

**HISTOPATHOLOGICAL OBSERVATIONS ON ORAL SKIN
PAPILLOMA OF CULTURED OREOCHROMIS NILOTICUS AT
THE EASTERN PROVINCE OF SAUDI ARABIA**

By

Ibrahim , M. M.* and Mahmoud ,A.M.**

**Animal Health Research Institute , Dokki, Giza , Egypt.*

***Dept.of pathol.Faculty of Vet.Med.Cairo Univ.Egypt.*

ABSTRACT

The prevalence of tumours and tumour like lesions of fish have been devoted special attention specially those regards to skin tumours with particular emphasis on skin papilloma . Tilapia fish (*Oreochromis niloticus*) from some fish farms at the Eastern region of Saudi Arabia showed an obvious growth on the anterior portion of the covering operculum of the gills at the lower jaw . It was unilateral or bilateral in occurrence. The lesion was appeared round or oval in shape in the early stage, later it became hard nodular projection in consistency. Histological examination revealed pronounced epidermal spongiosis together with severe hyperplasia of the basal cell layer with increase number of malpigen cells associated with intercellular edema of the epidermal layer. The subepidermal layer showed accumulation of melanomacrophage cells while the dermal layer revealed evidence of fibroplasia. The dermal layer also revealed severe edema with dilation of the blood vessels.

INTRODUCTION

Tumours in fish are unusual growths or swellings and occur in any part of the body. The prevalence of tumours and tumours like lesions of fish have been devoted special attention especially those regards to skin tumours (**Aneer and Ljunghberg 1976; Peter, 1977; Sindermann, 1979; Anders and Moller, 1985; Moller, 1988 and Sindermann , 1990**). The prevalence of skin papilloma in Flounder fish sp., Eel and other fish in north sea has been surveyed by **Wolthaus, (1984); Obiekezie *et al.*, (1987)**. **Sindermann, (1979)** reported that, skin papillomas of Atlantic salmon were most common in young fish with remarkably high incidence (60 %) and was appeared histologically as hyperplastic plaques growth of the epidermis **Lames *et al.*, (1990)** revealed that skin papillomas of turbot sp. mainly composed of epidermal hyperplasia. The papillomas of head and body were also reported in

koi carp fishes by Wildgoose, (1992). The tumour may be occurred as a result of herpes virus infection (Sano *et al.*, 1993). In the other hand, Poulet *et al.*, (1994) recorded spontaneous papillomas in brown bullhead (*Ictalurus nebulosus*). Tilapia fish species *O. niloticus* is one of the main common fish species that cultivated extensively in concrete ponds as fish farms in Saudi Arabia. During the course of routine examination for the health condition of such fish, unusual obvious firm swelling growth in the oral region that affected its marketability were observed. Unfortunately few data on skin tumours of tilapia fish species as freshwater fish are scarce, so the present study was undertaken to observe the histopathological nature of such growth.

MATERIAL AND METHODS

50 fish samples of tilapia fish *O. niloticus* of marketable size (12 to 14 cm in length) and of (150 to 200 g. in weight) showed obvious growth oral lesions. They were collected alive from container vessels of 500 fish that were obtained from fish farm which rear tilapia fish species in concrete ponds. The fish were transported directly to the laboratory for complete examination. For histopathological examination parts of the oral lesions were cut and fixed in 10 % buffered formalin and waxed sections were prepared at 5 μ m, stained with Hematoxyline and Eosine (H & E stain) according to (Carleton *et al.*, 1967).

RESULTS

The gross examination of the affected fishes showed a conspicuous clear skin lesion either in mouth commissure or on the anterior portion of the covering operculum of the gills. The lesion in some fishes was noticed unilateral (Fig.1 A&C) but in other cases was bilateral (Fig. 1 B). In the early stage, the lesion appeared as polypoid and hemorrhagic overgrowth and sometimes with ulceration (Fig. 1A B & C). In other examined fishes, the lesion was advanced and the tumour appeared as whitish plaques with healing process (Fig.1 D). The morbidity rate of the examined fishes was 10% but there were no signs of life threatening or mortalities.

The histopathological examination revealed pronounced epidermal hyperplasia characterized by increased number of malpighian cells with sloughed epithelium in some parts of the epidermis (Fig. 2. A). In some of the examined fishes, spongiosis of the epidermis was noticed where intercellular oedema was observed between the epidermal cells. In such cases, the melanin containing cells were infiltrated in the dermal layer (Fig. 2.B). In advanced cases, mononuclear cells infiltration was noticed in both epidermis and dermis together with oedema in the dermal layer (Fig. 2C). Sometimes fibroplasia with excessive fibrous connective tissue proliferation was noticed in the dermal layer.

