The Effects of Salinity on Daphnia

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State Climate Office of North Carolina

BURROUGHS WELLCOME FUND

Introduction

Our project was on the effects of salinity on Daphnia and how global warming causes salt water to pollute our freshwater sources. With global warming rapidly occurring, salt water is steadily intruding into our fresh water sources. We were curious about the effects and the possible detriments of this event. Saltwater intrusion is one of the biggest telltale signs that sea levels are in fact rising. Daphnia live in mainly freshwater habitats. They are bio-indicators which means they are excellent indicators of whether something is wrong with an environment. These factors all contribute to Daphnia being the best test subject for our experiment.

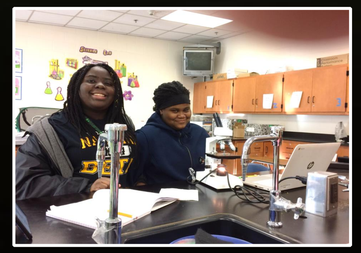
Research Question

How high of a tolerance do Daphnia have for salinity?

Our purpose was to better understand the effect of salinity on organisms like Daphnia and how climate change may affect them.

Hypothesis

We think that small contents of salt will be fine, but when we reach 2% they will die.

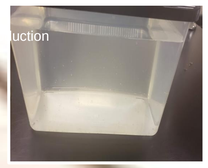


Procedures

1. Set up our tank
2. We transferred the Daphnia to the new tank.
3. We put controlled amounts of them into 1% salt, 2% salt, and 5% salt water.
4. We used a microscope to count their heart beats.
5. We analyzed the data.

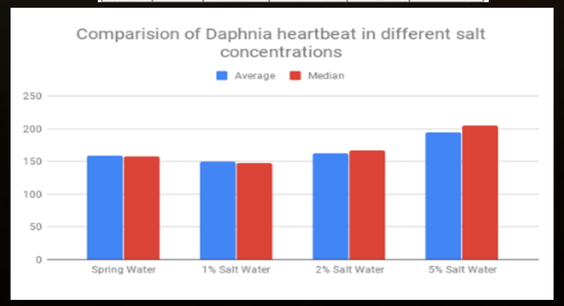
Materials and Methods

- Daphnia
- [redacted]
- Food source
- 1% salt water
- 2% salt water
- 5% salt water
- Microscope with depression slide



Data

Daphnia	Time	Spring Water	1% Salt Water	2% Salt Water	5% Salt Water
			Beats		
1	1 minute	138	189	190	205
2	1 minute	177	178	100	220
3	1 minute	156	190	189	230
4	1 minute	159	163	162	210
5	1 minute	153	100	173	235
6	1 minute	151	224	126	220
7	1 minute	167	100	187	208
8	1 minute	156	99	234	205
9	1 minute	146	100	147	190
10	1 minute	189	189	110	256
11	1 minute	200	125	177	205
12	1 minute	167	211	176	146
13	1 minute	171	129	231	189
14	1 minute	189	146	179	176
15	1 minute	170	123	105	138
16	1 minute	120	148	152	121
17	1 minute	146	142	233	269
18	1 minute	110	158	149	168
19	1 minute	137	123	131	152
20	1 minute	183	171	109	140
Average		159.25	150.4	163	194.15
Median		157.5	147	167.5	205



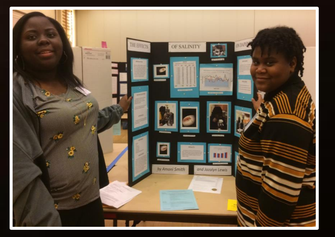
Results

Our Daphnia survived in all concentrations of water. They got more and more stressed as the tests progressed. 1% slightly accelerated their heart beat, unlike 5% where it rapidly increased. This was an insightful project.

Discussion

We think there is a lot more to test. It should beconsidered that our data can always be built upon. We could have done better by completing more tests. The average heartbeat showed that 5% salt water is a stressor.

We would like to thank the Burroughs Wellcome Student Science Enrichment Program, the NC State Climate Office, Mrs. Snow, Ms. Dano and Mrs. Karl for their help on this project.



Conclusion

Our hypothesis was only partially correct. The Daphnia survived in all concentrations of salt water, but were stressed out in the higher concentrations.

References

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