قسم : علم الحيوان .
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دراسات على ميتاسركاريا الاسماك النيلية

بمحافظة المنيا - جمهورية مصر العربية

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تبين من فحص بعض الاسماك النيليه وجود خمسة أنواع من الميتا سركاريا تصيب عضلات وكبد وكلى ستة أنواع من الاسماك هي البلطي النيلي ، البلطي الجاليلي ، القرموط ، البياض ، الشلبه ، البويزه ، صيدت من مناطق مختلفة بنهر النيل بمحافظة المنيا . والميتاسركاريا هي :

ميتاسركاريا فيفاكس ، ميتاسركاريا هابلوركس بوميليو ، كلينوستوماتيد ميتا سركاريا ، سينود بلوستوماتيد ميتاسركاريا ، دبلوستوم ميتاسركاريا ، وقد تبين أن سمكة البياض تعمل كعائل ناقل جديد لميتاسركاريا فيفاكس ، وكذلك سمكتي البياض والشلبه تعملان كعائلان ناقلان جديدان لميتاسركاريا هابلوركس بوميليو ، كما أن وجود سركاريا فيفاكس في كبد وكلى الاسماك المصابه تكون مناطق معيشيه جديده للميتاسركاريا . تمت دراسة نسبة الاصابة والانتشار والتغيرات والكثافة العددية للميتاسركاريا في المناطق المختلفة من الاسماك التي درست .

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STUDIES ON THE METACERCARIAE OF THE NILE FISHES AT EL-MINIA PROVINCE, A.R. EGYPT

(With 4 Tables and Two Figures)

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SUMMARY

Examination of the fishes revealed the presence of five types of metacercariae infesting six species of fishes namely Tilapia nilotica, T. galilae, Clarias lazera, Bagrus bayad, Mormyrus kannume and Schilbe mystus. The metacercariae are: metacercaria vivax, metacercaria of Haplorchis pumilio, clinstomatid metacercaria, cynodiplostomatid metacercaria and diplostomulum metacercaria.

The incidence, distribution, and seasonal variation of the metacercariae in different regions of the fish examined were studied.

INTRODUCTION

The role played by fish as transport hosts of helminth parasites of birds and animals have been the subject of considerable study. The opportunities of this study are limitless, and have atracted the attention of many investigators due to the importance of fish as a source of animal protein.

The present work aims to the following :

1- Identification of the different metacercariae found in the fishes which inhabit the part of the Nile passing through El-Minia Province.

2- Study of the incidence, density, distribution and seasonal variations of the metacercariae in different regions of the fish examined.

MATERIALS and METHODS

A total of 2323 fish were cought from different localities of the River Nile at El-Minia Province. The fish examined representing 6 species namely Tilapia nilotica, T. galilae, Clarias Lazera, Bagrus bayad, Mormyrus kannume and Schilbe mystus.

The fishes were examined first by the naked eye to show any macroscopic metacercariae, then the examination was carried out by taking small snips of the muscles from different regions of the body especially the head, trunk and tail. Each snip was compressed between

two slides and examined under a binocular dissecting microscope to look for metacercariae and the prevalence of infection was calculated. The metacercariae wre isolated by tissue dissection.

The intensity of infection in the different regions was estimated in 5% of the fish by examining one gram of muscle tissue from each fish and pressed between two slides and the encysted metacercariae were counted, described and illustrated after staining with acetic acid alum carmine and mounted in canada balsam. Any detected metacercariae were drawn by the aid of a camera lucida and the measurements were in microns.

RESULTS

The incidence of metacercariae in the fish examined :

On dealing with the infection in general, table (1) give a summary of the fish examined with metacercariae collected from them. The table included 2323 fishes of which 665 Tilapia nilotica and T. galilae, 560 Clarias lazera, 364 Bagrus bayad, 344 Mormyrus kannume, and 390 Shilbe mystus.

It was found that out of 2323 fish examined, 1914 (82.39 %) were infested with one or more species of encysted metacercariae.

The data indicates that highest incidence of infestation with metacercariae was found in Clarias lazera (90.89 %) followed by Schilbe mystus (87.44 %), Bagrus bayad (82.42 %), Tilapia nilotica and T. galilae (76.39 %) and lastly Mormyrus kannume (71.51 %).

Table (2) and Fig. (1) show the relative incidence of metacercariae in the fish examined during the different seasons. The highest incidence with metacercariae was found in summer and spring which was 90.25 % and 83.62 % respectively. The lowest incidence (67.80 %) was found in winter.

The higest incidence with metacercariae in different seasons was found in Clarias lazera which is represented by 98.48 % in summer, 91.50 % in spring, 88.39 % in autumn and 77.30% in winter.

The metacercariae were found in the superficial layers of the muscles allover the body especially in head, trunk and caudal regions. They were also found in other organs such as liver and kidneys.

