A REVISION STUDY ON SOME PROTOZOAL INFECTIONS IN NILE CATFISH (CLARIAS LAZERA) IN UPPER EGYPT AFTER 20 YEARS

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SUMMERY

The present study was carried out on 160 catfish Clarias lazea collected from upper Egypt. The study revealed four different species of protozoa *Henneguya branchialsis; myxobolus spheroidalis; Trichadina fultoni and Trypanosoma mukasai* in percentage of 35.5%, 22.6%, 21.0% and 21.0% respectivley. While the total percentage of infected fish was (38.75%). The present study clarified that the highest percentage of isolated three previous protozoal infection occurred during summer season and the lowest in winter season. On the other hand, the infection of *Trypanosoma mukasai* was higher during winter season and lower in summer season.

INTRODUCTION

The protozoal infection pronounced serious pathological affections as well as significant economic harzzard among fish population. Internal protozoa may be described as one of the most important parasitic affection among cultured and wild fresh water fish, (Hoffman, 1970). The most common and widely spread internal protozoal infection of fish are due to *Myxosporidia* spp. *(Hennegyua* and *Myxobolus spp.), Trichodina* spp. and the blood protozoa, Trypanosoma spp. As the available literature about the true incidence of protozoal infection among cat fish in Egypt is Scanty, thus, it was found worthy to make an inquiry on the subject after 20 years from the work carried by El-Naffar (1970) and Fahmy et. al., (1971) in upper Egypt. The Nile cat fish, *Clarias lazera* is one of the most popular economic predatory fish in Egypt, where it is exposed to several protozoal infection. This work included the prevalence, incidence and seasonal distribution of internal protozoa infection among Nile cat fish, Clarias lazera in upper Egypt.

MATERIAL AND METHODS

A total of 160 living Nile cat fish, Clarias lazera were collected form upper Egypt. They were examined for internal protozoa during the year 1993. The fish were brought alive in plastic bags filled with water; air (2:3). Their length ranged between 21-32 cm & weight 110-135 gm. The surface water temperature at site of collection at mid day was registed and their seasonal mean was calculated. Clinical examination was done on the living fish in the aereated glass aquaria with chlorine free tap water. They were grossly examined for detection of any external lesions or visible cysts and grossly visble lesions were isolated and immediately examined microscopically. Thin blood films were taken from heart or caudal vein, then they were airdried, fixed with methanol and stained with Giemsa for 30 to 45 minutes. Then they were rinsed intap water and left to dry and examined under the oil immersion lens. Direct smears were made form cysts of suporbranchial organs and gill; filaments, liver and kidney were dissected out and gently pressed between two slides where wet preparation were made on dry clean slide, air dry and fixed with methanol for 5 minutes. They were stained with Giemsa stain for 30 to 45 minutes, washed in tap water and examined microscopically.

RESULTS

From a total of 160 Nile cat fish Clarias lazera examined 62 fish were found infected with protozoal parasites in a percentage of 38.75% at the different seasons of the year in (Table I).

The clinical signs noticed were emaciation, weakness and sluggish movements among infected fish, in some cases fading in colour and hypersecreation of mucous were noticed on gill leaflets.

Table (I): Seasonal Prevlence of internal Protoza in Clarias lazera.

Season	total of fish examined	No. of infected fish.	% of infection	Temperature at midday C°
Spring: march May	40	16	40	26 ± 2
Summer June August	40	17	42.5	28 ± 2
Autumn September November	40	15	37.5	24 ± 2
Winter december February	40	14	35	18 ± 2
Total	160	62	38.75%	

Table (II): Incidence Percentage of internal protozoa in *Clarias lazera*.

Parasites	No. of examined fish.	No. of protozoaisolated	% of infection
Henneguay branchialis	160	22	35.5
Myxobolus spheroidalis	160	14	22.6
Trichodina fultoni	160	13	21
Trypanosoma mukasai	160	13	21
		62	

From the data in (Table II), the examination of Nile cat fish under investigation revealed that they were infested with *Henneguya brannchialis, Myxobolus spheroidalis, Trichodina fultoni* and *Trypanosoma mukasai.*

the cysts oozed viscoid contents including a great number of Henneguya spores. The spores were elongated fusiform inshape, containing 2 equal banana shaped polor capsules, each with 2 caudal processes and an oval to rounded vacuole. From the present study it could be concluded that the

Table (II): Seasonal distribution of protozoa in Clarias Lazera.

