

# Why Are You So Slimy?

## Characterizing Mucous Production Glands in Two Stingray Populations.

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### INTRODUCTION

- The epithelium of vertebrates is a vastly complex structure with a wide range of functions, one of the most important being protection.
- Epithelial mucous cells or goblet cells accomplish this function.
- Among vertebrates, fish are well known to produce copious amounts mucous for protection, particularly in stingrays
- The Atlantic Stingray (*Dasyatis sabina*) is one of the few species that inhabits both freshwater (i.e., St John River) and saltwater habitats (Atlantic ocean)
- It was observed that St. Johns river population was producing noticeably larger amounts of mucous compared to the Atlantic population (Gelsleichter pers. comm).

### GOALS

- The goal of this project is to investigate the reasons behind this event by characterizing the epithelium in both stingray's populations to understand any underlying anatomical or physiological changes that may explain these observations .
- If differences were detected a thorough characterization of the goblet cells will aim to identify if this event is due to a larger number of cells or larger mucous producing cells.

### METHODS

- Stingrays will be obtained from museum collections and FWC's fisheries monitoring program
- A preliminary protocol was performed maximizing samples effort in order to locate anatomically relevant areas for our study
- Histology will be then performed with all samples to identify location/ concentration of goblet cells
- Once the most relevant areas are identified, further samples will be obtained from stingrays' specimens from different populations
- Samples will be stained with Alcian blue targeting Goblet Cells.
- Histological section will be analyzed under a microscope (Zeiss Axiolab). Goblet cells density and size will be determined for each sample along their body .
- Paired T-test will be performed among the same body regions from the two different stingray populations to evaluate any significant difference in number or size of goblet cells.



Figure 1. Stingray epithelium showing copious amounts of mucous.

