



RESEARCH ARTICLE

The Annals of Zoology

ISSN (Print): 0003-5009

Annals of Zoology, Vol. 29; December 2013, 20-24

©All Rights Reserved Council of Natural Sciences, India

Studies on a Protozoan Parasite, *Myxobolus* in Some Fresh Water Fishes

Dhan Devi Misra

Department of Zoology, D.S. College, Aligarh

Email: dhandevimisra@gmail.com

ABSTRACT

Studies were performed on a protozoan parasite, *Myxobolus* in some fresh water fishes. Different fishes were found to be differently infected. Observations indicate that Locality F (Shekha Lake in Aligarh region) was highly infected in comparison to other localities. *Channa striatus* fish was found to be highly infected in comparison to other fishes.

Key words: *Myxobolus*, *Channa striatus*, Fish, Aligarh

INTRODUCTION:

Fishes are one of the most numerous vertebrate species and represent more than half of the total vertebrates present around the world. They constitute natural food of many animals including human beings. They contain proteins, vitamins and minerals. Like all animals fishes also suffer from a number of diseases.

The great majority of the infectious diseases of fishes are caused either by bacteria or by protozoa (Khanna, 2000). Among the protozoan parasites sporozoans are largest in number. These are the endoparasites occur in the skin, muscles and various visceral organs and are causative agents of various diseases in fishes. Among the sporozoan parasites, *Myxobolus* is an important fish parasite. Many species of *Myxobolus* are highly pathogenic, often causing fatal diseases or even death of host fish. *Myxobolus* affects fish population by causing mortality, reduction in growth, weight loss, and suppression of reproductive activity. The significance of recognizing these parasites increases with the development of aquaculture. In natural waters fishes exhibit diseases in exceptional cases, but when fishes are in small water bodies, they often get diseased (Chakravarti, 1994).

Many workers have reported the infection of *Myxobolus* in fishes, Yu and Wu (1992), Kent et al (1994), Hoffman, G.L. (1990), Das and Mukherjee (1998), Molnar and Szekeley (1999) and Molnar (2000), Das et al (2000) and Biswas (2000). Present study has been conducted to study the *Myxobolus* infection in some fresh water fishes in Aligarh region.

MATERIAL AND METHODS:

The fresh water fishes were brought to the laboratory from different localities, such as Ganga River in Narora (locality A), Yamuna River in Mathura (Locality B), Canals (locality C), Kali Dah (locality D), Kali Nadi (Locality E) and Shekha Lake (Locality F) in Aligarh region, and kept in aquarium. The behavioral and gross pathomorphological changes in the spontaneous cases were recorded. The fishes were dissected to remove gills, kidney and liver. Tissue samples from these organs were taken and fixed in Bouin's solution for 24 hours, dehydrated using graded series of alcohol, embedded in paraffin wax, sectioned and examined by light microscope. Finally photomicrographs were taken out with the help of a digital camera.

RESULTS AND DISCUSSION:

Protozoan parasite *Myxobolus* represents an important group of fish parasite. Many species of this parasite are highly pathogenic. Present investigation was conducted on 8

fresh water fishes i.e. *Channa striatus*, *Heteropneustes fossilis*, *Clarias batrachus*, *Labeo rohita*, *Wallago attu*, *Catla catla*, *Cirrhina mrigala* and *Mystus seenghala*. These are abundantly present in Aligarh region and are very popular as food fishes. These fishes (living specimens) were collected from different localities and were dissected to remove gills, kidney and liver. The body weight and length of all fishes under observation was measured before dissection.

For the present study 670 specimens of 8 species of fishes were collected from Aligarh region from various localities as mentioned in material and methods. Some of the species such as *Heteropneustes fossilis*, *Clarias batrachus* and *Channa striatus* were collected from all localities. *Labeo rohita* and *Wallago attu* were collected from the Ganga River in Narora (Locality A) and Yamuna River in Mathura (Locality B). *Catla catla*, *Cirrhina mrigala* and *Mystus seenghala* were collected from Ganga River in Narora (Locality A).

Table 1: Collection of fishes from different Localities

S. No.	FISH	LOCALITIES					
		A	B	C	D	E	F
1.	<i>Heteropneustes fossilis</i>	+	+	+	+	+	+
2.	<i>Catla catla</i>	+	-	-	-	-	-
3.	<i>Labeo rohita</i>	+	+	-	-	+	+
4.	<i>Clarias batrachus</i>	+	+	+	+	+	+
5.	<i>Cirrhina mrigala</i>	+	-	-	-	-	-
6.	<i>Mystus seenghala</i>	+	-	-	-	-	-
7.	<i>Wallago attu</i>	+	+	-	-	-	-
8.	<i>Channa striatus</i>	+	+	+	+	+	+

