World Applied Sciences Journal 4 (1): 100-103, 2008
ISSN 1818-4952

Structure of Barbel in Cyprinidae (*Cyprinus carpio*)

[1]Z. Saadatfar, [2]M. Asadian and [2]E. Alishahi

[1]Department of Anatomical Science, [2]Department of Veterinary Medicine,
School of Veterinary Medicine, Ferdowsi University of Mashhad, Iran

Abstract: *Cyprinus carpio* had two barbels on each side of mouth and the front pair of barbels were longer than the pair behind. The short pair was about 0.8 cm that is almost 2.2% of its body length and the longer pair was about 1.8cm that is about 5.1% of its body length. Its thickness in the mid part of barbel was about 1260 µ. It had stratified epithelium with different cell types. There were taste buds in epithelium of barbel. Its dermis had collagenous fibers. Myelinated fibers and a lot of blood vessels were in the central region of barbel. This fish had barbels with taste buds, smooth muscle, blood vessels, nerves and the center was without skeletal support.

Key words: Barbel . *Cyprinus carpio*

INTRODUCTION

In fishes, there are barbels that have awidespread distribution among the teleosts such as cyprinus carpio, misgurus anguillicaudatus, parasilurus asotus [1]. Among the cyprini formes, all members of the cyprinidae, have 2 barbels on each side of the mouth (FOX.H.1999). *Cyprinus carpio* has the front pair of barbels longer than the pair behind. Barbel variability in number and/or size has been described [2]. The barbel may be located on nasal(Catfish) [3], mental(Artedidraco mirus) [4], chin(Goat fish) [5] and etc. Also, barbels can be classified as: Tender barbels, rigid barbel, barbels without taste buds, with taste buds and without cartilage (Cyprinidae, carps), barbels with taste buds and cartilage (Cat fish, Goat fish) and also with an axial rod of striated muscle (Polymixia type) [2]. In this manuscript we have studied barbel of cyprinidae (*Cyprinus carpio*).

MATERIALS AND METHODS

Samples from fishes(about 35 cm body length) were placed in buffered neutral formalin 10%. After dehydrated, cleared and embedded in paraffin wax. Thin section (6microns) were cut using microtome and mounted on to glass microscope slide. After staining the slides with H&E, VanGisson and MassonTrichorome, they were studied by light microscope and micrometry lens.

RESULTS AND DISCUSSION

Cyprinus carpio, like other members of cyprinidae had two barbels on each side of the mouth and it had the front pair of barbels longer than the pair behind. Relative size of short pair was about 2.2% of body length and relative size of longer pair was about 5.1% of body length. There were stratified epithelium with different cell types in barbel. Also, barbel had taste buds in epithelial layer. The size of taste buds were about 30 µ in height and about 20µ in width. To some extent the barbel thickness correlated with epidermal thickness. In *Cyprinus carpio*, epidermis was about 130 µ thick but barbel in the midpart was about 1260µ thick. So, the epidermal thickness was 10% of barbel thickness. The dermis had collagenous connective tissue. In the more central regions it contained numerous blood vessels and myelinated nerve. The skeleton rod of barbel in *Cyprinus carpio* was without cartilage but among teleosts barbels of gaidrop Sarus and lata have cartilage. Also, members of silluridae, cobitidae, sturgeon(Acipenser percius)and channel cat fish (Ictalurus punctatus) have barbels with cartilage. Also, the barbel of *Cyprinus carpio* had smooth muscle with morphology of longitudinal and circular, but Sturgeon (Acipencer percius), channel catfish, ictularus punctatus and goat fish have barbels without muscle. Channel catfish (Ictalurus punctatus) has barbel with skeletal muscle [6]. In artedidraconidae they have a core of pseudocartilage was surrounded by connective tissue [4]. As a result, the barbel.

