Macroinvertebrate Sampling Determining Water Quality of Rocky River

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Objective:

Macroinvertebrate sampling is a proficient way to estimate the quality of water without testing the chemical properties. These aquatic organisms are found in freshwater sources and their absence can infer that the water is chemically or environmentally compromised. Our sample areas have been known to be polluted, based on studies done by the Ohio Division of Parks and Watercraft, therefore our hypothesis is that we will find more tolerant species than sensitive species at each location. (Ohio DNR, 2019, Bartley).

What Are Macroinvertebrates?

Macroinvertebrates are miniscule organisms found in bodies of water that can be seen by the naked eye. According to the Ohio Water Quality Association, there are three different groups of aquatic macroinvertebrates: tolerant, semi-tolerant, and sensitive. There are many factors that contribute to the presence and absence of these organisms including but not limited to:

- **The pH of the water**
- **The oxygen level of the water**
- **The weather/season**
- **Surrounding vegetation**
- **Nutrients in the water**
- **Material at the bottom of the river**
- **Pollution**

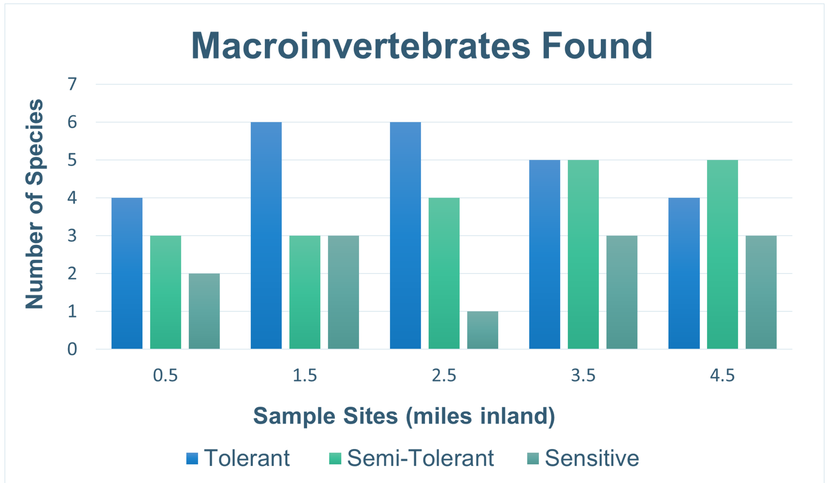
(OWEA, 2019, Ohio DNR, 2019)

Figure 1. A mayfly larva, characterized as sensitive, and commonly found in Ohio's freshwater sources (Schreiter, 2011, Ohio DNR, 2019).

Procedure:

- **Beginning approximately a half mile where the Rocky River drains to Lake Erie, we sampled the main stem in 1-mile increments.**
- **In total, we tested a 4.5-mile long segment of the river that includes the most polluted tributaries according to Cuyahoga Soil and Water Conservation: Coe Creek, Abram Creek, Plum Creek, Blodgett Creek, and Baldwin Creek (Bartley).**
- **Nets were placed at the bed of the channel.**
- **Rocks were lifted so the organisms emigrated out from under.**
- **Various organisms were captured, identified, and put into trays to examine.**

Figure 2. Out in the field sampling and identifying macroinvertebrates.



Graph 1. Number of macroinvertebrates found at each sampling site based on tolerance characteristic.

Figure 3. A damselfly larva, categorized as semi -tolerant.

Result:

Our hypothesis that more tolerant species of macroinvertebrates will be found than sensitive species was accepted. Based on the macroinvertebrates found in Rocky River at each site, the quality of the water could be classified as compromised from the lack of sensitive specimen diversity. More tolerant species most likely means that sensitive species are unable to live in the current conditions of the water. The season and weather could have played a role in the lack of macroinvertebrates found, considering that most of the organisms found were not as grown as they could have been.

Why Does this Matter?

Recognizing the condition of Rocky River is vital because it runs directly into Lake Erie and as a major river that covers 294 square miles, this natural resource plays a vital role in the hydrological cycle, supporting the natural habitats and water resources in western Cuyahoga County. Furthermore, it is enjoyed by thousands of people annually as a major part of the Cleveland Metro Parks system (Bartley).

What Tests Could Be Done in the Future?

Testing the chemical properties of water sources to could help us scientifically determine the quality of water. Also, testing the quality of water of different rivers that run into Lake Erie, such as Chagrin River, Black River, and Cuyahoga River.

References

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