



BEETLES: The Coming Out

Participants:

C.J. Stevens
Ryan Swartz
Irene Hawkins

Schools:

Mountain Pointe High School
Moon Valley High School
Tempe Preparatory Academy

Grades Affected:

7th – 10th grade life sciences

Title: “Hatching Bruchid beetle eggs.”

Description: We will design an experiment to test the variables involved in the hatching of the Bruchid beetles.

This activity is to follow the discovery lab designed by the Ecology Explorers, “What’s happening to our Palo Verde tree?”

Purpose: What are the affects of different environments on the emergence rate of the Bruchid beetles?

Materials:

- Blue Palo Verde Pods: use the pods already collected for the Ecology Explorers’ “What’s happening to our Palo Verde’s?” project. The number of pods needed depends on the number of students, or student groups, that are participating. The more pods, the better.
- Containers: plastic cups with tops, jelly jars, or baby food jars work best. The beetles will need some sort of air flow, so the tops should not be screwed on all the way. The containers can be covered with a sheer cloth fixed by a rubber band.
- Thermometers: to measure temperature variants of the experiments.
- Lamp: to control the light variable.
- Refrigerator: to control the cold variable. A brown bag/sack to keep the seeds dark will also be necessary.
- Sponge: to control the wet variable.
- Heating Pad: to control the heat variable.



Protocol:

- Obtain a container with Blue Palo Verde pods. Collect the seeds out of the pods that have no eggs attached to them or holes in them. Add Bruchid Beetle adults to the container with the seeds.
- Observe the seeds daily and when the beetles lay an egg on a seed, remove the seed and keep track of what day each egg was laid.
- Each set/day of experiment-ready seeds will be put together in an experiment container so as not to confuse the dates of egg-laying.
- The experiment will be designed to test the following variables affecting adult Bruchid Beetle emergence: heat, moisture, cold, and light.
- When a set of eggs is laid on seeds, put all of those seeds in one container to begin the experiment. The control group set will be kept dry in a room temperature container inside a drawer/cabinet.
- The lamp needs to be set up to place consistent light on the light-container seeds.
- The heating pad needs to be set up to place consistent heat on the heat-container seeds.
- The cold-container seeds need to be set up in a brown-bag and placed in the refrigerator.
- The sponge needs to be set up in the bottom of the wet-container to keep the seeds moist.
- Be sure to record the egg-laying date on the container or record sheet to ensure that the dates are kept straight, as eggs may be laid on different days!
- Each day, have students check to see if beetles have emerged from the seeds. When they do, count the number of adults that have emerged that day, and then remove them and release them into the wild. This will ensure proper counting for the following days.
- When all eggs on one seed have emerged, or the experiment is done and eggs have not emerged, record the percentage of eggs that emerged as adult beetles on the table in the correct column. This only needs to be done at the end of the experiment because each seed may have differing numbers of eggs laid on it, therefore the percentage of eggs that actually emerged is the most important point to understand.

Egg-Rearing Container Data:

Container	Date (eggs laid)	Number of Individual Eggs	Number of Seeds
Wet			
Light			
Hot			
Cold			
Control			



Questions:

1. Did the adult beetles lay their eggs immediately after being put in with the seeds?
Which day were the most eggs laid? Why do you think the amount laid each day was the same/different?
2. What was the average number of eggs laid per seed?
3. What was the average length of time between egg laying and emergence?
4. Which experiment had the highest percentage of adult emergence, and which experiment had the lowest percentage of adult emergence?
5. What is the percentage of the control groups' emergence?
6. Explain the differences found in questions four and five.