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Research Article

Distribution of Helminth parasites in Bagridae Catfishes (Order Siluriformes)

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Abstract: Present study was conducted to investigate the distribution of helminth parasites in catfishes belonging to family Bagridae. Four species namely, *Sperata seenghala*, *Mystus cavasius* and *M. tengara* belonging to family Bagridae were screened for the occurrence of helminth parasites. Five helminth species were recorded during the investigation period, which includes two digenetic trematodes, one species of cestode, and two species of acanthocephalan. The maximum prevalence (100%) was showed by *Mystus tengara* followed by *Mystus cavasius* (80%) and minimum (36.36%) by *Sperata seenghala.* Thus, variation in distribution or prevalence of parasites in a particular host fish which may depend on their feeding habit or immunity of fish.

Keywords- Catfishes, Helminth parasites, Bagridae, Occurrence

INTRODUCTION

Disease is a prime agent affecting fish mortality, especially when fish are young. Fish can limit the impacts of pathogens and parasites with behavioural or biochemical means and such fish have reproductive advantages. Interacting factors result in low-grade infection becoming fatal diseases. In particular, things that cause stress, such as natural droughts or pollution or predators, can precipitate outbreak of disease[1]. Disease can also be particularly problematic when pathogens and parasites carried by introduced species affect native species.

Bagridae are a family of catfish that originate from Africa and Asia from Japan to Borneo.[2] These fish are commonly known as naked catfishes or bagrid catfishes. Large Bagrids are important as food fish. The Bagridae are carnivorous fish, feeds mainly on animal food[3]. Due to their feeding habit, these

fish can act as an intermediate or a final host for many helminth parasites. Number of workers described various aspects of helminth parasites of air-breathing catfishes. Reddy *et al.*[4] worked on a new Proteocephalidean tapeworm, *Gangesia (Gangesia) bendsurensis* n. sp. from fresh water catfish, *Wallago attu* at Beed district (M.S.), India. Vankara and Vijaylakshmi[5] also worked on the metazoan parasites of *Mystus vittatus* (Bloch) of River Godavari and described a new species of Acanthocephala, *Raosentis godavarensis* sp. nov. Ash *et al.*[6] described revision of *Gangesia* (cestoda: Proteocephalidea) in the Indomalayan region. Ash[7] explained the diversity of tapeworms (cestoda) in fresh water fish of India.

EXPERIMENTAL DESIGN AND SETUP

Collection of host fishes: The host fishes (*Mystus tengara*, *Mystus cavasius* and *Sperata seenghala)* were collected from the local fish markets of Bhopal regions like Piplani, Habibganj, Barkherra markets were survey for the collection of fish specimens. Fishes were collected twice in a weak. Standard length and weight were also taken. The hosts brought to laboratory were subjected to a thorough investigation as per the methods employed by Cable[8], Meyer, and Olson[9].

Collection of Endoparasites: After the complete external examination, the hosts autopsied for the collection of internal parasites. They were first killed by the usual method of giving a blow on the head or sometimes either and chloroform. The hosts were then split open by giving an incision through the body wall mid-ventrally. Before removing the viscera, the body cavity was thoroughly examined for any parasite. Various organs were then removed and kept in separate petri dishes containing normal saline (0.75%). For detailed examination intestine was split open and placed in saline water in a petri dish. Parasites collected were killed and fixed in Alcohol-Formalin-Acetic acid (AFA) solution for 24 hours. The parasites were dehydrated using different concentrations of alcohol: 30% alcohol, 50% alcohol, 70% alcohol, 90% alcohol, and 100% alcohol for a period of ten to fifteen minutes each depending on the thickness of specimen. After dehydration, the parasites were stained with acetocarmine. The parasites were cleared in xylene then mounted on a slide using DPX. The slides were then observed under a light microscope and the parasites identified using taxonomical keys given by Yamaguti[10] and Gibson *et al.*[11].

