

Dept. of Food Hygiene
Faculty of Vet. Med., Assiut Univ.,
Head of Dept. Prof. Dr. H. Youssef.

HISTOPATHOLOGICAL CHANGES ASSOCIATED WITH ENCYSTED METACERCARIAE IN THE MUSCLES OF CLARIAS.

(with 10 Figures)

By
H. YOUSSEF, T. EL-KHATEIB, S.H. AFIFI,
FATMA G. SAYED and R. M. RIAD*

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التغيرات الهستوباثولوجية المصحوبة لوجود اليرقات المتحصلة فى عضلات سمك القرموط

حسين يوسف ، طلعت الخطيب ، صلاح غففى ، فاطمه جلال ، رأفت منير

تم فحص ٥٠ سمكه من نوع القرموط جمعت من أسواق مدينة أسيوط. وفحصت عضلات هذه الاسماك ظاهريا وبالميكروسكوب لوجود اليرقات المتحصلة لديدان التريوماتودا ووجدت نسبة الاصابه بهذه اليرقات ٩٢%. وقد وجد نوعين من اليرقات المتحصلة فى عضلات سمك القرموط. النوع الأول يرى بالعين المجردة وهو يرقات ديدان السيئوديبيلوستومم ازييمى، النوع الثانى يرى فقط بالميكروسكوب وهو يرقات ديدان البروهيمستومم فيفاكس. وقد تبين من الفحص الهستوباثولوجى لعضلات هذه الأسماك المصابه وجود تتركز والتهابات وتليف وتكلس فى العضلات كرد فعل دفاعى لوجود هذه اليرقات المتحصلة بها.

*: part of M.V.Sc. Thesis.

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SUMMARY

Fifty specimens *Clarias lazera* fish were collected from different fish markets in Assiut city and examined grossly and microscopically for the presence of trematode encysted metacercariae in their muscles. The incidence of infestation was found very high (92%). Two forms of encysted metacercariae were detected, one form appeared grossly as whitish raised nodules, while the other form appeared only by microscopic examination. They were those of *Cynodiplostomum azimi* and *Prohemistomum vivax* respectively. Histopathological examination of fish muscles of *Clarias lazera* showed degenerative, necrotic and inflammatory changes. Parasitic granuloma were detected among degenerated muscle fibers. Fibrosis and calcification were observed as a response of tissue against the parasite.

INTRODUCTION

Fish is an important source of protein diet in Egypt. Very high percentage of infection of fish muscles with trematode encysted metacercariae was noticed by ROBERT (1978), ABDEL-METAAL (1983), EL-SHERBINY (1987) and OTIFY *et al.* (1989). ROBERT (1989) reported that the presence of these metacercariae may produce certain pathological effects which might make the fish unfit for human consumption, therefore the present study was conducted to describe the histopathological changes in the muscles of heavy parasitic infective fish (*Clarias lazera*) in Assiut city.

MATERIAL and METHODS

Fish were collected and killed by pithing the brain tissue. Examination of the muscles for encysted metacercariae was done by dividing the body of fish into three regions, anterior, trunk and posterior. These were examined grossly for macroscopic encysted metacercariae. Several small pieces of muscle from each region from the different region of fish were taken immediately and fixed in 10% formalin. Samples were dehydrated, embedded in paraffin and sectioned at 4-6 μ and stained with hematoxyline and eosin, then examined by light microscope.

RESULTS

The gross appearance of infested muscles of *C. lazera* showed whitish raised areas (1-2 mm in diameter) and were mostly located in the posterior region (Fig. 1). Compression of these nodules between two slides and microscopical examination revealed large encysted metacercariae (of *Cynodiplostomum azimi*) Fig. 2. Another form of metacercariae were only seen by microscopic examination of fish muscles and were smaller in size (those of *Prohemistomum vivax*) Fig. 2. The percentage of infection in the muscles of *Clarias lazera* were 92%.

Tissue response against these encysted metacercariae were shown in different stages (Fig. 3-10) depending on the degree of infection. The first stage showed features of hyalinization. The muscle bundles were structureless, refractile, glossy and highly eosinophilic. Mild myolysis was expressed by loss of striation of the muscle bundles, Fig. (3,4). Figure (5) showed features of myositis which is manifested by myopathy, cellular reaction mainly of lymphocytes, and extravasated red blood cells. Parasitic granuloma were detected and have shown inflammatory cellular reactions of lymphocytes, macrophages and fibrous connective tissue around the metacercariae (Fig. 6,7). Replacement fibrosis surrounding the metacercariae was observed (Fig. 8). While dystrophic calcification on the invaded metacercariae was illustrated in Fig. (9) as bluish granules. Complete loss of the epidermis with severe myolysis were shown in Fig. (10).

DISCUSSION

The incidence of metacercarial invasion of the muscles of *Clarias lazera* was very high (up to 92%) for the total samples examined. ABDEL-METAAL (1983), EL-SHERBINY (1987) RECORDED high infestation rate of metacercarial infection in the muscles of *C. lazera* (85%, 86% respectively). This agreed with the present finding. The degrees of muscular lesions in the present study support previous observations with respect to parasitic infestation in fish muscles. ROBERT (1978) reported degenerative and necrotic changes in fish skeletal muscles infested with *Cryptocotyle lingua*. He also reported that if the infectious agents are present, the lesion may be extending to fibrosis and inflammation.

In the present investigation, the inflammatory changes were expressed by a pronounced lymphocytic and macrophagal reaction. Since the temperature when collected was in the range of 25-23°C, this could explain such reaction. Cold temperature

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is immunosuppressive and decrease the rate and quality of inflammation, MacMIDLAN (1985). While fibrosis and calcification observed in this study suggested a reaction against the metacercariae and could be considered as the late stage of the defense mechanism. Absence of the epidermis in the present study can lead to disturbance in osmoregulation. The skin is an important osmotic barrier and if damaged may result in osmoregulatory problems, MacMILLAN (1985). It is obvious that the location, numbers and viability of metacercariae has a deleterious effects on the muscles of fish. Moreover, studying such changes can be a helpful tool to understand the pathophysiologic mechanisms involved and its impact on fish health.

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