DISCUSSION

The presence of abnormal growth in the skin of fish is considered unmarketable and rejected by the consumers. The presence of epidermal protrusion growth swelling in the anterior portion of lower jaw of the (*O. niloticus*) that were cultivated in concrete ponds and described histologically as epidermal hyperplasia with supporting connective tissues stroma in the dermal layer, resemble the typical epidermal papillomatosis structure that grossly described in numbers of marine fish by (**Wellings *et al.*, 1964; Honma and Kon, 1968 and Bloch *et al.*, 1980**). It could be induced by continuous mechanical irritation on the wall of the ponds especially when the fish tried to pick up the sunkened feed pellets or could be due to previous parasitic gill infections that induced continuous rubbing of the fish to the wall of the concrete pond and hence lead to chronic irritation that could promote such condition, These interpretation and explanations were nearly agree with (**Mix, 1986 and Edward, 1996**) who found that physical injures and traumas might have a role in epidermal skin papillomatosis in fish.

Also, it might be of hereditary in such kinds of fish and these explanations were in harmony with **Moller, (1988)** who reported that several other epidermal papillomas, hyperplasia and Pseudotumours on fish of unknown origin. In contrast, other authors supposed that skin papillomatosis in the fish might be due to infectious agents (**Wellings *et al.*, 1964; Cooper and Keller, 1969; Grabda, 1982 and Mix, 1986**). Hence, It could be concluded that oral epidermal skin papillomas in the observed *O. niloticus* constitute a remarkable percent in the farmed fishes and further investigations should be done regarding the etiology and epizootiology.

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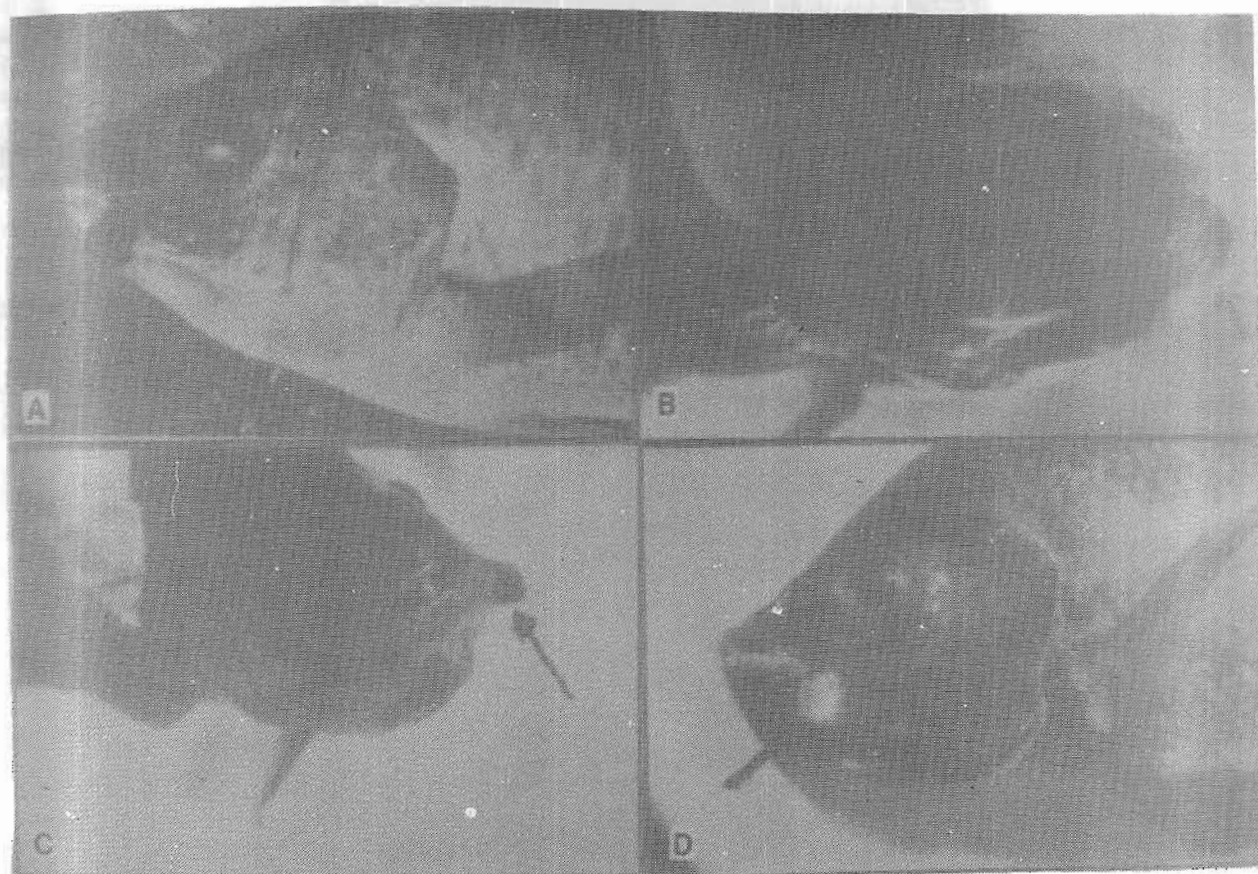


Fig. (1): A-*Oreochromis niloticus* showing unilateral hemorrhagic overgrowth in lateral part of the lower jaw.
B- *O. niloticus* showing bilateral tumified massin the lower jaw.
C- *O. niloticus* showing advanced unilateral overgrowth in the mouth commissure.
D- *O. niloticus* showing greyish white tumified tissue mass.

