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Helminth Parasites of Fishes of Chatla Haor Wetland in Cachar District of Assam

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Abstract

Fish culture as a hobby or business is well established throughout the world. Increased interest in fish culture has also increased awareness and experience with parasites that affect fish health, growth and survival. A common mistake of fish culturists is misdiagnosing disease problems and treating their sick fish with wrong medication or chemical. Selecting the wrong treatment may be more detrimental to the fish than no treatment at all. A preliminary study of helminth infected fishes revealed that1 13.6% of fishes in the Chatla Haor are infected with different types of helminth parasites. Out of 12 species of fishes belonging to four orders % of occurrance was found to be maximum in *Channa punctatus* (33.33%) and minimum in *Puntius ticto* (11.11%). Among the four orders Perciformes shows the highest degree of infection (27.58%).

Key words : Helminth parasites, Prevalence of infection, Intensity of infection, Water quality, Host specific.

Fish are in equilibrium with potential disease organisms and their environment. Changes in this equilibrium, viz. deterioration in water quality (environment) can make the fish vulnerable to diseases. It is, therefore, important to assess water quality parameters and their management, which influence on growth and survival of aquatic organisms. The major cause of fish disease and mortality is poor water quality. The fish in good, clean, oxygenated and temperature regulated water are generally resistant to disease. Chatla Haor, situated between $93^0 15' 25''$ N to $24^0 10' 30''$ E in the Cachar district of Assam is one of the biggest floodplain wetlands (haor) in Assam. The haor is drained by a number of small inlets (viz., Jalengachhara, Baluchhara, Salganga) and an outlet (viz., river Ghagra) which drains itself into the river Barak. The maximum length (L), breadth (B), depth (D) and water spread area (A) of the wetland at FSL have been measured to be 10 km, 2.5 km, 5.5 m and 1,600 ha respectively. It contains about 57 species of fishes belonging to major families like Notopteridae, Cyprinidae, Bagridae, Siluridae, Schilbidae, Channidae (1). There has been much work done on parasites in fishes. Many Indian workers like Bhalerao (2), Dayal (3) made substantial contribution to the taxonomy of digenetic trematode parasites. Kar and Barbhuiya (1) worked on the ecology of aquatic macrophytes of Chatla haor. Kar and Dey (4) studied the occurrence of advanced fry of *Hilsa ilisha* in Chatla haor in Assam. Kar (5) made detailed study of the limnology and ichthyofauna of the water bodies of north-east India including diseases in fishes. Kar and Sen (6) studied systematic list and distribution of fish biodiversity in Mizoram, Tripura and Barak drainage in north-east India. Kar et al. (7) studied the panorama of fish diversity in certain rivers, wetlands and protected areas in Assam. Kar and Barbhuiya (8)studied on the mahseer fishes of Barak drainage, Mizoram and Tripura. Shomorendra and Jha (9) studied the helminthes parasites of air breathing fishes from Manipur. Works of Yamaguti (10—12) relate to occurrence of helminthes parasites in vertebrate host. Chubb (13, 14) illustrated the studies of seasonal occurrence of helminthes in freshwater fishes in different climate zones of the world.

Methods

Fishes are sampled from the water body by using various fishing gears at regular intervals. The fishes are carried in polythene bags having water of the same place to the laboratory. The were identified

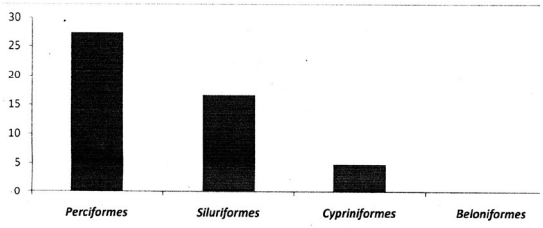

Figure 1. Prevalence of parasitic infection in fishes of Chatla Haor.

by following standard literature (6, 15—18). The fishes were subjected to macroscopic and microscopic examination. Length and weight of the collected fishes were taken. Estimation of physico-chemical factors (pH temperature, DO, phosphate, nitrate, TA, conductivity, free CO_2) of the water sample were recorded. External (scales, gills) and internal (liver, intestine) body organs are thoroughly examined for parasites. Collected parasites were preserved in recommended fixatives. To facilitate identification, the worms, trematodes and cestodes were dehydrated, stained in alum carmine, cleared in methyl salicylate and mounted in Canada balsam while nematode and acanthocephalan worms were cleared in lacto phenol and mounted in glycerin gelly. Parasites were identified following standard literature (10—12).

Table 1. Physico-chemical characteristics of water of Chatla haor.

