Spatial Variation in Oyster Macroparasites Across the Georgia Coast

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Introduction

- Eastern oysters (*Crassostrea virginica*) are ecosystem engineers
  - Stabilize sediments, filter water, cycle nutrients, habitat provisioning
- Parasite infection causes shell damage, poor condition
  - Parasitized oysters expend more energy on immune defense, shell repair (Carroll et al. 2015)
- Degraded reefs are more vulnerable to predation and damage

Methods

- Sampled 24 oyster reefs across 8 sites along the Georgia coat
  - Collected oysters from 0.25m^2 quadrats at each reef
  - Measured salinity, dissolved O_2, temperature, reef rugosity (complexity) and oyster density
- Retained up to 50 oysters per reef for macroparasite analysis
  - Quantified macroparasite prevalence for each oyster

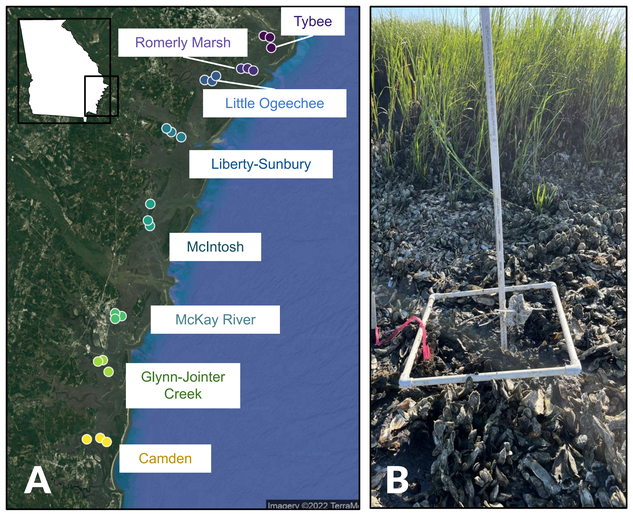

Figure 1: (a) Map of sampling sites. (b) Quadrat deployed on a sampled reef.

Key Questions

- Does the presence of oyster macroparasites (boring sponge, pea crabs, and blister worm) vary geographically?
- Do reef complexity and environmental conditions correlate with macroparasite prevalence?

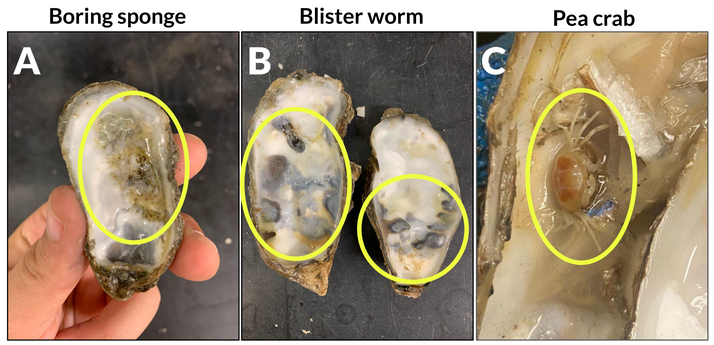

Figure 2: Oysters infected with (a) boring sponge, (b) blister worm, and (c) pea crab.

Results

Macroparasite prevalence did not vary between sites

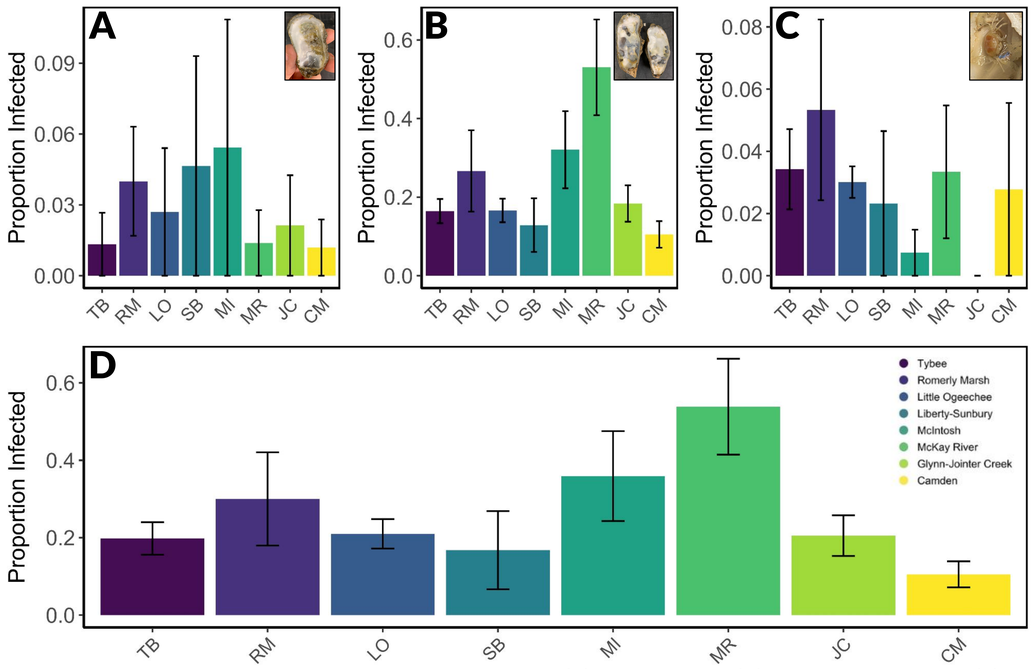

Figure 3: Proportion of oysters infected with (a) sponge only, (b) blister worm only, (c) pea crabs only, and (d) any macroparasite infection across the eight sampling sites.

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Higher blister worm prevalence at low salinity reefs

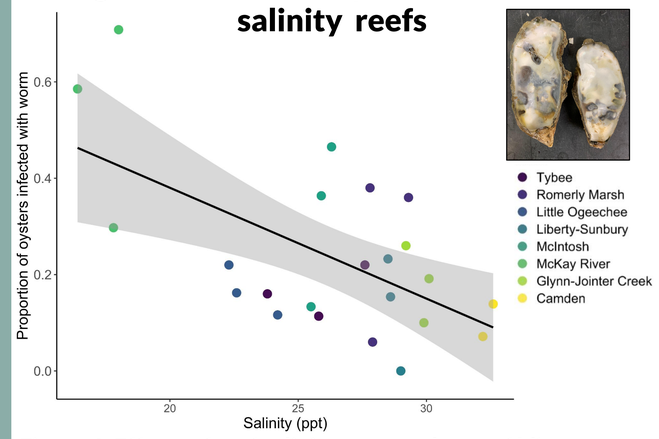

Figure 4: Effects of reef salinity on prevalence of blister worm infection.

Higher blister worm prevalence at low complexity reefs

Figure 5: Effects of reef rugosity on prevalence of blister worm infection.

Discussion

- Low complexity reefs and low salinity reefs exhibit higher infection prevalence regardless of geographic location.
- Climate change predicted to cause increasing salinity on Georgia coast (Alexander et al. 2020)
  - Regional effects are less predictable
  - Parasite distributions may change with changing climatic conditions

References
Carroll, John M., et al. "Are oysters being bored to death? Influence of Cliona celata on Crassostrea virginica condition, growth and survival." *Diseases of Aquatic Organisms* 117.1 (2015): 31-44.
Michael A., et al. "The response of the northwest Atlantic Ocean to climate change." *Journal of Climate* 33.2 (2020): 405-428.