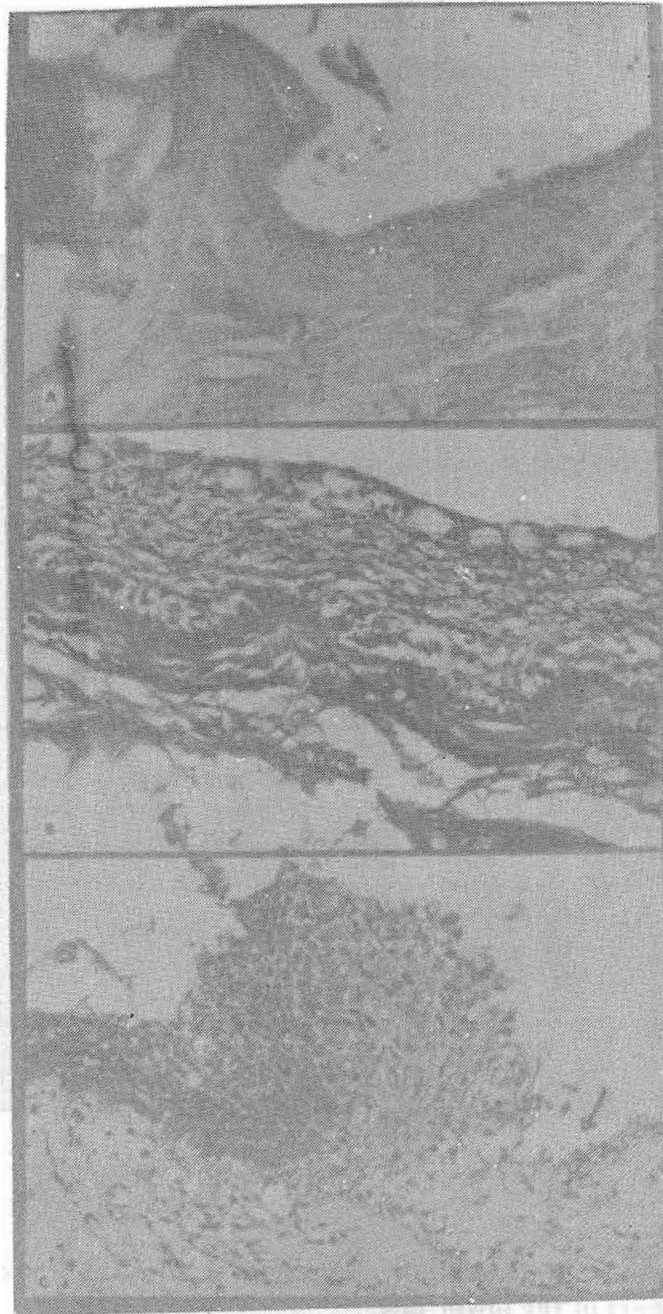


Fig. (2): A-Skin of *O. niloticus* showing epidermal hyperplasia (H&E stain)X100.
B-Skin of *O. niloticus* showing epidermal spongiosis and melanophores
aggrigation in the dermal layer (H&Estain)X400.
C- Skin of *O. niloticus* showing oedema in the dermal layer with mononuclear
cells infiltration (H&E stain)X400.

الملخص العربي

لقد أجريت هذه الدراسة بالمنطقة الشرقية بالمملكة العربية السعودية لدراسة بعض حالات الأورام التي ظهرت في أسماك البلطي المرباة في الأحواض الأسمنتية. ولقد لوحظ ظهور نموات لحمية ظاهرة في الأجزاء الأمامية من الغطاء الخيشومي وكذلك بالفك السفلي .

وفي بعض الحالات كانت هذه الأورام في ناحية واحدة من الجسم بينما في حالات أخرى كانت في الناحيتين. ولقد أوضح الفحص التشريحي أنه في المراحل الأولية يظهر الورم على هيئة زوائد دائرية أو بيضاوية الشكل بينما في المراحل المتقدمة يظهر على هيئة زوائد عقديه صلبة الملمس .

ولقد أوضح الفحص الميكروسكوبي للنسيج المكون للورم حدوث فراغات إسفنجية بخلايا طبقة الأدمة في الجلد، كذلك زيادة عدد الخلايا القاعدية به وفي هذه الحالات كانت الخلايا الطلائية ممتلئة بالسوائل. وفي طبقة ما تحت الأدمة، أوضح الفحص وجود تجمعات للخلايا الحاملة لصبغة الميلانين وكذلك حدوث احتقانات بالأوعية الدموية لهذه الطبقة .