Egypt. J. Agric. Res. , 71 (3), 1993.

CLINOSTOMIASIS (YELLOW GRUB DISEASE) IN TILAPIA NILOTICA & GALILAE IN HIGH DAM LAKE, WITH RELATION TO PUBLIC HEALTH IMPORTANCE IN EGYPT

N. A.M. MAHMOUD AND A. A. M. SAHLAB

Animal Health Research Institute, Agricultural Research Centre, Giza, Egypt.

(Manuscript received 21 April 1992)

Abstract

Clinostomatid metacercariae were isolated from freshwater Nile fish Tilapia nilotica and Galilae in the High Dam Lake. This is considered as the first record of this parasite in Egypt. The identified metacercariae were isolated, the predilection sites described and morphometric measurments carried out and the public health important was discussed.

INTRODUCTION

Larval trematodes belonging to the family Clinostomatidae Luhe 1901 had been isolated from freshwater Nile fish as *Eculinostomum heterostomum* in *Tilapia zilli, T. spp.* and *Clarias* spp. In Giza and Cairo provinces (Fischthal and Kuntz 1963). However, Clinostomatid metacercariae were isolated as *Clinostomum tilapiae* from the branchial region of freshwater fish *T. Zilli , T. heudeloti* and *T.galiae* in the locality of Nungue Dam near Accra (Ukoli 1966). Nevertheless, Clinostomatid metacercariae were recorded in Ghana freshwater fish *Auchenoglanis occidentalis* and *Clu-*

pisudis nilotics from the Volta River drainage system as *Nephrocephalus bagri incpsulatus* (Fischthal and Thomas 1972). The Clinostomatid metacercariae were recovered from freshwater fish, *T. nilotica* in Giza province, identified as *Clinostomum spp.* and considered to be the first record of such metacercariae from the Egyptian Nile fishes (Imam *et al.* 1979). In addition to the previous authors (IlanPaperna 1980) reviewed that larval Clinostomatids related to the species *Nephrocephala* with crocodiles as definitive host were also apparently widely distributed in Africa, and in the the last century they were reported from Egypt. Morecover, such larvae were also recorded in Sudan Nile among *T.spp.* with a peak of infection towards, the end of rainy seson September, October. Imam *et al.* (1979) recorded that *Clionstomum spp.* metacercariae were isolated from *T. nilotica* in an incidence up to 3.7% from Giza markets and mainly localised in the pharygeal walls. Fishthal and Thomas (1972) reviewed that Clinostomatid larvae had been reported and described as *Distoma bagri incpsulatus.* From the public health importance, IlanPaperna (1980) reported that larval trematodes of *Clinostomum complanatum* caused a few cases of laryngo pharyngitis (Halzuun) in humans.

The aim of the present work is to emphasize the public health importance of Clinostomiasis in High Dam Lake as one of the most imprtant fish productivity resources in Egypt, to improve the methods of control and prophylaxyis.

MATERIALS AND METHODS

A total of 40 freshwater Nile fish *Tilapia nilotica* and *Galilae* were obtained from High Dam Lake port in June 1991. The fish samples were collected in an ice container, and each sample was placed in a plastic bag and examined on the spot according to Syme (1966) to record any pathological changes on the external and internal surfaces or the cahnges due to the parasitism in the pharynx, alimentary canals, eye sockets, branchial and visceral organs, body cavity and musclature. The Clinostomatid encysted larvae found were isolated from the head region and incubated at 37^{o}C for 2h in pepsin digestive solution for the excystation of metacercariae according to Oshima *et al.* (1966). The larval Clinostomatidae recovered were fixed in formol saline 10%, stained with acetic alum carmine, dehydrated in ascending grades of ethyl alcohol up to absolute one, then cleared in clove oil and xylol and mounted by canada balsam and covered with cover glasses according to Soulsby (1982). The morphometric measurments were carried out among the whole mounted

specimens in mm.

The drawing has been done with the aid of camera lucida compared to the criterion recorded by Ukoli (1966), Imam *et al.* (1979) and Ilan Paperna (1980).

