

# Macroinvertebrates as indicators of water quality in Yauco River and Duey River at Yauco, Puerto Rico



Andrea Rivera-Rodríguez, Jaleisha Vélez-Velázquez, Prof. Glenda Almodóvar-Morales  
Ernesto Ramos-Antonini Fine Arts School in Yauco, Puerto Rico



## Introduction:

This investigation has the purpose of comparing the diversity and abundance of the macroinvertebrates found in Duey River (Site 1) and in Yauco River (Site 2) as indicators to determinate the quality of the water. In addition, it has been started a habitat assessment by collecting data about the pH, temperature, and total suspended solids, among others.

The Yauco River was born in the Puerto Rico Mountain Range from the North between Frailes (Yauco, PR) and Indiera (Maricao, PR) Districts passing through the Luchetti Reservoir. The Duey River was born in the District of Aguas Blancas and is the main tributary of the Yauco River and finishes in the Caribbean Sea by the Guayanilla Bay covering a distance of 22 miles (35 kilometers). The Aquatic macroinvertebrates are substrates organisms which live from the bottom of the aquatic systems whether sediments, rocks, and leaves. They can be affected by anthropogenic defects caused by man in different types of the water systems.

## Problem:

Can the pH, temperature, and total suspended solids in the water of the Duey River and Yauco River will influence the factors in the diversity and abundance of species?

## Hypothesis:

The pH, temperature, and total suspended solids of the Duey and Yauco Rivers will vary the diversity and abundance of species.

## Methodology:

The researchers:

- Selected a topic and searched for information.
- Selected two rivers in the town of Yauco : Yauco River and Duey River to perform the research.
- Visited each selected river four times for collecting the samples of macroinvertebrates.
- Measured the pH and temperature of the water in each visit.
- Also, collect three water samples in each visit to send to the VT EPSCoR CWDD to measured the total suspended solid (TSS).
- Used a network to collect these samples of macroinvertebrates.
- Placed the macroinvertebrates collected in a small plastic bag with alcohol.
- Carefully analyzed the samples from a microscope.
- Identified each one of them macroinvertebrates by using the guide to aquatic macroinvertebrates of the upper Midwest or Puerto Rico.
- Arrived to conclusions.

For more information  
Glenda Almodóvar, MA. Ed.,  
[glenda\\_lee2@yahoo.com](mailto:glenda_lee2@yahoo.com)



## Duey River



Baetis (Beatidae)



