

## ORAL CAVITY ARCHITECTURE IN OREOCHROMIS MOSSAMBICUS.

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### ABSTRACT

The study showed that the structures with feeding in *Oreochromis mossambicus* from Kaigaon Toka, Aurangabad has several modifications which reflects the feeding habit with specialized morphological characters like having two types of teeth, one present on jaws and other on pharynx. Mouth surrounded by upper and lower lip and jaws. Buccal cavity not very large. Pharynx dorso-ventrally compressed having fine, thin, unicuspid, hooked up pharyngeal teeth and gill rakers which are short, thicker, numerous, widely spaced arranged on brachial arches.

**KEY WORDS:** Buccal cavity, feeding, gill rakers, mouth, *Oreochromis mossambicus*. pharynx, teeth.

### INTRODUCTION

The mouth cavity is an important component of the alimentary canal. It may be involved in the seizure, selection of food, rejection of undesirable items ingested by fish and pre-digestion preparation of food. Among species, the mouth cavity shows great plasticity and structural adaptability for the exploitation of different food items (Kapoor, and *et al.* 1975), (Kapoor and Khanna, 1994) and (Horn, 1998). The buccal cavity of fish play a major role in suction ram (forward swimming) and manipulation of prey capture in fishes,(Neveen El Said Reda El Bakary, 2012) Among fishes, diversity of the food resources lead to evolution of various adaptive characters in the pharynx, which play an indispensable role in the retention, manoeuvring and transport of food for swallowing (Kumari, Yashpal *et al.*, 2009) A few studies are done on the buccal cavity of fish; the adult Zebra fish (*Danio rerio*) (F. Abbot, G.P. German; *et al.*, 2006) and on small herbivorous Cichlid fish *Telmatochromis temporalis* (Sima Keita Mboko, *et al.*, 1998), carnivorous fish *Rita rita* (Ham.) (Madhu Yashpal, Usha Kumari; *et al.*, 2006). The effectiveness of these structures is dependent on modifications in relation to food and feeding habits of the fishes and environmental niches inhabited by them. Morphological data are also key to understanding fish nutrition in ecology and aquaculture, and during development as well as mechanisms for physiological adaptations to a changing environment. The aim of the present study is to provide better knowledge of the surface architecture of the mouth cavity of *Oreochromis mossambicus*.

### MATERIALS AND METHODS

For the study of jaws and teeth of *Oreochromis mossambicus*. The fishes were collected randomly from Kaigaon Toka, Aurangabad District (M.S) India. They were washed and preserved in 10% formaline solution. The preserved fishes were cut and opened at each angles of the mouth. The roof and floor of the buccopharynx were properly washed and preserved in 70% alcohol and glycerine for stretching. The jaws, teeth, gills and gill rakers were examined properly for detailed studies.

### RESULTS AND DISCUSSIONS

#### **Buccal cavity:**

The buccal cavity of *Oreochromis mossambicus* is not very large. It possesses teeth on upper and lower jaws. The roof of buccal cavity is formed by the base of the cranium. The side walls and the floor of the buccal cavity are formed by the branchial arches (Figure 1b).

Similar observations were reported by (Khanna, 1970) in some Teleosts. (Gautam R, and *et al.*, 2008) reported similar results while studying the buccopharynx in *Cirrhina mrigala*, *Schizothorax plagiostomus* and *Mystus seenghala*.

