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METACERCARIAL ENCYSTATION IN BAGRUS BAYAD FRESHWATER FISH AT SOHAG PROVINCE, EGYPT

(With 4 Tables and 3 Figures)

By

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ميناسركاريا في قشرالبياض سمك المياه العذبه في محافظة سوهاج

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تم جمع ١٠٠ عينه من سمك المياه العذبه (قشر البياض) في محافظة سوهاج وتم فحصها لبيان نسبة الاصابه بالميناسركاريه. ومن الدراسه اتضح أن نسبة الاصابه بالميتاسركاريا تبلغ ٦٠٪ وكانت متمركزه في الانسجه تحت الجلد والعضلات والزعانف. اما بقية الاعضاء مثل الكبد والكلى والطحال والخياشيم والامعاء والاغشيه المبطنه لجدار المخ كانت خاليه من هذه الحويصلات كما اتضح من الدراسه أن الحويصلات كانت متمركزه في الجرام الواحد بنسبة ٢٥و٣١ حويصله. وكذلك تم عزل نوعين من الديدان الورقيه وهى هيلوركس بيملبو(لوس ١٨٩٦) التي تتبع عائلة هيلوركيني ، بروهيموسنومم فيفاكس (سون سبنو ١٨٩٢) والتي تتبع عائلة سباثوكوتيليدي.

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SUMMARY

Fish tody has become a highly productive industry in Egypt due to the pressure of a rapidly expanding human population and lack of animal protein. Neverthless, a number of endemic larval parasites in freshwater Nile fish have a piscivorous mammalian carnivores as their final host and able to infect human due to the low host specificity of such adult stages. The present study attempts to find out any metacercarial infection in tissues or organs of *Bagrus bayad* collected from the markets in Sohag province. The present study showed that 60% of infection was localised in subcutaneous tissues, muscles and base of dorsal fin, while liver, kidney, spleen gills, intestinal wall, the body cavity and brain with its surrounding tissues were free from the infection. The number of metacercarial encystation were up to 31.25 cyst per gram of edible fish tissues. Metacercariae were identified according to the a dult worms which have been recovered after experimental feeding of parasite free kittens into two groups. The first groups was related to family *Cyathocotylidae* and yeilded adults of *Prohemistomum vivax*. The second group was related to family *Heterophyidae* and yeilded adults of *Haplorchis pumilio*. The public health importance of these parasites was discused.

INTRODUCTION

Reviewing the available literature indicated that the incidence of encysted metacercariae in *Bagrus bayad* was 62.7% and was recorded by *SHALABY (1982). EL-NAFFAR and EL-SHAHAWY (1986)* stated that 82.42% of *Bagrus bayad* harboured metacercarial infection in tissues. Moreover, *AUOB (1991)* revealed that the rate of infection with encysted metacercariae in *Bagrus bayad* were 66%. Recently *EBTSAM (1993)* recorded that *Bagrus bayad* in Cairo markets harboured metacercarial infection up to 64%. The number of metacercariae per gram of fish meat was recorded up to 120 cyst per gram by *EL-NAFFAR and EL-SHAHAWY (1986).* However, *AUOB (1991) and EBTSAM (1993)* recorded an average up to 24.33 and 9.18 cyst per gram respectively. Moreover, they recorded that the highest incidence of metacercarial infection was localised in the tail region than other parts of the body regions and the types of encysted

metacercariae in *Bagrus bayad* were identified into two families *Heterophyidae* and *Cyathocotylidae*. The aim of the present work is to study the incidence and morphometeric characters of metacercariae in *Bagrus bayad* at Sohag province.

MATERIAL and METHODS

A total of 100 *Bagrus bayad* apparently healthy Nile freshwater fish were collected from Sohag province markets. The samples were packaged separately with a serial number in a clean plastic bags. The specimens were sent to Sohag Vet. Provincial Lab. in a cool container at 4°C according to *JOHN (1966)*. The mean dimensions of the fish specimens (Lenght, width and depth) were measured according to *PETER (1981)*. Samples from the body surface, gills, eyes and fins were examined for metacercarial infection, on the other hand metacercariae were collected from the internal organs and examined according to *MORISHITA et al. (1965) and JOHN (1966)*. In addition, digestion technique according to *OSHIMA et al. (1966)* was applied. The isolated metacercariae were experimentally fed to parasite free kittens (one month old) to identify the metacercariae based on the revealed adult worms. The metacercariae and the adult worms recovered were fixed in 10% formol-saline, washed, stained with acetic acid alum carmine, dehydrated in assending grades of ethyle alcohol, cleared in clove oil and mounted according to *SOULSBY (1982)*. Morphometric characters and identification were studied according to *HAN PAPERNA (1980); MAHMOUD (1983) and EBTSAM (1993)*.