Xiphocentronidae

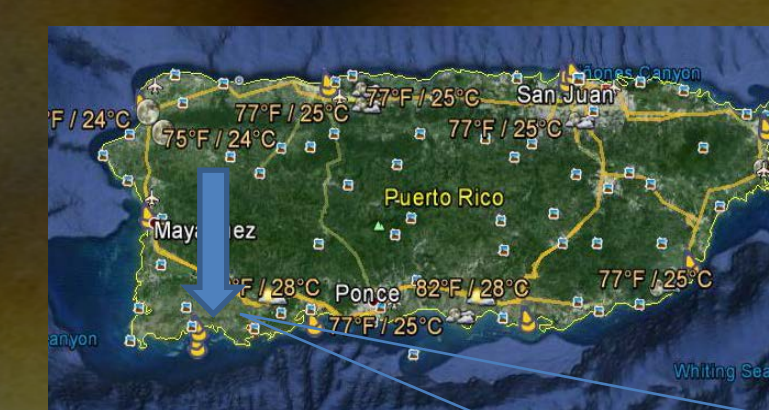
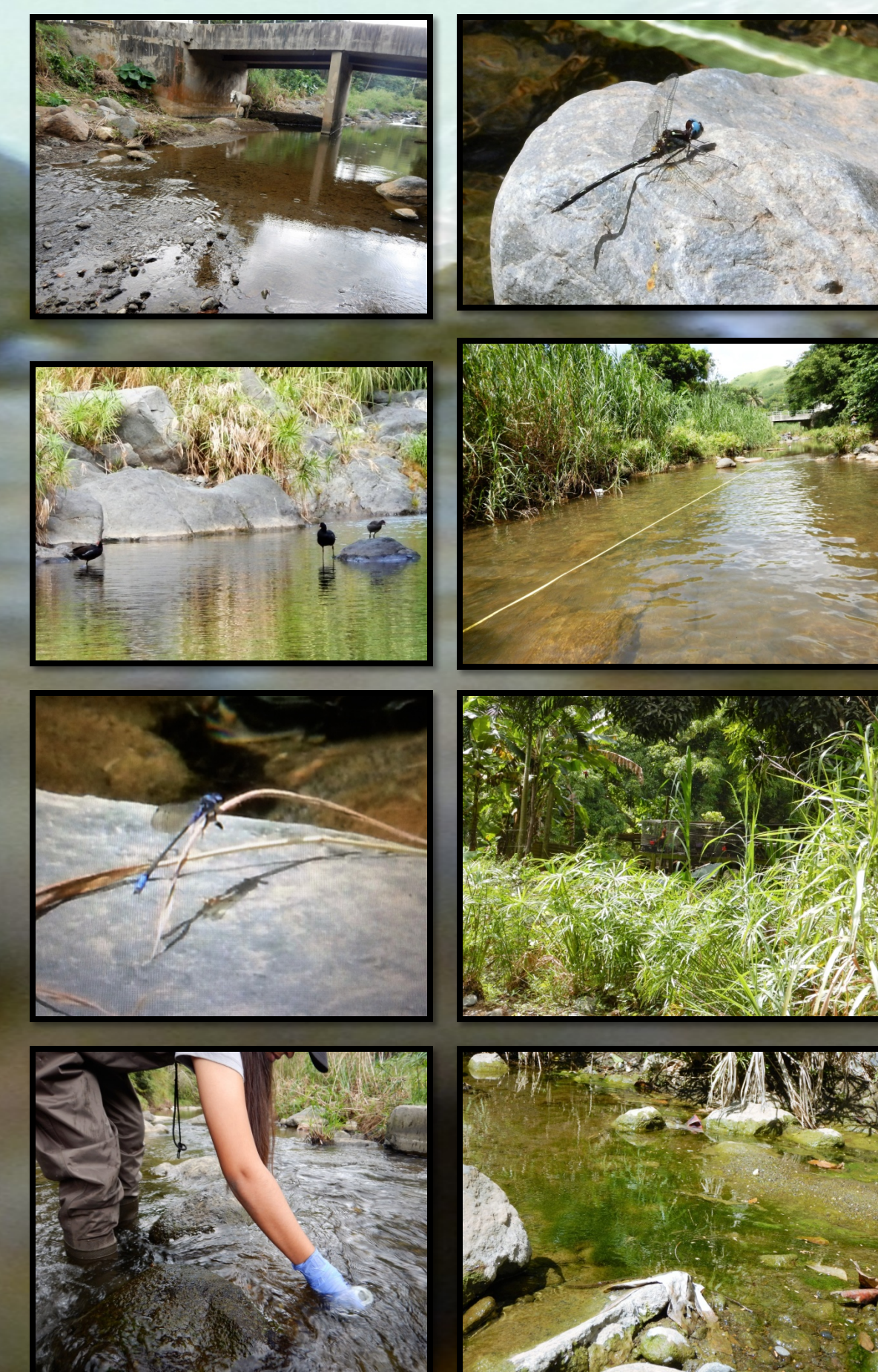


Helichus (Dryopidae)

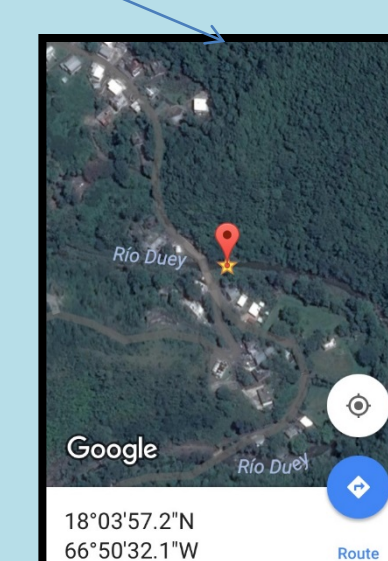


Polycentropus (Polycentropodidae)

## Habitat Assessment



Site 1:  
Duey River  
Yauco, PR



Site 2:  
Yauco River  
Yauco, PR



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## Data and Results

### Duey River

- There are 15 species.
- Total of macroinvertebrates are 107.
- The Xiphocentromidae was the most abundant species in this river with 49 organisms.
- The least abundant species was Beatidae with 14 organisms.
- There are more anthropologic effects present in this river, trash, animal waste, and a bridge.
- The average of temperature is 23.9°C in this river.
- The average of pH is 8.0 in this river.
- The average of TSS is 8.8 mg/L.