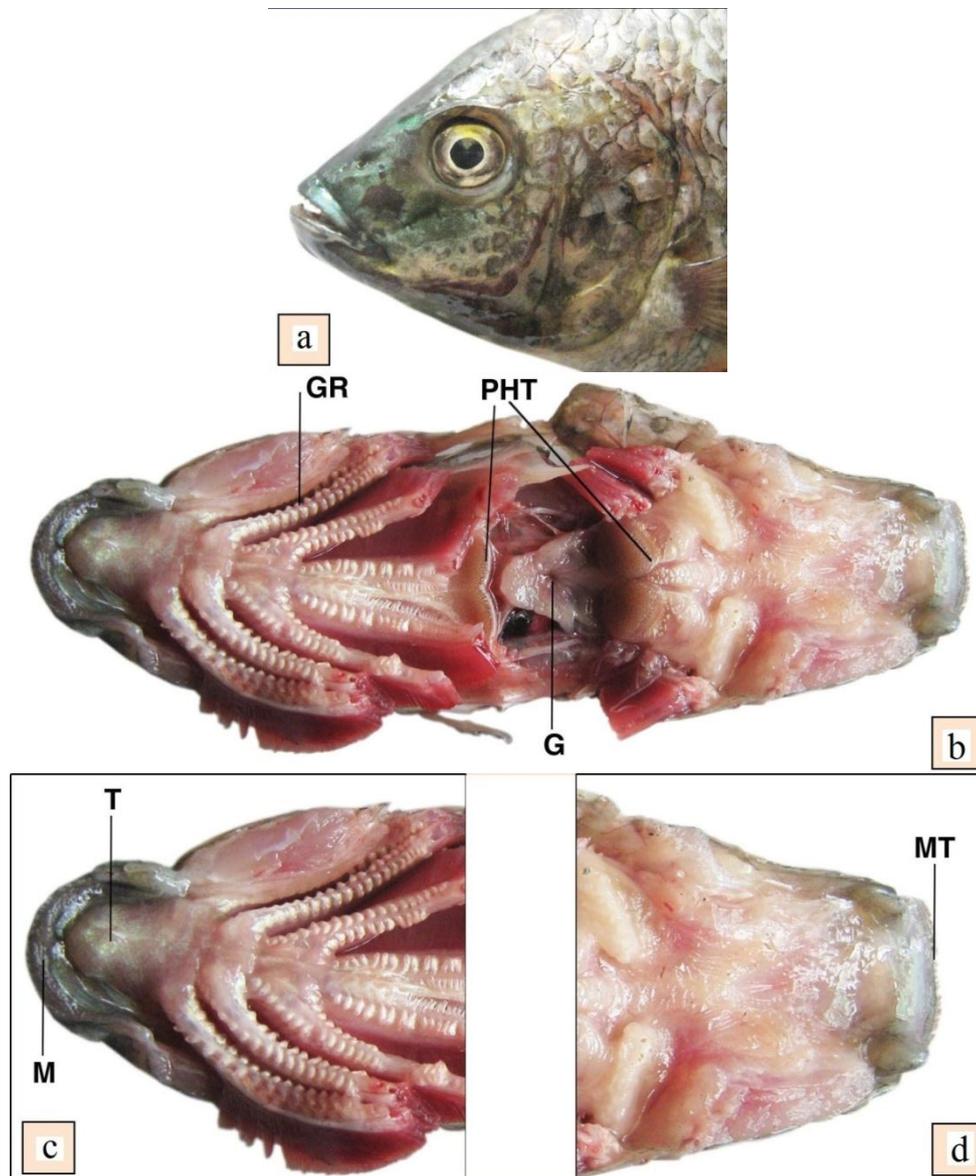
#### **Mouth:**

The mouth of *Oreochromis mossambicus* is large, surrounded by upper and lower lips which are thick. The lower jaw extends the upper jaw (Fig. 1a).

#### **Pharynx:**

The pharynx was observed to be dorso-ventrally compressed. It was observed that the pharyngeal teeth are fine, thin, unicuspid and hooked on the pharyngeal bones (Fig. 1b, 3i, 3j and 3k).

Similar observations were reported by (Sasagawa, I., 1997) in *Tilapia* species and (Gautam R, Rakesh M. and Singh N.P., 2008) in *Cirrhina mrigala*, *Schizothorax plagiostomus* and *Mystus seenghala*.