Types of metacercariae in different fish examined :

Five types of metacercariae were metwith in the present investigation. Table (1) indicates that every type of metacerariae may infest more than one species of fish hosts, for example, metacercaria vivax was found in Tilapia nilotica, T. galilae, Clarias lazera, Bagrus bayad, Mormyrus kannume and Schilbe mystus. Metacercaiae of Haplorchis pumilio was found in Tilapia nilotica, T. galilae, Bagrus bayad and Schilbe mysus. A sigle host may harbour more than one type of metacercariae namely metacercaria vivax, metacercaria of Haplorchis pumilio, clinostomatid metacercaia and diplostomulum metacercaria. Clarias lazera harbours metacercaria vivax and the cyhodiplostomtid metacercaria; Bagrus bayad and Schilbe mystus harbour metacercaria vivax and the metacercaria of Haplorchis pumilio.

The density of metacercariae in different regions of the fish examined is shown in table (3) and Fig (2) and is represented by the number of metacercariae per gram of muscle tissue.

Table (3) indicates that four types of metacercariae (metacercaria vivax, metacercaria of Haplorchis pumilio, clinostomatid metacercaria and diplostomulum metacercaria were found in the muscles of Tilapla nilotica and T. galiliae. Sometimes the metacercariae were found in the internal organs e.g. liver and kidney. The highest density was found in the head region and represented by 73 - 117 (98) metacercariae and the lowest was found in the trunk region and is represented by 50 - 94 (66) metacercariae while in the caudal region, the density was found 62 - 104 (81) metacercariae (table 3, fig. 2).

The same table indicates that two types of metacercariae (metacercaria vivax, and cynodiplostomatid metacercaria) were found in the muscles of Clariae lazera. The density was higher in the head region which varies between 119 - 202 (148) metacercariae per gram tissue, then the trunk reion which contains 102 - 168 (132) metacercariae per gram tissue and the lowest was found in the caudal region which contains 95 - 138 (114) metacercariae per gram tissue. These metacercariae were rarely found in the liver and kidney of Clarias laxera.

Table (3) also indicates that two types of metacercariae (metacercaria vivax and metacercaria of Haplorchis pumilio were found in the muscles of Bagrus bayad. They were found in the head, trunk and caudal ragions, and in the muscles of buccal cavity. The density was higher in the trunk region whcih was ranged between 119 - 167 (139) metacercariae per gram tissue, then the tail region which is about 96 - 137 (120) metacercariae per gram tissue and lastly the head region especially near the base of the pectoral fins which ranged between 81 - 124 (102) metacercariae per gram tissue (table 3, fig. 2).

The same table indicates thet one type of metacercariae (metacercaria vivax) was found in the superficial muscles of Mormyrus kannume. The density was higher inthe caudal region whcih was 61 - 107 (86) metacercariae per tissue, then trunk region which contains 49 - 98 (72) metacercariae per gram tissue and the lowest wa found in the head region especially near the base of pectoral fins which was represented by 42 - 77 (55) metacercariae per gram tissue (table 3, fig 2).

Table (3) also indicates that two types of metacercariae (metacercaria vivax and metacercaria of Haplorchis pumilio were found in the muscles of Schilbe mystus. The highest density of metacercariae was found in the trunk region which contains 104 - 147 (130) metacercariae per gram tissue, then the caudal region which contains 99 - 136 (116) metacercariae per gram tissue, and lastly the head region especially near the base of the pectoral fins which contains 79 - 120 (96) metacercariae per gram tissue (table 3, fig. 2).

Occasionally metacercaria vivax and diplostomulum metacercaria were found in the stomach of one specimen of Schilbe mystus which contains a semidigested young Tilapia niotica.

The comparison between the 5 types of metacercariae is shown in table 64).

DISCUSSION

The result of the present study revealed the presence of 5 types of metacercariae namely metacercaria vivax, metacercaria of Haplorchis pumilio, clinostomatid metacercaria, cynodiplostomatid metacercaria and diplostomulum metacercaria recovered from the fishes of the River Nile at El-Minia Province which constitue a new locality for these metacercaia.

The results also revealed the presence of metacercariae in 6 species of fishes namely Tilapia nilotica, T. galilae, Clariae lazera, Bagrus bayad, Mormyrus kannume and Schilbe mystus. The metacercariae of Bagrus bayad were studied for the lst time by the present authors.

The results indicates that the incidence of infection with metacercariae in all the fish examined was 82.39 % and the highest incidence of infestation was found in Clarias Lazera (90.89 %) followed by Schilbe mystus (87.44 %), Bagrus bayad (82.42 %), Tilapia nilotica and T. galilae (76.39 %) and lastly Mormyrus kannume (71.51 %) (table 1).

