

Isopod Preferences: Light vs Dark  
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## Isopod Preferences: Light vs. Dark

### INTRODUCTION

Behavior can be described as how an organism reacts to a change. It can be learned or inherited. In animals, there are 2 types of movement kinesis and taxis. Kinesis movement is a random movement and change in speed due to a change like insects when a rock is lifted. Taxis movement is when an organism moves towards or away from something in the environment. Moths have phototaxis movement when they move towards lights at night. Isopods are terrestrial isopods usually found in humid places like compost piles, leaf litter, under logs, and near rubble piles. Like their relatives, marine crustaceans, they have gills that they use to breathe. They like humid places because of how they use their gills to breathe. In one day if the humidity is below 50%, the pillbug can lethally dehydrate. At about 86% humidity, they can absorb the water vapor to rehydrate themselves. This explains the results for the preliminary testing on the isopods in wet vs dry environments. The preliminary test showed they preferred the wet environment (Figure 1.2 and Figure 1.3). They like wood and dead leaves because they feed off of dead vegetation. In this investigation the isopods' preferences in environment was looked at to determine if wet and dry was the only preference isopods had or if there were more like light and dark. The hypothesis for this experiment was that if isopods were given the choice between a light and dark environment then the isopod would choose to stay in the darker environment.

### PURPOSE

The purpose of this lab is to determine if isopods prefer light or dark environments. The number of isopods that are in each choice chamber will be looked at.

### MATERIALS

- stopwatch
- microspoon
- choice chamber
- black construction paper
- Isopods (10)
- scissors
- tape

### PROCEDURE

- 1) Cut out a 4x4 inch square of black construction paper. Tape left side of paper down over the left choice chamber.
- 2) Take 10 isopods from original environment.

- 3) Place 5 isopods in the left choice chamber using the microspoon and tape the other side of the construction paper down.
- 4) Place 5 isopods in the right choice chamber (the light one) using the microspoon.
- 5) Using the stopwatch for 10 minutes, count the number of isopods in the light choice chamber every 30 seconds and record.
- 6) Takes notes and observe their behaviors. In the dark choice chamber, bend down and peer through the side where they come in.
- 7) Put the isopods back in their original environment.

### DATA

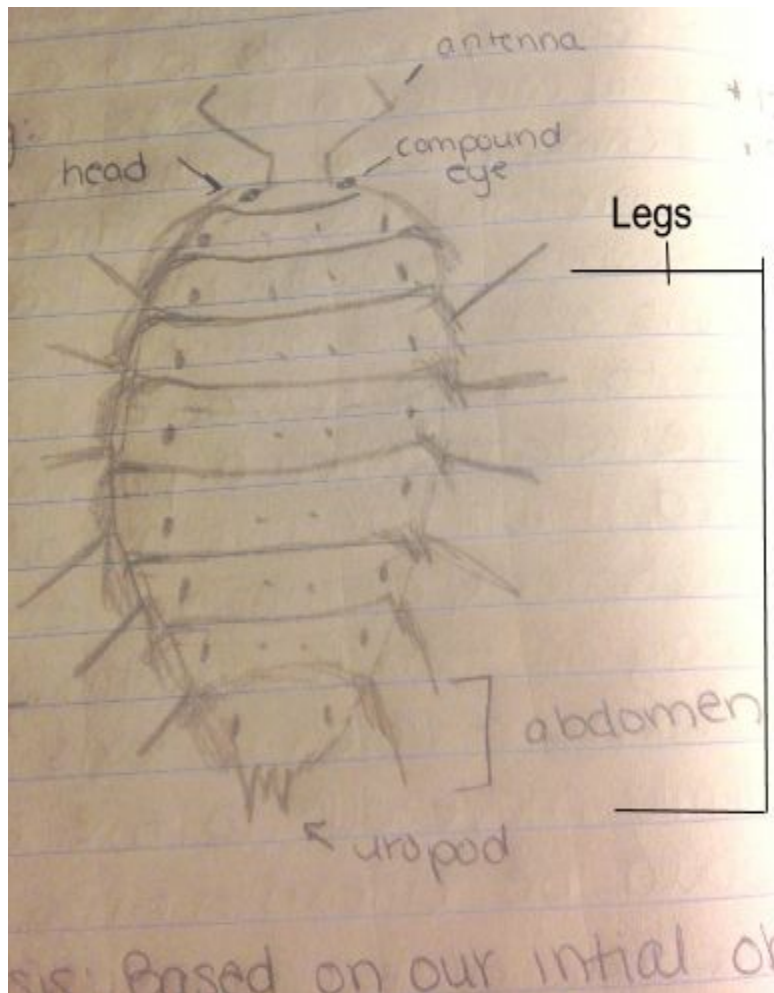


Figure 1.1 Isopod Drawing

### Preliminary Testing of Isopods Wet vs Dry Environments

Time into the experiment (Minutes)	Number in wet environment	Number in dry environment
0	5	5
.5	7	3
1	3	7
1.5	3	7
2	4	6
2.5	4	6
3	6	4
3.5	7	3
4	6	4
4.5	6	4
5	5	5
5.5	5	5
6	2	8
6.5	6	4
7	9	1
7.5	9	1
8	9	1
8.5	10	0
9	9	1
9.5	9	1
10	6	4
Average	6.19	3.81

Figure 1.2 Data table for the preliminary testing of moisture.

