# Shrimps and leaf decomposition: Effect on macroinvertebrates and meiofaunal assemblages

Josué D. Santiago-Vera*, Pablo E. Gutiérrez-Fonseca & Alonso Ramírez
Universidad de Puerto Rico in Rio Piedras.
* josue.santiago11@upr.edu

## Introduction

- Macroconsumers are important structuring lower trophic levels and therefore regulating leaf decomposition.
- In tropical island streams, atyid shrimps brush the substrate with their modified chelae to feed, resuspending sediments into the water column.
- This action removes meiofaunal organisms (45 – 1000 µm) but facilitate the presence of some macroinvertebrates, such as mayflies (Ephemeroptera) that feed by scraping algae that grows on rocks (periphyton).
- Enhancing or reducing particular functional groups could therefore affect decomposition of organic matter.
- Thus ecological processes in streams could be regulated by macroconsumers through top down control.

## Objectives

Determine the effects of macroconsumers on:
1. Leaf decomposition
2. Macroinvertebrates richness and abundance
3. Meiofaunal richness and abundance

## Methodology





## Results

1. Leaf decomposition

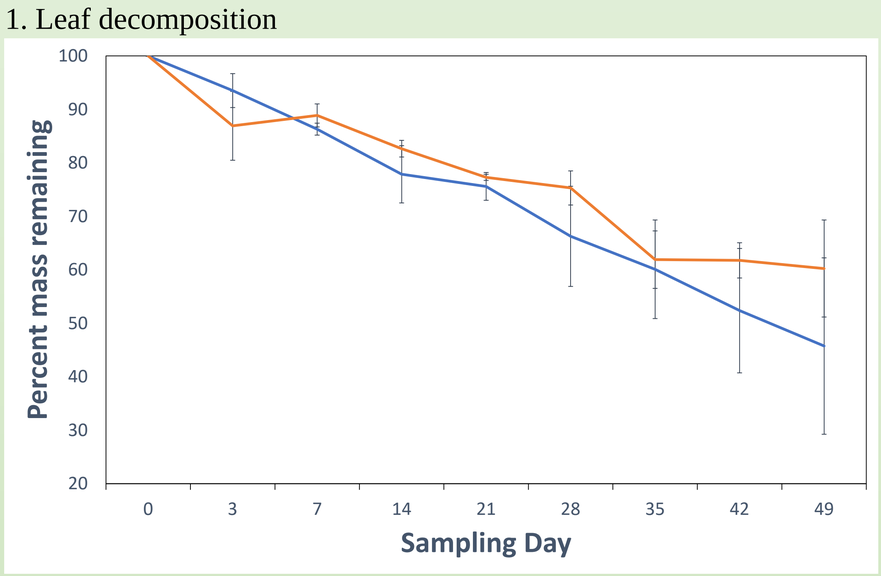



Figure 1. Percentage mass remaining for each sampling date. Blue= Control, Orange= Macroconsumers exclusion

2. Macroinvertebrates

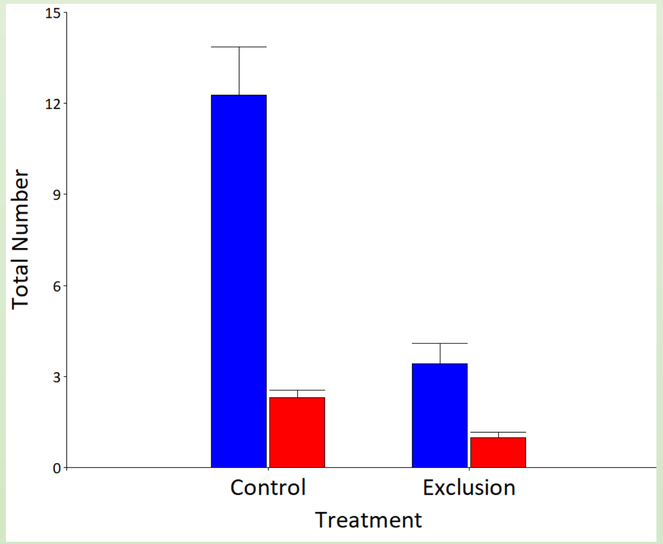



Figure 3 Abundance and richness of macroinvertebrates ± S.E. Blue= Abundance, Red= Richness