	Parameters	Value Feb 2010	Mar 2010	Optimum range
1	Water color	Light copper red	Tea and milk mixture	Clear or plae green
2	pH	6.06	6.65	6—9
3	Temperature (C)	18.9	25.4	20—38
4	Dissolved oxygen (mg/l)	7.4	5.4	4—7
5	Conductivity (µmho)	49	48	50—150
6	Free CO_2 (mg/l)	8	9	Surface water contain <10
7	Phosphate (µg/ml)	27.82	29.30	>1.5 harmful
8	Nitrate (µg/ml)	23.60	24.56	>10 is not suitable
9	Total alkalinity (mg/l)	19	22	20–200

Results and Discussion

Values found are almost suitable for pisciculture. Phosphate and nitrate show remarkable increase after a rain and is due to effluents from the neighboring paddy fields and tea garden.

Afer a brief survey for helminth fish parasites of Chatla Haor it was found that out of 125 fishes 17 were infected with helminthes (13.6%). Out of 11 species of fish *Channa punctatus* showed the highest degree of infection (33.33%). *Anabas testudineus* and *Heteropneustes fossilis* also showed a remarkable degree of infection 18.18 and 17.64% respectively.

Out of five species of helminth found *Pallisentis* sp. showed the highest intensity of infection (1.75). *Mystus tengara, Amblypharyngodon mola, Xenotodon cancila, Lepidocephalus guntea, Labeo rohita, Labeo calbasu* were found to be not infected by parasites.

Among Perciformes, Siluriformes, Cypriniformes

Table 2. Host-parasite and prevalence of infection.

Fish host	Parasite	No. of fish examined	No. of fish infected	Percent of parasitisation
Anabas testudineus	*Camallanus anabantis* (Pearse, 1933)	11	2	18.18
	Clinostomum complanatum (Rudolphi, 1809)		2	11.11
Channa punctatus	*Pallisentis* sp.	18	4	22.22
Colisa fasciatus	*Syphacia* sp. (Srivastava and Gupta, 1977)	13	2	15.38
Clarias batrachus	*Procamallanua succobranchii* (Karve,1952)	12	2	16.66
Heteropneustes fossilis	*Unidentified cestode*	17	3	17.64
Puntius ticto	*Acanthocephalus* sp. (Koelreuther, 1771)	18	2	11.11
Labeo rohita	-	4	-	-
Labeo calbasu	-	5	-	-
Mystus tengara	-	9	-	-
Amblypharyngodon mola	-	11	-	-
Lepidocephalus guntea	-	3	-	-
Xenentodon cancila	-	4	-	-

Table 3. Intensity of parasitic infection in fishes of Chatla Haor.

	Name of parasite	Site of infection	Number infection	Number of worms	Intensity of infection
1	*Clinostomum complanatum*	Liver	2	3	1.5
2	*Pallisentis* sp.	Intestine	4	7	1.75
3	*Syphacia* sp.	Intestine	2	3	1.5
4	*Unidentified cestode*	Intestine	3	5	1.6
5	*Acanthocephalus* sp.	Intestine	2	2	1.0
6	*Procamallanua succobranchii*	Liver	2	3	1.5
7	*Camallanus anabantis*	Intestine	2	3	1.5

and Beloniformes, prevalence of infection was found to be highest in Perciformes (27.58%) followed by Siluriformes (16.66%) while existence of any helminth was not found in fishes belonging to order Beloniformes in this study.

Most of the parasites are host specific. It can thus be said that it is the species and feed of host fish and the life cycle of parasites, and location of the habitat play role in diversity. Also the choice and composition of the food is important for the diversity of the helminthes fauna in fishes.

Conclusion

Most fish health problems occur because of environmental problems : Poor water quality, crowding, dietary deficiencies, or stress. The best cure for any fish health problem is prevention. Good water quality management and proper fish husbandry techniques will eliminate most parasites described here.

Moreover, treatment of the water body should be on scientific basis i.e. treatment for a particular parasite should be target specific not on the basis of sampling. Sometime elimination of intermediate host like snails, copepods using $CuSO_4$ is often recommended. There are many nematodes (fenbendazole) cestode (praziquante) specific chemicals which can be used.

Helminth parasites is a problem as their infections not only deteriorate the muscle quality and stunt growth but sometimes cause internal injury including anaemia, emaciation, unthriftiness and reduced vitality. *Clinostomum complanatum* could cause nectrotic tissue damage and various gill damages. *Clinostomum complanatum* when ingested with fish is capable of producing laryngopharyngitis in man which is an unpleasant inflammatory condition.

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