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Study on the infestation of endoparasites in *Channa gachua* from wetlands of River Kosi

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ABSTRACT

Parasites infestation is found in abundance in freshwater food fishes. The present study explores endoparasites infestations in fresh water food fish *Channa gachua* and the changes and damages caused due to them. The parasites association may vary in *Channa gachua* due to excessive use of fertilisers and pesticides in cultivated lands near and around wetlands of Kosi division of Madhepura region. Three different genera were abundantly found during the investigation of the parasites of fishes. One of them was Acanthocephala and the rest two were cestodes. Genarchopsis sp. belongs to Acanthocephala whereas *Lytocestus* sp. and *Gangesia* sp. belongs to cestode. Their prevalence was different in different seasons. The study was carried out during November 2020 to October 2021 but due to covid-19 pandemic it is hard to collect the specimens. The highest prevalence of these parasites was found during the summer season and the lowest in monsoon season whereas in the monsoon season it is found to be moderate. Due to the prevalence the growth of the fishes was hampered. Parasites infestation clearly effects the production of fishes. An attempt has been made to describe the parasites of *Channa gachua* to improve their production.

Key words: Endoparasites, *Channa gachua*, Acanthocephala, Cestodes, Infestation

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INTRODUCTION

Dwarf snakehead (*Channa gachua*) is a freshwater food fish native to southern Asia. It is referred as "poor man's food" due to its availability in paddy fields. *Channa gachua* is not only known for its edible value but also as an aquarium fish (Saikia *et al*., 2012). As it is a rich food for poor people, it is a good source of high-quality proteins, vitamins and minerals for them. These fishes are carnivores which fed mainly on animal foods (Chandra and Haq, 1986) and because of their feeding habit, these fishes can act as an intermediate host or final host for many cestode parasites. Infections are harmful to the health of fish as well as the people who consume them. Due to the infestation of endoparasites mortality rate increases. For successful eradication and prevention of such endoparasitic infections, study of the prevalence and intensity of infection in fish is important along with the mode of infection, including the larval stages of the parasite.

Parasitism is a form of symbiosis in which one organism (parasite) benefits at the expense of another organism that is usually of different species (host). This host–parasite association may occur in host injury. Parasites can be classified into ectoparasites and endoparasites. Parasites that live outside the host are called ectoparasites while those that live inside the host are called endoparasites. Parasites are an important group of organisms since its evolution. Parasitic disease influences the weight and reproduction of the host

and alters the population characteristics which effect their economic importance (Rhode, 1993).

Since human utilizes fish, and it is a major source of income, it is necessary that they should be healthy and free from parasitic infection. The present study deals with the infestation of endoparasites in a specific fish *Channa gachua* sampled from, waterbodies in and around Kosi division, Madhepura region. The parasites association may vary in *Channa gachua* due to excessive use of fertilisers and pesticides in cultivated lands of this region. Parasites have a specific position in animal kingdom because of their extraordinary adaptation and damaging activities towards host. The composition of fish parasites depends on various environmental factors such as the geographical location of the habitat, season of the year, physiological factors of the water, organisms present in and around the habitat, etc. The injury in fishes can carry heavy infection of parasites (Gupta 1983). However, small numbers of cestodes can be found in fish without causing significant symptoms. The fish can be the final host or the intermediate host. In terms of health, parasites can have a huge impact on the ecology of their hosts (Cumming *et al*., 2015). Present study may help to understand the prevalence and infestation of endoparasites in freshwater food fish *Channa gachua* in this region.

MATERIALS AND METHODS

Study Area

The experimental fish was collected from fish markets near different waterbodies of Kosi division of Madhepura region during November 2020 to October 2021 but due to covid-19 pandemic it is hard to collect the specimens. A total of 123 live specimens of fishes were brought to laboratory, University Department of Zoology, B. N. Mandal University Madhepura. Live specimens of fishes were collected from localities in different seasons. At first measurements of fishes were done by centimetre scale and were weighed by electric balance. Then fishes were dissected and parasites were collected from their intestine using hand lens, the parasites were kept in separate petridish and were washed in saline solution. The parasites were preserved in 4% formalin solution, after dehydration in alcohol they were stained with borax carmine then after cleared in xylene and mounted in D.P.X. The collected endoparasites were identified by methods of Schmidt, (1986). One of them was Acanthocephala and the rest two were cestodes. *Genarchopsis* sp. belongs to Acanthocephala whereas *Lytocestus* sp. and *Gangesia* sp. belongs to cestode. To make permanent slides for Acanthocephala the collected parasites were stained with borax caramine for two hours and then were dehydrated in 35%, 50%, 70%, 85%, 95% and 100% alcohol after that the parasites were cleaned with xylene and mounted in Canada balsam.