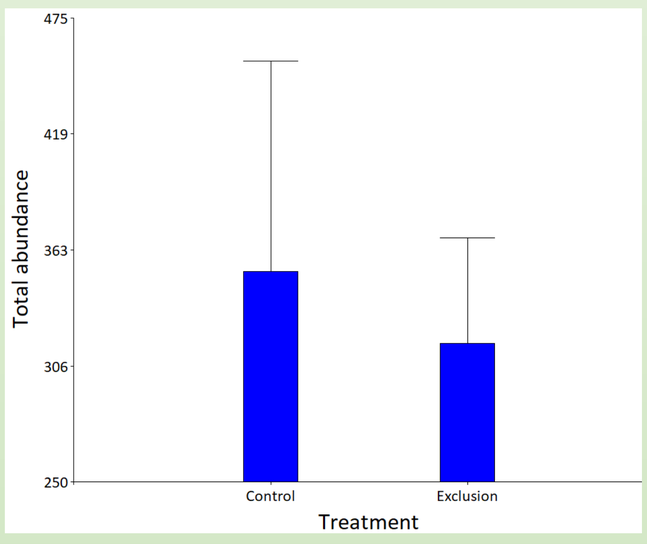



Figure 5. Abundance of meiofauna ± S.E.

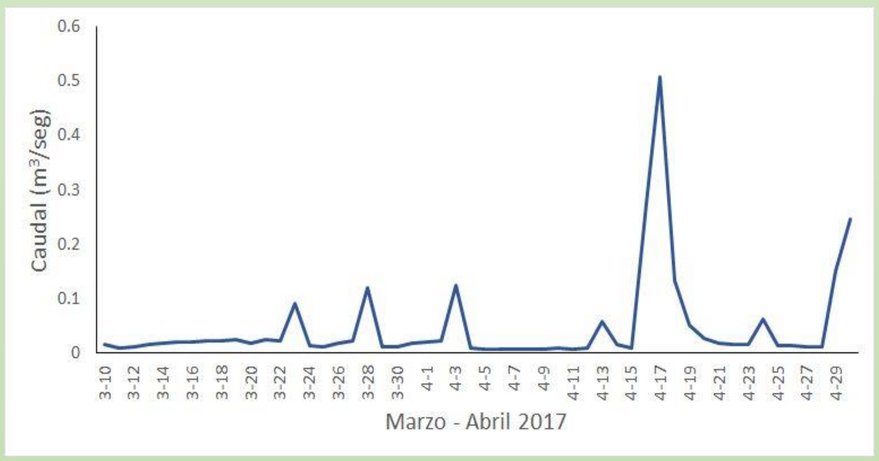



Figure 2. Streamflow ($m^3$/sec) during the period of the experiment (March-April 2017)

3. Meiofauna

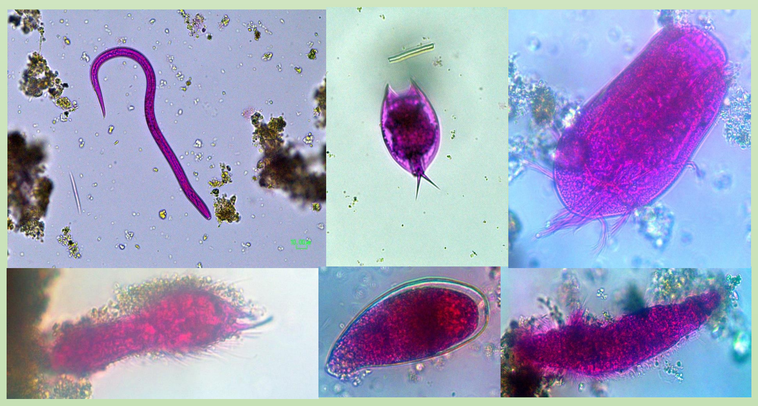


Figure 4. Some representatives of the meiofauna from left to right
Top: Nematode, *Lecane* sp., *Euplotoides eurystomus*
Bottom: *Chaetonotus* sp., *Cyphoderia ampulla*, *Catenula* sp.

