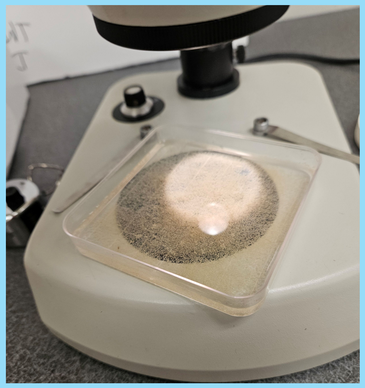
Zoeae and Megalopae Abundance of the White-Tipped Mud Crab (*Rhithropanopeus harrisii*) in the Freshwater Lake Monroe, Florida over Temporal Scales

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Introduction

Little is currently known about the reproductive activity of the crustacean species *Rhithropanopeus harrisii* in freshwater lakes and brackish water lakes in its native range. Other studies have looked at the reproductive period of the species within a brackish water or oceanic setting, which found that larvae were present all year, but none have determined *R. harrisii*'s reproductive patterns in freshwater specifically (Tolley *et al.*, 2013). Within a freshwater lake, it was hypothesized that megalopa counts would be highest in the summer months, and lowest during other seasons.





Materials and Methods

Plankton tows were conducted at Lake Monroe twice monthly for 19 consecutive months. Plankton samples were stored with ethanol until processing. Each plankton sample was processed by pouring the sample through a 500 micron mesh sieve and rinsed into a gridded tray of 1 mm x 1 mm squares. The abundance of zoeae and megalopae of *R. harissi* were examined using a dissecting scope and hand counter.

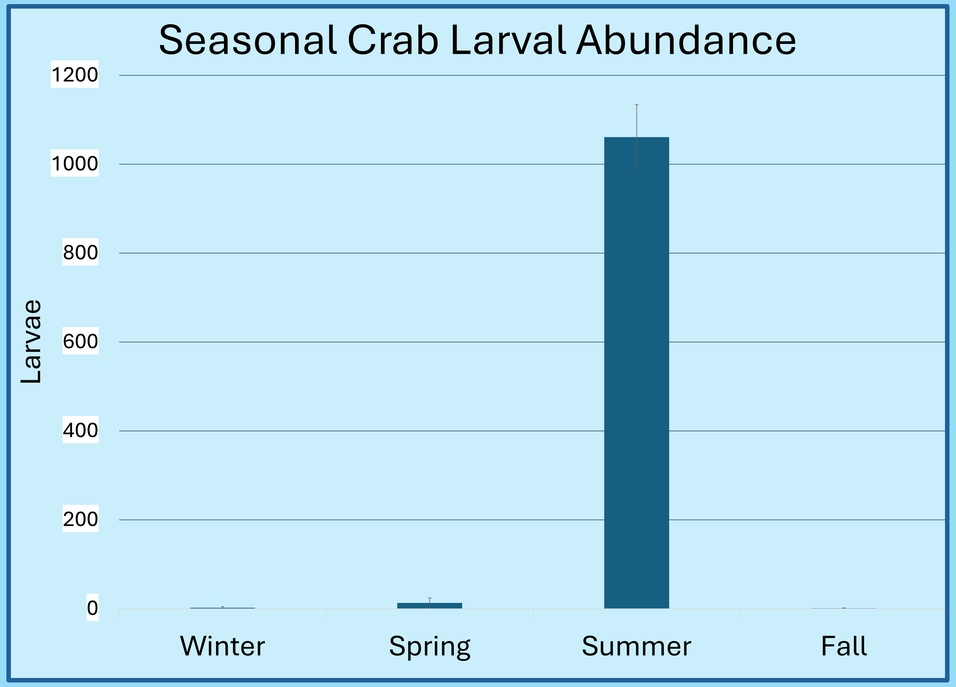
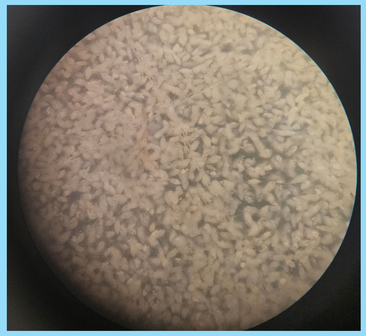


Figure 1. Abundance of *R. harrisii* larvae (zooeae and megalopae) in winter, spring, summer, and fall months (n=4, mean ± SD).



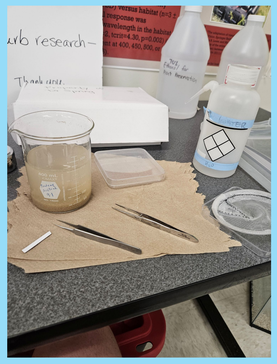


Results

There were significantly more *R. harrisii* larvae (zooeae and megalopae) in summer than in other seasons (1-way ANOVA, $F_{3,12}=599.83$, $p<0.05$) (Figure 1).

Discussion

The data supports the hypothesis that larvae are highest during the summer months as opposed to other seasons throughout the year. However, the numbers of zoeae and megalopae in other seasons, while it was very low, was not zero, indicating that the species reproduces at all times of the year in fresh water. Other studies have found that in a laboratory setting, *R. harrisii* can occasionally mate outside of the expected breeding season, but generally reproduce within the summer months (Goy, *et al.* 1985). Another study found that *R. harrisii* can reproduce all year in a laboratory, but few studies have looked at the reproductive capacity of the species in the wild within its native range (Morgan *et al.* 1988). The study that was performed for this project indicates that *R. harrisii* will reproduce year-round in the wild but will reproduce in the highest numbers during the summer. It was also found that megalopae are primarily present during the month of May, while zoeae were mostly present during the month of June, the next stage in the species' life cycle. Further studies could look at how the species reproduces outside of its native range, as *R. harrisii* is highly invasive in other parts of the world.



Literature Cited

Morgan *et al.*, (1988). *Effect of Density, Sex Ratio, and Refractory Period on Spawning of the Mud Crab* Rhithropanopeus harrisii *in the Laboratory.* Journal of Crustacean Biology Vol 8. No 2.

Goy, J. W., Morgan, S. G., & Costlow, J. D. (1985). *Studies on the Reproductive Biology of the Mud Crab, Rhithropanopeus harrisii (Gould): Induction of Spawning during the Non-Breeding Season (Decapoda, Brachyura).* Crustaceana, 49(1), 83–87.