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Honors Biology F Block

Observations of Pillbug Behavior Under Different Conditions

Abstract: This lab tested the behavior of pillbugs that were subjected to different environments with different variables. The variables that we tested related to the touch, taste, and sight of the pillbugs and yielded interesting results. The different trials involved two-sided containers where the variable was isolated on one side of the container, which allowed for the pillbugs to progressively choose which side they preferred.

Introduction: Behavior is defined as anything that an organism does involving reaction and response to stimulation. Two types of questions that can be asked about behavior are proximate and ultimate question. A proximate question about behavior would simply relate to how the environment or internal mechanisms affect animal behavior. For example, how do birds know when to sing? On the contrary, an ultimate question would revolve around the evolutionary significance of animal behavior. For example, why does the bird sing? An action pattern is a highly stereotypic pattern of animal behavior that is repeated extremely often by the species. An example of this would be the pattern that birds form when they fly during migration. Imprinting is a rapid phase-sensitive form of learning that is independent from consequences of behavior. A proximate cause for young geese imprinting is the way that their brain has been wired to copy the behavior of the mother and an ultimate cause is the need for survival of the species. Taxis is a direct responses to a stimulus, whereas kinesis is a random, indirect responses to stimulus. An example of taxis would be birds migrating to a more suitable environment, whereas a kinesis would be the pillbugs reacting to light exposure. Operant conditioning utilizes punishment or reinforcement to develop a certain behavior, whereas classical conditioning naturally develops a behavior through repetition.

Hypotheses:
1) If one side of the container is wet, then the pillbugs will migrate to the wet side.

2) If rocks are added to one side of the pillbug container, then the pillbugs will migrate to the side with the rocks.

3)If honey is added to one side of the pillbug container, then the pillbugs will migrate to the side with the honey.

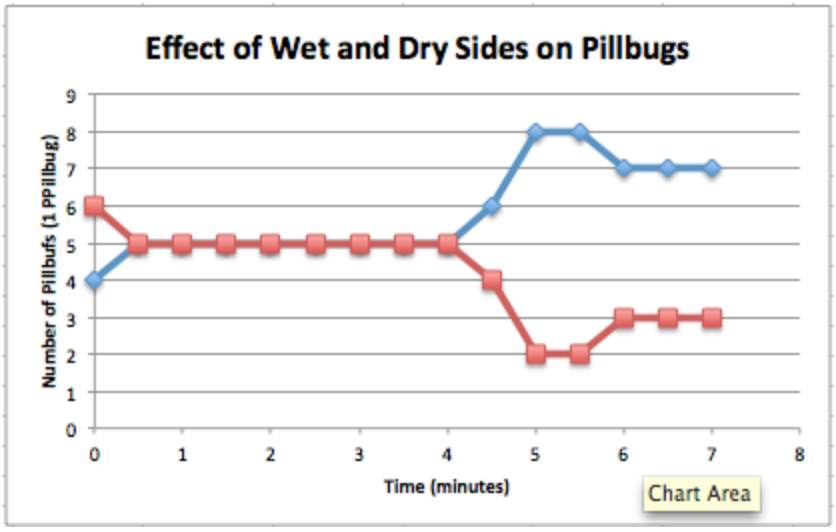
Materials:

- Pillbugs
- Two-Sided Container
- Water
- Honey
- Rock
- Paper
- Scissors
- Timer

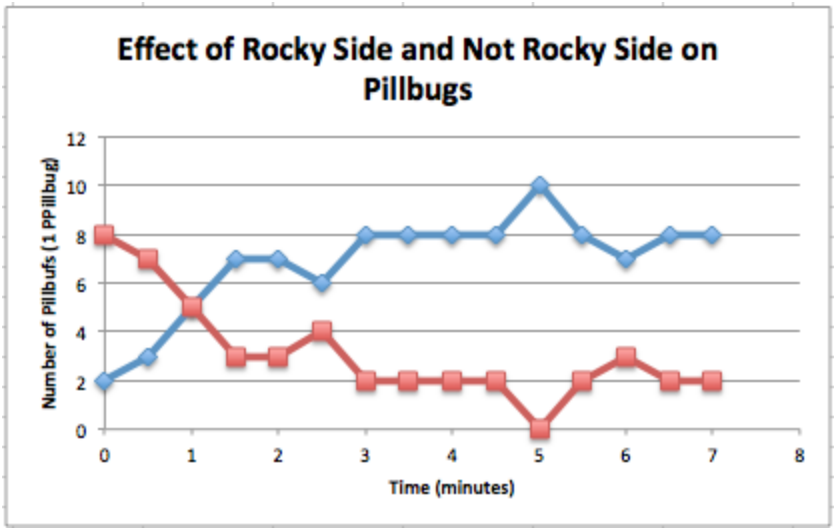
Procedure:

1. Obtain 10 pillbugs
2. Create a two-sided container
3. Change a variable on one side of the container
4. Place the pillbugs in the container
5. Count the number of pillbugs on each side every 30 seconds
6. Repeat

Results:

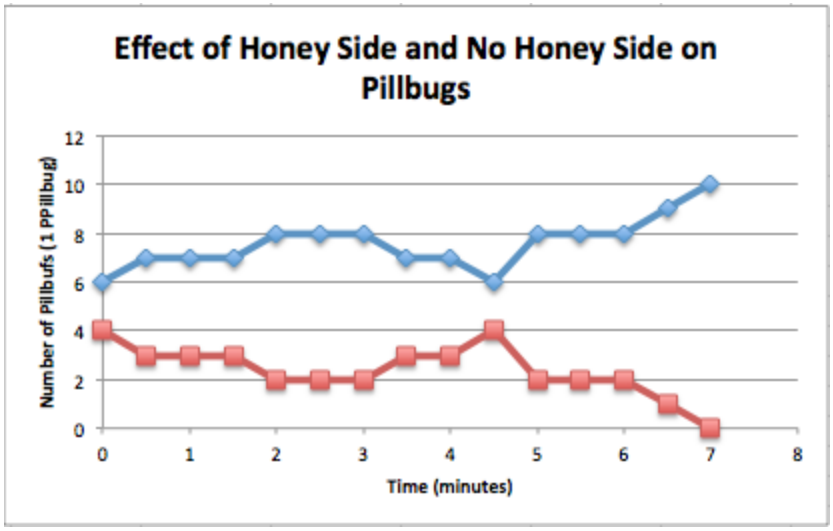


Red Line = Dry Side
Blue Line = Wet Side



Red Line = Not Rocky Side

Blue Line = Rocky Side



Red Line = No Honey Side

Blue Side = Honey Side

Conclusion: After performing three different experiments, my partner and I managed to obtain some interesting information about pillbug behavior. By testing the pillbugs with specific variables, we were able to isolate specific behavioral traits, which relate to how pillbugs will function in their natural environment. The first test showed that pillbugs are both more active in the light and tend to prefer a more wet environment. These results can likely be attributed to a pillbug seeking protection under shaded rocks and desire to be in a nurturing environment with water. The second experiment was slightly fraudulent because we unintentionally tested two variables: touch and color. The results of this experiment showed that pillbugs prefer rocky, colorful environments; however, this data does not prove anything specific because of the multiple variables being tested. Our final experiment proved that pillbugs desire an environment with food like honey. This result is likely due to the fact that the pillbugs need sugar to survive and were able to locate this substance in the honey-filled environment. The multiple variables tested in this lab allowed us to obtain a greater understanding of pillbugs and learn how to test how animal behavior is affected by different variables.

Sources of Error: My partner and I made one very bad mistake because we accidentally tested two variables during Trial 2. We put rocks on one side of the container, which meant that we would be testing the pillbugs for both color and texture. This undoubtedly a catastrophe and means that all of the data collected for Trial 2 is worthless because we cannot define which variable we were actually testing. Also, sometimes we got distracted and were bad at timing. Finally, one time a pillbug tried to climb out, so I pushed him over and he may have rolled to a different side of the container than he was on before.

Citation: http://www.biologycorner.com/worksheets/isopod_behavior_lab.html#.U0riZRZ17Bw