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Occurrence of Helminth Parasites in Fresh Water Fishes of Narmada River at Dindori, Dindori District, M.P., India

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Abstract

Freshwater fishes from Narmada River, Dindori, Dist. Dindori (M.P.) were collected from December 2021 to January 2023 in different season at different site.600 fishes were observed for helminth infections, out of them 96 fishes were infected with helminths parasites six species of helminths were recovered throughout the study period ,3 Species of Cestodes included, Caryophyllidea sp, Bothriocephalus sp and Protocephalus sp, 2 species of Nematodes included Camallanus sp, and Acanthosentis sp and 1 species of Trematodes, Dactylogyrus sp, .The highest Prevalence 7.67 occur in Summar season where lowest Prevalence 3.33 in Winter season.

Keywords- Helminth Parasite, Narmada River, Dindori.

Introdution

Freshwater fishes are an important source of food for millions of people around the world, providing vital nutrients such as protein and essential fatty acids. How ever these fish can be hosts to a range of parasites, including helminths which can impact the health and productivity of fish population as well as posing a potential risk to human health. Helminths are a type of parasitic worm that can infect a wide range of animals, including fish. There several major groups of helminth parasites that infect fish worldwide. These include nematodes, trematodes, and cestodes. These parasites are known to cause significant damage to their hosts, leading to reduced growth rates, decreased survival rates, and impaired reproductive capacity. Fish helminths are a concern for both wild and farmed fish populations, as they can cause significant economic losses in the aquaculture industry and pose a threat to wild fish populations. In this context, understanding the life cycle, biology, and impact of helminth parasites in fish is of great importance to the management and conservation of fish populations. Some helminths can also be transmitted to humans through consumption of contaminated fish leading to a range of health problems such as abdominal pain, diarrhea and even organ damage. That's way it is important to understand the occurrence and prevalence of helminths parasites in freshwater fishes as well as the factor that contribute to their transmission. This study aims to provide an overview of the helminth parasites that infect fish.

Material and Methods

Freshwater fishes were collected from different seasons and different sites of Narmada River at Dindori District during December 2021 to January 2023. The present studies were carried out from in four different sampling site

S_1 – Sati Ghat, S_2- Dam Ghat, S_3- Jogi Tikariya Ghat and S_4- Shiv Ghat. These sites are situated at the bank of river Narmada. The fishes were collected by hand net and cast net with the help pf local fisherman. 37 species of fishes such as Labeo *rohita,* Catla *catla,* Cirrhinus *mrigala,* Cyprinus *carpio,* Clarias *batrachus,* Wallago *attu* etc. are commonly found in this river. 200 adult fishes were collected in each season. After external examination body cavity of the fishes was cut open and examined body cavity, gills, eyes, heart, gonads, digestive tract, liver, spleen, kidney, swim bladder and urinary bladder were carefully removed to separate clean petri dishes containing normal saline solution. The organs were slit open carefully and examined under binocular microscope. Adult helminths parasites (not larval stages) were collected, preserved, processed and identified. Identification was done with the help of 'Systema Helminthum' Vol II Helminths of Vertebrates and series. Prevalence of helminthic infections were studied and recorded. Prevalence is a term used in epidemiology to describe the proportion of individual in a population who have a particular health condition or disease at a specific point in time or over a certain period. It is expressed as a %. It can also be used to compare the prevalence of a disease in different population or to track changes in the prevalence over time. Prevalence of helminths parasite were determined by following formula.

$$\text{Prevalence \%} = \frac{\text{Total no. of infected fishes}}{\text{Total no. of fish examined}} \times 100$$

Result

Table no.1 shows that checklist of helminths parasites was reported in different fish species during study period. Table no.2,3 and 4 shows the parasite infection of fishes in winter, summer and rainy seasons respectively. Graph 1,2 and 3 shows the Prevalence % in winter, summer and rainy season respectively. In study seven species of helminth parasite were reported. The maximum parasitic infection was observed in summer season. During summer season maximum number of parasite (Cestode, Trematode and Nematode) were collected from freshwater fishes.

