Best Oral Presentation

139.4 Monday, Jan. 7 **Using RNA-Seq and gene-specific methods to examine salinity-induced gene expression changes in an anchialine shrimp** *HAVIRD, J. C.*; HENRY, R. P.; SANTOS, S. R.; Auburn University; Auburn University; Auburn University* jhavird@auburn.edu

Understanding how organisms respond to environmental variation is critical in order to comprehend how they function in their niches. Taxa from the coastal anchialine ecosystem represent good candidates for studying responses to environmental variation since their habitats undergo wide oscillations in physical and chemical properties, like temperature and salinity. Currently, little is known on how anchialine organisms cope with the environmental variation experienced in these habitats. To address this, we investigated how the Hawaiian anchialine shrimp *Halocaridina rubra* responds to changing salinity via analyses of gene expression. Illumina technology was first used to sequence transciptomes from two *H. rubra* genetic lineages (from East Hawaii and Windward Oahu) previously identified based on divergence in their mitochondrial COI. Six known crustacean osmoregulatory genes were identified from this transcriptomic data and targeted for expression analyses using qPCR. The expression levels of these genes remained relatively constant, or decreased, when shrimp were transferred from iso-osmotic conditions (32‰) to either hyper-regulatory (15‰ and 2‰) or hypo-regulatory (45‰) conditions. This is in contrast to previously studied crustaceans, which tend to upregulate these genes during salinity transfer. These and previous results suggest that alternative or novel osmoregulatory genes, pathways, or mechanisms may be utilized by *H. rubra* to cope with the rapidly changing salinities experienced in anchialine habitats. Ongoing experiments utilizing RNA-Seq will investigate salinity-induced gene expression changes across the entire *H. rubra* transcriptome and shed light on this possibility.

Best Poster Presentation

P2.55 Saturday, Jan. 5 **Looking at invisibility: anti-reflective structures and strategies in hyperiid amphipods** *BAGGE, L.E.*; JOHNSEN, S.; Duke University; Duke University* laura.bagge@duke.edu

Transparency is a common camouflage strategy for animals inhabiting marine pelagic environments. Transparent species are almost perfectly invisible when viewed under ambient light conditions in the mesopelagic zone; however, at shallower depths, and under the bioluminescent searchlights of potential predators, transparent species may become visible due to reflections from their body surface. No study has yet explored whether any pelagic, transparent animals have developed specific adaptations to minimize surface reflections, though anti-reflection cuticular nanoprotuberances, which optically function as a gradient refractive index material, have been found in the eyes of butterflies and moths, and in transparent wings of moths. Our study uses scanning electron (SEM) and transmission electron (TEM) microscopy to investigate the cuticle of several species of pelagic, transparent hyperiid amphipods, *Phronima* spp. and *Cystisoma* spp. Preliminary results show that the appendages of *Cystisoma* spp. (n=2) are covered with an ordered array of papillae, 200-300nm in height. Interestingly, the dorsal surfaces of *Phronima sedentaria* (n=4) and *Cystisoma* spp. (n=2) are covered with a biofilm of densely aggregated sphere-shaped bacteria. Preliminary analysis suggests that the biofilm could effectively function to reduce reflectance of 500nm blue-green bioluminescent light, though future work is needed to further characterize and determine the refractive index of the biofilm

Honorable Mention for Poster Presentation

P3.65 Sunday, Jan. 6 **Food choices and values for a benthic herbivore, *Idotea wosnesenskii*** *BURGESS, S.A.*; EISENLORD, M.E.; GALLOWAY, A.W.E.; DETHIER, M.N.; University of Michigan; University of Washington, Friday Harbor Laboratories; University of Washington, Friday Harbor Laboratories; University of Washington, Friday Harbor Laboratories*
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Spatial subsidies of aged detrital seaweed from habitats of high primary production may provide a significant source of energy to adjacent food webs. Previous studies indicate nearshore consumers use aged algal material as a food source. As aging occurs, algae are thought to increase in food value due to bacterial colonization. To test this, two experiments were conducted. The first examined preference of aged versus fresh thalli of two different kelp species, *Nereocystis luetkeana* and *Agarum fimbriatum*, in laboratory feeding experiments. Adults of *Idotea wosnesenskii*, an intertidal isopod common to the Pacific Northwest, were given four treatments of aged and fresh kelp of both species. Significantly more *N. luetkeana* was consumed than *A. fimbriatum*, but contrary to expectations, there were no significant differences in consumption of fresh versus aged tissue for either species. The second experiment was a 10 week long feeding trial with newly hatched *I. wosnesenskii* to determine growth rates on five different diets: aged *N. luetkeana*, fresh *N. luetkeana*, and fresh *Ulva* spp., *Fucus gardneri*, and *Mazzaella splendens*. Diets of algae with anti- herbivore defenses, one chemical (*F. gardneri*) and one mechanical (*M. splendens*), resulted in significantly lower growth rates than algae without these defenses. There was not a significant difference in growth rates between aged and fresh *N. luetkeana*. Our results suggest the species of algae may be more important in providing useful subsidies to benthic grazers than the degree of aging. The effects of aging on the nutritional value of algal blades needs further investigation..