Such results are nearly similar with that recorded by EL-NAFFAR (1970) and HASSAN (1980) for the metacercariae of Schilbe mystus, Tilapia nilotica and Mormyrus kannume.

Table (2) revealed that the highest incidence with metacercariae was found in summer and spring (90.25 %) and (83.62 %) respectively. Such results are coincide with that reproted by BOULOS (1979) for Tilapia nilotica infested with metacercariae of Pygidiopsis genata which she stated that the prevalence of infection was higher during the summer months than other seasons.

Table (1) shows that 4 types of metacercariae were found in the muscles and kidneys of Tilapia nilotica and T. galilae, two types in Clarias lazera, two types in Bagrus bayad, one type in Mormyrus kannume and two types in Schible mystus which coincide with the results obtained by HASSAN (1980) and EL-NAFFAR et al. (1985) for the metacercaria of the lst three types of fishes; but in contrast with them for the metacercaria of Schilbe mystus in which they reproted that one type of metacercaria was found in Schilbe mystus.

The density of the metacercariae in different region of the fish examined was studied in the present work. It was found the highest density with metacercariae in Tilapia nilotica and T. galilae nilotica and T. galilae was found in the head region and the lowest in the trunk region, such results are coincide with the results of BOULOS (1979) which stated that the metacercariae of Pygidiopsis genata in Tilapia nilotica was found mostly in the head region followed by the tail and body of the fish.

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Table (1)

The relative incidence of the fish examined with the metacercariae collect fro them

Fishes				Type of metacercariae
Scientific name	Total nubmber			
	examined	infected		
		No.	%	
Family Cichlidae : Tilapia nilotica, Tilapia galilae	665	508	76.39	metacercaria vivax, metacercaria of Haplorchis pumilio, clinostomatid metacercaria and diplostomulum caria.
Family Clariidae Clarias lazera	560	509	90.89	metacercaria vivax and cynodiplostomatid metacercaria.
Family Bagridae Bagrus bayad	364	310	82.42	metacercaria vivax and metacercaria of Haplorchis pumilio.
Family Mormyridae Mormyrus kannume	344	246	71.51	metacercaria vivax.
Family Schilbeidae Schilbe mystus	390	341	87.44	metacercaria vivax and metcerceria of Haplorchis pumilio.
Total	2323	1914	82.39	

Table (2)

The relative incidence of metacercariae in different species of fish examined durin different seasons.

Seasons	Summer 81			Autumn 81			Winter 82			Spring 82		
	No. of fish examined	No. of fish infected	% of infection	No. of fish examined	No. of fish infected	% of infection	No. of fish examined	No. of fish infected	% of infection	No. of fish examined	No. of fish infected	% of infection
Tilapia nilotica Tilapia galilae	217	184	84.79	147	110	74.83	115	69	60	186	145	77.96
Clarias lazera	198	195	98.48	112	99	88.39	97	75	77.30	153	140	91.50
Bagrus bayad	130	120	92.30	79	66	83.54	63	45	71.43	92	79	85.87
Mormyrus kannume	130	104	80	75	52	69.33	59	32	54.24	80	58	72.50
Schilbe mystus	115	110	95.65	102	87	85.30	79	59	74.68	94	85	90.43
Total	790	713	90.25	515	414	80.39	413	280	67.80	605	507	83.62

Table (3)

The number and average number of metacercariae per gram of muscle tissue from head, trunk and caudal regions of the different fish examined

Types of fish	Type of metacercariae	Average number of metacercariae per gram tissue from fish		
		head region	trunk region	caudal region
Tilapia nilotica tilapia galilae	metacercaria vivax metacercaria of Haplorchis pumilio, olinostomatid metacercaria and diplostomlus metacercaria.	73-117(98)	50-94(66)	62-104(81)
Clarias lazers	metacercaria vivax and cynodiplostomatid metacercaria.	119-202(148)	102-168(132)	95-138(114)
Bagrus bayad	metacercaria vivax and metacercaria of Haplorchis pumilio.	81-124(102)	119-167(139)	96-137(120)
Mormyrus kannume	metaceroaria vivax	42-77(155)	49-98(72)	61-107(86).
Schilbe mystus	metacercaria vivax, and metacercaria of Haplorchis pumilio.	79-120(96)	104-147(130)	99-136(116)

Table (4)

Comparison between the 5 types of metacercariae (Measurements are in microns)

