

## Microfloral Diversity in Fish: An Editorial

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### Abstract

It is well-known that the digestive tract structure in different fish species is distinct. The differences are highly prominent in the various stages of fish development. Hence the digestive tract structure is the first factor that affects and influences the formation of gastrointestinal bacteria communities. The formation of the regular microflora is indeed a complex process that takes place in the digestive tract of fish larvae and fry and it depends on fish spawn (lay and deposit large quantities of eggs in water) food and the microflora of the surrounding water. Lot of investigation has been carried on in order to study the formation of the microflora in the digestive tract of carp from the larval stage to adult fish and it has been ascertained that the formation of bacterioflora in the digestive tract of fish is a gradual process. The most dominant genera residing in the digestive tract of fish are *Aeromonas*, *Pseudomonas*, *Clostridium* and *Bacteroides*.

**Keywords:** Fish; Microflora; Digestive tract

### Introduction

*Aeromonas hydrophila*, *Pseudomonas* and *Vibrio* are the bacteria present on the skin of fishes. This bacterial population is generally influenced by the marine ecosystem. The bacterial population along with the slimy coating on the scales of the fish body provides an efficient barrier against the entry of virulent microorganisms through skin of fishes. Bacteria associated with the fish skin can be enumerated by acridine orange epifluorescence microscopy and by plate counts on several media.

### Microflora present in fish respiratory system

The breathing process in fishes takes place through their gills. One of the most intriguing thing in fish is having a long bony cover for the gill which is used for pushing water. Some of the fishes make use of operculum for pumping water. Water flows into the mouth and across the gills while the fishes swim. Countercurrent flow is used by most of the freshwater fishes to increase the uptake of oxygen. Countercurrent flow takes place when deoxygenated blood moves through the gill in one direction whereas oxygenated water moves through the gill in the other direction. The concentration gradient is well maintained by this process which in turn increases the efficiency of the respiration process. So, the only types of microflora evidenced in fish respiratory system are symbionts which generally occur in their surrounding aquatic environment. Till date, no pathogenic microflora or microflora of aquatic interest regarding fish respiratory system have been reported.

Microflora residing on skin has no role to play in nutrient digestion and metabolism in fish [1].

### Microflora present in fish digestive tract

In the digestive tract of fish, bacteria belonging to the genus *Bacteroides* appear as late as on the 44<sup>th</sup> day after hatching. Subsequently they become prevalent in the intestine of adult fish. Some findings imply that bacteria of the genera *Aeromonas*, *Pseudomonas* and *Flavobacterium-Cytophaga* dominate in the bacteriocenoses of the digestive tract of the freshwater fish. Many scientists investigated the effect of feeding intensity and food on the qualitative and quantitative composition of intestinal bacteriocenoses of fish. The distribution of intestinal bacteriocenoses of fish is affected by farming conditions of fish, too. *Aeromonas* and *Lactobacillus* bacteria predominate in the intestinal bacteriocenoses of fish inhabiting natural water bodies, whereas *Enterobacteriaceae* that make up to 50% of all bacteria, are prevalent in the bacteriocenosis of fish which are raised in farms and are fed on artificial food. In-depth study has been done on the various aspects of the microflora of the digestive tract of fish but data about the impact of xenobiotics on the intestinal microflora of hydrobiont is limited. If bacteria non-typical of the living environment of hydrobionts are abundant in the water surrounding the latter, they make a negative influence on the immune system of fish by restraining it, thus impacting the animal's general physiological state [1].

### References

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Received September 19, 2013; Accepted September 30, 2013; Published October 07, 2013

Citation: Ganguly S (2013) Microfloral Diversity in Fish: An Editorial. Fish Aquac J 4: e101. doi: 10.4172/2150-3508.1000e101

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