RESULTS

In the present study, the Clinostomatid larvae were isolated from *T. nilotica& galilae* at High Dam Lake and identified as *Clinosomum spp.* based on the morphometric features (Ukeli 1966), Imam *et al.* (1979) and Ilanpa Paperna (1980). They were recovered from the branchial organs, eye sockets and pharynx which were localised as hypodermic cysts whitish yellow in colour pea-size and embedded in tissues or attached free. The average size of each cyst was up 5 mm. in diameter (Fig. 1). The excysted larvae, after digestion (Fig. 2) were elongate, wide at the premordial sex organs with whitish yellow excretion. They were highly motile and characterised by two suckers (oral and ventral ones) and two intestinal cecae. The morphometric measurments were as follows:

Total length 12. 02 -27 mm average 19.51 mm, maximum width (In premordial gonads region) 3.81 - 5.53 mm average 4.35 mm, oral sucker 0.37-0.79 mm, ventral sucker 1.41-1.43 mm, prepharynx 0.18 mm, pharynx 0.31 mm, anterior testis 2-3 lobes triangular 0.58-1.01, posterior testis 3 lobes triangular, 2 lateral lobes and one posterior, the lateral lobes are divided into 3-5 lobes measuring 1.55-1.75mm, ovary 0.26 - 0.33, ootype complex 0.47 - 1.12 mm, uterus 0.27-3.95 mm tubular, running ventrally and dorsally to the anterior testis, then opening into the uterine sac, cirrus pouch 0.29 - 0.36 mm, intertesticular region 2.025 mm, length from ventral sucker to anterior testis 9mm, length from anterior tip to ventral sucker 1mm, length from posterior testis to posterior tip 3-10mm, The excretory bladder appeared Y-and V-shaped, extending from the excretorry pore to posterior testis. Drawings with the aid of camera lucida are shown on Plate 1.

SDISCUSSION

Clinostomiasis known as Yellow grub disease in fish has been realized as one

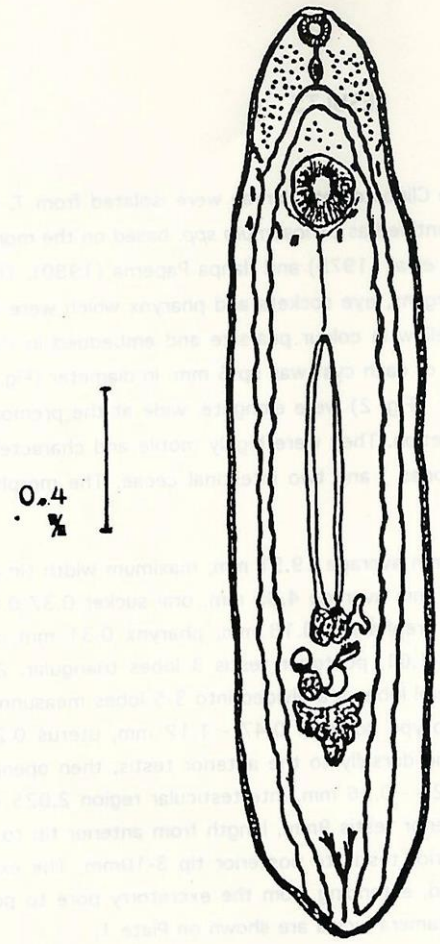

plate 1 . Clinostomum spp.

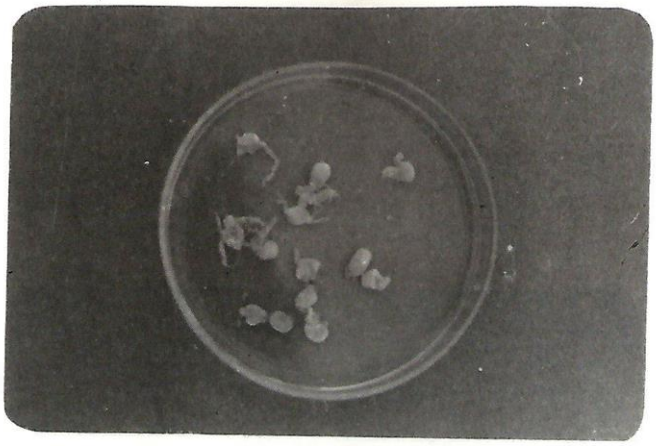

Fig. 1. Macroscopical picture of encysted Clinostomum spp.