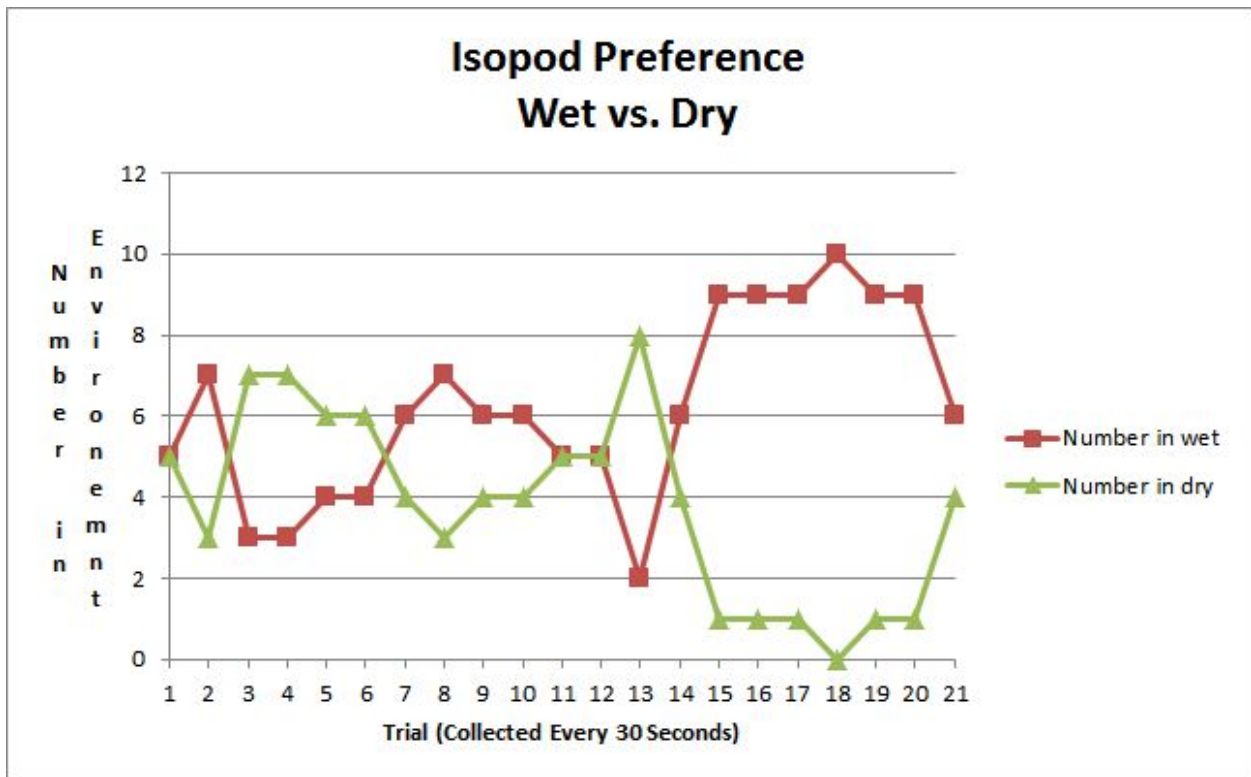


Figure 1.3 Line Graph of Isopod Preference Wet vs. Dry

### Isopod Preference Light vs Dark Environments

Time into the experiment (Minutes)	Number in light environment	Number in dark environment
0	5	5
.5	4	6
1	3	7
1.5	0	10
2	0	10
2.5	0	10
3	0	10

3.5	0	10
4	1	9
4.5	1	9
5	0	10
5.5	0	10
6	1	9
6.5	1	9
7	2	8
7.5	1	9
8	2	8
8.5	0	10
9	1	9
9.5	3	7
10	1	9
Average	1.238	8.762

Figure 1.4 Data table for the experiment over 10 minutes.