Corresponding Author: Dr. Z. Saadatfar, Department of Anatomical Science, School of Veterinary Medicine, Ferdowsi University of Mashhad, Iran

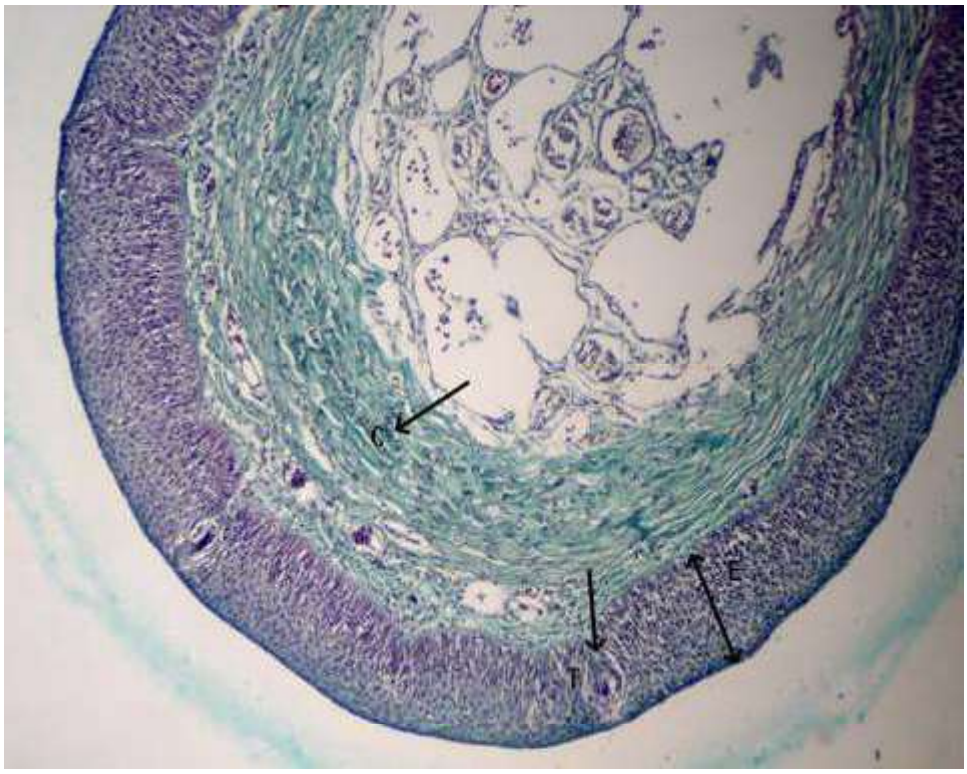

Fig. 1: *E. stratified* epithelium T.taste buds in the the stratified epithelium *C. collagen* fiber *Trichrome* Masson staining (×64)

Fig. 2: M.smooth muscle C.collagen fiber Van gisson staining (×160)