RESULTS AND DISCUSSION

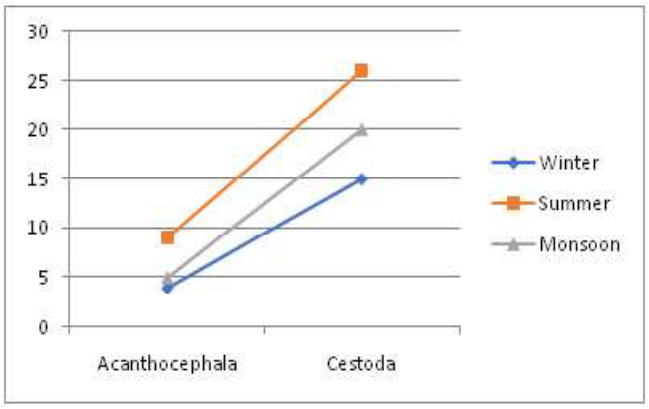
During the study period i.e., November 2020 to October 2021 collection of fish sample is tough because of Covid Pandemic. However, parasites and the diseases caused by them are the most serious limiting factor in aquaculture due to the increasing density of fish populations cultured in restricted bodies of water and the ease with which pathogens are transferred from one fish to another (Kabata, 1985). A total of 123 live specimens of *Channa gachua* were collected from fish markets near different waterbodies of Kosi division of Madhepura. Almost all the fishes were infected by parasites Table 1. Three different genera were abundantly found during the investigation of the parasites of fishes collected from the study area. Out of the three collected groups of parasites one belongs to Acanthocephala and the rest two were Valuable information regarding the effect of weather on cestode parasites was provided by several activists. A study by Sharma *et al.,* (2010) also shows high prevalence in summer followed by other seasons. Factors like rainfall and humidity, temperature, feeding habits of host, the availability of the infectious host and parasite maturation are responsible for influencing parasite infection (Khan, 2012). Bhure and Nanware (2014) reported high cestodes infection from *Channa puntatus*. Cestodes have been found to infect freshwater fishes. Many authors have studied about caryophyllaeid

cestodes infection in fishes Some of them are Mackiewicz *et al*. (1972), Ramadevi (1973), Gupta (1983), Chakravarthy and Tandon (1989), Jadhav and Ghavane (1991), Kadam *et al.* (1998), Ash *et al.* (2011a,b) etc. The edible fishes are known to harbour a number of cestode parasites which cause deterioration in their health include emaciation (significant loss of body mass), nodules or masses present in skin or muscle, growth inhibition, abnormal swimming and weakness or death, hence their market and nutritive value is affected.

Table 1- Season wise list of collected parasites from *Channa gachua*

Host	No. of fish examined season wise	Infected host	Parasites	Parasites collected	Site of infection
Channa gachua	41 Winter	40	Acanthocephala	9	Stomach and Intestine
			Cestoda	15	Intestine
	41 Summer	41	Acanthocephala	5	Stomach and Intestine
			Cestoda	26	Intestine
	41 Monsoon	39	Acanthocephala	2	Stomach and Intestine
			Cestoda	20	Intestine
Total	123 Species				

Graph 1- Graphical representation of season wise collected parasites from *Channa gachua* along with their prevalance



CONCLUSION

The investigation was conducted for a complete year and a noticeable difference was observed in fishes. In the present investigation, data recorded showed high incidence of infestation and infection of the acanthocephalan and cestode species in *Channa gachua*. The highest prevalence of these parasites was found during the summer season and the lowest in monsoon season whereas in the monsoon season it is found to be moderate. Due to the prevalence the growth of the fishes was hampered. Parasites infestation clearly effects the production of fishes. This type of result indicates that environmental factors and feeding habits influences the parasites infection.

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