

Science Fair 2021 Lab Report

A. TITLE: The Effect of the Concentration of Salt in Water on the Activity of Brine Shrimp

B. BACKGROUND RESEARCH/PURPOSE: “Brine shrimp are (genus *Artemia*), any of several small crustaceans of the order Anostraca (class Branchiopoda) inhabiting brine pools and other highly saline inland waters throughout the world.” They can also be easily raised artificially in a controlled environment. The reason I’m doing this project was to test a theory that I had that shrimp have different activity rates in different parts of lakes with different salt concentrations, and since I couldn’t hatch the common whiteleg shrimp that we eat, I figured brine shrimp would suffice, as they are relatives.

C. TESTABLE QUESTION: How does changing the concentration of salt in water affect the activity of brine shrimp?

D. HYPOTHESIS: If I decrease the concentration of salt in the water, I think that the activity of the brine shrimp eggs will slightly decrease. If I increase the concentration of salt in the water, the activity will harshly decrease, because there is a certain concentration of salt in their water that is optimal for their health.

E. MATERIALS: For this assignment you will need:

- 6 1 gallon white buckets with lids
- Tank aerator
- 6 sections of Aquarium tubing
- Aquarium salt
- Measuring tools - like a tablespoon
- Brine shrimp eggs
- Scissors
- Large glass pipettes
- 6 Stick-on aquarium thermometers
- yeast
- Petri dishes
- Silicone Caulk
- Extremely fine net
- Small Air stones
- pH testing kit
- Filming device

F. PROCEDURE:

1. Make your special tanks by cutting a hole the width of the tubing in the lid, attach one end of the tubing to the airstone and put the other end through the lid and put silicone caulk around the hole in the lid to form an airtight seal.
2. Then, to break the seal, (you don’t want air trapped in the tank) cut a hole about the size of a quarter in the lid.

3. Attach the end of tubing that does not have the airstone to the aerator.
4. Fill the buckets with 1 gallon of water.
5. Have your tanks at a temperature of about 82°F (28°C)
6. Put 8 tablespoons of salt in two buckets, 10 tablespoons of salt in two buckets and 12 tablespoons of salt in the remaining two buckets.
7. “pH should be on the alkaline side, from 8.0-9.0. As pH decreases fewer eggs will hatch. pH Adjusting agents should always be on hand as well as water test strips or fluid tests to monitor chemistry in between and after water changes.”
8. Set up a lamp “A continual source of aeration and good illumination increases the rate of hatching. Fluorescent lamps are best for the light source, but any 60-100 watt bulb placed a few inches from your hatch cone will work fine. Be cautious of a light source which might overheat your hatchery!”
9. Turn on the aerator.
10. Monitor the tanks everyday (up until their death) by pipetting them onto a petri dish and examining them with a microscope, then take notes on what you see. (Film what you see in the microscope for evidence)

Safety Precautions -

1. Make sure the aerator is functioning throughout the experiment so that the shrimp have enough oxygen in the water.
2. Be careful when working with salt, for it can irritate your skin or eyes.