+ = Present species; - = Absent species

Table 2: Incidence of infection of *Myxobolus* in fishes of different Localities

Locality of host	No. of fishes examined	No. of infected fishes	% of infection
A	180	17	9.44
B	150	12	8.00
C	80	0	0
D	78	0	0
E	92	6	6.52
F	100	30	30.0

The table-2 clearly indicates fishes in locality F (Shekha Lake in Aligarh region) were most highly infected in comparison to other localities. 30 out of 100 fishes observed were found infected in this locality. However, fishes in locality A (Ganga River in Narora), locality B (Yamuna River in Mathura) and locality E (Kali Nadi) were less abundantly infected i.e. 9.44%, 8.0%, 6.52% respectively. In other two localities i.e. locality C and locality D (Canals and Kali Dah near D.S. College, Aligarh) fishes were not found to be infected with *Myxobolus*.

The incidence of infection in all 8 species of fishes in same localities has also showed interesting variations. These variations are shown in different tables form table 3-8.

Table-3 shows percentage of infection of *Myxobolus* in 8 species of fishes taken for present investigation from locality A (Ganga River in Narora). The table clearly indicates the highest infection in *Channa striatus* (34.78%) which decreases respectively in *Clarias batrachus* (15.62%), *Heteropneustes fossilis* (10%), *Labeo rohita* (5%), while other species such as *Catla catla*, *Cirrhina mrigala* and *Mystus seenghala* and *Wallago attu* were not found to be infected.

Table 3: Infection of *Myxobolus* Parasite in different fishes from locality (A)

S. No.	Name of Fish	No. of Fishes Examined	No. of Fishes Infected	%age of infection
1.	<i>Heteropneustes fossilis</i>	30	3	10
2.	<i>Clarias batrachus</i>	32	5	15.62
3.	<i>Channa striatus</i>	23	8	34.78
4.	<i>Labeo rohita</i>	20	1	5
5.	<i>Catla catla</i>	17	0	0
6.	<i>Cirrihina mrigala</i>	15	0	0
7.	<i>Mystus seenghala</i>	21	0	0
8.	<i>Wallago attu</i>	22	0	0

Table-4 shows percentage of infection of *Myxobolus* in 5 species of fishes present in locality B (Yamuna River in Mathura). The table indicates the highest infection in *Channa striatus* (31.57%) which decreases respectively in *Clarias batrachus* (12%), *Heteropneustes fossilis* (7.4%), *Wallago attu* (4%) while other species such as *Labeo rohita* was not found to be infected.

Table 4: Infection of *Myxobolus* Parasite in different fishes from locality (B)

S. No.	Name of Fish	No. of Fishes Examined	No. of Fishes Infected	%age of infection
1.	<i>Heteropneustes fossilis</i>	27	2	7.4
2.	<i>Clarias batrachus</i>	25	3	12
3.	<i>Channa striatus</i>	19	6	31.57
4.	<i>Labeo rohita</i>	54	0	0
5.	<i>Wallago attu</i>	25	1	4

Table-5 and Table-6 show percentage of infection of *Myxobolus* in 3 species of fishes present in locality C (Canals) and locality D (Kali Dah). Both tables show no infection.

Table 5: Infection of *Myxobolus* Parasite in different fishes from locality (C)

S. No.	Name of Fish	No. of Fishes Examined	No. of Fishes Infected	%age of infection
1.	<i>Heteropneustes fossilis</i>	27	0	0
2.	<i>Clarias batrachus</i>	24	0	0
3.	<i>Channa striatus</i>	29	0	0

Table 6: Infection of *Myxobolus* Parasite in different fishes from locality (D)

S. No.	Name of Fish	No. of Fishes Examined	No. of Fishes Infected	%age of infection
1.	<i>Heteropneustes fossilis</i>	30	0	0
2.	<i>Clarias batrachus</i>	22	0	0
3.	<i>Channa striatus</i>	26	0	0

Table-7 shows percentage of infection of *Myxobolus* in 3 species of fishes present in locality E (Kali Nadi). The table indicates the highest infection in *Channa striatus* (10%) which decreases respectively in *Clarias batrachus* (5.55%) and *Heteropneustes fossilis* (3.84%).

Table 7: Infection of *Myxobolus* Parasite in different fishes from locality (E)

S. No.	Name of Fish	No. of Fishes Examined	No. of Fishes Infected	%age of infection
1.	<i>Heteropneustes fossilis</i>	26	1	3.84
2.	<i>Clarias batrachus</i>	27	2	5.55
3.	<i>Channa striatus</i>	30	3	10

Table-8 shows percentage of infection of *Myxobolus* in 3 species of fishes present in locality F (Shekha Lake in Aligarh region). The table clearly indicates the highest infection in *Channa striatus* (46.87%) which decreases respectively in *Clarias batrachus* (28.57%) and *Heteropneustes fossilis* (17.5%).