Season	Henneguya branchialis	%	Myxobolus spheroidalis	%	Trichodina fultoni	%	Trypanosoma mukasai	%	Total
Spring	6	27.3	4	28.6	4	30.8	2	15.4	16
Summer	7	31.8	4	28.6	4	30.8	2	15.4	17
Autumn	5	22.7	4	28.6	3	23.1	3	23.1	15
Winter	4	18.2	2	14.3	2	15.4	6	46.2	14
Total	22	35.5	14	22.6	13	21.0	13	21.0	62

***Henneguya branchialis* (Fig. I)**

The macroscople cysts of *Henneguya* spp. were observed in 22 out of 62 *Clarias lazera* fishes (35.5%). They were located in the suprabranchial organs. The cysts were ovoid to rounded in shape, whitish white creamy in colour, firm in consistency and of different sizes. When rupurted,

percentage of infection with *Henneguya branchialis* was the highest rate (35.5%) especially in summer and lowest in winter in (Table III).

Myxobolus spheroidalis (Fig. 2)

The macrospic cysts of *Myxobolus* spp. showed in

Fig (1): Henneguya branchialis (X400)

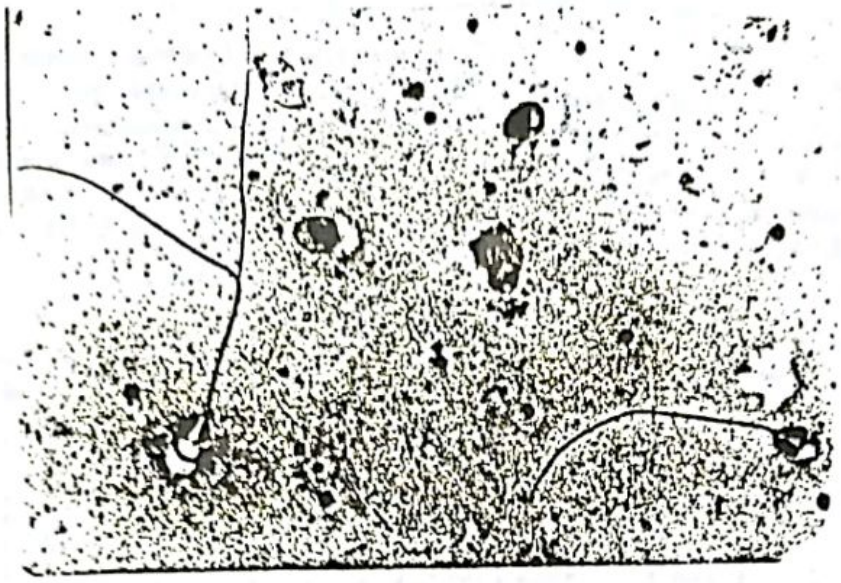

Fig (2):Myxobolus Spheroidalis. (X 400).

14 out of 62 Nile cat fish (22.6%). Cysts isolated from liver were whitish in colour, ovoid in shape. The spores of this species were found in smears prepared from liver cysts; they were almost broad oval in shape. In some spores polar filaments were naturally extruded from the polar bodies. From present study found that rate of infection with Myxobolus spheroidalis lowest incidence in winter and increased in spring, in (Table III).

Trichodina fultoni (Fig. 3)

This parasite was obtained form 13 out of 62 Nile cat fish (21%). The parasite was isolated from posterior kidneys of Nile cat fish in the present study. The parasite sporadically appeared as large trichodinid with discs. The adhesive disc was saucer shaped being surrounded with a finely striated border membrane. The cilia were absent. In (Table III) found that the infection with *Trichodina fultoni* was lowest incidence in winter and increased in spring.

Trypanosoma mukasai Hoare (1932) Fig. (4)

Fig (3): Trichodina fultoni (X 1000).

Fig (4): Trypanosoma mukasai (X 1000).