G. DATA:

0 = Not yet hatched

1 = Sedentary

2 = Mildly sedentary

3 = Slightly active

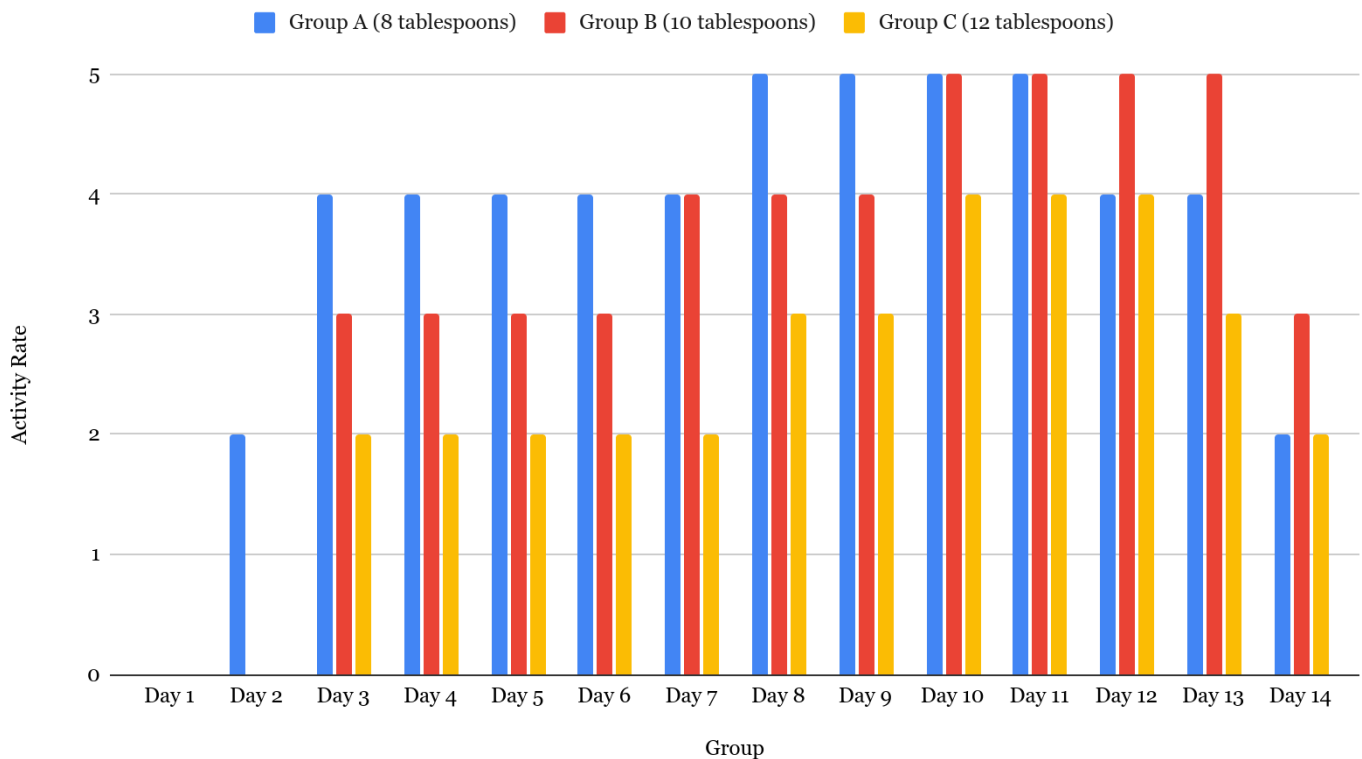
4 = Mostly active

5 = Fully active

	Group A (8 tablespoons)	Group B (10 tablespoons)	Group C (12 tablespoons)
Day 1	0	0	0
Day 2	2	0	0
Day 3	4	3	2
Day 4	4	3	2
Day 5	4	3	2
Day 6	4	3	2
Day 7	4	4	2
Day 8	5	4	3
Day 9	5	4	3
Day 10	5	5	4
Day 11	5	5	4

Day 12	4	5	4
Day 13	4	5	3
Day 14	2	3	2

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H: ANALYSIS:

The salinity of the water did affect the activity of the brine shrimp, the farther away from the optimal water salinity in the tanks, the lower the activity of the brine shrimp. I think that this happened because the brine shrimp couldn't handle having too much or too little salt in their system. A source of error would be having too much water in each bucket for it affects the concentration of the dilute (salt).

I: CONCLUSION:

The farther away from the optimal water salinity in the tanks, the lower the activity of the brine shrimp.

J: SOURCES:

- <https://www.britannica.com/animal/brine-shrimp>
- <https://www.buildyouaquarium.com/raising-brine-shrimp/>
- <https://www.brineshrimpdirect.com/about-us/articles/brine-shrimp-hatching-instructions-equipment/>
- <https://www.oceannutrition.com/uploads/pdf/How-to-Hatch-Brine-Shrimp.pdf>