

CHS REPORT: DNA BARCODING
AQUATIC INVERTEBRATES
SAYVILLE HIGH SCHOOL

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AQUATIC INVERTEBRATES

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*Seasonal Variability of Aquatic Invertebrates in the Waters
of Brookside County Park, West Sayville NY*

ABSTRACT

Throughout the year the seasons have a profound impact on the diversity of wildlife in different environments, particularly aquatic invertebrates. Aquatic invertebrates specifically are known to adjust their diversity in reply to environmental and weather changes. The hypothesis for this experiment would be that there will be more invertebrates during the summer and spring months, and there will be less invertebrates during the winter and fall months. The objectives of this project are to collect approximately twenty samples of invertebrates, conduct DNA barcoding on the samples, and analyze the DNA from each sample. Then the genetic variation across all samples will determine the diversity of the invertebrates during the different seasons.

SUMMARY

During my project I asked the question “What is the Seasonal Variability of Aquatic Invertebrates in the Waters of Brookside County Park, West Sayville NY?”. Throughout the year as the seasons change, so does the environment along with it and along with the environment the life in those environments change as well. The importance of finding the diversity of aquatic invertebrates such as beetles, mayflies, water fleas, and so many more throughout the seasons of the year is to determine what the food chain could possibly look like for the larger living organisms in the areas such as fish and even ducks. Although the invertebrates don't die they do move a lot slower, possibly making it easier for fish or ducks to hunt for them and have food during the later fall and winter months. This research is also important because freshwater aquatic invertebrates also process and breakdown materials such as algae and leaves in the

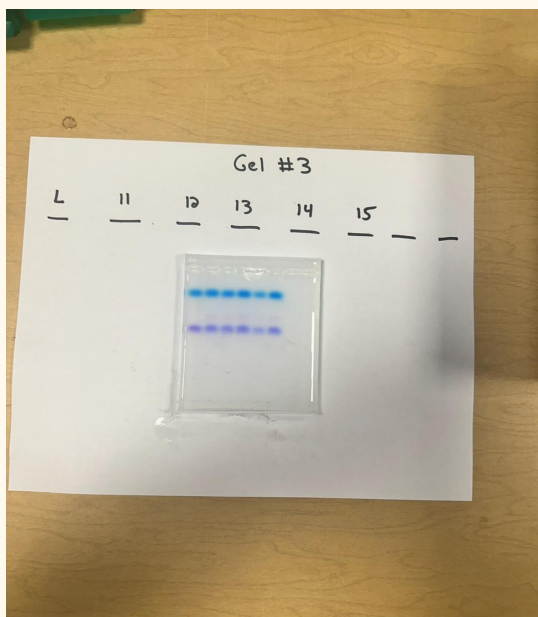
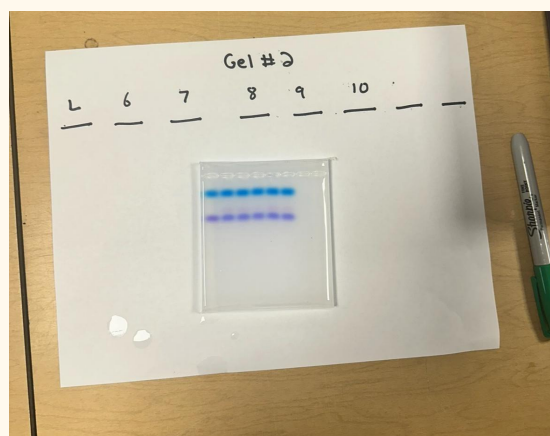
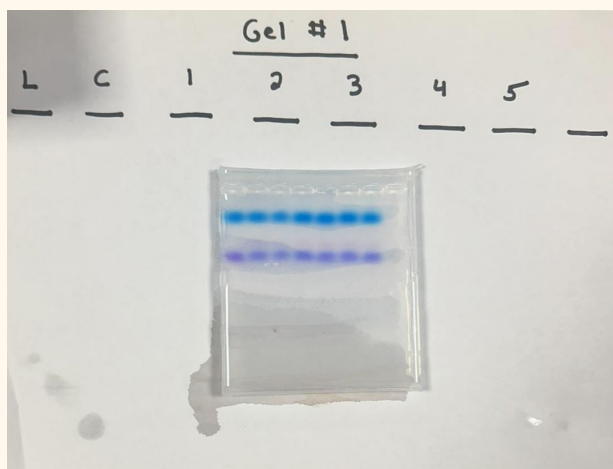
water making the water more clear and clean for the other organisms that live in it and drink/eat out of it. In the past there has been research showing that the change in seasons do affect the viability of aquatic invertebrates, but for Brookside County Park it may be different. I am trying to find the diversity of these organisms through the warmer and winter months to see a difference. I strongly believe that there will be more diversity in the warmer months than the colder months.

First in the steps of the methods and procedures we collected at 13 different types of aquatic invertebrates from Brookside County Park, Sayville NY (Latitude: 40.736662 Longitude: -73.092656) from December 21, 2023 thru March 21, 2023. We used a net at specific locations at Brookside and kicked up the bottom of the lake and collected what we could in the net. We then took the samples back to the lab (Latitude: 40.734711 Longitude: -73.094150) and began the steps for DNA barcoding. Which are as follows: Collect and document the specimens, Isolate DNA from the specimens, Amplify the DNA by PCR, Analyze the PCR products by gel electrophoresis, and Sequence the PCR product and analyze the results. We collected all types of samples including scuds, leeches, aquatic isopods, and different types of water bugs.

After performing DNA barcoding and sending the samples to the lab there was only one true result that came back and that was the leech. The others did not work and I am not sure of why they did not work. When we also did the gels the ladder ended up going opposite of where it was supposed to go.

This project is still not complete and we will not be able to have clear results to find the diversity of these organisms until another student continues this project next year during the warmer months. Although I do still believe that there will be more aquatic invertebrates in the warmer months due to the changes I saw in the amounts of organisms in the beginning of the winter and towards the end. There were a lot more towards the end of the winter verses the beginning.

Overall, my results for this project did not work as we thought they would so this means that it would most likely have to be redone another time. I feel that my results are important because aquatic invertebrates are very important to the health of Brookside County Park and the health of other animals at Brookside County Park. My hypothesis cannot be proven yet but in the future it will continue in the upcoming summer months to prove if the hypothesis is correct or not.



References:

1. *DNA Learning Center Barcoding 101*. (n.d.). Dnabarcoding101.org.
<https://dnabarcoding101.org/programs/bli/>
2. *CSHL DNA Learning Center*. (2019). Cshl.edu. <https://dnalc.cshl.edu/>