

Using DNA Barcoding to Determine the Biodiversity of Flatworms throughout a Riverine Ecosystem



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Abstract

The Forge River is a 20,000 year old river that is very polluted due to duck waste produced from duck farming and due to heavy metals and nitrate phosphorus infiltrating the river. This project aimed to analyze the biodiversity of flatworms throughout this riverine ecosystem due to their ecological importance and impact on human health. This was done by analyzing the COI gene in flatworms using DNA Barcoding. It was expected that the biodiversity of flatworms would be similar throughout the river due to organic matter and nutrient pollution present.

Introduction

Research Questions:

- 1) What is the level of parasitism of Flatworms throughout the Forge River?
- 2) What is the biodiversity of Flatworms throughout the Forge River?

Hypothesis: Regions with increased pollution will have a lower biodiversity of Flatworms

Key points:

- Impact on human health
- History of Forge River and its pollution's effect on Flatworm biodiversity
- DNA Barcoding
- Biodiversity of Flatworms

Materials & Methods

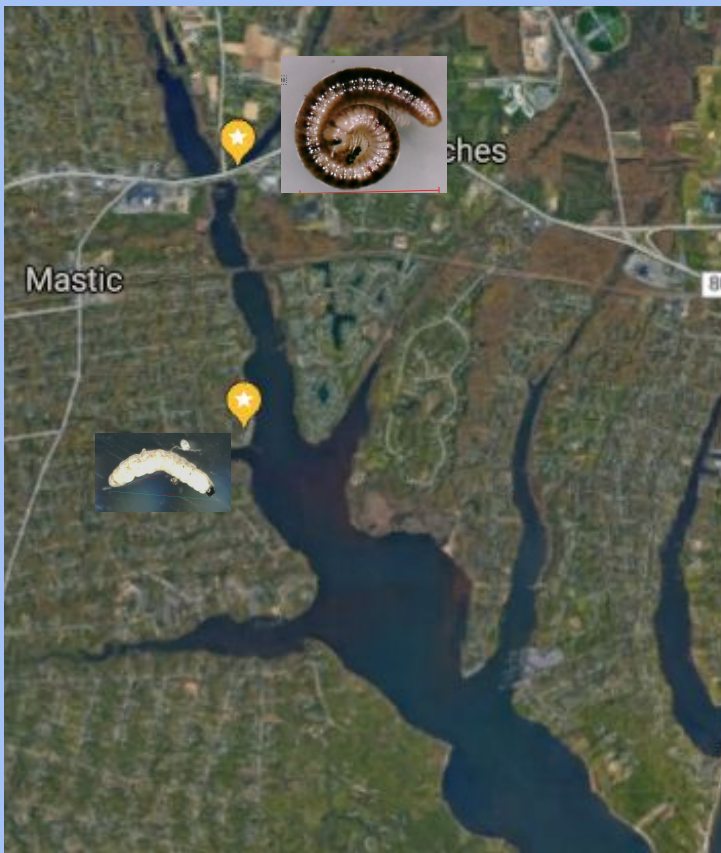
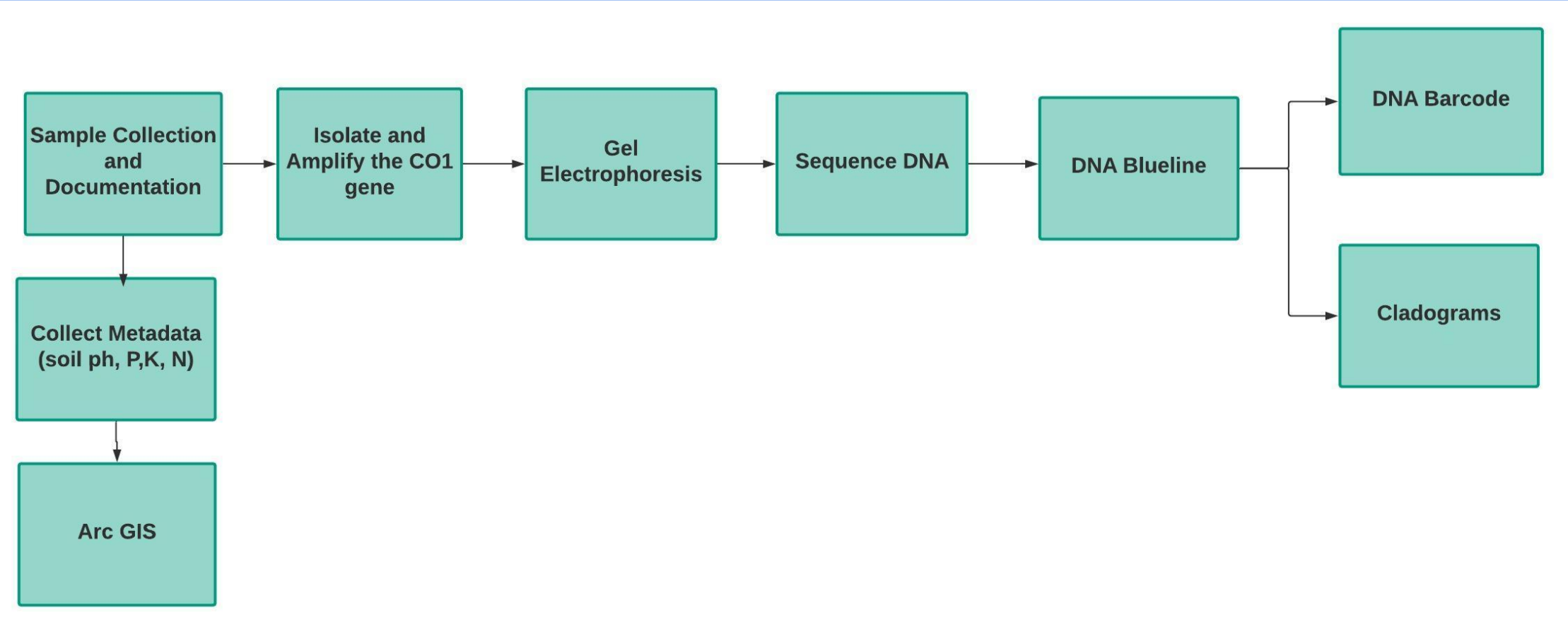


Figure 4: This map demonstrates the types of flatworms in the 2 different sites of the Forge river.

