

Dissertation Defense Announcement

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“Assessment of the bacterial communities associated with invasive Indo-Pacific lionfish, a study of biogeography and host-microbe interactions”

**Friday, March 14, 2014
12:00 PM Shelby Hall RM 1093**

The inundation of lionfish into the Western Atlantic, Caribbean Sea, and Gulf of Mexico is considered one of the worst recorded marine invasions. Native to the Indo-Pacific, lionfish were introduced through the aquarium trade into the water of southern Florida sometime in the late 1980s to early 1990s. Invasive species are thought to share seven common attributes. Prior to the work reported in this dissertation, five of these had been recoded for lionfish. The final two attributes, pathogen release and symbiont retention, had yet to be investigated and served as the basis for these studies. The diversity of bacterial communities associated with the skin surfaces of lionfish throughout their native and invaded ranges was characterized. Lionfish were shown to support a significantly different bacterial community than three fish species native to the Caribbean Sea, and all fish hosted bacterial communities that were significantly different from the ambient bacterioplankton. Additionally, lionfish did not host any known opportunistic or pathogenic bacteria, yet the native fish species hosted multiple pathogens.

Core bacterial communities are common in host-microbe interactions, and when these communities display biogeographical patterns, they often reflect the patterns displayed by the host. Bacterial communities of lionfish in the native and invaded ranges were not significantly different, indicating that lionfish also retain a core bacterial community. However, local level effects did generate significant differences in bacterial communities based on collection location, but these differences did not reflect proposed lionfish population differences. Bacteria were cultured from lionfish collected throughout both ranges and their ability to aid in disease resistance was tested against six known fish pathogens. Compared to native Caribbean fish, lionfish hosted a greater percentage of bacteria capable of producing antibacterial and potentially protective metabolites.

The results of these studies indicate that lionfish retained a core beneficial bacterial community upon introduction to the invaded range and that this community appears capable of withstanding infection by known fish pathogens. Therefore, the bacterial communities associated with lionfish appear to have contributed to the invasive success of lionfish over the last three decades.