Investigating the Abundance of *Lirceus fontinalis* and its Feeding Preferences

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QUESTIONS

1. Since American Sycamore leaves are tougher than Sugar Maple leaves, which leaf type will isopods prefer to feed on given the choice between the two in a multiple choice feeding experiment?
2. When investigating isopod abundance throughout the stream, will isopod abundances vary by microhabitat (riffle, edge, and run)?

INTRODUCTION

Detritivores are vital to aquatic ecosystems, and are critical to decomposition, incorporation of detritus into secondary production, and creating fine particulate organic matter for organisms downstream (Graca 2001). Different types of detritus may enter food chains rapidly or slowly based on litter characteristics and shredder preference. Shredders prefer to feed on leaves that have been conditioned by bacteria and fungal colonies. As this increases, so does the nutrient content and palatability of the leaves. (Graca 2001)

In this experiment, American Sycamore and Sugar Maple leaves, were used in a feeding experiment to determine which leaf type an abundant shredder, the isopod *Lirceus fontinalis,* prefers. In addition, we investigated abundance and distribution of these isopods in stream microhabitats.

METHODS

Our study site is a first order stream with a full canopy of trees in Owen County Indiana. The isopod *Lirceus fontinalis* is the most abundant shredder observed at this site with a mean length of 5940.0 µm ± 425.5 µm.

For the leaf preference experiment, we conditioned Sugar Maple (*Acer saccharum*) and American Sycamore (*Platanus occidentalis*) leaves for two weeks in our study stream. Using individual aquaria made after Iyengar et al. (2017) we presented a single isopod with the choice of these two leaves (see Figure 1). For the purposes of the feeding experiment we used a sample size of 20. Four discs of each leaf species were placed in each tank containing 1 isopod. The amount consumed by each isopod was estimated by subtracting the dry weight of the experimental disks from their paired control leaf disk.

To determine isopod abundance we randomly sampled 0.25 m^2 areas using a Surber sampler. Macroinvertebrates were collected in 3 microhabitats (riffle, edge, run, n=3 in each habitat).

RESULTS

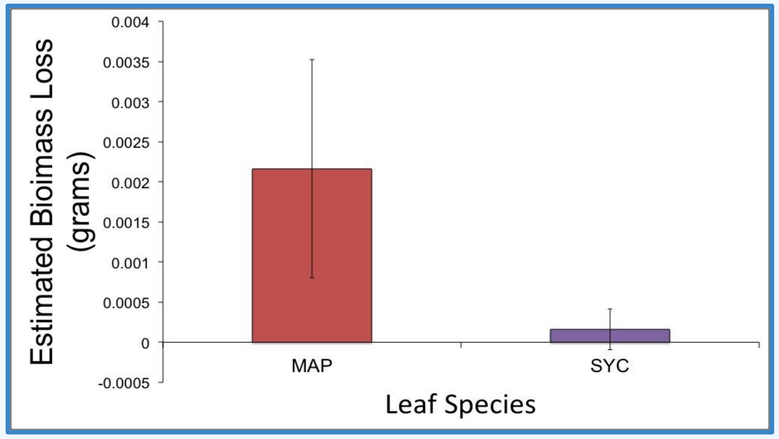

Figure 2: The estimated mean for biomass lost of each leaf type, *A. saccharum* (MAP) and *P. occidentalis* (SYC) Numbers reported here are a mean of sum of biomass lost across punches. Error bars calculated using standard error. n=18 of each leaf species. Paired t-test: t = -1.37, df =17, P=0.19.

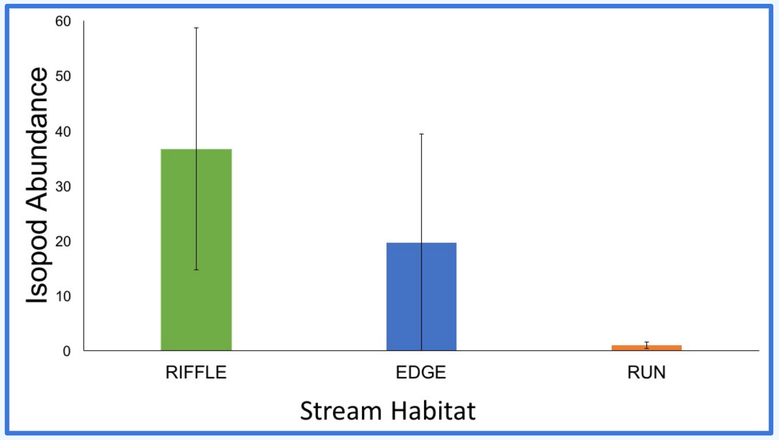

Figure 3: Calculated mean of isopods found in samples collected from riffles, edges, and runs. Error bars calculated using standard error. n=3 for each microhabitat. One-way ANOVA: $F_{2, 6}$=1.09, P=0.39.

Figure 1: Photograph demonstrating the experimental set-up for the multiple choice feeding experiment.

DISCUSSION

The results from our feeding experiment indicated that there was no statistical difference in feeding preferences when the isopods, L. *fontinalis*, were given the choice between the two leaf species (Fig 2).

We expected to find a greater abundance of isopods in the riffles of the stream rather than the edges or runs. We found the greatest density of isopods in a riffle sample; however, we did not find significant differences among stream microhabitats (Fig 3). It is important to note that the among sample variability was large because there were great differences in physical structure within the same microhabitat type.

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