The parasite was obtained from 13 out of 62 Nile cat fish (21%). The organisms were polymorphic trypamostigotes. Both ends were tapering with the anterior end more slender and cytoplasm appeared less deeply stained, highly and finely granular. The nucleus was oval, located infront of the middle and reddish stained from the data display in (Table III) found that the infection with Trypanosoma mukasai is highest in winter and lowest in summer.

DISCUSSION

Almost for the reviewing literature found that a wide spread of protozoan infection among fresh water fish allover the world. While in Egypt was comparatively few authors have dealt with protozoan parasites infesting fresh water fish (Haiba, 1963; El-Naffar, 1970; Fahmy et. al., 1971 and 1975; Imam et. al., 1985, and 1987; Abu-Alwafa, 1988; Abdel Meguid, 1989; Ashmawy, et. al., 1989 and Alyain, 1990). In this investigation 62 Nile cat fish *(Clarias lazera)* were found to harbour protozoa infection in percentage of 38.75%. These results are in agreement with Imam et. al., (1987) and Alyain (1990).

Henneguya branchialis was found to parasitize 35.5% of Clarias lazera. This percentage was higher than that recorded by Alyain (1990). However, El-Naffar (1970) did not notice that parasite among fish in upper Egypt.

Also, this protozoan was mostly seen in summer and rarely in winter. These results are in agreement with that recorded by Alyain (1990) but disagree with that recorded by Abu-Alwafa (1988) who found that their maximum infection infresh water fish in lower Egypt (Behera governorate) was in spring. Moreover, Narasimbamurti and Kalavati (1989) reported that the peak of that protozoan was in winter.

Myxobolus spheroidalis reached 22.6% among investigated cat fish; this incidence was higher than that reported by Alyain (1990) who reported 9.4% in the some fish from lower Egypt. Also Ashmawy et. al., (1989) detected thisparasite and that its maximum level of infection was during summer and least during winter in Clarias lazera captured from Edfina. Also, Boahua et. al., (1979); Kovacs and Molnar (1983) and Korting and Hermanns (1984) stated that infection with Myxobolus was mostly seen during July and August.

Trichodina fultoni was found to parasitize 21.0% Nile cat fish. This finding agreed with Brown and Gratzek (1980) who stated that smaller forms of trichodina had been observed in the English channel cat fish fingerling and in marine species. This ciliate was previously registed from the outer surface and gills of Clarias lazera by Abou Al-Wafa (1988). However Alyain (1990) found that infection rate of parasite in the kidneys in Nile cat fishes from lower Egypt within of 8%. The presence of *Trichodina* spp. in the kidneys fishes was mentioned by Davis (1970), Amlacher (1970). Arthur and Lom (1984). Alyain (1990) stated that *Trichodina* appeared in hemoblotic tissue between renal tubules in the posterior kidney. The present study revealed that infection with *Trichodina* reached to its maximum level during summer and lowest in winter and autumn. This result is supported by conclusion of Kovting and Hermanns (1984) and Alyain (1990). *Trypanosoma mukasai* in this investigation reached to 21.0 % among cat fish. This percentage is higher than reported by of Haiba (1963) who stated that 14% of Nile cat fish from Giza governorate and Alyain (1990) 11.4 of Nile cat fish from Lower Egypt.

In the present study found that the maximum level of infection with *Trypanosom mukasai* occurred during winter and least during summer due to presence of leeches as the vector for these parasites in witner season.

The significant importance of this work is highly incidence of protozoal infection (38.75%) in the summer season than other season. Probably the incease of temperature during the summer season may affect the oxygen present. This leads the fish to migrate to the margin of the nile where the water is not deep and water better aerated.

Probably infection can take place where the I. H. or vectors are found. On the other hand the biological pollution of aquatic faunna acts as an

important factor to pronounce the species of infection than other roles. The infection with these protozoal parasites could be considered as stress factors to initiate the infection with bacterial and fungal agents as secondary in vador. On the control of these parasites the workes suggest to use antiprotozoal durgs to water near the border as well as control of I. H. or vector would be easy.

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REFERENCES

Abdel Meguid, M. A. (1989): Parasitological and histopathological studies on the grass carp.M. Sc. Thesis, Ain Shams University.

