Development of a Parasitic Isopod Microbiome Culture Collection

Overview

- Novel natural products are required to address a growing number of health concerns from antimicrobial resistance to cancer.
- Microbially derived natural products are largely terrestrial in origin, however, there has been a plateau in new chemical structure discoveries from this source.
- Unique ecological niches, such as the insect-microbe relationship or the marine environment, might lead to new compound discovery.
- Very few bacteria can be cultured in the laboratory currently, however, alternate culture methods are needed.
- The marine ectoparasitic isopod, *Anilocra acuta*, whose host is the longnose gar (*Lepisosteus osseus*) common to coastal waters in Southeastern North Carolina, has potential for drug discovery efforts.

Terrestrial Examples of Bioactive Natural Products from Insect Microbiomes

- Denigerumycin6
- Coprisamides9
- Pericidin10

BLAST Database Search for Phylogenetic Identification

antiSMASH Search for Related Strain Biosynthetic Gene Cluster Identification

Culture Independent Assessment of Bacterial Community

DNA Extraction

- 16S rRNA Metabarcoding by Zymo Corporation

Cultural and Culture-independent 16S rRNA sequencing

Overview

- Many represented phyla are prolific producers of bioactive natural products.
- Most represented phyla are common to coastal waters in Southeastern North Carolina, including:
  - *k_Bacteria;p_Firmicutes*
  - *k_Bacteria;p_Bacteroidetes*
  - *k_Bacteria;p_Acidobacteria*
  - *k_Bacteria;p_Euryarchaeota*

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Acknowledgements

- NC Department of Marine Fisheries
- UNCW Center for Marine Science
- UNCW Office of Innovation and Commercialization
- UNCW Cullum Award
- Dr. Monique van Hoek
- Dr. Yue Xi
- Dr. Andrew Fribley
- Dr. Kevin Kaiser
- Dr. Blake Ushijima
- Dr. Remington Poulin
- Katie Clements (MS-MS 2020)

References