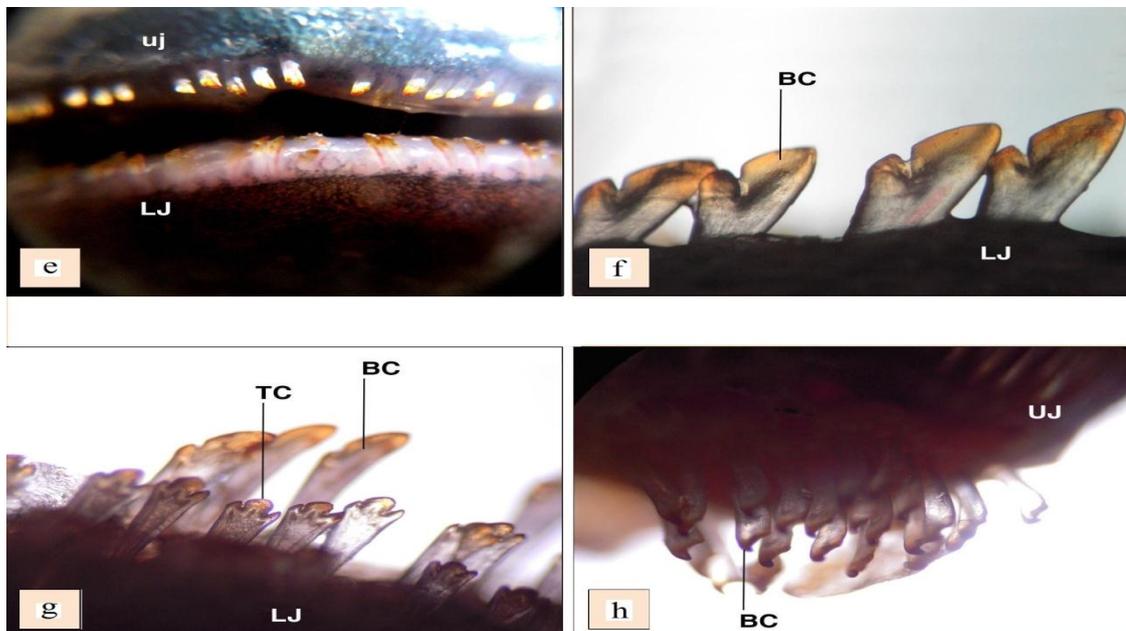
**Fig 1.** a. Lateral view of mouth of *Oreochromis mossambicus* b. Buccal cavity of *Oreochromis mossambicus* showing (GR) gill rakers (PHT) pharyngeal teeth (G) gullet  
c. Lower jaw or floor of the mouth of *Oreochromis mossambicus* showing, (MT) mandibular teeth, (T) tongue  
d. Upper jaw or roof of the mouth of *Oreochromis mossambicus* showing, (M) maxillary.

### Teeth:

It was observed that there are several rows of teeth on the upper and lower jaw the teeth are uniformly small, distally flattened, unicuspid, bicuspid and tricuspid enameloid structures. The outer rows of teeth are observed to be capped with a brown material.

Teeth on the pharyngeal bones of the *Oreochromis mossambicus* were observed to be fine, thin and lodged on the pharyngeal bones. (Figure 1c, 1d, 2e, 2f, 2g and 2h).

(Sasagawa, I., 1997) reported that Tilapias possess jaw teeth between one and five rows. The structure of the teeth is typical of generalist feeders, being uniformly small, distally flattened, unicuspid, bicuspid or tricuspid enameloid structures. (Fryer, and Iles, 1972) reported that the jaw teeth of Tilapia are small, tricuspid, bicuspid or tricuspid structures, arranged in one to five rows and flattened distally to form blades that can be used as scrapers. (Northcott, M.E. and Beveridge, 1988) reported that the outer row of teeth in *Oreochromis niloticus* is capped with a brown material that may be iron oxide and may afford some protection during grazing or browsing. (Fryer, and Iles, 1972); (Caulton, 1976); (Bowen, 1982) reported that the jaw teeth are employed by Tilapia species to bite and tear plant material. (Caulton, 1976) reported that the pharyngeal teeth of the phytoplanktivorous tilapia, such as *Sarotherodon*, are fine, thin and hooked on the pharyngeal bones, whereas those of macrophyte feeders, such as *rendalli*, are coarse and robust. (Fryer, G. and Iles, T. D., 1972) reported that Tilapia have pharyngeal teeth which are varied in configuration from one tilapia species to another, to suit the different diet preferences. Periods of periphyton grazing are interspersed with periods of buccopharyngeal processing, swallowing and foraging.