[C] Ecological analysis - The ecological analysis was done by followed the formula given by Margolis *et al.* [12].

$$\text{(i) Prevalence} = \frac{\text{Total No. of Hosts Infected} \times 100}{\text{Total No. of Hosts Examined}}$$

$$\text{(ii) Mean Intensity} = \frac{\text{Total No. of parasites}}{\text{Total No. of Infected Hosts Examined}}$$

$$\text{(iii) Relative Density} = \frac{\text{Total No. of parasites}}{\text{Total No. of Hosts Examined}}$$

RESULTS AND DISCUSSION

Four species of *Sperata seenghala* (syns. *Mystus seenghala* and *Macrones seenghala*), *M.cavasius* and *M. tengara* belonging to order Bagridae were screened for the occurrence of helminth parasites. Five helminth species were recorded which includes two digenetic trematodes, one species of cestode, and two species of acanthocephalan. Out of 49 specimens of host fishes examined, 27 were found infected with helminth parasites. The maximum prevalence (100%) showed by *Mystus tengara* followed by *Mystus cavasius* (80%) and minimum (36.36%) by *Sperata seenghala* **(Fig. 1)**. Thus, the sequence of prevalence of parasites in these species was as follows: *Sperata seenghala* □ *Mystus cavasius* < *Mystus tengara* which may depend on their feeding habit.

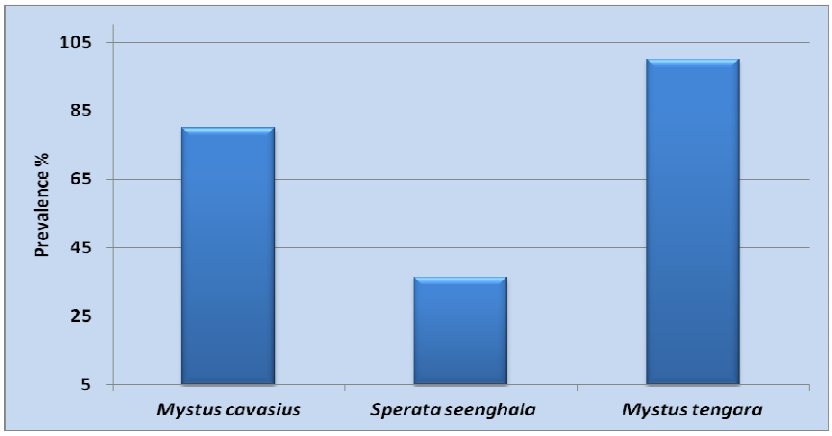

Fig. 1: Graph showing compassion of prevalence of helminthes among the species of family Bagridae

Maximum number of infected specimens belonging to order Siluriformes were collected in fifth week of investigation. As maximum number of parasites recovered in tenth week of investigation. The maximum prevalence (100%) was recorded in second & ninth week of investigation while the minimum prevalence 25.00 % was recorded in seventh week **(Fig. 2)**.

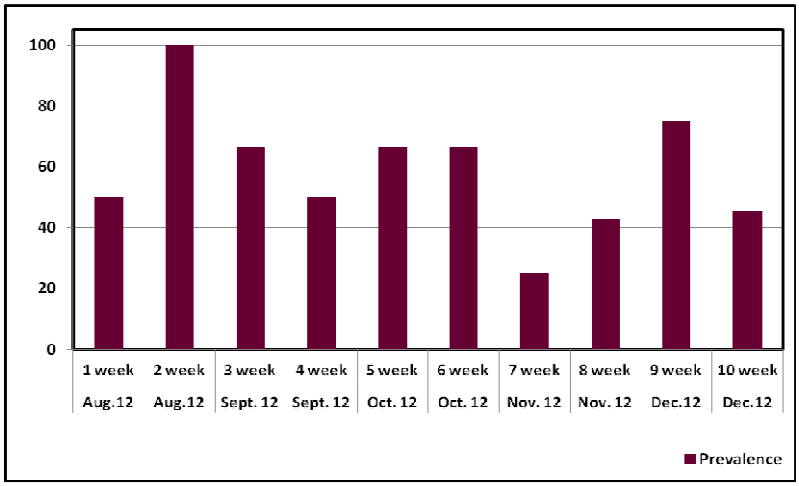

Fig. 2: Variations in the percentage of prevalence of parasites among Bagridae species

Among species of family Bagridae, the maximum intensity (4.6) was recorded in tenth week. The lowest intensity (1.00) was recorded from firth to fourth week of investigation. The recorded value of relative abundance ranged from 0.5 – 2.09. The highest density (2.09) was recorded in tenth week and the lowest density (0.5) in first, fourth and seventh week of investigation **(Fig. 3)**.

