International Journal of Biology Sciences

ISSN Print: 2664-9926
ISSN Online: 2664-9934
Impact Factor: RJIF 5.45
IJBS 2022; 4(1): 16-19
www.biologyjournal.net
Received: 10-01-2022
Accepted: 18-02-2022

Kakde VR
Department of Zoology,
Jijamata Mahavidyalaya,
Buldana, Maharashtra, India

Choudhari SN
Department of Zoology,
Jijamata Mahavidyalaya,
Buldana, Maharashtra, India

Thakare PR
Department of Zoology,
Jijamata Mahavidyalaya,
Buldana, Maharashtra, India

Corresponding Author:
Kakde VR
Department of Zoology,
Jijamata Mahavidyalaya,
Buldana, Maharashtra, India

Biodiversity and prevalence of helminthes parasites of Nalganga dam fishes of Buldana district (M. S.)

Kakde VR, Choudhari SN and Thakare PR

DOI: 10.33545/26649926.2022.v4.i1a.36

Abstract
The present study will be helpful for biodiversity status of helminthes parasites found in Nalganga Dam. A total of 300 fishes were examined from which about 50% fishes were infected with cestode parasites and 50% with nematode parasites. Present study suggest that cestodes mainly *Circumoncobothrium* spp, *Senga* spp., *Lytocestus* spp., *Polyoncobothrium* spp., and nematodes mainly *Eustrongylides* spp., *Rhabdochona* spp., *Syphaciella* spp., *Contracaecum* spp., *Ascardia* spp.,and *Trichuris* spp., are the main intestinal parasites of Nalganga dam fishes (*viz. Mastacem bellusarmatus, Wallago attu, Ophiocephalus punctatus, and Clarius batrachus*) are the main intestinal parasites of Nalganga dam fishes. The incidence of parasite infection was higher in winter season whereas intensity of infection was higher in Mansoon. This report summarizes the data of incidence, intensity, and index of incidence in fresh water fishes in relation to environmental factor. Present study is carried out during July 2019 to June 2020.

Keywords: Helminthes, parasites, Nalganga dam, cestodes, nematodes

Introduction
The survey of helminth parasites in freshwater fishes was undertaken to investigate the internal helminth parasitic environment of the host and the environmental factor such asseason, temperature, humidity, age of the host. The common parasites of fishes causing the Economic losses includes the helminth parasites. One objective of this study was to determine monthly incidence of infection to various organ of the host body. Parasites are extremely abundant and diverse in nature, representing a substantial portion of global biodiversity. Fishes are important components of ecosystem from ecological, medicinal, nutritional and economical point of view. These fishes are parasitized by helminthes parasites, which reduce the food value of host fish. Study of helminthes parasites is therefore an urgent necessity of today. Helminthes infections are very common in people who consume improperly un-cooked meat, unhygienic habits and poor sanitation. These helminthic infection leads to various disorders i.e. anemia. Population dynamics of parasite increases rapidly and results in fish mortality because of PIHM (Parasite induced host mortality) and thus fish population infected firstly (Arora 2010) [11]. The parasitic infections are sometimes very fatal and cause high mortalities when their life cycles are well supported by Intermediate hosts. (Shakir, 2006) [14]. Survey of seasonal infection of fish infected with *Caryophyllids* has been done in other countries by different workers Hanley, Anderson (1976) [1], in carps, The current study will expect to helpful for futuristic researchers on helminthes infection on fresh water fishes in Buldana region. Keeping that point of view, the importance of Piscean helminthes, present study was undertaken to investigate and evaluate prevalence of helminthes on freshwater fishes *Mastacem bellusarmatus Wallago attu, Ophiocephalus punctatus and Clarius batrachus* and distribution of Piscean helminthes *Molineria intestinalis, Ascardia* spp. *Trichursis* spp. *Syphaciella* spp, *Rhabdochona* spp *Polyoncobothrium* spp., *Eustrongylides* spp, *Circumoncobothrium* spp. *Lytocestus* spp & *Senga* spp.

Materials and Methods
The fresh water fish collected from Nalganaga dam during July 2019 to June 2020. Fishes were opened up dorso-ventrally and the internal organs examined.