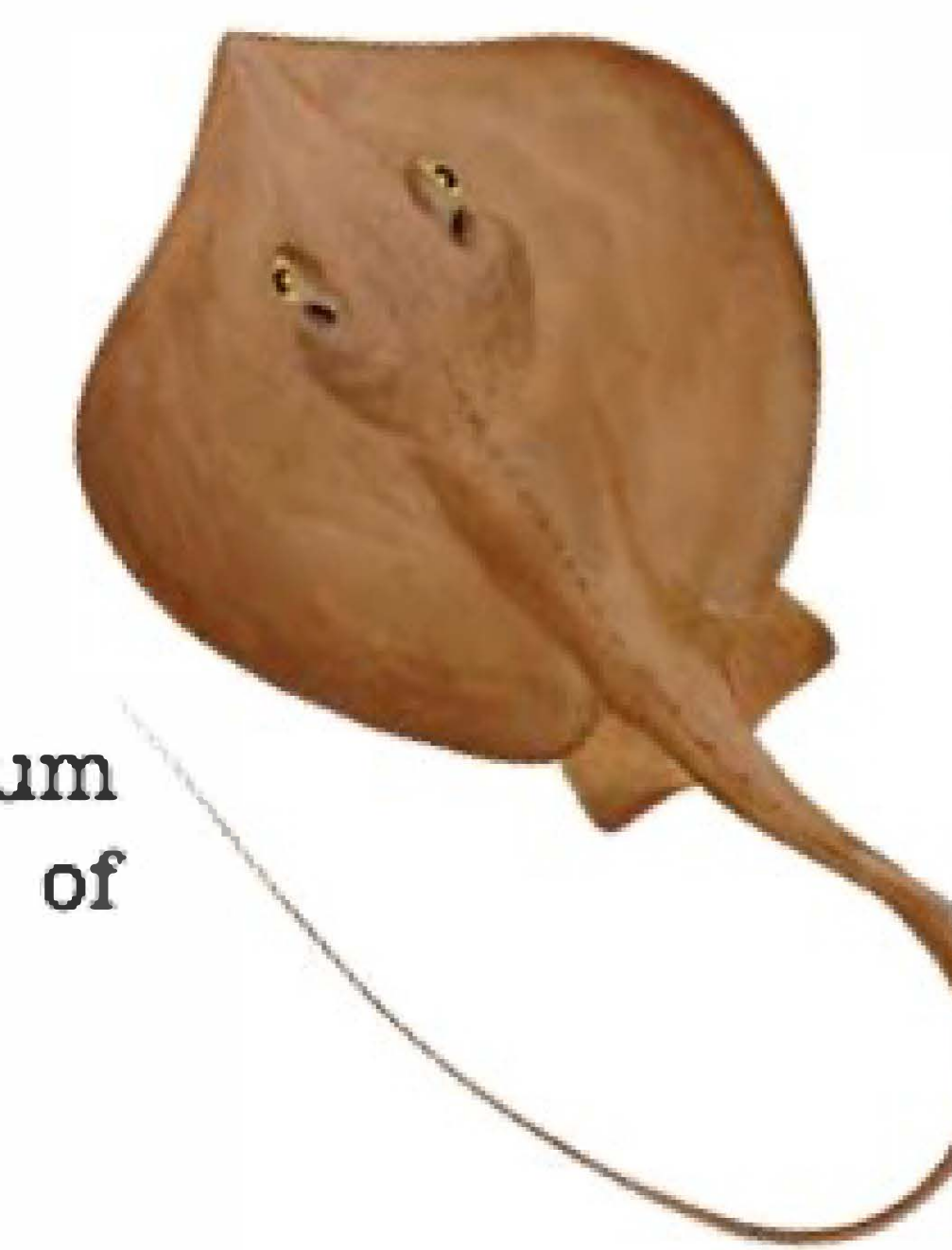
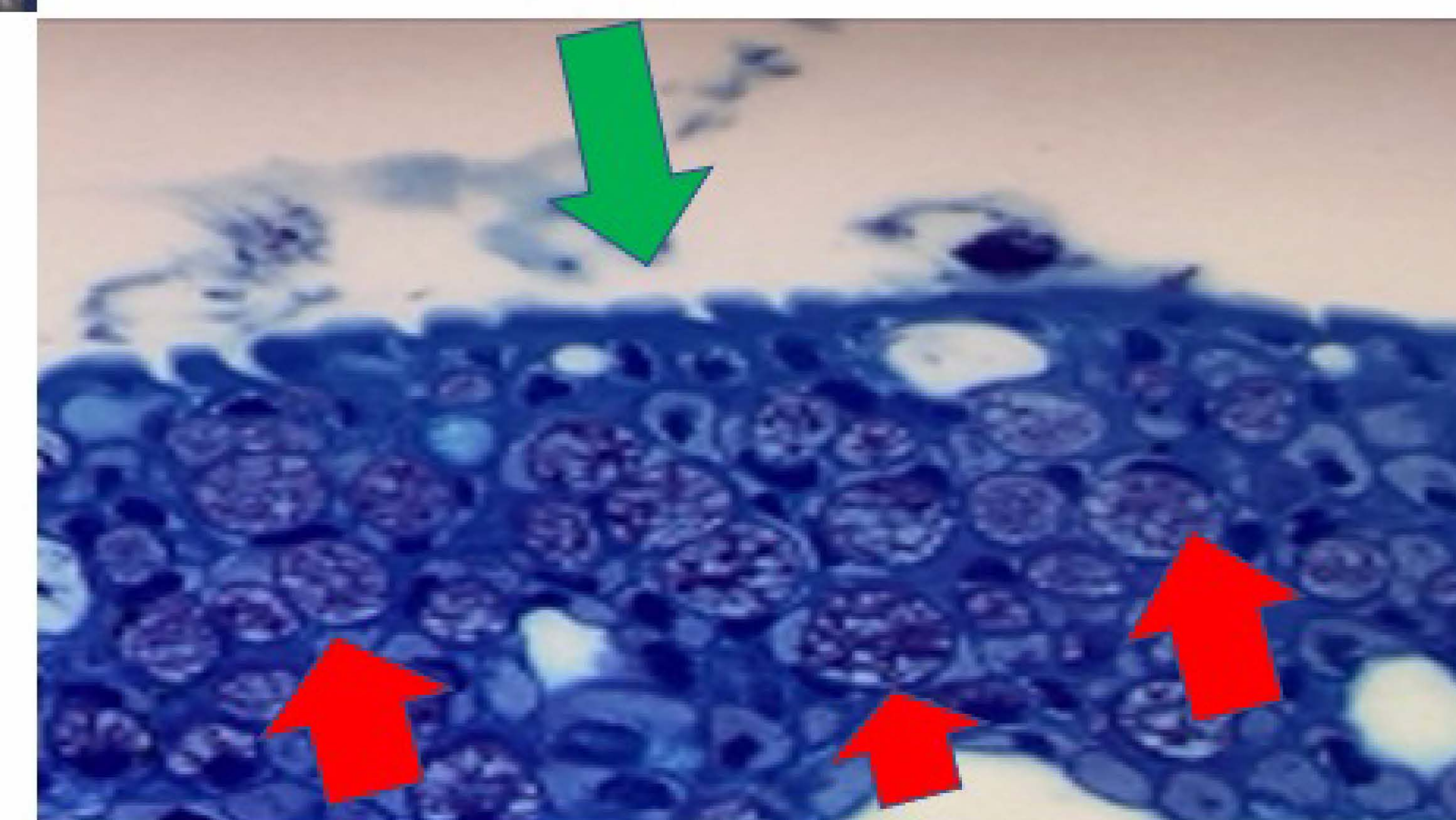


Figure 3. *D.sabina* specimen showing Preliminary mapping locations along its body (dorsal view)

Figure 2. Histological section of stingray epithelium stained with Alcian blue showing an abundant number of goblet cells (Red arrows). The green arrow shows the outer portion of the epithelium. The Goblet cells are lining the epithelium in an astounding rate.



### ANTICIPATED RESULTS

- We expect the St. Johns River population will have a higher number of Goblet Cells than their saltwater counterparts.
- Based on these results we would like to include water quality parameters associated to each location to correlated possible poor water quality and mucous production

### IMPLICATIONS OF STUDY

- Regardless of the importance of the integument, anatomical characterizations in vertebrates are lacking, specially in fishes.
- This study will widen our limited knowledge on this subject but also will shed light into anatomical variations that may be induce by changes in the environment

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