

# Habitat and ontogenetic-associated differences in the skin microbiome of two *Stegastes* damselfishes (Pomacentridae) from the eastern Caribbean Sea.

Raquel Xavier<sup>1\*</sup>, Ana Pereira<sup>1</sup>, J. Andres Pagan<sup>1</sup>, Gina C. Hendrick<sup>2</sup>, Matthew D. Nicholson<sup>2</sup>, Daniela Rosado<sup>1</sup>, Marta C. Soares<sup>1</sup>, Marcos Perez-Losada<sup>3</sup>, Paul C. Sikkel<sup>2</sup>

## Background:

### Skin microbiome (MB):

- Provides protection from pathogens
- May have pathogenic components
- Vary within individuals, between individuals, populations, etc.

### MB influenced by:

- Species
- Ontogeny
- Diet
- Environment

### *Stegastes*:

- Territorial
- Species occupy different habitats
- Ontogenetic habitat shifts

### Objective:

- **Characterize difference in skin microbiome of *Stegastes***
- **Identify factors influence microbiome.**

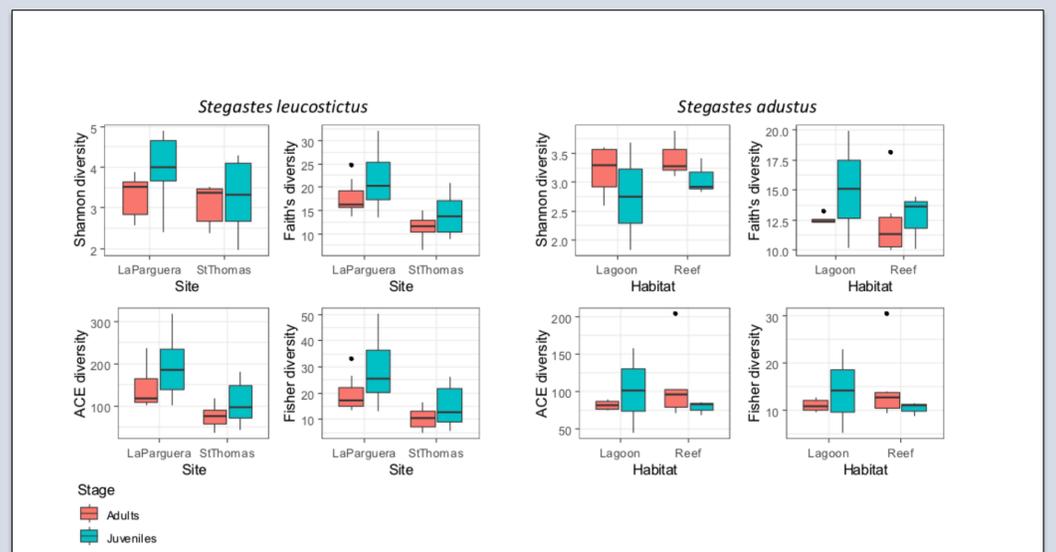
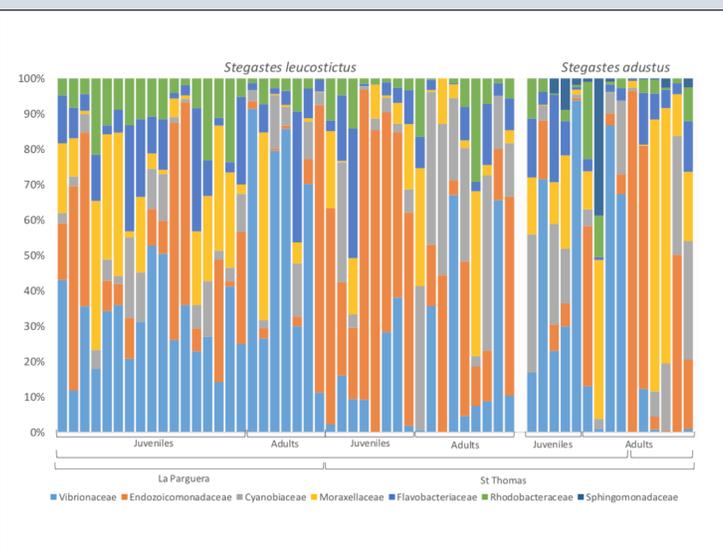
1 Cibio – InBio, University of Porto

2 Department of Biology, Arkansas State University

3 Computational Biology Institute, The George Washington University



<i>Stegastes leucostictus</i>				<i>Stegastes adustus</i>			
La Parguera		St Thomas		Lagoon		Reef	
Adults	Juveniles	Adults	Juveniles	Adults	Juveniles	Adults	Juveniles
n = 7	n = 17	n = 9	n = 8	n = 4	n = 2	n = 6	n = 3



## Results:

### Overall:

- 3000+ ASVs: *S. Leucostictus* 3000v. ~900 in *S. Adustus*
- 950 total genera, 855 in *S. leucostictus* v. 401 in *S. adustus*
- Alpha diversity not different, Beta diversity sig. different

### *S. Leucostictus*

- Diversity between sites significantly different and higher in Parguera
- Life stage not significant
- Pathogenic Vibrionaceae bacteria 2x more abundant in Parguera
- Diet primarily polychaets in Parguera for all life stages, St Thomas adults consumed algae, juveniles consumed copepods

### *S. adustus*:

- Habitat influenced beta diversity
- Life stage x habitat also significant
- *Psychrobacter* 3x more abundant in lagoon, other *Vibrionaceae* more prevalent in Reef

## Conclusions:

- High intraspecific variability
- Environmental differences both (locality and habitat) influence skin MB
- Interaction between factors (species, age, habitat) may be important.
- Several pathogenic taxa are abundant in skin microbiome
- Abundance and impact of pathogenic bacteria predicted to increase with changing climate
- Continued monitoring and further research on pathogenic bacteria crucial

## Methods:

- Total of 64 juvenile and adult *Stegastes leucostictus* and *S. adustus*
- Sampled La Parguera, Puerto Rico and Brewers Bay St Thomas USVI
- Within Brewers Bay, fish were caught from Reef and Lagoon habitats.
- Skins were swabbed with cotton swabs
- V4 hypervariable region of 16s rRNA gene (~250bp) amplified