

NSF-REU at Savannah State University in Marine Biology



White and Brown shrimp tank she maintained to do her project



Mortality and Efficacy of Three Over the Counter Anti-Parasitic Medications for Treating Shrimp Black Gill

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Introduction/ Background

White Shrimp (*Litopenaeus setiferus*) and Brown Shrimp (*Falsetipennaeus arcticus*) are an economically important crop in Georgia and South Carolina. In the recent years, shrimp fishery has seen a decline in harvest due to infestation by a parasitic ciliate called shrimp Black Gill (sBG). sBG darkens the gill tissue in White and Brown shrimp in the South Atlantic and hence is called Black Gill, a symptom indicating infection by the parasitic ciliate (Gambill et al., 2015). The presence of the ciliate triggers activation of prophenoloxidase system in the hemocyte cells which play an important role in the immune system of shrimp. The shrimp's immune system attacks the ciliate by encasing it in hemocytic melanized nodules, which blackens the gills and has the inadvertent effect of impairing the shrimp's ability to obtain oxygen. The life history of the shrimp Black Gill (sBG) ciliate is not well known and many critical questions remain, such as method of survival, transmission, physiological effects and behavior of the ciliate. An additional impediment in elucidating the life history of sBG ciliate is the availability of a ciliate-free shrimp that can serve as a control group in experimental studies. In this study we tested the effect of different anti-parasitic medications in an attempt to find a cure for shrimp with Black Gill.

Objective

The purpose of this study is to create a Black Gill-Free Shrimp. By using three over the counter anti-parasitic medications we wanted to determine the maximum tolerable concentration that would cure shrimp of the black gill ciliate.



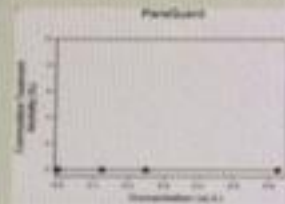
Methods

Exposed shrimp in controlled aquarium setting to increasing concentrations of three commonly used anti-parasite drugs.

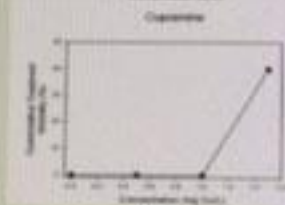
- Cupramine
- ParaGuard
- Metroplex-5

At maximum tolerable anti-parasite drug dose, determined if the shrimp is free from the sBG parasite by using Polymerase Chain Reaction (PCR) techniques.

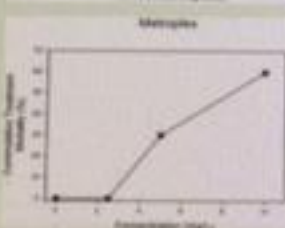
Results



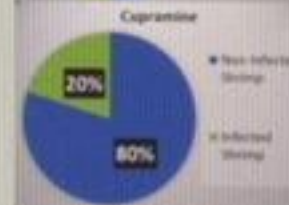
ParaGuard: No tolerable dose was found



Cupramine: tolerable dose 3 mg Cu/L



Metroplex: tolerable dose 8 mg/L



Conclusions/ Future Directions

Our studies showed that anti-parasitic medication ParaGuard and Cupramine were most effective in curing shrimp of black gill. Metroplex was not found to be effective.

Studies will be repeated in August & September as well to determine anti-parasitic drug concentrations tolerated by parasitic ciliate (sBG).

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