



Fecal Trails: The Road to Water Quality

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Abstract

The objective of this experiment was to test nutrient quality in the Lake Waco Wetlands. The primary hypothesis was that the amount of fecal deposits left by snails housed in water from the different cells would indicate: water from Cell 4 would indeed lack the nutrient quality that would be present from Cell 1. In order to test this hypothesis, snails were allowed to interact in simulated microcosms of Cell 1 and Cell 4 of the wetlands. Two pairs of microcosms containing tap water and bottle water were used as controls. Algae plates from Lake Waco Wetlands were provided as a food source over the span of the four week project. The results showed that the snails produced greater amounts of feces in the Cell 1 microcosm than in the Cell 4 microcosm. It can be concluded from the results that the North Bosque water quality is preferable to snails in comparison to the water quality from Wetlands’ filtered water.

Introduction

Fluctuation of the nutrients in water that is filtered through the Lake Waco Wetlands was unclear. The hypothesis for this experiment speculated that the present nutrient quality in the water diminishes as other solids and contaminants are removed while it is passed from cell 1 through cell 4 of the wetlands. This is likely due to plant uptake of the nutrient rich water entering from the North Bosque River in cell 1; which slowly lowers in nutrient quality by the time water passes through cell 4. Snails used in this experiment were all collected directly from Lake Waco Wetlands. Bucket nets were used in capturing all 120 Ramshore snails used in this experiment.

Methods

Microcosms #1 & #2

- 1.5 Liters of filtered bottled water
- 15 Ramshore snails each
- 1 algae-covered Hester Dendy plate

Microcosms #3 & #4

- 1.5 liters of tap water from the Waco Wetlands
- 15 Ramshore snails

- 1 algae-covered Hester Dendy plate

Microcosms #5 & #6

- 1.5 liters of water from cell one of the Waco Wetlands
- 15 Ramshore snails each

- 1 algae-covered Hester Dendy plate

Microcosms #7 & #8

- 1.5 liters of water from cell four of the Waco Wetlands
- 15 Ramshore snails each

- 1 algae-covered Hester Dendy plate

Data Gathering:

1. Take snails out of each container
2. Filter water using a coffee filter
3. Dry coffee filter with feces
4. Weigh the samples

Discussion: The experiment “Fecal Trails: The Road to Water Quality” of North Bosque Water tested whether North Bosque water affects animal behavior negatively. The research was concentrated on snails. Four mock environments were created: Tap Water, North Bosque Shore Water, North Bosque Exit Water, and Filtered Bottle Water. There were two sets of each environment created in order to validate the results. The snails’ excretions were weighed after about four weeks of leaving them in these mock environments. The Tap Water microcosm had an average weight of 1.5 grams. North Bosque Shore Water had an average of 1.9 grams, while North Bosque Exit Water had an average of 1.35 grams. The Filtered Bottle Water microcosm had the lowest weight of 1.2 grams. The original hypothesis proposed that the North Bosque Water would affect the snails positively, meaning that there would be more fecal matter in the mock environments that used North Bosque water. Thus, the hypothesis was confirmed through the fact that the North Bosque Shore Water microcosm resulted in the heaviest fecal weight.

Conclusion: The results of our study can be used as a reference to confirm the effectiveness of Waco Wetlands, and to insinuate that North Bosque Water positively influences the behavior and ecology of other animals in the ecosystem. The fact that the North Bosque Shore Water microcosm resulted in the heaviest fecal matter proved that the North Bosque water quality is preferable in comparison to the water quality of filtered water.

Results

The weight of the coffee filter with the feces for microcosms containing water from cell one were 1.7 grams and 1.9 grams, averaging 1.8 grams per container. For microcosms with water from cell four, the weights were 1.2 grams and 1.5 grams, the average being 1.35 grams per container. For microcosms with tap water from the Waco Wetlands Learning Center, the weights were 1.7 grams and 1.3 grams, averaging 1.5 grams per container. The microcosms with Sam’s Choice filtered bottled water, the weights were 1.2 grams and 1.2 grams, averaging 1.2 grams per container. (Figure 1).

Types of Water & the Weight of the Feces Produced

	Weights from the 2 Microcosms (g)	Average of the 2 Weights (g)
Filtered bottled water	1.2 & 1.2	1.2
Tap water	1.7 & 1.3	1.5
Cell one water	1.7 & 1.9	1.8
Cell four water	1.5 & 1.2	1.35

Figure 1