Table 8: Infection of *Myxobolus* Parasite in different fishes from locality (F)

S. No.	Name of Fish	No. of Fishes Examined	No. of Fishes Infected	%age of infection
1.	<i>Heteropneustes fossilis</i>	40	7	17.5
2.	<i>Clarias batrachus</i>	20	8	28.57
3.	<i>Channa striatus</i>	32	15	46.87

Table-9 shows the highest percentage of infection in *Channa striatus* while the lowest percentage of infection was found in *Labeo rohita* in all localities.

Table 9: Infection of *Myxobolus* Parasite in different fishes

S. No.	Name of Fish	No. of Fishes Examined	No. of Fishes Infected	%age of infection
1.	<i>Heteropneustes fossilis</i>	180	13	7.22
2.	<i>Clarias batrachus</i>	159	18	11.3
3.	<i>Channa striatus</i>	159	32	20.12
4.	<i>Labeo rohita</i>	74	1	1.35
5.	<i>Catla catla</i>	17	0	0
6.	<i>Cirrhina mrigala</i>	15	0	0
7.	<i>Mystus seenghala</i>	21	0	0
8.	<i>Wallago attu</i>	47	1	2.12

In this study the most infected species was *Channa striatus*. The maximum percentage of *Myxobolus* infection has been found in *Channa striatus*. *Clarias batrachus* and *Heteropneustes fossilis* were also found to be infected, but infection is less in comparison to *Channa striatus*. *Labio rohita* and *Wallago attu* were less infected, While no infection has been reported in *Catla catla*, *Cirrhina mrigala* and *Mystus seenghala* (Table-9).

Thus locality F (Shekha Lake in Aligarh region) was highly infected in comparison to locality A (Ganga River in Narora), locality B (Yamuna River in Mathura) and locality E (Kali Nadi), while no infection was found in locality C and locality D (Canals and Kali Dah).

ACKNOWLEDGEMENT:

The author is highly thankful to the staff of fisheries department for their help in this study.

REFERENCES:

1. Biswas K.P. (2000): Prevention and control of fish and prawn diseases. II Edition, Narendra Pub. House, Delhi, 1-222.
2. Chakrabarti N.M. (1994): *Diseases of cultivable fresh water fishes and their control*. International books & Periodicals supply service Pub. Delhi, 35: 1-143.
3. Cone, David, K., Stickel, R.G., Eck, G.W., Muzzall, P.M. (1996): *Myxobolus cognate* n.sp; (Myxosporea) from the opercular integument of *Cottus cognatus* (Cottidae) in Lake Michigan. J. Parasitol., 82(1):137-139.
4. Das, BK and Mukherjee, SC (1998): Pathology of black spot discuse in fry and finger lings of Rohu, *Labeo rohita*. Geobios, 25:102-104.
5. Das, BK and Mukherjee, SC and Murjani, G (2000): Histopathological studies on the myxoboliasis of *Cirrhinus mrigala*. Indian J. Fish, 47:61-64.
6. Duijn C. Van Jr. (2000): *Diseases of fishes*, Reprinted. Narendra Publ. House, Delhi: 174 pp.
7. Hoffman L (1990): *Myxobolus cerebralis* a worldwide cause of salmonid whirling diseases. J. of Aquatic Animal Health, 2:30-37.

8. Kent, ML, Margolis, L and Corliss, J O (1994): The demise of a class of protists: Taxonomic and nomenclatural revisions proposed for the protist phylum Myxozoa Grasse, 1970. *Canadian J. of Zoology*, 72:932-937.
9. Khanna, S.S. (2000). An introduction to fishes. Reprinted. Central book depot publication, Allahabad: pp 459-469.
10. Molnar, K and Szekely, C. (1999). Myxobolus infection of the gills of common bream (*Abramis brama*) in Lake Balaton and in the Kis-Balaton reservoir, Hungary. *Acta Veterinaria Hungrica*, 47: 419-432.
11. Molnar, K. (2000): Survey on Myxobolus infection of *Alburnus alburnus* in the River Danube and in Lake Balaton. *Acta Veterinaria Hungrica*, 48:421-432.
12. Pandey, K and Shukla, J.P. (2005): Fish and Fisheries. 1st ed. Rastogi Publication, Meerut, pp. 444-460.
13. Srivastava, C.B. (1975): Fish pathological studies in India a brief review, 349-358.
14. Yokoyama, H., Ogawa, K. and Wakabayashi, H. 1995. *Myxobolus cultus* n.sp. (Myxosporea: Myxobolidae) in the Actinosporean stage in the oligochaete *Branchiura sowerbyi*. *J. Parasitol.*, 81(3): 446-451.
15. Yu Y. and Wu B. (1992): Histopathological changes: Studies on the twist disease of *Hypophthalmichthys molitrix*. *J. Zhejiang Coll. Fish Zhjiang Sulichan Xaeyuan Xaebao*, 11:95-97.