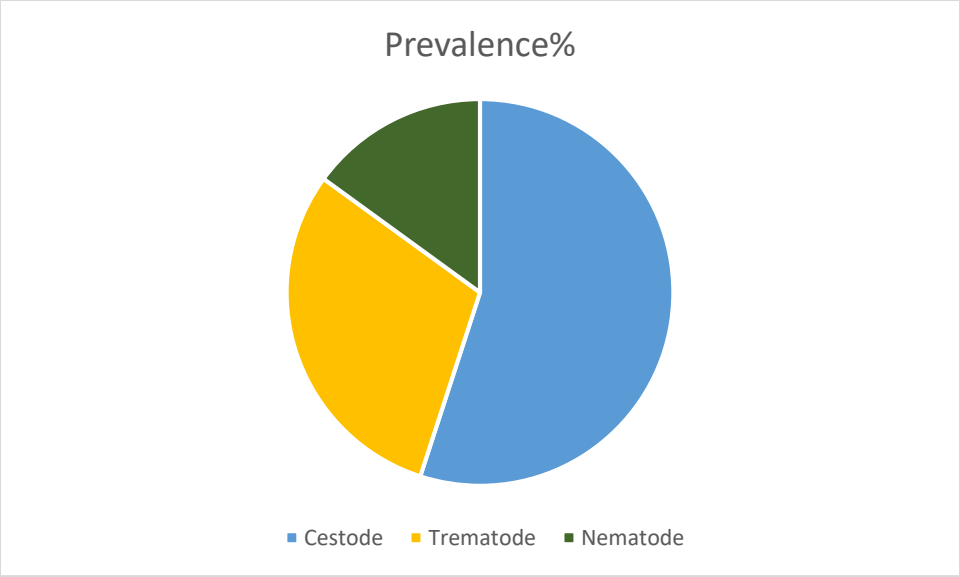
Results shows a considerable difference in the prevalence of helminths infection among the different season. The highest cestode prevalence (9), trematode prevalence (7.5) and nematode prevalence (6.5) recorded in summer season whereas lowest cestode prevalence (5.5), trematode prevalence (3) and nematode prevalence (1.5) in winter season.

Table 1- Checklist of the helminths, their host fish and Organ of infection

Helminth Species	**Host Fish**	**Organs Infected**
Cestoda		
Caryophyllidea sp	Clarias *batrachus*	Intestine
Protocephalus sp	Mastacembelus sp Labeo *calbasu*	Intestine
Bothriocephalus sp	Puntius Spp	Intestine
Nematoda		
Camallanus sp	Channa *stratus*	Intestine
Acanthosentis sp	Channa *stratus*	Intestine
Trematoda		
Dactylogyrus sp	Glossogobius *giuris*	Gills

No. of fishes Examined	Total No. of Fish Infected	Parasite	No. of fishes Infected				No. of Parasite Collected				Prevalence %
			S1	S2	S3	S4	S1	S2	S3	S4	
200	20	Cestode	3	5	3	-	5	8	3	2	5.5
		Trematode	2	3	-	1	2	2	1	1	3
		Nematode	1	-	2	-	3	4	2	2	1.5

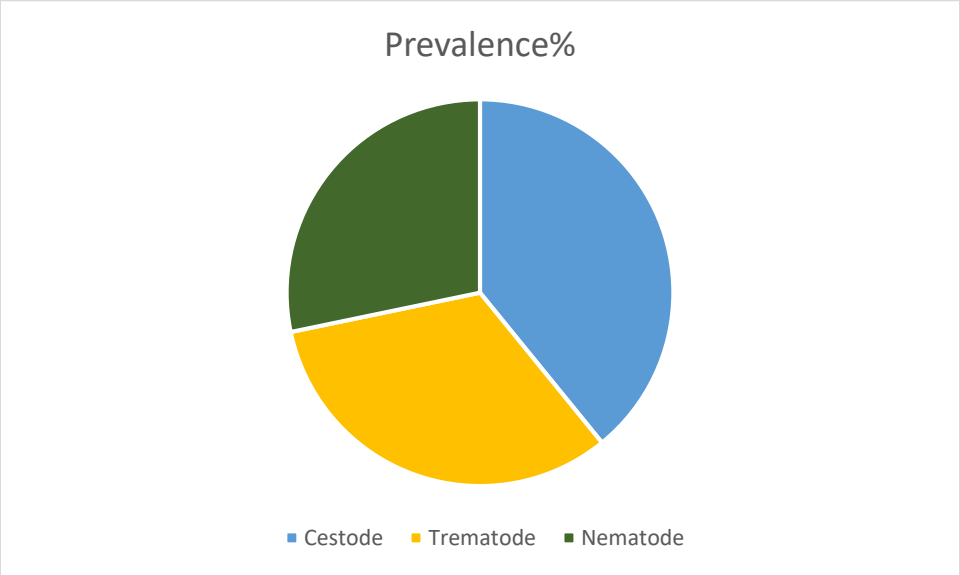
Table -2 Parasite infection of fishes in Winter Season in Narmada River, Dindori. (S1 – Sati ghat dharmshala, S2- Dam Ghat near stop dam, S3- Jogi Tikariya, S4- Shiv Ghat near model College)



Graph 1: Shows the Prevalence % in Winter Season.