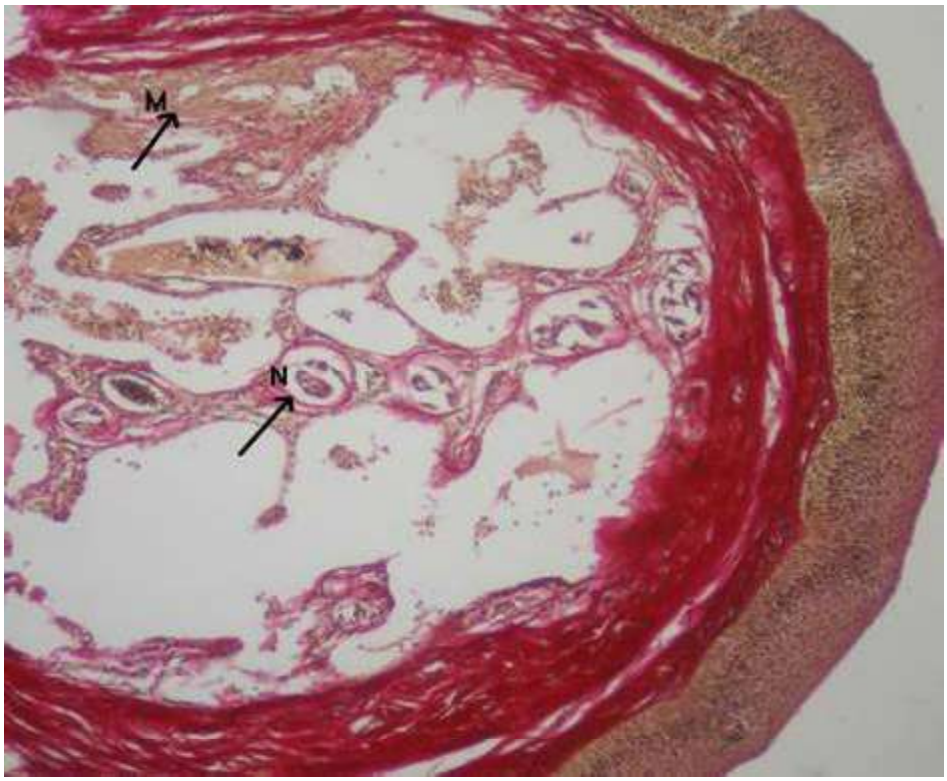

Fig. 3: N.Myelinated fiber in central region of barbel M.smooth muscle Van gisson staining (×64)

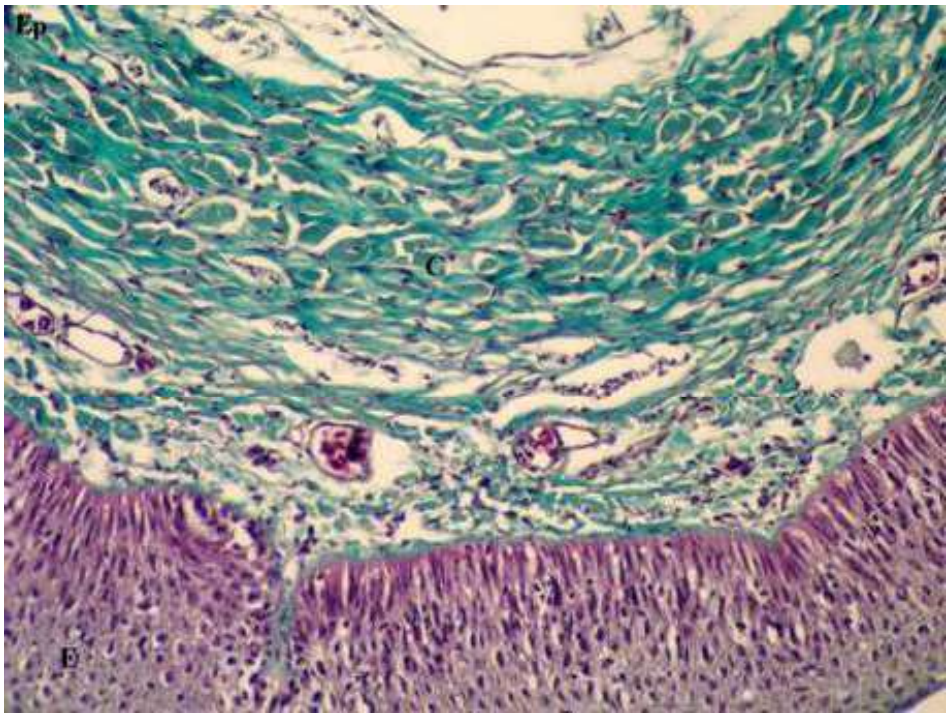

Fig. 4: *E: epithelium C: collagen*.fiber Trichrome Masson staining (×160)

Of *Cyprinus carpio* can be classified as barbel with taste buds, smooth muscle and without cartilage.

REFERENCES

1. Meng, F., 1923. Beitrage Zur kenntnis der Morphologie der Barteln einiger fische. Zool. Jb. Anat. Ontog. Tiere., 45: 141-161.
2. Fox, H., 1999. Barbels and barbel-like tentacular structures in sub-mamalian vertebrates: A Review. J. Hydrobiol., 403: 153-193.
3. Elaine, C. Joyce and George B. Chapman, 2005. Fine structure of the nasal barbel of the Channel catfish. Ictalurus Punctatu.
4. Richard, R. Eakin, Joseph T. Eastman and Christopher D. Jones, 2001. Mental barbel variation in pogonophryne scotti Regan. Pisces: Perciformes: Artedidra conidae. Antarctic Science, 13: 363-370.
5. Kiyohara, S., Y. Sakata, T. Yoshitomi and J. Tsukahara, 2002. The goatee of goat fish: Innervation of taste buds in the barbels and their representation in the brain. Proc. Biol. Sci., pp: 1773-1780.
6. Stephanie Blackstone, 2006. Comparison of the barbel structures of the channel catfish, Ictalurus punctatus, to previously observed specimens of varying species.