RESULTS

The results are illustrated and explained in the tables 1-4 and figures 1-3.

The metacercarial cyst has double contour, the outer surface is characterized by fibrous layer, while the inner one is membranous. The curled metacercariae showed inside the cyst structure and pronounced a metabolized fluid (ES) production, Fig. (1). The two morphological types appeared to belong to two families, the family *Cyathocotylidae*; the metacercariae were characterized by having tribocytic organ, oval in shape, large in size and absence of lateral suckers. In kittens they yeilded adults of *Prohemistomum vivax* Fig. (2). Metacercariae belonging to the family *Heterophyidae* were characterized by ventral sucker was seen with difficulty, while the lateral suckers were absent, the metacercariae were spherical in shape, small in size, the excretory vesicle was located in the caudal end, and

recovered one species of adult worm: *Haplorchis pumilio* Fig. (3).

DISCUSSION

The present study revealed ahigh rate of metacercarial infection in *Bagrus bayad* freshwater fish at Sohag province 60%, Table (1). The results of infection agreed with the results recorded by *SHALABY (1982)* that 62.7% of metacercarial infection in *Bagrus bayad*. Moreover, *AUOB (1991) and EBTSAM (1993)* revealed that 66% and 64% respectively of metacercarial infection in tissues of *Bagrus bayad* which were collected from Cairo markets. However, the incidence of the present study disagree with the results recorded by *EL-NAFFER and EL-SHAHAWY (1986)* who stated that 82.42% of *Bagrus bayad* was infected with metacercariae and this difference may be attributed to the environmental factors include the eutrophic water, presence of gastropoda, seasonal variation and water pollution with animal and human settelments. In the present study the intensity of metacercarial infection in edible tissues of *Bagrus bayad* was up to 31 cyst/gram of fish tissues, Table (4) thus indicates a light infection comparable with that recorded by *AUOB (1991) and EBTASAM (1993)* who stated that intensity of infection was up to 24.33 and 9.18 cyst per gram respectively, while our results disagree with *EL-NAFFER and EL-SHAHAWY (1986)* who revealed that a metacercarial infection was up to 120 cyst/gram. The present study revealed that metacercarial infection was localised in subcutaenous tissues, muscles, base of dorsal fin that disagree with that recorded by *AUOB (1991) and EBTSAM (1993)* who stated that the highest infection was localised in the tail region than other parts of the body regions and coincides with them in identification that the two types of metacercariae were related to families *Heterophyidae* and *Cyathocotylidae*. Regarding the public health importance of metacercarial infection in *Bagrus bayad* revealed that *Prohemistomum vivex* and *Haplorchis pumilio*, Fig. (2 & 3) were infective to man and recorded in Egypt by *NASR (1941) and KHALIL (1932)*.

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LEGENDS

Fig.. 1: Curled metacercarial cyst in tissues of *Bagrus bayad* fresh specimens I- Spherical type 2- Oval type (X 100).

Fig. 2: Adult trematode *Prohemistomum vivax* (Sonsino, 1892). F.Cythocotylidae (X 40).

Fig. 3: Adult trematode *Haplorchis pumilio (Looss, 1896).* F.Heterophyidae (X 40).

