember to compare to your own previous ratings to recheck yourself. After you rate these areas you will place them giving

1st place to the area with the **lowest** infestation,

2nd place to the area with the next lowest and so forth.

If two areas look the same they can tie. For example, if two areas have no aphids present you would award both 1st place. After assessing how much damage the aphids are doing, look for their control measures (the natural enemies). You will probably see 5 types of natural control occurring.

1. predation by ladybird beetle larvae
2. predation by fly larvae
3. predation by lacewing larvae
4. predation by assassin bugs
5. parasitism - which will be evident by off-colored aphids and mummies.



You may also see other insects on your milkweed such as the famous monarch caterpillar or milkweed bugs; however, for this project we are not worried about these bugs. If you are especially interested in the insects you are seeing on your milkweed plant I suggest you check out the website... <http://home.satx.rr.com/txento/MWpix.htm>

SO now you are ready to begin.....

1. Fill out the pesticide usage questionnaire. Harsh pesticides can have an adverse effect on beneficial insects. As a class we can go back to see if what you sprayed had an effect on who observed beneficial insects and who did not.

2. Now data collection commences. First make sure to fill out the top portion of your form. Try to observe your aphids at the same time each day. Also note what the current weather is like: sunny, windy, rainy, overcast, and maybe temperature if you are especially dedicated.

3. Mentally divide your milkweed plant into 3 areas: the lower third, middle third and upper third. Rate each area based on the 0-3 scale. Make sure you also check the underside of leaves. Award places.



4. Locate new buds (if present), new leaf growth, hardened (older) leaf growth, and senescing (dying) leaves and buds. Rate each based on the 0-3 scale. Award places.

5. Look for natural enemies. On the back page of this handout are pictures of some natural enemies of aphids. See if you can identify them on your milkweed. Remember you will probably be looking for larvae, since this is the less mobile and often hungrier stage of many beneficial insects. You will also be looking for parasitized aphids.

- a. Count any ladybird larvae present on your milkweed (black with orange spots).
- b. Count any syrphid fly larvae present on your milkweed (anything that looks snot/slug like is a fly larva).
- c. Count any lacewing larvae (brown and yellow with sickle-shaped jaws).
- d. Count any assassin bugs (both nymphs and adults).
- e. Look for parasitism by counting parasitized aphids (red aphids with swollen bodies)

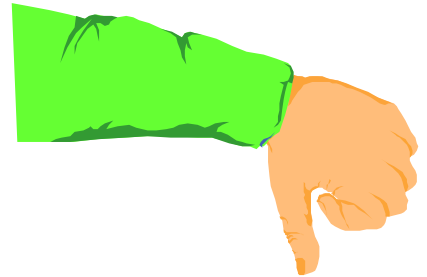
6. Throughout this experiment don't forget to include comments and observations that you find interesting. For example, do you see any eggs on the leaves? Do you see any other unidentified insects? Do you see any aphid mummies (the dead aphid bodies left

behind after they are parasitized)? Did you see any of the natural enemies actively feeding?

7. Repeat these observations 3 more times, trying to spread them out over the next two weeks.

SOME RULES

1. NO spraying during the experiment, even soap or oil sprays are NOT allowed. If you spray, your experiment stops from that point.



2. Don't worry if by the third day all your aphids are gone. Remember that zeros still count as data, and are valuable to show how long your natural enemies took to bring your aphids under control.

3. Remember you can contact your extension agent with any questions.

*Ladybird, ladybird fly away home,
Your house is on fire, your children are gone.*

PESTICIDE USAGE SURVEY- to complete before project

How often do you apply pesticides (insecticides, herbicides, and fungicides) in a year

0=never used

1=used once

2=used 2-5 times

3- used 6 or more times

Where do you apply pesticides

0=never used

1=pest infested plants only

2=all plants susceptible to pest

3=all plants

Please write down the names of any pesticides you have used in the past 3 months below.

FIRST COUNT

Date _____

Scout's Name _____

Time _____

Weather Conditions _____

		Rating of infestation 0=no aphids 1=low infestation 2=medium infestation 3=high infestation	OTHER COMMENTS	Award places based on 1 st place = lowest infestation rate
Plant height areas	Low			
	Medium			
	High			
Type of tissue where aphids observed	New leaves			
	New buds			
	Older leaves			
	Dying tissue			
NATURAL ENEMIES		NUMBER	COMMENTS	
Ladybeetle larvae				
Syrphid Fly larvae				
Lacewing larvae				
Assassin bugs				
Parasitized (discolored) aphids				

SECOND COUNT

Date _____

Scout's Name _____

Time _____

Weather Conditions _____

		Rating of infestation 0=no aphids 1=low infestation 2=medium infestation 3=high infestation	OTHER COMMENTS	Award places based on 1 st place = lowest infestation rate
Plant height areas	Low			
	Medium			
	High			
Type of tissue where aphids observed	New leaves			
	New buds			
	Older leaves			
	Dying tissue			
NATURAL ENEMIES		NUMBER	COMMENTS	
Ladybeetle larvae				
Syrphid Fly larvae				
Lacewing larvae				
Assassin bugs				
Parasitized (discolored) aphids				

THIRD COUNT

Date _____

Scout's Name _____

Time _____

Weather Conditions _____

		Rating of infestation 0=no aphids 1=low infestation 2=medium infestation 3=high infestation	OTHER COMMENTS	Award places based on 1 st place = lowest infestation rate
Plant height areas	Low			
	Medium			
	High			
Type of tissue where aphids observed	New leaves			
	New buds			
	Older leaves			
	Dying tissue			
NATURAL ENEMIES		NUMBER	COMMENTS	
Ladybeetle larvae				
Syrphid Fly larvae				
Lacewing larvae				
Assassin bugs				
Parasitized (discolored) aphids				

FOURTH COUNT

Date _____

Scout's Name _____

Time _____

Weather Conditions _____

		Rating of infestation 0=no aphids 1=low infestation 2=medium infestation 3=high infestation	OTHER COMMENTS	Award places based on 1 st place = lowest infestation rate
Plant height areas	Low			
	Medium			
	High			
Type of tissue where aphids observed	New leaves			
	New buds			
	Older leaves			
	Dying tissue			
NATURAL ENEMIES		NUMBER	COMMENTS	
Ladybeetle larvae				
Syrphid Fly larvae				
Lacewing larvae				
Assassin bugs				
Parasitized (discolored) aphids				



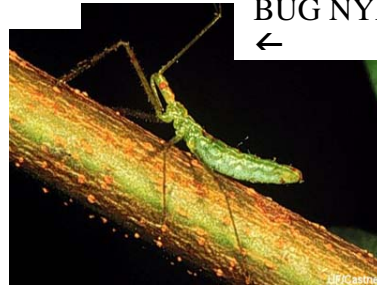
← HEALTHY MILKWEED APHIDS



LADYBIRD LARVA
Often black with orange spots



LACEWING LARVA
notice the pincher
←like mouthparts



ASSASSIN BUG NYMPH
←



ASSASSIN BUG
←ADULT



SYRPHID FLY LARVA

← SYRPHID FLY LARVA
sluglike can range in color from green to black



PARSITIZED APHIDS



← APHID MUMMIES
hole is made by exiting parasite

Mummies from: <http://mamba.bio.uci.edu/~pjbryant/biodiv/hemipt/37.jpg>
Ladybeetle larva from: <http://www.uidaho.edu/so-id/entomology/Convergent%20LB-larva.jpg>
Lacewing from : http://entomology.unl.edu/images/beneficials/lacewings/glacewing_larv.jpg