Results

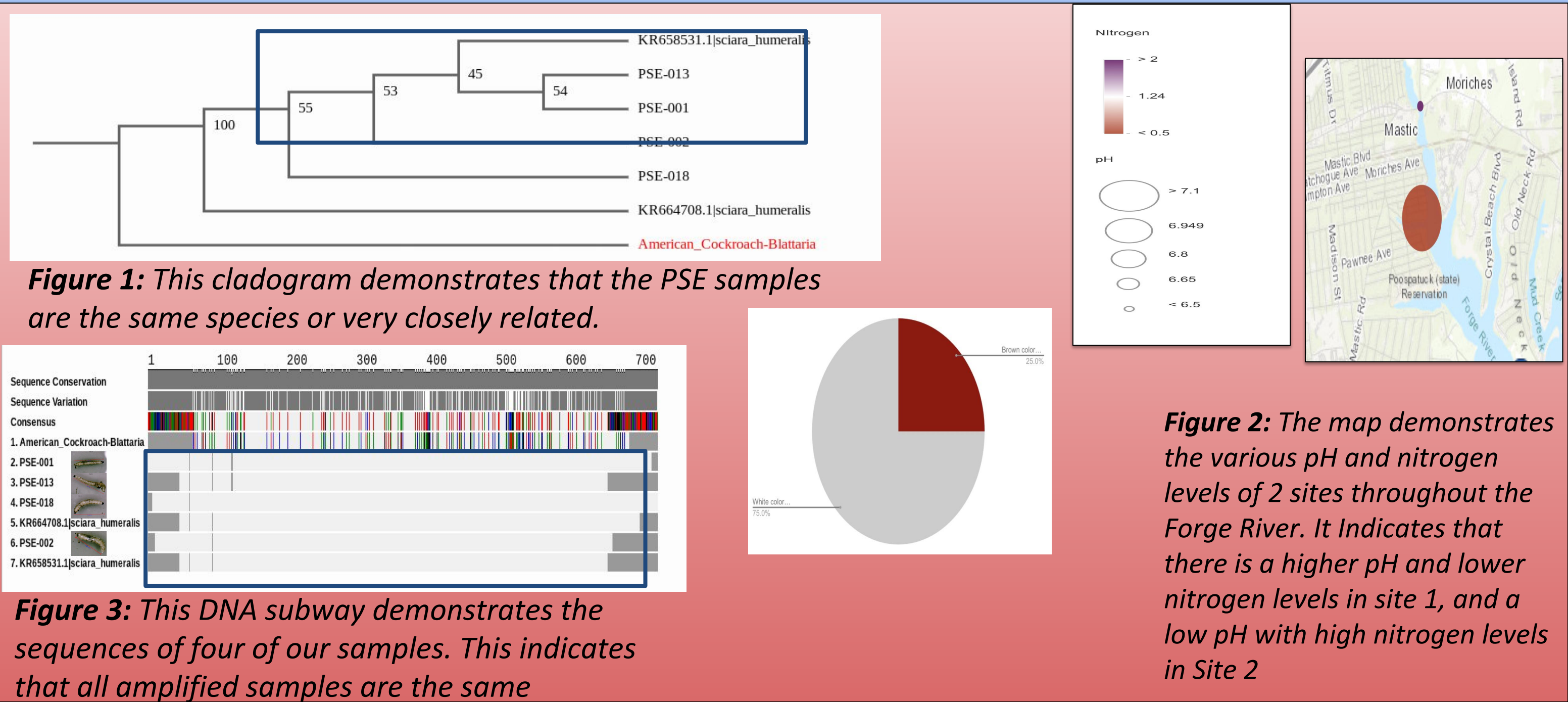


Figure 1: This cladogram demonstrates that the PSE samples are the same species or very closely related.

Figure 3: This DNA subway demonstrates the sequences of four of our samples. This indicates that all amplified samples are the same species.

Discussion

- Our original hypothesis, regions with increased pollution will have a lower biodiversity of flatworms, was supported, but there was no indication that the flatworms were parasitic. However, it is important to note that only one region had amplification and samples from the other region had to be identified by physical characteristics
- Similar to our belief, the results concluded that in regions with increased pollution there is a lower biodiversity of parasitic flatworms. As shown, the cladograms demonstrate that the PSE samples are the same species, and the DNA subway also demonstrate that all the amplified samples are the same species. There is a low biodiversity of flatworms because, Flatworms have sensory cells on either side of their head. These cells are sensitive to chemicals, food, and movement which is why the pollution impacted the flatworms significantly, decreasing the biodiversity This is important because flatworms exchange gasses like CO₂, ammonia, and Oxygen, which is important to contribute to for healthy ponds, streams & lakes. So the decrease in their species will create a ecological imbalance.
- Future experiments conducted on this should collect the flatworms when climate is warm and wet to find more samples, and go to more polluted areas to find the different types of flatworms, and test if they're parasitic.

References

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