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Biotic and Abiotic Factors Influence formation and ontogenic dynamics of the lake sturgeon and channel catfish larval gut microbiome

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Gastrointestinal (GI) or gut microbiota play essential roles in host development and physiology. These roles are influenced in part by microbial community composition. During early developmental stages, ecological processes underlying the microbial colonization in host GI tract are influenced by factors including dispersal from the surrounding environment, age-dependent changes in the gut environment, and changes in dietary regimes. Here, we characterized the gut microbiota of two important aquaculture fish species, lake sturgeon (*Acipenser fulvescens*) and channel catfish (*Ictalurus punctatus*) at larval stages in two separate, different experimental settings using 16S rRNA gene sequencing. Both fish share commonalities as they were raised in high density population and experienced diet transition throughout their ontogenetic stages. These fish however, differed in digestive anatomy although both have similar feeding ecology. Sturgeon larvae were raised in hatchery environments that differed in water source (stream vs filtered groundwater) and diet (supplemented vs non-supplemented Artemia). In contrast, catfish were maintained in pond-based aquaculture following standard practice as larvae were exposed to hatchery water and nursery pond water environments.We quantified gut microbial composition and taxonomic diversity at different life stages capturing the critical transition from endogenous to exogenous feeding to further investigate factors influencing their gut colonization. Gut communities for both fish appear to be under selective pressure showing strong influence of host growth shaping the communities composition. The roles of water, diet, and host physiological changes were discussed in influencing taxonomic compositional divergence between the gut and environmental microbiota among stages across water bodies and dietary treatment.

Biography

Shairah recently completed her PhD. from Michigan State University (MSU) receiving dual major in Fisheries & Wildlife and Ecology, Evolutionary Biology & Behavior (EEBB). She received prestigious award from Government of Malaysia and Dissertation Completion Fellowship from MSU for her studies as part of a training program for college-level teaching with the National University of Malaysia (UKM). She is currently affiliated with the UKM and just started collaboration with local experts on new projects pioneering gut microbiome studies involving fish species in Malaysia. She's also looking for any future collaborations with experts in microbiome studies, with a particular interest in fish aquaculture and human.

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