

Maximizing Acheta Domesticus (house cricket) Lifespans by Creating Artificial Environments
That Imitate Their Natural Habitat

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21 January 2022

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Abstract

In this investigation, five different artificial environments were tested to determine which would maximize *Acheta Domesticus* lifespan most effectively. Various elements such as water, food, and soil were placed in plastic containers to simulate different elements found in the *Acheta Domesticus*' natural habitat. The goal of this experiment was to find which combination of habitat amenities would extend *Acheta Domesticus* the longest, information that would be valuable to researchers, pet owners, and anyone who needs to raise and house crickets regularly. According to pestworld.org, crickets kept in artificial environments without food or water live from five to seven days on average. It was hypothesized that if *Acheta Domesticus* are kept in an environment similar to their natural habitats, then they will live longer than *Acheta Domesticus* kept in a plastic container. This hypothesis was accepted because the crickets in the containers with the amenities survived longer than those in a container with only a piece egg carton. The crickets in the containers with added moisture survived the longest, which suggests that water is the most important factor in cricket survival rate.

Question

Does keeping Acheta Domesticus in an artificial environment similar to its natural habitat extend its lifespan?

Variables

Independent: Artificial environment materials

Dependent: Cricket lifespan

Control: Container 1- 1 piece of egg carton

Hypothesis

If Acheta Domesticus are kept in an environment similar to their natural habitats, then they will live longer than Acheta Domesticus kept in a plastic container.

Background Research

In an artificial environment crickets die after 2-3 days because of the waste they drop. If the environment isn't cleaned the debris can release a gas called ammonia which can cause the remaining crickets to suffocate. High levels of humidity also aren't great for crickets. Crickets should be kept in a relatively dry environment. They can obtain most of their moisture from food. So only 50% to 70% of humidity is needed. The average lifespan of crickets in the wild is 1-3 months which is 90 days, but some have lived up to a year in the wild. If crickets in captivity are taken well care of, they can live to be 8-10 weeks old. To keep crickets well taken care of, they need to be kept in a dark area that maintains a steady temperature. If the temperature is too cold the crickets will die and eat each other, and if the temperature is too hot the cricket's lifespan will be shortened. The temperature should be around 75-90 F. Cleaning the environment

daily will also keep the crickets healthy. Pieces of egg cartons can be added to the environment to make the space they need to thrive and create shade. For food, crickets can be fed cornmeal, oatmeal, or cricket food (Samuel Ramsey, 2021). For a water source, you can use a sponge or a piece of fruit because crickets can drown in a bowl of water (thatpetblog, 2015). They can suck out the moisture from the fruit. The fruit will need to be replaced every day to prevent bacteria. Crickets in the wild live throughout the United States and are primarily found east of the Rocky Mountains (House Crickets, 2021). They can survive for 5-7 days without food or water.

Definitions:

Acheta- a species of crickets (house cricket)

Domesticus- Latin for belonging to the house

Artificial Environment- is formed as a result of human modification in the natural environment

Natural Environment- encompasses all living and non-living things occurring naturally on Earth

Lifespan-length of time for which a person or animal lives or a thing functions

Materials:

5 clear containers

50 crickets (purchased from PETCO)

Sanitized Tweezers

5 pieces of Egg Carton

40 Oats

1 cup Colorado Soil

Black Marker

Spray bottle for moisture

Measuring Cup

Small Glass Bowl

Experimental Procedure:

1. Label each plastic container 1-5.
2. Create each artificial environment using various materials.
 - Container 1- 1 piece of egg carton. Container 1 represents the artificial environment that does not simulate any aspects of a cricket's natural environment.
 - Container 2- 1 piece of egg carton and moisture (sprayed with spray bottle once per day).
 - Container 3- 1 piece of egg carton and ½ cup of Colorado Soil.
 - Container 4- 1 piece of egg carton and 20 oats.
 - Container 5- 1 piece of egg carton, moisture, ½ cup of Colorado Soil, and 20 oats.
3. Place containers in indirect light and keep room temperature between 65-70 degrees Fahrenheit.
4. Select 10 living crickets for each artificial environment and place in container. Leave small crack after placing lid for ventilation.
5. Once a day after initial cricket placement, check each container and record the number of living crickets remaining. Remove all dead crickets with a sanitized tweezer. Spray containers 2 and 5 four times with spray bottle to replenish moisture.
6. Repeat the previous step until no living crickets remain in any container.