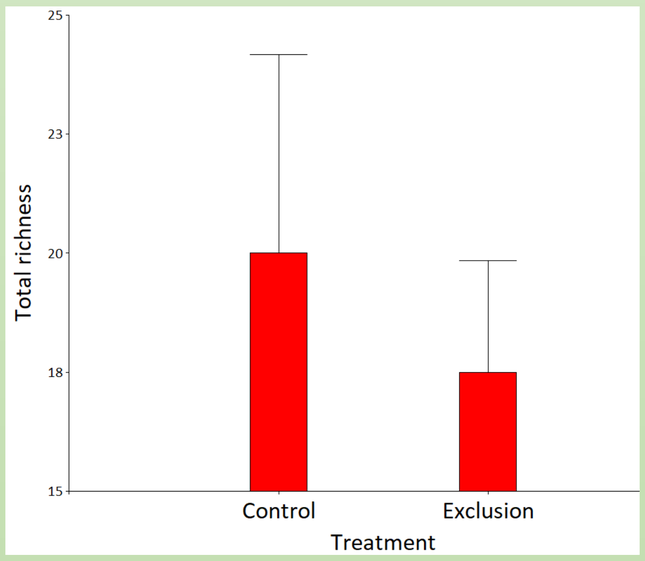



Figure 6. Richness of meiofauna ± S.E.

## Discussion

- There was a trend of faster organic matter decomposition in the presence of macroconsumers.
- Even when decomposition rate was not significantly affected, macro and meiofaunal assemblages were.
- Macroinvertebrates abundance and richness was higher in the presence of macroconsumers than in the absence of macroconsumers.
- Meiofaunal groups were just affected in composition, where in the absence of the macroconsumer the meiofaunal composition is more similar than in the presence of the macroconsumers.
- This could be due to the fact that macroconsumers, such as shrimps removes the sediment therefore the meiofaunal community is always recolonizing the sediment and thus never stabilizing.
- These differences could overshadow the decomposition effect since macroinvertebrates and meiofaunal groups are known to feed on bacteria, fungi and organic matter.
- Another factor that could be overshadowing the decomposition, is the fact that during the duration of the project, the stream experienced high flows due to a heavily rainy period, which could affect decomposition by mechanical breakdown of the leaves.
- However, macroconsumers can regulate lower trophic levels that could in turn have effects on decomposition of organic matter.

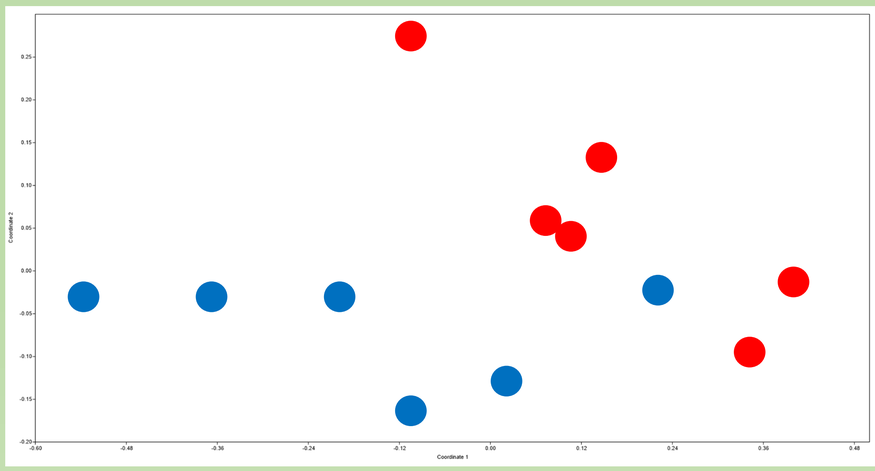



Figure 7. nMDS of meiofaunal groups composition between treatment. Stress=0.07, Blue= Control, Red= Exclusion

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