### Yauco River

- There are 14 species.
- Total of macroinvertebrates are 115.
- The Libellulidae was the most abundant species in this river with 25 organisms.
- The least abundant species was Beatidae with 3 organisms.
- There are minor anthropologic effects present like 4x4 vehicles crossing the river and there's a recreational park near.
- The average of temperature is 22.0°C in this river.
- The average of pH is 7.9 in this river.
- The average of TSS is 11.4 mg/L.

Both rivers have in common the following species: Beatidae, Buruquena, Ceratogonidae, Libellulidae, Philotopotamidae, Xiphocentronidae, and Nymphulinae.



## Yauco River



Philorus californicus (Blepharicedae)



Buruquena

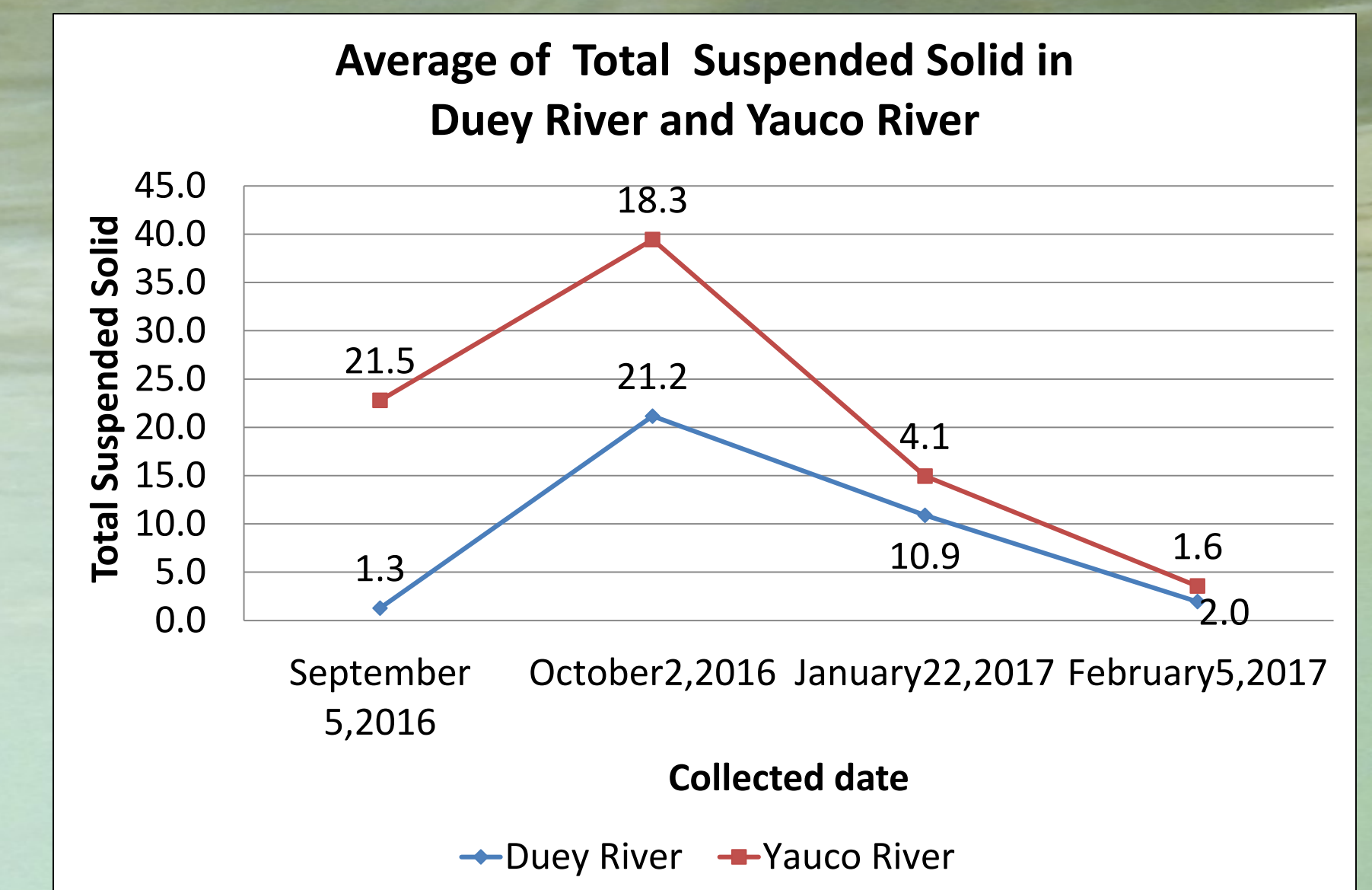
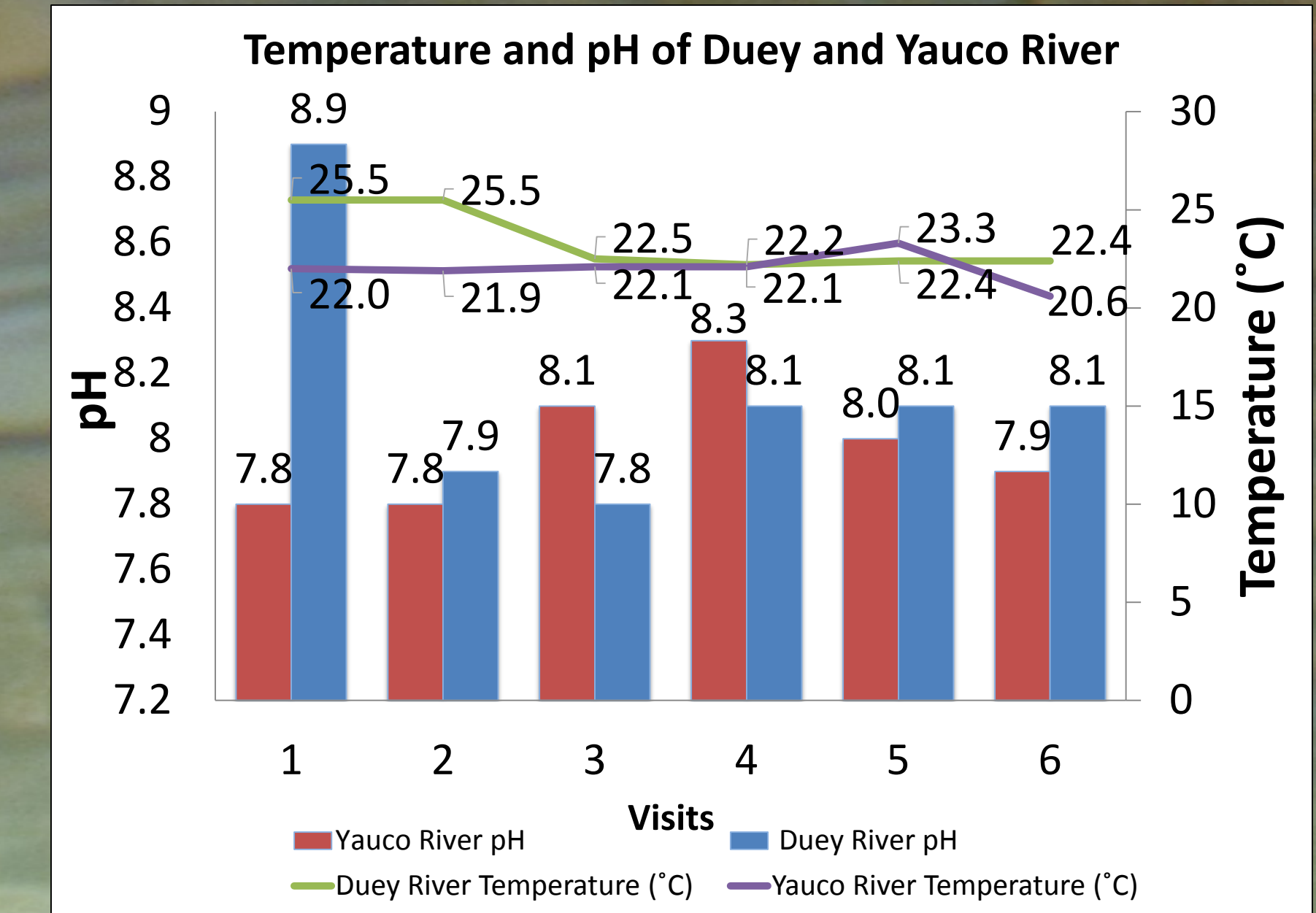
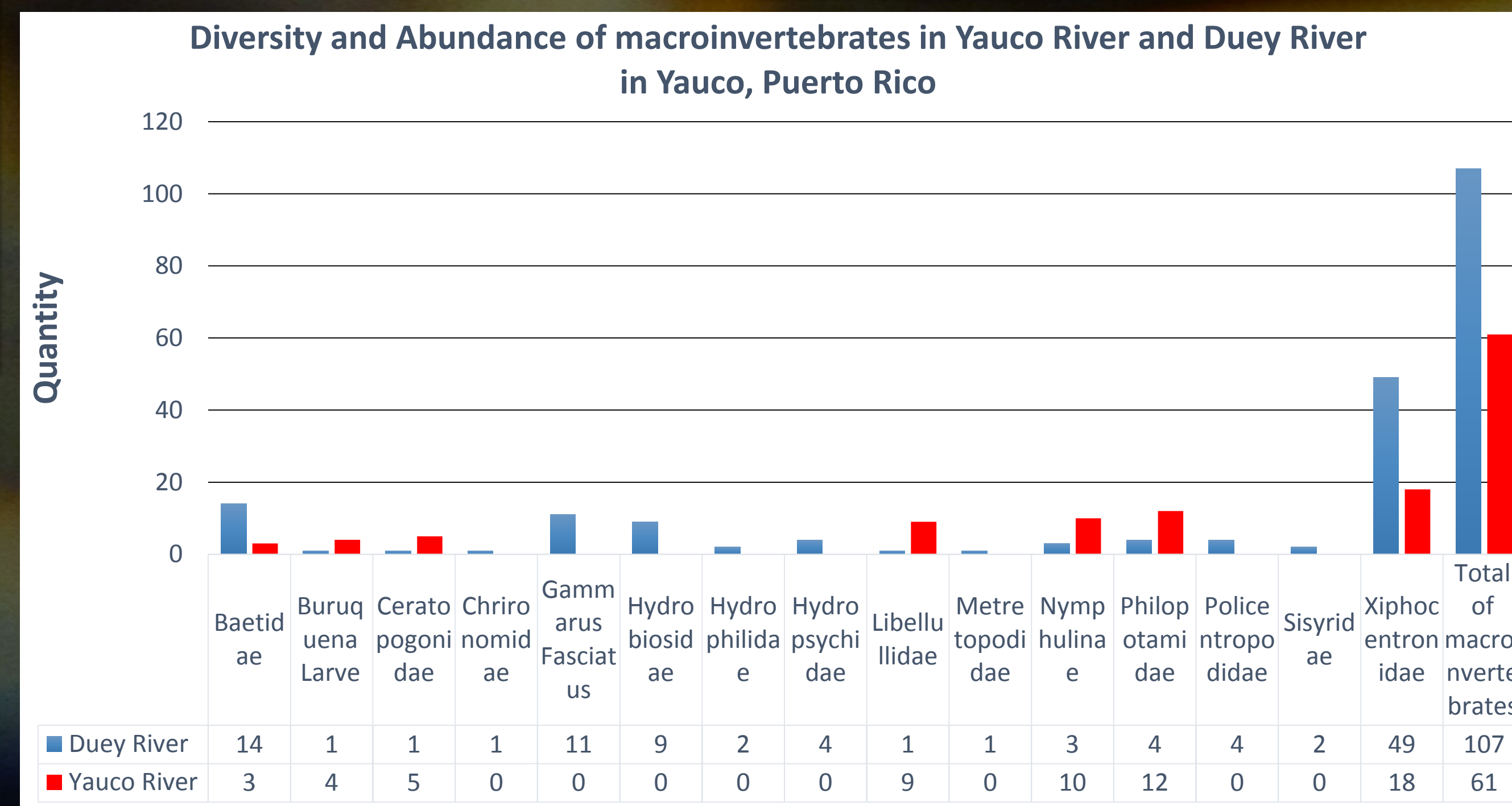


Pachydiplax longipennis (Libellulidae)



Baetis (Beatidae)

## Habitat Assessment



## Conclusion:

In general, by the data we collected, it can be inferred that both rivers have a good water quality. We found that none of the rivers were affected by the anthropologic or chemical effects; there were only find a species that is associated with pollution, the Beatidae.

It is recommended a long term detailed research to determinate if indeed have good water quality.

## References:

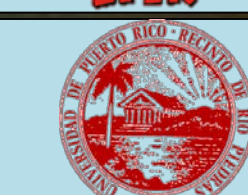
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Noelia Báez  
Prog. Coord. LTER Schoolyard



ITES  
UPR-Río Piedras Campus