Contributed paper. Tuesday, 10:45. **100**

Defining lobster-pathogen interactions via high-throughput gene expression studies: The discovery and description of the interplay between the American Lobster (*Homarus americanus*) and the ciliated parasite *Anophryoides haemophila*

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The American lobster (*Homarus americanus*) fishery is the economic engine for hundreds of coastal communities in Atlantic Canada and represents the last remaining significant wild fishery in Canada. Lobsters appear remarkably resistant to microbes in their natural environment however they are susceptible to the opportunistic ciliated pathogen *Anophryoides haemophila*, the causative agent of bumper car disease, during live holding. We have completed numerous controlled experimental infection studies to define the gross, histopathology, biochemical and molecular responses of lobster to this ciliated parasite. Recently completed high throughput oligonucleotide microarray and RNA-Seq transcriptomics studies have revealed a more comprehensive understanding of the molecular pathogenesis of disease in this unique lobster – parasite interaction. One caveat is interpreting the overwhelming wealth of bioinformatic data generated. This issue will be explored in the context of current annotation limitations for both arthropods and protistan parasites.

Contributed paper. Tuesday, 11:00. **101-STU**

Metabolomic investigation of Bitter Crab Disease in snow crabs (*Chionoecetes opilio*)

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Bitter crab disease (BCD) is a fatal disease of crustaceans caused by parasitic dinoflagellates of the genus *Hematodinium.* This emerging disease has been reported in over forty species of crustaceans world-wide including several commercially important crustacean species. In Atlantic Canada BCD occurs in snow crabs (*Chionoecetes opilio*) off the northern coasts of Newfoundland and Nova Scotia. In the late stages of this disease, the dinoflagellate parasites proliferate within the hemolymph and hemal spaces within the crustacean's organs, with no apparent cellular inflammatory response to the infection. The cause of death in cases of BCD is presumed to be metabolic and osmotic dysregulation. In this study, we use a combination of untargeted and targeted metabolomic approaches to characterize some of the metabolic changes associated with BCD.

Contributed paper. Tuesday, 11:15. **102-STU**

Assessment of immunocompetence in the shore crab, *Carcinus maenas*, to natural exposure of pathogens

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UK populations of the shore crab *Carcinus maenas* host various pathogen assemblages. In particular, two geographically close but distinct populations in Weymouth, (Newton's Cove and Harbour), demonstrated entirely different pathogen profiles. Immune biomarkers were used to assess the immunocompetence of individuals in these populations in relation to their pathogen burden. Selected immune genes included *carcinin*, (antimicrobial peptide), *peroxinectin* (cell adhesion molecule and osponin) and the zymogen *prophenoloxidase,* (cleaved to form active *phenoloxidase,* involved in the melanisation of many invading pathogens). Immune gene expression was quantified using real-time PCR. Histopathology revealed greater pathogen incidence in Newton's Cove (95%) compared with Harbour (37%) and a high dissimilarity in the pathogen profile (82.61% SIMPER) between sites. Host immune expression in relation to the presence and absence of pathogens and number of different infections per crab, revealed significant (p=<0.01) differences in transcription between populations, suggesting site-specific factors also influenced immune expression. In addition, host RNA quality was compared between pathogen groups ('viruses', 'bacteria', 'macroparasites' and 'no pathogens' groups). Further analysis may reveal whether RNA degradation is a function of pathogen type within the host. This is the first study to compare immunocompetence and histopathology between different *Carcinus maenas* populations in the wild.

Contributed paper. Tuesday, 11:30. **103-STU**

Effects of artificial infection of juvenile edible crabs, *Cancer pagurus* with the parasitic dinoflagellate, *Hematodinium* sp.

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Parasitic dinoflagellates of the genus, *Hematodinium*, are thought to be significant pathogens of a wide range of crustaceans. Much is known of the ecology and effects of this disease on the sustainability of crustacean populations but significantly less is known about the mode of transmission and fate of infected animals. Attempts have been made to transmit the disease under aquarium conditions to several species of crabs resulting in a great deal of variation in mortality levels and the timescale of disease progression. To determine if *Hematodinium* infections are significant drivers of mortality in juvenile edible crabs (*Cancer pagurus*), crabs were injected with either 1 x 10^5 *Hematodinium* trophonts from an infected animal or sterile saline. Crabs were bled every four weeks to determine the progression of infection and its effects on the numbers of circulating haemocytes. Thirty three percent of the *Hematodinium*-injected crabs became infected and mortality occurred between 93 and 378 days post-challenge. Infected crabs appeared to moult less frequently than their uninfected counterparts but mortality did not appear to be directly caused by *Hematodinium,* as there was no significant difference in the mean time to death between infected and uninfected crabs. Both *Hematodiunium*-infected and uninfected crabs exhibited infections by a number of other disease causing agents including haplosporidium-like parasites, fungi and bacteria. These appeared to be key drivers of the mortality observed. These studies, albeit carried out on small cohorts of edible crabs, imply that *Hematodinium* is not a driver of host mortality at least under aquarium conditions.