No. of fishes Examined	Total No. of Fish Infected	Parasite	No. of fishes Infected				No. of Parasite Collected				Prevalence %
			S1	S2	S3	S4	S1	S2	S3	S4	
200	46	Cestode	7	8	1	2	7	10	1	2	9
		Trematode	4	7	1	3	5	8	4	5	7.5
		Nematode	3	4	2	4	4	4	3	6	6.5

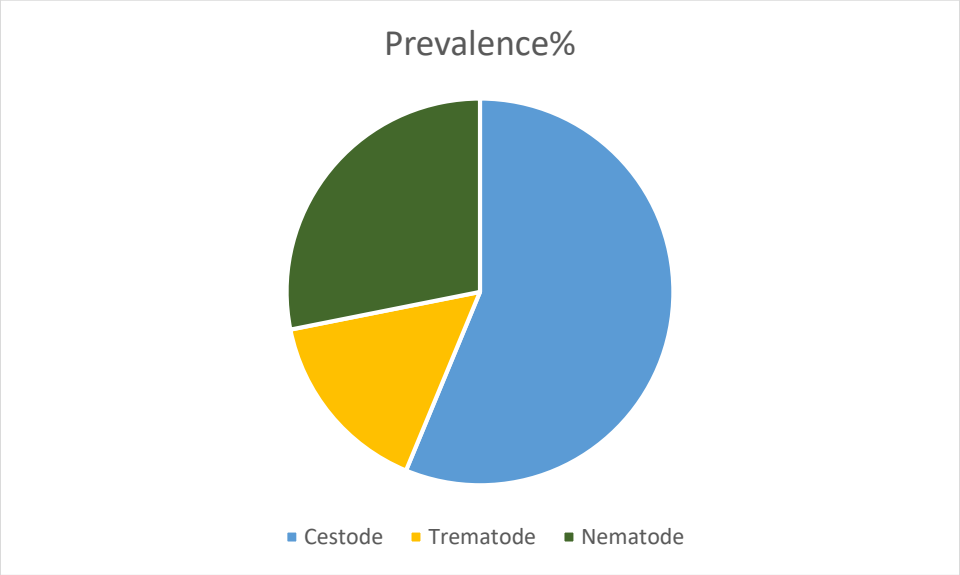
Table -3 Parasite infection of fishes in Summer Season in Narmada River, Dindori (S1 – Satighat dharmshala, S2- Dam Ghat near stop dam, S3- Jogi Tikariya, S4- Shiv Ghat near model College)



Graph 2: Shows the Prevalence % in Summer Season.

No. of fishes Examined	Total No. of Fish Infected	Parasite	No. of fishes Infected				No. of Parasite Collected				Prevalence %
			S1	S2	S3	S4	S1	S2	S3	S4	
200	30	Cestode	5	8	3	2	5	8	3	2	9
		Trematode	1	2	1	1	2	2	1	1	2.5
		Nematode	1	4	2	2	3	4	2	2	4.5

Table -4 Parasite infection of fishes in Rainy Season in Narmada River, Dindori (S1 – Satighat dharmshala, S2- Dam Ghat near stop dam, S3- Jogi Tikariya, S4- Shiv Ghat near model College)



Graph 3: Shows the Prevalence % in Summer Season.

Discussion

The analysis of data shows that the occurrence of helminth parasite varies according to seasons. There were 96 fishes were infected with helminth parasite out of 600 fishes. The 3 Species of Cestodes included, Caryophyllidea sp. in Clarias *batracus,* Bothriocephalus sp. in Puntius sp. and Protocephalus sp. in Mastacembelus sp and Labeo *calbasu* 2 species of Nematodes included Camallanus sp, and Acanthosentis sp in Channa *stratus* and 1 species of Trematodes included Dactylogyrus sp in Glossogobius *giuris* . The present investigation reveals that some parasite was host specific where some was extent and capable to infect the few species. The present study also reported that helminth parasite was extensively distributed in intestine of edible freshwater fishes. The occurrence of helminths in freshwater fish is influenced by a range of factors, including water quality, temperature, and the presence of intermediate hosts such as snails. In addition, human activities such as deforestation and pollution can also increase the prevalence of these parasites in aquatic environments.

The present investigation indicated that the helminth parasite prevalence high in summer season. The high prevalence during summer season were reported by some researcher (Fartade et al 2017, Nimbalkar et al 2010 and Podwal et al 2007) in different water bodies. Study showed that some of the physicochemical features showed a significant positive correlation with the prevalence (Wali et al 2016). The water quality of Narmada River was pollution free. (Karode et al 2022).

Conclusion

After the analysis of data, present study can be concluded that the high infection of helminth parasites was occurred in summer season, and low in winter season. Some factors like pH, temperature, turbidity, feeding habit and season were influence the infection directly or indirectly. So effective management strategies are needed to control the occurrence of helminths in freshwater fish populations, including monitoring of water quality, improvement of habitat conditions and proper handling and processing of fish for human consumption. Understanding the ecology and transmission of these parasites is crucial for developing effective control measures and ensuring the sustainability of freshwater fish population.

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