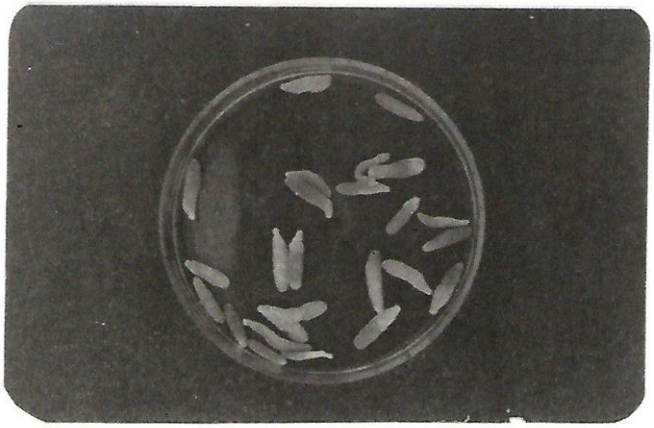

Fig. 2. Macroscopical picture of excysted Clinostomum spp. larvae

Fig. 3. Clinostomum larvae as hypodermic cyst embedded in head tissues

of the most fascinating group of metaceraciae in freshwater fish in Egypt (Fig. 1&2). This causative agent is related to the familty *Clinostomatidae* Luhe 1901. The main species of freshwater fish in Egypt harbouring the metacercariae are *Tilapia nilotica, T. zilli, T. galilae, Bagrus spp.* and *Clarias spp.* (Fischthal and Kuntz 1963, Fischthal and Thomas 1972 and Imam *et al.* (1979). In the present study, it was emphasized that the incidence of infection in *T. nilotica* and *Galilae* at High Dam Lake was 27.5%, higher than that recorded by Imam *et al.* (1979) who found a prevalence of 3.7% (Table 1). The morphological picture of *Clinostomum* larvae (Fig. 3) isolated in the present study from these fish is identical with that reported by Ukoli (1966), Imam *et al.* (1979) and Ilan Paperna (1980). This type of larval encystation could be released and recovered from the cysts using a digestive solution at 37°C for 2-3h. (Fig. 1). The *Clinostomum* larvae in the present study are considered as the first recorded case in High Dam Lake freshwater fish in Egypt, whereas El-Naffar (1983) and Mahmoud (1988) during the routine inspection for fish health at High Dam Lake failed to find the Clinostomiasis in fish. On the other hand, Ukoli (1966) recorded the finding of *Clinostomum spp.* in *T. zilli, T. heudeloti* and *T. galilae* in reservoir of Nungia Dam near Accra. Fischthal and Thomas (1972) isolated Clinostomatid larvae from freshwater fish *Auchenoglanis occidentalis* and *Clupisudis niloticus* from Volta River drainage system in Ghana. Ilan Paperna (1980) isolated it from *Tilapia spp* in Nile at the Sudan.

The intensity of infection in the present study was up to 19 cysts in fish, a finding which coincides with that recorded by Fischthal and Kuntz (1963). Clinostomiasis or Yellow grub disease is seasonally recorded in Africa depending on a few epidemiological factors that enhance the outbreak. The rainy season including the presence of infected migratory birds, biologic pollution due to waste material settelements and huge number of favourite molluscs are among those factors causing high peak of infcetion (IlanPaperna 1980). Reviewing the previous literature, IlanPaperna (1980) reported that *Clinostomiasis* (Yellow grub disease) was a zoonotic one due to few cases recorded in the Near East inducing laryngopharyngitis (Halzuun) as a result of ingesting inadequately cooked infected fish with *Clinostomum complanatum.* Therefore, it is recommended to control the disease, from the public health point of view, by adopting the rules based on the main hygienic security reviewed by Syme (1966), Mahmoud (1983) and Benenson (1990).

Table 1.The prevalence of *Clinostomum spp.* infection in *Tilapia nilotica* and *galilae* at High Dam Lake, Egypt.