Table(I):The rate of infection with metacercariae and their average number per gram of fish meat

Fish species	Number of metacercariae per gram of fish meat	mean	total sample	number of infected fish	Incidence of infection %
Bagrus bayad	15 -30 -45 - 25 35	31.25	100	60	60%

Table(2): The average dimensions of isolated metacercarial cysts

Types of cyst isolated	morphological types	mean dimensions/micron
Oval	Cyathocotylidae	406 x 460
Spherical	Heterophyidae	280 x 280

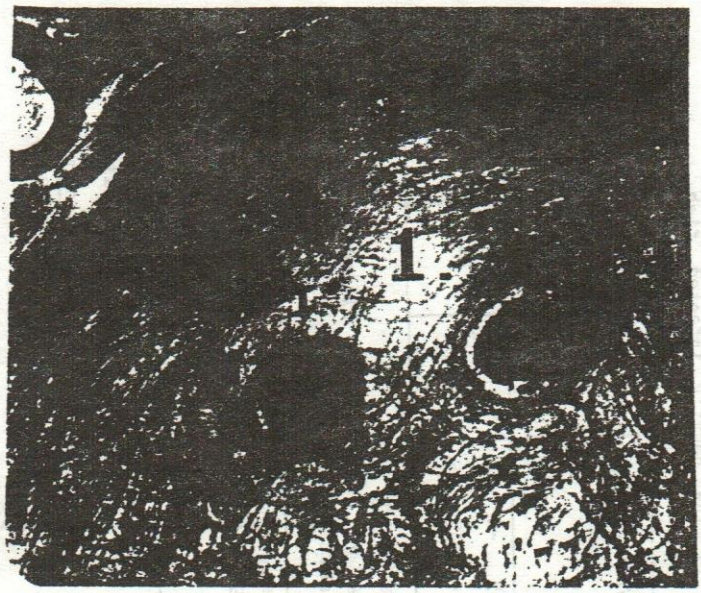
Table(3): The average dimensions of the heavily infected fish

Fish species	Total samples	number of infected fish	Length/cm	Width/cm	Depth/cm	Mean/cm		
						Length	Width	Depth
Bagrus bayad	100	60	-15 -20 -25 10 30 20	-5 -8 -10 - 35 25	21/9=2.3	21	9	2.3

Table(4):The experimental feeding of parasite free kittens (one month old) in Lab.

Fish species	experimental hosts	time of feeding per day	Amount of fish consumed in gram per day	number of EM. per gram	species of adult trematode recovered
Bagrus bayad	3 kittens	I	10	31.25	F.Cyathocotylidae Prohemistomum vivax (Sonsino,1892) F.Heterophyidae Haplorchis pumilio (Looss,1896).

The prepatent period 3 days - Recovery rate 7.81 - EM Encysted Metacercariae
- 2 kittens served as control were fed on parasite free fish.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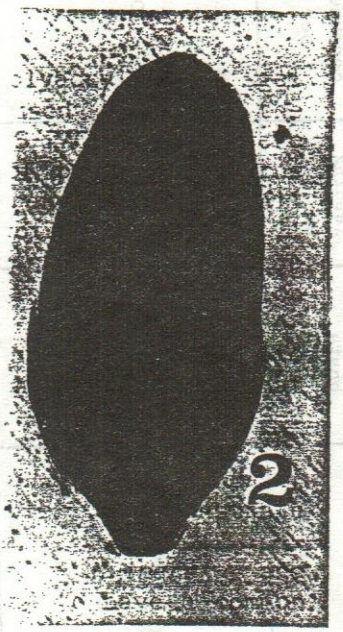
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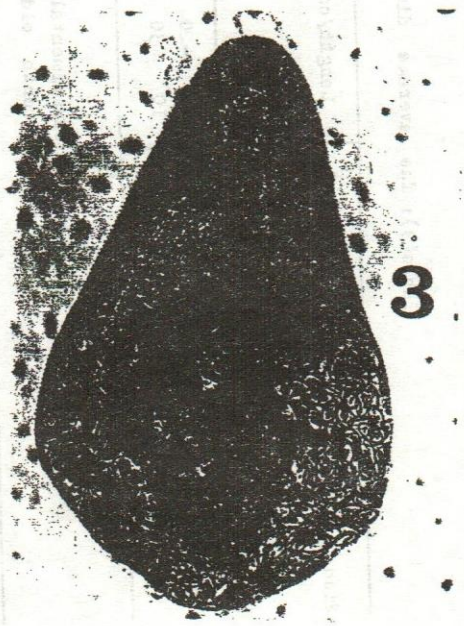
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