

## **SOME HISTOLOGICAL OBSERVATION OF THE EYE IN THE FISH (*Mystus pelusius*)**

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### **SUMMARY**

The eyes of 50 fishes (*Mystus pelusius*) were located in protective myodome of the skull and were basically made up of an elongated globe. The corneal epithelium was composed of stratified squamous non-keratinized. The iris bends sharply inward over the lens and consisted of richly vasculared connective tissue stroma and a pigmented epithelium. The sclera was cartilaginous. The choroid was made of connective tissue and containing choriocapillaris. Longe single, short single and double cones and rods was the characteristic feature of the retina.

### **INTRODUCTION**

The eye is a complex and highly developed photosensitive organ whose function is to collect and transmit visual information to the central nervous system. Gross, light as well as electron microscopic studies have been conducted on the eye structure of vertebrates such as frog and tadpole (1), pigeon (2), rat (3), rhesus monkey (4), camel (5), human (6). Little information is known about the eye of the fishes in the available literatures (7,8). Therefore, this work has been suggested to describe some histological structures of the eye of the fish (*Mystus pelusius*).



## MATERIAL AND METHODS

Fifty adult fishes (*Mystus pelusius*) were obtained from Euphraty river in Nassria city. All fishes were anesthetized with 0.002 % solutions of Quinaldine. The head of each fish was cut and fixed immediately in Bouin's fluid for 24 hours, and the eyes were extirpated and post fixed in the same fixative (9). Specimens of different parts of the eye were taken, dehydrated by graded in alcohol, cleared in xylol and embedded in paraffin wax. Cross and tangential sections were made at five micrometer thickness. The sections were stained with Harris hematoxylin and eosin, masson trichrome (10), Periodic acid shiff (11), and mounted in Depex mounting media. Light photomicroscopy was done with Olympic equipment. Kodak Panatomic-X film was used.

## RESULTS AND DISCUSSION

The fish (*Mystus pelusius*) exhibits bilaterally elongated eye which is located in myodome of the skull and attached to it by six striated oculomotor muscles. Each eye is integrated with the optic lobe of the brain via an optic nerve. The major structure of refraction in the eye of fish is the cornea (12). The cornea of eye of this fish (*Mystus pelusius*) was seemed as flattened structure as compared with the elongated shape of its eyeball. It was covered by stratified squamous and non-keratinized epithelium. The basal cells were typical simple squamous epithelium that followed by a thin homogeneous layer of collageneous fibers. The cartilaginous sclera was looked as incomplete cup surrounded the cornea. The sclera was transferred into fibrous texture in the posterior region. The iris was partially covered the lens. The stroma of the iris was found to be loose, poorly vascularized connective tissue with few fibers, with many fibroblasts and pigmented cells. The



anterior surface of the iris was covered by simple squamous epithelium while the posterior surface was heavily pigmented.

The suprachoroidal lamina lies beneath the sclera which is a thin layer of loose connective tissue rich in melanocytes, fibroblasts, and elastic fibers. Blood vessels were found embedded into the loose connective tissue of the choroid. Melanocytes were also abundant in the choroid which give it its characterisitic black colour. Nicole (13) suggested that the melanocytes of choroid form a dark screen that usually absorbed much of the light intering the choroid. The choriocapillaries were abundant in the inner layer of the choroid. Munz (14) noted that the choriocapillaries have an important function in nutrition of the retina, and damage of this tissue causes serious damage to the retina.

The components of the retina in the eye of this fish (*Mystus pelusius*) form nine distinct layers: Outer epithelial layer, vision-cell layer, external limiting membrane; external nuclear layer, external plexiform layer, internal nuclear layer, internal plexiform layer, ganglion cell layer, and a nerve fiber layer that synapses with the optic nerve. The vision cells of the retina in the eye of fish (*Mystus pelusius*) was consisted of rods, single cones and double cones. This is in accordance with the observation of Lyall (15), in Stripped bass fishes. Triple or quadruple cones as was observed by Kunz et al (16) were not found. It seems to be that the acuity of vision was different in fishes according to spacity and arrangement of cones (17).



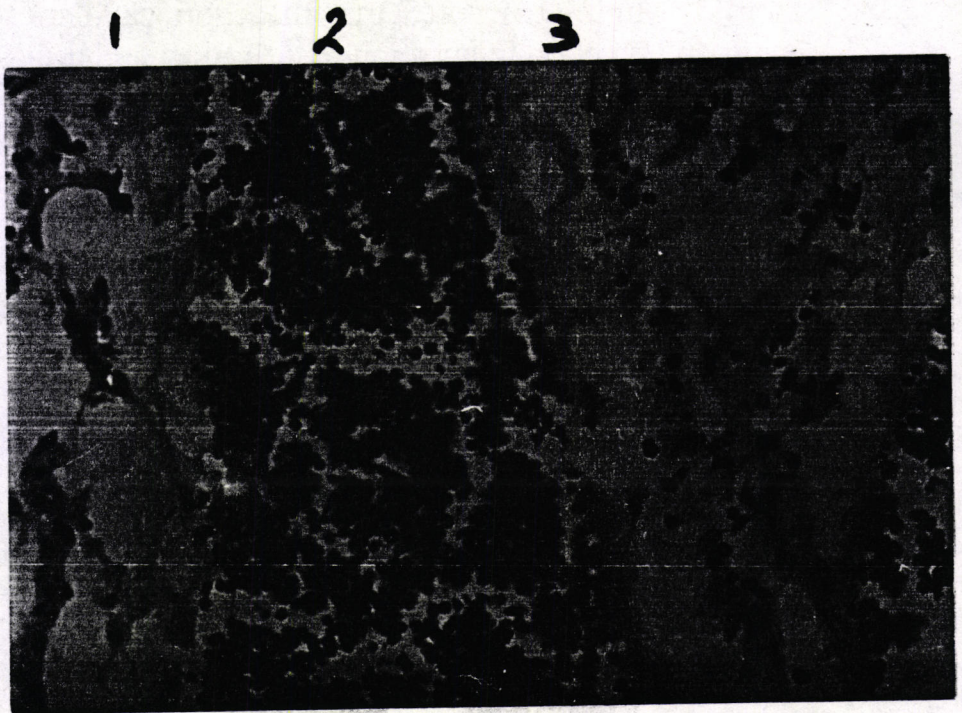


Fig.1: Transverse section in the retina of the fish eye: (Mystus pelusius) showed some of its layers : 1-Internal nuclear layer. 2- External plexiform layer. 3- External nuclear layer. Masson trichrome 1250X



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بعض الرؤى النسيجية لعين سمكة أبو الزمير  
(MYSTUS PELUSIUS)

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الخلاصة

تقع عين سمكة أبو الزمير (*Mystus pelusius*) في التجويف القحافي وعلى شكل كرة متطاولة. تغلف القرنية بظهارة مطبقة حرشفية غير متقرنة. تنحني القرنية بشدة نحو الداخل وتغطي جزءا من العدسة ويكون متنها من نسيج ضام غني بالاوعية والظهارة الصباغية. تكون الصلبة غضروفية. تتحدد المشيمية بنسج ضام وتحتوي على شعيرات مشيمية. ان الصفات المميزة لشبكية العين، تكمن بوجود مخاريط طويلة مفردة ، مخاريط قصيرة مفردة ومخاريط مزدوجة يرافقها العصي.