Fish species	Total No	No. of infected fish	Intensity of infection	Incidence of infection %
T. nilotica	21	9	7-19	42
T. galilae	19	2	7-19	10.5
Total	40	11	7-19	27.5

*Average weight in gram: 326.30 g.
Total fish length : 20 - 25 cm.
Average width : 10 - 15 cm.

REFERENCES

1. Benenson, A.S. 1990. Control of communicale diseases in man. 15th. ed an official report of the American public health Association, Washington, USA.
2. El-Naffar, M.K., M.F. Saoud and I. M. Hassan. 1983. A general survey of the helminth parasites of some fishes from Lake Nasser at Asswan, A. R. Egypt. Assuit Vet. Med J., 11 (21) : 141-148.
3. Fischthal, J. H. and R. E. Kuntz. 1963. Trematode parasites of fishes from Egypt. Part 6. The metacertcariae of *Euclinostomum heterostomum* Rudolphi 1809, Travassos 1928 (Clinostomatidae) with a review of the genus. Trans. Am. Micr. Soc., 82(3):335-342.
4. Fischthal, J. H. and J. D. Thomas. 1972. Digenetic trematodes of fish from the Volta River Drainage in Ghana prior to the construction of the Volta Dam at Akosombo in May 1964. J. Helminth., 64:91 - 106.
5. IlanPaperna, H. S. 1980. Parasite infections and diseases of fish in Africa. FAO. CIFA Technical paper, 7:79.
6. Imam, E. A., A. A. Hassan, M. N. El-Shabrawy and M. A. Tawfik. 1979. On some parasites of Nile fishes in Egypt. J. Egypt Vet. Med. Assoc., 39 (1) 119-126.
7. Mahmoud, M. A. N. 1983. Parasitic infestations of some native species of fishes in Cairo markets with special refereneces to parasites transmissible to man and animals. M. V.Sc. Thesis, Faculty Vet. Med., Cairo Univ., Giza, Egypt.
8. Mahmoud, M. A. N. 1989. Observational and some studies on the acquistion of *Ascarididae* larvae by *Tilapia nilotica* and Galilae at the High Dam Lake, Egypt. Agric. Res. Rev., 67 (2) ; 261 - 270.
9. Oshima, T., Kagei, N. and M. Kihata. 1966. A simple method for estimating the total number of metacercariae of *Metagonimus yokagauai* in *Plecoglossus altivalis*. Jap. J. Parasit., 15: 161- 167.
10. Soulsby, E.J.L.1982, Helminth. Arthropod and protozoa of domesticated animals .7th ed Bailliere, Tindall and Cassel. London.
11. Syme, D. J. 1966. Fish and fish inspection. 2nd ed. H. K. Lewis and Co. Ltd, London.
12. Ukoli, F.M.A. 1966. On *Clinostomum tilapiae* n. sp. and *C. phalacrocorecis* (Dubeis 1931) from Ghana and a discussion of the systematics of the genus Clinostomum (Leidy 1856). J. Helninth., 40 : 187-214.

مرض الحويصلات الصفراء (الكلينوستومياسز) فى أسماك البلطى النيلى والجاليلى فى بحيرة السد العالى وعلاقتها بالصحة العامه فى مصر

نشأت عبد المتعال محمود ، احمد عبده مصطفى سحلب

معهد بحوث صحة الحيوان – مركز البحوث الزراعية – الدقى – الجيزة

يعتبر مرض الحويصلات الصفراء فى أسماك البلطى النيلى والجاليلى من أهم الأمراض البيئية ، وقد تم عزله لأول مره فى مصر من أسماك المياه العذبه ببحيرة السد العالى أثناء الفحص الدورى للكشف عن المسببات المرضية بأسماك البحيرة فى يونيو ١٩٩١. وقد تم عزل هذه الحويصلات وتسجيلها وتصنيفها وتحديد المظاهر الباثولوجيه الناتجة عنها فى الاسماك (العائل الوسيط) بالإضافة الى تسجيل القياسات المورفوميتريه ومناقشة علاقتها بالصحة العامه فى مصر والتوصيات الخاصه بمكافحة المرض.