Abou Al-Wafa, S. A. (1988): Protozoa parasities of some fresh water fishes in Behera Governorate. M. Sc. Thesis, Alexandria University.

Alyain, S. A. (1990): Studies on certain internal protozoal infections of Egyptian fresh water fish. Ph. D. Thesis, Alexandria University.

Amlacher, E. (1970): Text book of fish Disease, Labortory Fur Fischkrankheiten, Dip. Biol. Eiten, Bealin. Translated by D. A., Conroy and R. L. Hermon, Published by Gustav Fisher Verlay, Jena D. D. R. T. F. S. Publication Jersy, U. S. A. pp. 117-135.

Arthur, J. R. and Lom, J. (1984): Trichodinid Protozoa (Ciliophara: Peritrichida) from fresh water fishes of Rybinsk Reservoir USSR. J. Protozoal: 31(1) 82-91.

Ashmawy, K. L.; Abou El-Wafa, S. A.; Imam, E. A. and El-Otifi, Z. (1989): Description of newly recorded Myxosporidium Protozoa of fresh water fishes in Behera Province, Egypt. J. Egypt. Vet. Med. Ass. 49: No. 1-2: 43-53.

Baohua, W.; Shuxia, W.; Yushan, g.; Chuancal, L. and Lifeng, H. (1979): The Pathogenic agent of twist disease of the silver carp in Hangzhou region of Zhjiang Province. Acta Zoologica Sinica 25 (1): 50-57.

Brown, E. E. and Gratzek, J. B. (1980): Commonfish and their control. Fish Farming Hand book, pp. 287-288.

Davis, H. S. (1970): Parasites and disease of Game fishes. Internal animals parasites pp. 237-246. University of California Press, Beskeley, Los Angeles, London.

El-Naffar, M. K. (1970): Studies on parasites of Nile fishes (Some Parasites in Assiut Province). Ph. D. Thesis, Assiut University.

Fahmy, M. A.; Mandour, A. M. and El-Naffar, M. K. (1971): *Myxobolus niloticus* n. sp. in the fish *Labeo niloticus* from the River Nile of Assiut. J. Egypt. Soc. Parasit., 1: 39-46.

Fahmy, M. A.; Mandour, A. M. and El-Naffar, M. K. (1971a): A survey of *Myxosporidia* of fresh water fish collected form River Nile at Assiut Province. J. Egypt. Soc. Parasit. 4&5 : 93-102.

Haiba, M. H. (1963): On the Nile fish Parasites in Egypt. H. A. Egypt. II. A new host record with detailed study of *Trypansoma mukasai*.. Hoare (1932) in Egyptian Nile fish *(Clarias lazera)*. J. Arab. Vet. Med. Ass., 23: 27-34.

Hoffman, G. L. (1970): Parasites of North American Fresh water Fishes. Univ. California Press, Berkeley and Los Angeles, 21.

Imam, E. A.; Marzouk, M. S. M.; Hassan, A. A.; Derhally, F. S. and Itman, R. H. (1985): Studies on blood parasites in fection in Nile fishes. J. Egypt. Vet. Med. Ass., 2: 97-108.

Imam, E. A.; Ramadam, E. L. and Derhally, F. S. (1987): On some internal protozoa infecting some Nile fishes in Egypt. J. Egypt. Vet. Med. Ass., 47: 55-61.

Korting, W. and Hermanns, W. (1984): Myxosporidian infection in the kidney of carp *(Cyprinus carpio)* in pond farm in Lower Saxony (GFR). Berliner und Munchener Tieraztliche Wochenschrift 97 (7): 255-259.

Kovacs-Gayar, E. and Molnar, K. (1983) Studies on the biology and pathology of the common carp parasite *Myxobolus basilamellaris* lomet Molner, 1983 (Myxozoa: Myxosporea). Acta Veterinaria Hungarica 31 (1/3): 91-102.

Narasimhamurti, C. C. and Kalavati, C. (1984): Seasonal Variation of *Myxosporidian, Hennguya waltairensis* parasitic in the gills of fresh water fish, Channa punctatus Bl. Arch. Protistenk., 128: 351-356.