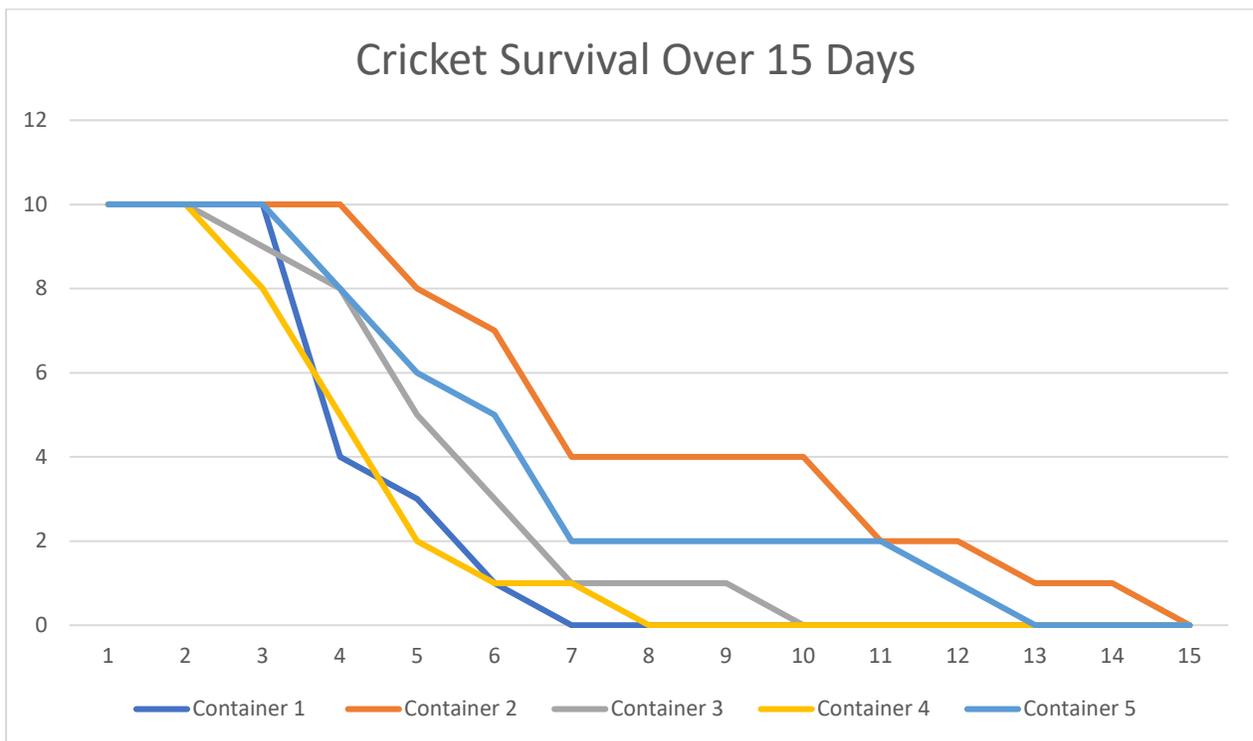


Data

Cricket Survival After 15 Days in Artificial Environments

Day	Container 1	Container 2	Container 3	Container 4	Container 5
1	10	10	10	10	10
2	10	10	10	10	10
3	10	10	9	8	10
4	4	10	8	5	8
5	3	8	5	2	6
6	1	7	3	1	5
7	0	4	1	1	2

8	0	4	1	0	2
9	0	4	1	0	2
10	0	4	0	0	2
11	0	2	0	0	2
12	0	2	0	0	1
13	0	1	0	0	0
14	0	1	0	0	0
15	0	0	0	0	0



Results

- **Container 1 (egg carton)**- In this container the crickets survived for a total of 7 days.

This container was the control, and it was the most artificial environment.

- **Container 2 (moisture)**- In this container the crickets survived for a total of 15 days.
- **Container 3 (Colorado soil)**- In this container the crickets survived for a total of 10 days.
- **Container 4 (oats)**- In this container the crickets survived for a total of 8 days.
- **Container 5 (all of the above)**- In this container the crickets survived for a total of 13 days. This container had the most natural environment. It contained a food source, a water source, and a piece of cricket's natural habitat.

The environments with their natural surroundings made the crickets survive longer. The crickets in container 1 with just an egg carton died off the fastest compared to the other environments. The crickets in containers 1, 3, and 4 died off the fastest because they didn't have water from the moisture. Container 2, with the moisture, helped the crickets survive up to 15 days.

Conclusions

I accept my hypothesis because the *Acheta Domesticus* survived longer in the containers with added food and moisture. This shows that crickets survive longer in an artificial environment like their natural habitat than a plastic container. An interesting finding was that the crickets with added food survived a shorter time than those without. The crickets with only added moisture survived the longest. A possible explanation for this explained in my background research, which states that crickets typically find their water source in their foods, not as a separate source. This leads me to believe that having water is the most important factor in cricket survival, not food.

Future Recommendations

The information collected in this experiment is valuable to researchers, pet owners, and anyone who needs to raise and house crickets regularly. This experiment was helpful for my frog, because now her food can last longer and stay healthier. If this experiment were to be redone, I would repeat the procedure with drops of water instead of sprayed moisture so that crickets have constant access to drinking water. Drops of water would likely be easier for the crickets to drink and would also evaporate less quickly. I would also add natural plants in addition to soil to simulate the cricket habitat more effectively. After I collect all my data, I would redo the experiment using the best two artificial environments in the experiment. This would allow me to find the most effective environment to house *Acheta Domesticus* for long periods of time.

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