You’re Not Yourself When You’re Hungry:

Cricket Behavior: A Lesson in behavioral observation

Crickets, like many other organisms have been known to exhibit many different behaviors. We will start the session by sexing our crickets so that we may make claims about the behavior of the sexes. We will be looking at behaviors that crickets might exhibit while in the presence of other crickets, males and females. We may see their behaviors change in the presence of food, while competing for space, or differences in song for courtship, aggression, or calling of other crickets. We will look at these behaviors and discuss the costs and benefits of those behaviors in the cricket population. We will look at how these behaviors can impact the rates of differential survival amongst individuals in order to reproduce maintaining the diversity of the population. We will also discuss how natural selection can change the frequency of behaviors in a population as impacted by environmental pressures.

Materials

* Four crickets for each group of four
* Aquarium (split the bottom into a grid of six rectangles using a dry erase marker.)
* Dry erase marker
* Sticks
* Mulch
* Dog Food
* Timers
* Pencil
* Four different colors of nail polish or paint

Procedure for trial #1 (no food):

1. Place four differently marked crickets in the aquarium and let them equilibrate for five minutes.
2. Assign group members a cricket and record your cricket color under trial #1.
3. Indicate the location of your sticks, mulch, and rocks on your grid.
4. In thirty second intervals, you will record the location of your cricket on the recording grid in table 1 as well as the forward facing direction of the cricket. In data table two, you will record any observable behaviors of the assigned cricket. You will end your data recordings after five minutes has elapsed.

**Trial #1: Cricket behavior in the aquarium chamber without additional stimuli**

Cricket ID (color)\_\_\_\_\_\_\_\_\_\_\_ Focal cricket sex\_\_\_\_\_ Sexes of other crickets in tank\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hypothesis: IF my cricket is in an aquarium without food, I expect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ behaviors will be observed and my cricket will be \_\_\_\_\_\_\_\_\_\_\_\_ (highly, moderately, less) active.

Table 1: Timed cricket observation sample recording grid. Place a number for each time interval reading and an arrow as to what direction the cricket is facing.

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Table 2: Timed Cricket Observations Data Chart.

|  |  |  |
| --- | --- | --- |
| Time Interval # | Seconds | Observations of Cricket Behavior Keyed to Time Interval |
| 1 | 0-30 |  |
| 2 | 31-60 |  |
| 3 | 61-90 |  |
| 4 | 91-120 |  |
| 5 | 121-150 |  |
| 6 | 151-180 |  |
| 7 | 181-210 |  |
| 8 | 211-240 |  |
| 9 | 241-270 |  |
| 10 | 271-300 |  |

Procedure for trial #2:

1. Using the same crickets as trial #1, keep the same cricket for observation in trial #2 and record your color on the line indicated in trial #2.
2. Indicate the location of your sticks, mulch, and rocks on your grid.
3. Place three pieces of dog food on one of the rectangles of the aquarium. Indicate its location on the grid below.
4. In thirty second intervals, you will record the location of your cricket on the recording grid in table 1 as well as the forward facing direction of the cricket. In data table two, you will record any observable behaviors of the assigned cricket. You will end your data recordings after five minutes has elapsed.

**Trial #2:** **Cricket behavior in the aquarium chamber with the addition of food**

Cricket ID (color)\_\_\_\_\_\_\_\_\_\_\_

Focal cricket sex\_\_\_\_\_ Sexes of other crickets in tank\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hypothesis: If food is introduced into the aquarium, I expect my cricket to act (same, different) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than without food and my cricket will be \_\_\_\_\_\_\_\_\_\_\_\_ (more, less similarly) active. I will also see differences in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ observed behaviors because the cricket now\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Table 3: Timed cricket observation sample recording grid. Place a number for each time interval reading and an arrow as to what direction the cricket is facing.

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Table 4: Timed Cricket Observations Data Chart.

|  |  |  |
| --- | --- | --- |
| Time Interval # | Seconds | Observations of Cricket Behavior Keyed to Time Interval |
| 1 | 0-30 |  |
| 2 | 31-60 |  |
| 3 | 61-90 |  |
| 4 | 91-120 |  |
| 5 | 121-150 |  |
| 6 | 151-180 |  |
| 7 | 181-210 |  |
| 8 | 211-240 |  |
| 9 | 241-270 |  |
| 10 | 271-300 |  |

Procedure for trial #3:

1.

2.

3.

4.

5.

Trial #3: Cricket behavior in the aquarium chamber investigating:

 (your choice) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Hypothesis: IF I put my crickets in an aquarium together with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, THEN \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ behaviors will be observed.

Cricket ID (color)\_\_\_\_\_\_\_\_\_\_ Focal cricket sex\_\_\_\_\_ Sexes of other crickets in tank\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Table 5: Timed cricket observation sample recording grid. Place a number for each time interval reading and an arrow as to what direction the cricket is facing.

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Table 6: Timed Cricket Observations Data Chart.

|  |  |  |
| --- | --- | --- |
| Time Interval # | Seconds | Observations of Cricket Behavior Keyed to Time Interval |
| 1 | 0-30 |  |
| 2 | 31-60 |  |
| 3 | 61-90 |  |
| 4 | 91-120 |  |
| 5 | 121-150 |  |
| 6 | 151-180 |  |
| 7 | 181-210 |  |
| 8 | 211-240 |  |
| 9 | 241-270 |  |
| 10 | 271-300 |  |

Data Analysis:

What claims can you make about the observations that you made on crickets in each trial?

What evidence from your trials did you use to support your claims?

How much variation (intraspecific) did you see across the individuals in your tank?

Why do you think there is variation in behavioral traits within a population of crickets?

Are there advantages and disadvantages to different behaviors?

Summarize the results you found for your own investigation (trial #3).