During study, parasitic diversity were compared among three species of catfishes belonging to Family Bagridae namely, *Sperata seenghala*, *M. cavasius* and *M. tengara* were collected from the local fish markets of Bhopal region.

Shakir *et al*.[13] studied helminth parasites of a freshwater catfish, *Sperata sarwari* collected from Mangla Lake. The study revealed that the large size fishes has higher prevalence of infection (39.13 %) than small size fishes (28.85 %) infected with only one species of cestode, *Lucknowia fossilis*. These results indicate that the fishes found in Mangla Lake are good in general health since they are devoid of heavy parasitic load and the hygienic conditions of Mangla Lake are satisfactory. In the present study, it was observed that the fish were infected with only one species of cestode that prevails in *Sperata seenghala* while other parasites appear to be absent. However, minimum prevalence and only single species of cestode infection was observed in *Sperata seenghala* (36.36%) which means that fish are overall healthy

and least involved in life cycle of parasites as compared to *Mystus cavasius* (80%). While the maximum prevalence (100%) was showed by *Mystus tengara* retarded growth and health condition.

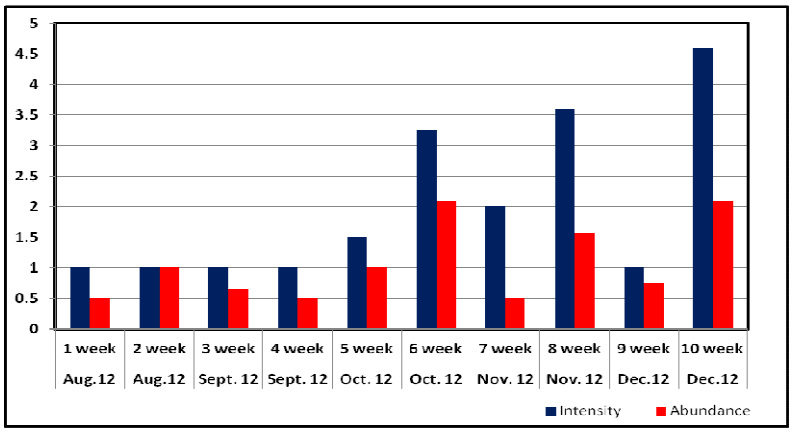

Fig. 3: Variations in the density and intensity of parasites among Bagridae species

Rafique *et al.* [14] 2002, examined freshwater fish *Mystus vittatus* from a pond at Roy walla, Kasur for the occurrence of intestinal helminths. They collected only one species of nematode *Rhabdochona magna* which is recovered from intestine of the fish. They observed that out of 48 fish only 18(37.5%) were infected and the mean intensity (6.5) of nematode infection was relatively high in host fish. As during present investigation *Mystus tengara* showed 100% prevalence for acanthocephalan infection, which may be due to their feeding habit and low immunological response.

According to Schmidt[15] the embryonic development in the eggs of parasites stops at the dissolved oxygen content. The factors like muddy bottom water and feeding habits of *Mystus vittatus* might also contribute for the incidence of helminth parasites in the fish. Whereas, other helminth parasites such as trematodes, cestodes and nematodes were not found in this fish species. The intermediate hosts for these parasites were probably not being used as food for this fish.

Purivirojkul and Areechon[16] observed parasitic diversity of Siluriform Fishes in Mekong River, Chiang Rai Province. Kalse and Mangale[17] reporting a new species of the genus *Lecanicephaluvi* from *Mystus vittatus* at Jampal lake, Shindkheda, Dist. Dhule, M.S. India. Reddy *et al.* 2011 collected the Proteocephalidean tapeworm *Gangesia (Gangesia) bendsurensis* n.sp. from *Wallago attu* at Bendsura dam, Beed district. Yakhchali *et al.*[18] studied the occurrence of helminth parasites in the gastrointestinal of catfish (*Silurus glanis*) and indicated that 18.96% of the examined catfish were infected with digenean trematodes including *Orientocreadium siluri* (27%), *Crowcrocoecum skrjabini* (39%), and cestode *Bothriocephalus gowkongensis* (34%), from the Zarrine-roud river, Iran.

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