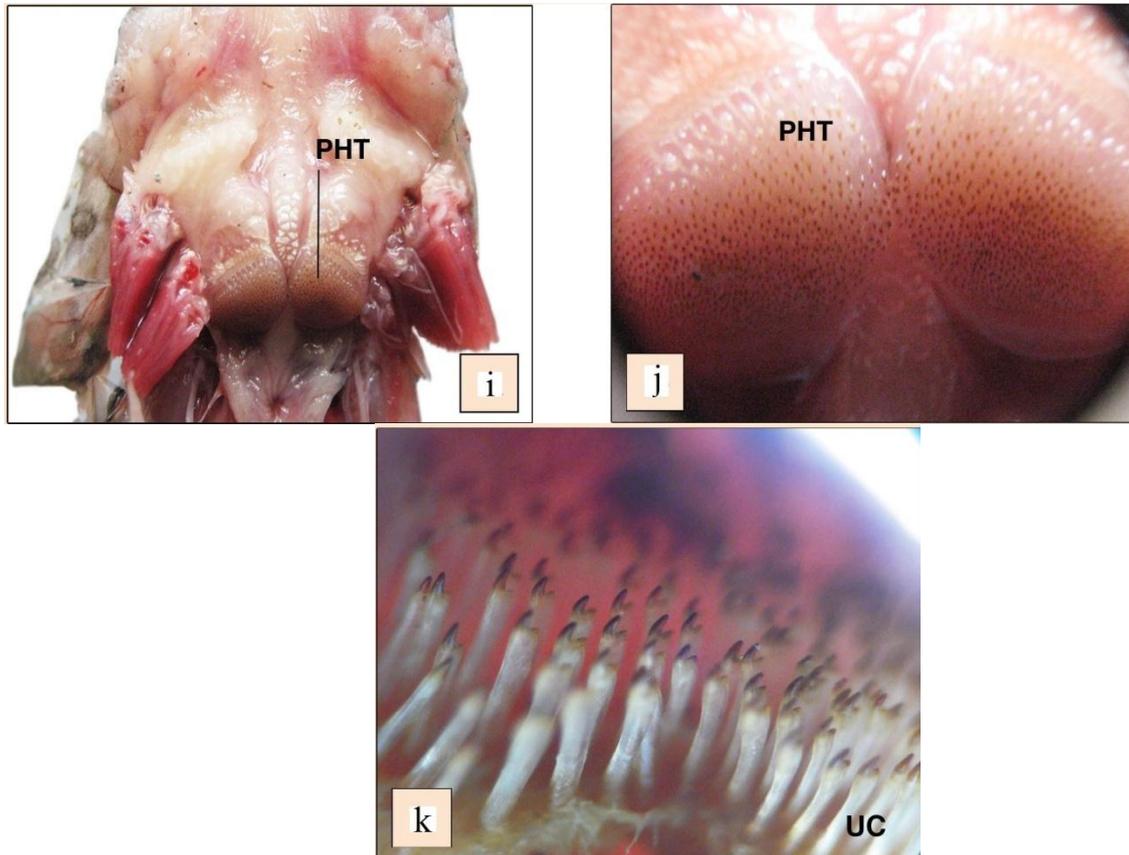
**Fig. 2 e.** Front magnified view of mouth of *Oreochromis mossambicus* showing, teeth on (UJ) upper jaw and (LJ) lower jaw **f.** Magnified view of lower jaw (LJ) of *Oreochromis mossambicus* showing (BC) bicuspid teeth capped with a brown material **g.** Magnified view of lower jaw (LJ) of *Oreochromis mossambicus* showing the outer row of teeth capped with a brown material and is (BC) bicuspid whereas the inner line of teeth is (TC) tricuspid **h.** Magnified view of upper jaw (UJ) of *Oreochromis mossambicus* showing (BC) bicuspid teeth.

### Tongue:

The tongue is small and not fleshy, which is affixed along the mid dorsal line of the floor of the buccal cavity (Fig. 1c).

### Gill rakers:

The gill-rakers in *Oreochromis mossambicus* are observed to be short, thicker, numerous and more widely spaced, arranged in two rows on the branchial arches on each side (Fig. 1b). Gautam R, Rakesh M. and Singh N.P., 2008 reported that when gill arches are closer to each other the gill rakers help in forming sieve to retain the food in buccopharynx.



**Figure 3 i.** Photo plate showing (PHT) pharyngeal teeth of *Oreochromis mossambicus*  
**j.** Magnified view of pharyngeal bone of *Oreochromis mossambicus* showing (PHT) pharyngeal teeth  
**k.** Magnified view of pharyngeal bone of *Oreochromis mossambicus* showing (UC) unicuspid teeth hooked on the pharyngeal bone.

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