



Comparison of Biodiversity of Aquatic Macroinvertebrates of Garvies Point, Glen Cove and Heckscher Park, Huntington using

DNA Barcoding

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Abstract

Aquatic macroinvertebrates are organisms that are spineless and observable to the human eye; these specific macroinvertebrates live in aquatic environments. Based on the quality of the environment, the diversity of these macroinvertebrates can greatly differ. We are looking to investigate what factors could make a difference in the biodiversity of aquatic macroinvertebrates. For our project we will collect aquatic macroinvertebrates from different two ponds, with these aquatic macroinvertebrates we will observe the diversity of the sample. With this information we will be able to observe our sample and apply it to the ponds each sample was collected from. This data will help us look at the biodiversity of Heckscher pond and Garvies Point, then it will help complete our comparison between the two places. The results of this experiment will aid us in finding what affects biodiversity in different aquatic ecosystems. We predict that there will be more biodiversity in the Heckscher pond located in Huntington.

Introduction

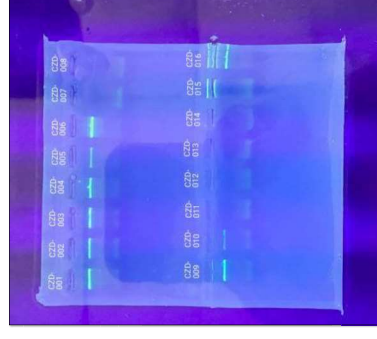
Biodiversity is the term used to describe ecosystem's with a variety of different species. The more species that live in an ecosystem the more biodiversity there is. In this project we are looking to compare the biodiversity of aquatic macroinvertebrates from two different ponds in Long Island. The ponds we will collect from are Garvies Point and Heckscher Park. Aquatic macroinvertebrates are species which are visible to the naked human eye, signifying the macro-, they don't have spines and live in or partially in water. In these waters we will be looking at the diversity of the ponds. Heckscher has more foot traffic and other organisms while Garvies point is more secluded. In the project we predict that Heckscher pond will have a higher biodiversity due to its higher amount of other interacting organisms. In these ponds we will also collect the pH levels to see if they align with pH needed for the aquatic macroinvertebrates environment One difference we think will make a big difference of diversity is the presence of geese in the Heckscher park, geese droppings in water may cause algal blooms which will alter dissolved oxygen levels in the water possibly altering biodiversity.

Materials & Methods

- Use water bottle to collect water samples
- Pour water into petri dish
- collect 10 samples of aquatic invertebrates from both ponds with tweezers
- place the samples in their own special testing tubes and freeze the tubes
- we will barcode the DNA and amplify the COI gene

Results

CZD 001 - *Cypridopsis vidua* mussel shrimp, 37 mismatches
CZD 002 - *Cypridopsis vidua* mussel shrimp, 36 mismatches
CZD 003 - *Cypridopsis vidua* mussel shrimp, 36 mismatches
CZD 004 - *Cypridopsis vidua* mussel shrimp, 41 mismatches
CZD 005 - *Cypridopsis vidua* mussel shrimp, 36 mismatches
CZD 006 - *Cypridopsis vidua* mussel shrimp, 38 mismatches
CZD 009 - *Macrocyclus albidus* littoral copepod, 17 mismatches
CZD 010 - *Proasellus* sp. one spotted water louse, 0 mismatches
CZD 016 - *Lumbriculus vagriegants*, California Blackworm, 0 mismatches



Out of our 16 samples we collected from the two ponds, only 10 of them were successful on the gel. However only 9 of them were successful for our coding.

Discussion

Our findings showcase that Heckscher Park indeed did have a great biodiversity of aquatic macroinvertebrate species. While comparing the viable species whose DNA were found, we see that Garvies point has many species that were tracked by DNA, however the majority of the species were the same. With Heckscher park, less species were available with the DNA however with the species that had worked we saw that there was a lot more biodiversity. With research, we have also found that the primary species found in Garvies point, *Cypridopsis vidua*, is better suited in pH levels that are more basic. When comparing levels at 6 to 8.3, the organism was found to have higher success rates and higher reproductive rates with the higher pH. We could implement that Garvies point has a more basic pH level compared to Heckscher park. Our results have importance because it showcases the types of factors that can affect biodiversity in bodies of water. If we see a certain pattern with our collection it can help us infer the results us and others may receive from a body of water. What our research could have done differently in order to achieve greater results was to change the time we collected the species. Our species from both ponds were collected in early spring, this is when species tend to start coming out and may not be abundant. If we had changed our collection time to late spring or even early summer, we might have seen stronger results. Our suggestions for other future research is that we should pick an optimal time and conditions to showcase results that could have strongly supported our hypothesis more than what we have resulted from this research.

Works Cited

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