HISC FY23 Final Report

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Introduction

Hawaii's shrimp broodstock producers are required by importing countries to conduct disease surveillance testing for the World Organization for Animal Health (WOAH, formerly OIE) listed diseases and other emerging diseases. The UH Animal Diagnostic Laboratory became the 2nd lab in the country approved by the USDA in May 2021 to provide these testing services. The laboratory is also capable of providing molecular diagnostic testing for fish and terrestrial livestock.

Project Objectives

1. Building Expertise in Crustacean Histopathology.
2. Enable the UHADL to perform diagnostic PCR testing services.

Project Outcomes

1. 120 shrimp (*L. vannamei* & *P. monodon*) were examined microscopically. Background lesions not uncommon to locally raised shrimp were documented. For example, degenerative changes to the eyes, aggregated transformed microvilli of the hepatopancreas, rare occurrence of melanized shrunken hepatopancreatic tubules, inspissated inflammatory material within spermatophores, non-pathogenic protozoa associated with outer cuticle, etc.

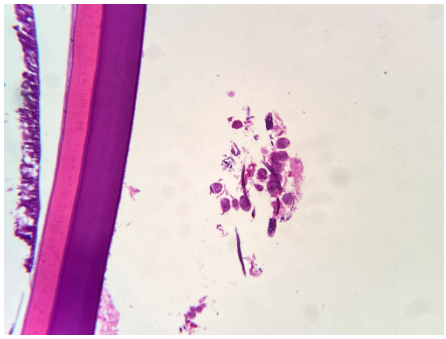

Figure 1: Outer cuticle with stalked protozoa (non-pathogenic)

2. Project work was affected by the departure of the UHADL PCR technician in May 2022. 36 samples (representing tissues from 60 shrimp) were tested for *Enterocytozoon hepatopenaei* (EHP) to support a local investigation. We were able to provide quick results to the Hawaii Department of Agriculture supporting a negative diagnosis. Testing to support another disease outbreak involved testing 5 swine samples for 6 pathogens. The UHADL was inspected by the USDA on September 20, 2022 and successfully passed, thereby continuing its status as an approved laboratory for export testing of OIE-listed shrimp pathogens. The University of Arizona-sponsored Ring Test was completed in August 2022 by a graduate student, who did not pass one of the assays. This was a somewhat subjective call. As a laboratory primarily concerned with surveillance, we will call borderline cases a "presumptive positive/non-negative" and pursue additional testing. However, this conservative approach resulted in incorrect scoring on the ring test. These results were not received until the end of October 2022, and at that point, the PI decided to discontinue accepting surveillance program samples and only accept diagnostic samples.

Conclusions

The PI has developed the experience to confidently prepare and examine shrimp tissues for histopathology. This skill will continually be honed by reading the literature and participating in additional continuing education opportunities. Hawaii Department of Agriculture has recently hired a full-time permanent Aquatic Veterinary Medical Officer, who the PI has started to train in these diagnostic skills.

The UHADL has not had a full-time laboratory technician since May 2022. Despite this, the laboratory still maintains its official status as a USDA-approved laboratory for export testing of OIE-listed diseases of shrimp and fish. The UHADL and HDOA are continuing discussions on how to best proceed with continuing molecular diagnostic testing of livestock and aquacultured animals. The expertise that the PI has developed with diagnostic testing and Quality Management System development and execution is critical to the success of the laboratory, regardless of which institution houses its activities. In this way, surveillance for emerging and foreign animal pathogens can continue in a timely manner, thereby supporting the health of Hawaii's domestic and non-domestic fauna.