Types of metacercariae	metacercaria vivax	metacercaria of Haplorchis	clinotomatid metacercaria pumilio	cynodiplostomatid metacercaria	diplostomulum metacercaria
Host	Tilapia nilotica, Tilapia nilotica T.galilae, Clarias lazera, Bagrus bayad, Mormyrus Kannume and Schilbe mystus.	Tilapia nilotica Bagrus bayad and Schilbe mystus	Tilapia nilotica and T.galilae	Tilapia nilotica Clarias lazera	and T.galilae
Shape	Spherical, subspherical or elliptical.	spherical to oval	spherical	elliptical	elliptical or oval
Size	240-360(305) diameter or 260 - 480 by 200 - 360 (390 x 280)	140-370(234) diameter or 160-380 by 120 - 290 (220 x 170)	4200 - 6300 (5400)	680 - 960 * 440 - 500 (794 x 573)	740 - 860 * 440 - 660 (795 x 530)
Cyst wall	thick, granular	thick	very thick	thick	delicate
Suckers	well developed	difficulty seen	difficulty seen	well developed	well developed
Black pigment	may be present	-	-	-	-
Stalk process	-	-	-	-	at one pole
Adipose tissue	may be present	-	-	-	-
Black vesicle	may be present	present	-	-	-
Light spots	-	may be present	-	-	-

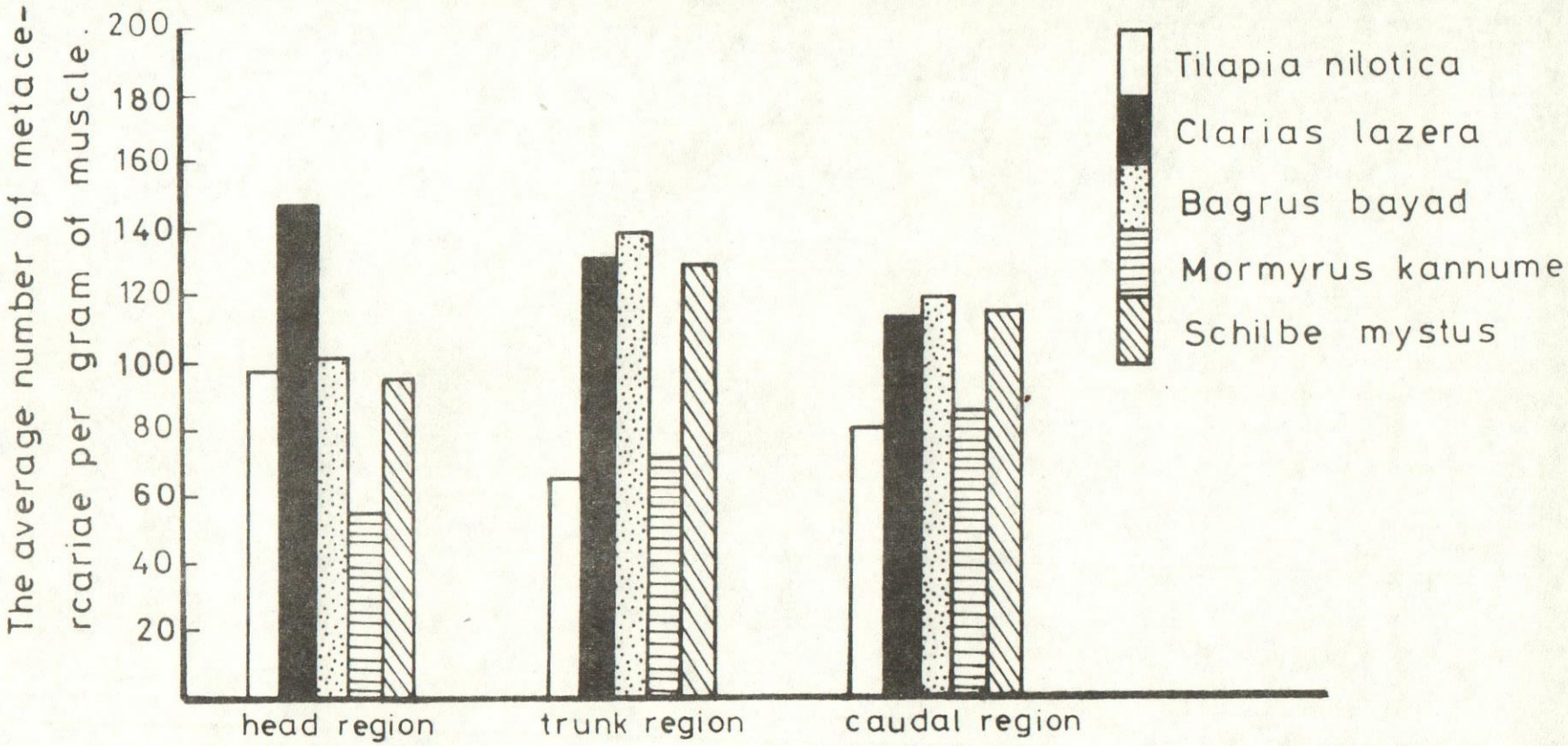

Fig. 2 : The relative incidence of metacercariae of muscle in each region of ten fish of different species of fish examined.