

Microbiota in the Intestinal tract of marine fish *Fundulus heteroclitus*

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July 27, 1995

Microbial Diversity Course, 1995, MBL, Woods Hole, MA.

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Fundulus heteroclitus is a stout-bodied little fish (Fig 1), they inhabit along sheltered shores where the tide flow over beds of eelgrass or salt hay. They can fairly be characterized as "universal" in suitable location around the entire coastline of the Gulf of Maine and are favorite for biological experiment. (1)

Gut microbiota has been an intriguing topic in environmental microbiology, but most of the studies were focus on mammalian intestinal tract and aquatic invertebrates. (2) Nearly none of the report has been described for marine fish gut microbiota. In this project, I tried to examine the gut microbiota of *Fundulus heteroclitus*.

Using phase contrast microscope and DIC microscope, I examined the gut content as well as gut wall itself to see if any significant bacterial population colonized inside the gut. Suprisingly I could not find any significant microbial population from the gut samples. (Fig 2) I also did 16S rRNA-directed, fluorescently tagged oligonucleotide probes hybridization (3), but no positive reaction was observed including universal probes. In some attempt by enrichment technique to isolate bacteria using different media (e.g. Sulfate reducing bacteria medium, yeast extract-glucose medium, TYG [a medium for Bacteroid]), I got different results from every different time and it seemed those were come from contamination. The initial conclusion for this project now is that there is no heavily colonization of bacteria in *Fundulus heteroclitus'* gut. It is not unusual since some marine isopod species have also been reported that absence of microorganisms in their digestive tracts. (4)

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Since the absence of microbiota in the gut, I tested if the gut content had inhibition effect to bacterial growth. I spread a mix bacteria (isolated from sea water where the fishes lived) on the SWC (sea water complete) agar plates as the lawn and lay a cut open gut on the plate. There was no inhibition zone after incubation. No further experiments has done after this. A suggestion for the experiment in the future will be using different concentration of bacterial lawn and using pour agar plate method instead of spread agar method.

References

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Figure 1: *Fundulus heteroclitus*

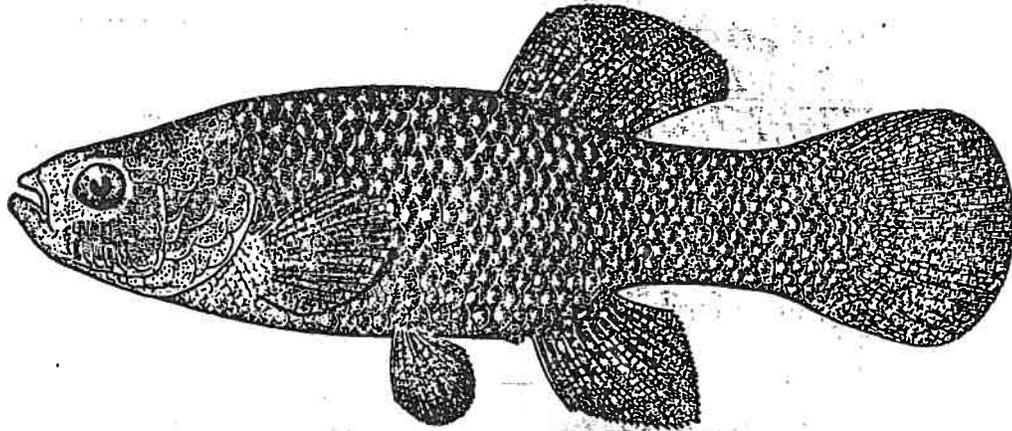


Figure 2: Examination of gut content under phase contrast microscope (A&D) and by 16S rRN directed probes. Both shown no major bacterial population present.