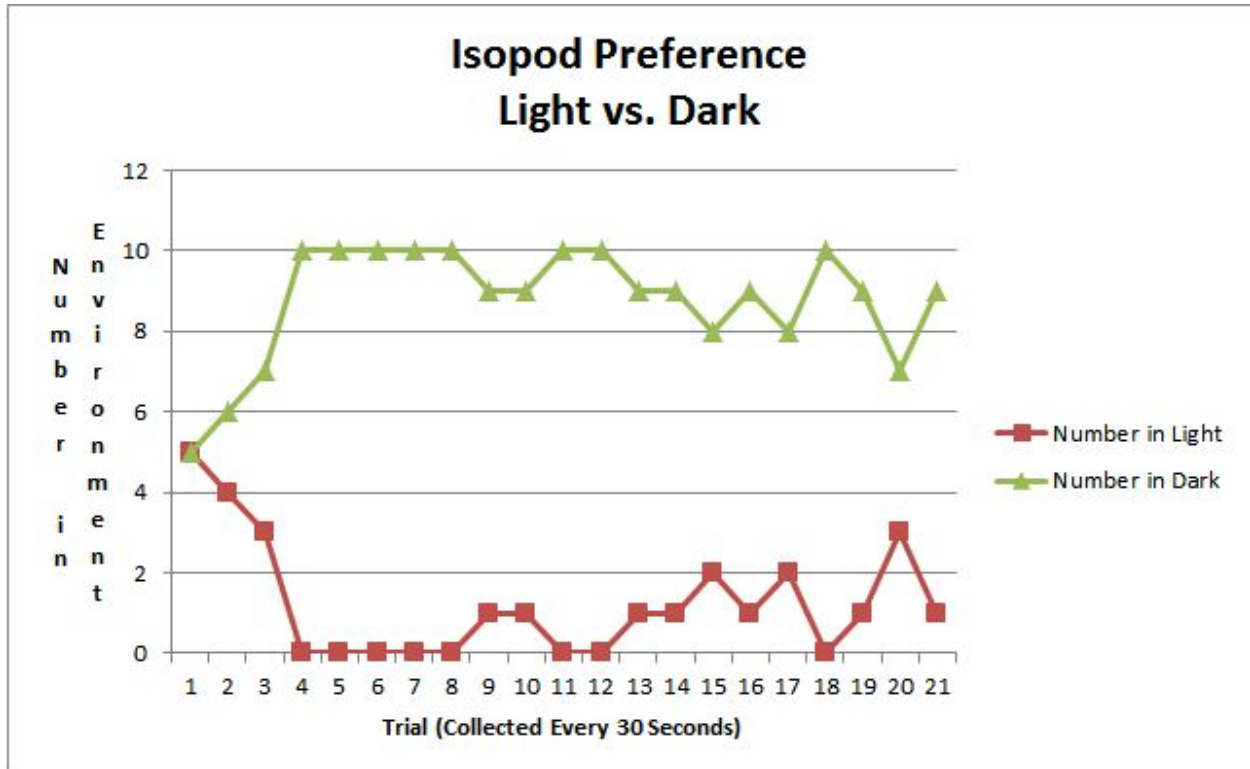


Figure 1.5 Line Graph of Isopod Preferences Light vs Dark

### CONCLUSION

If given the choice between a light and dark environment then it is predicted that isopods would choose the darker environment. After conducting the experiment on the isopods, it is accepted that isopods prefer darker environments over lighter ones. The light side contained 0 to 5 at all times with an average of 1.238. The dark side however, had between 5 and 10 with an average of 8.762 (Figure 1.4). On the dark side of the choice chamber, the isopods clumped together on the far left side furthest away from the opening into the light chamber. This clumping could be a survival mechanism. The isopods bring in their legs and blend together as one unit. This could make them look like a bigger organism. Isopods color can help them camouflage into their environment too. They can blend right into the trees and rocks where they usually stay. However, on the light side the isopods were very solitary. They usually moved alone to the light side. It was almost like the one isopod leaving the dark side was being a scout and checking the perimeter of the light side for danger. It would circle the dish then go back into the dark and come out a little bit later. Most of the time, it was the isopod who only had one antenna that would come out and circle the light dish. They seemed to have taxis movement. Conscious movement towards or away from something. They moved towards the darkness in most

situations. During the experiment, someone knocked into the choice chamber and sent one pillbug fleeing in the opposite direction. This was kinesis movement because the isopod moved randomly and very quickly when it was hit. Knocking into the choice chamber could have affected the outcome of the experiment sending more into the dark environment.

In nature, isopods are nocturnal. This makes sense because the more sunlight there is, the less moisture there is in the air. Isopods need at least 50% humidity in the air so they don't dehydrate and 86% for them to gather moisture from the air with their gills and hydrate themselves. Darkness can increase humidity and decrease temperature.

In the future, the choice chamber shouldn't be placed so close to the edge but in the middle of the testing table to avoid it being hit. In the future, conducting an experiment with both sides of the choice chamber moist then testing the light and dark could tell us if it was the brightness that affected which they liked better or if the darker environment was just a smidge colder and maybe had more humidity in the air.

## REFERENCES

Isopod Behavior Lab Background Information

Wright Dr, Jonathan, Department of Biology, Northern State University, Aberdeen, SD. 1997.  
"Pillbugs", The Natural Source. 4 November 2015  
<<http://www3.northern.edu/natsource/INVERT1/Pillbu1.htm>>