The various organs of the viscera such as stomach, liver, intestine and Skin. All these organs which are infected by helminthes placed under separate petridish containing normal saline water. Infection of each group of parasites was treated as follows:

Collected cestodes and Nematode were first relaxed and then fixed in hot 4%formalin and stained using Harris haematoxyline. Stained parasites were washed in distilled water, dehydrated in ascending grades of alcohol, cleared in xylene, mounted in D.P.X. Nematodes were fixed in hot 10% Glycerol and cleared in lacto phenol. Drawings were made using a camera lucida. The identification is made with the help of "Systema Helminthum" by Yamaguti (1961). Then organs are examined and recorded the data of infected and normal host. After that separating and counting the data of helminthes and fresh water fishes, the collected helminthes parasites preserved in separate bottle. Few of helminthes parasites might be useful for taxonomic study.

The calculation of prevalence of infection was obtained by the following formula

$$\text{Incidence of Infection} = \frac{\text{Infected host} \times 100}{\text{Total hosts examined}}$$

Observation

The infections of *Lytocestus* spp. are observed in only *Clarius batrachus* and *Senga sp, Circumoncobothrium sp.* are heavily found in *Mastacembelus armatus.* The infection of *Senga* spp in *Channa punctatus & Molineria intestinalis and Ascardia* spp *is* found in *Wallago attu*, because of the host specificity. Morphological, physiological and ecological factors play important role in the host specificity. *Senga* spp, *Circumoncobothrium spp.* were specifically recovered from intestine *M. armatus* and *W. attu. Lytocestus* are recovered from stomach of *C. batrachus.* This suggests that the worms are site specific and probably derive certain nutrients from the organs.

Table 1: Incidence of Helminthes parasites in fresh water fishes from Nalganga Dam during July 2019 –June 2020

Sr. No.	Parasites/ Helminthes (Cestodes & Nematodes)	No of Hosts Infected	Organ Infected
1	*Polyoncobothrium sp.*	22	Intestine
2	*Senga sp.*	48	Intestine
3	*Circumoncobothrium sp.*	62	Intestine
4	*Lytocestus sp.*	21	Intestine
5	*Trichuris sp.*	10	Large Intestine
6	*Ascardia sp.*	48	Intestine
7	*Molineria intestinalis*	49	Intestine
8	*Syphaciella* spp.	17	Body cavity, mesentery & Intestine
9	*Rhabdochona* spp.	16	Intestine
10	*Eustrongylides* spp.	07	Skin, Intestine
Total = 300			

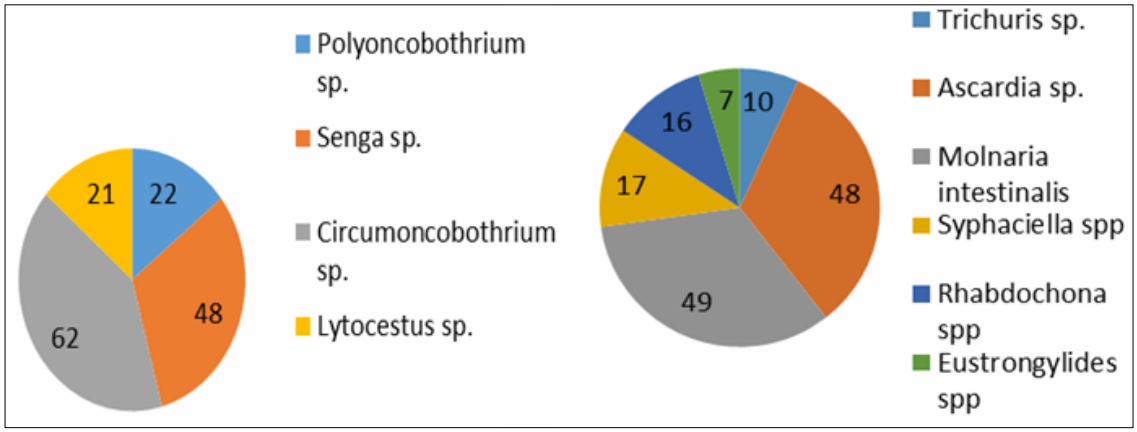
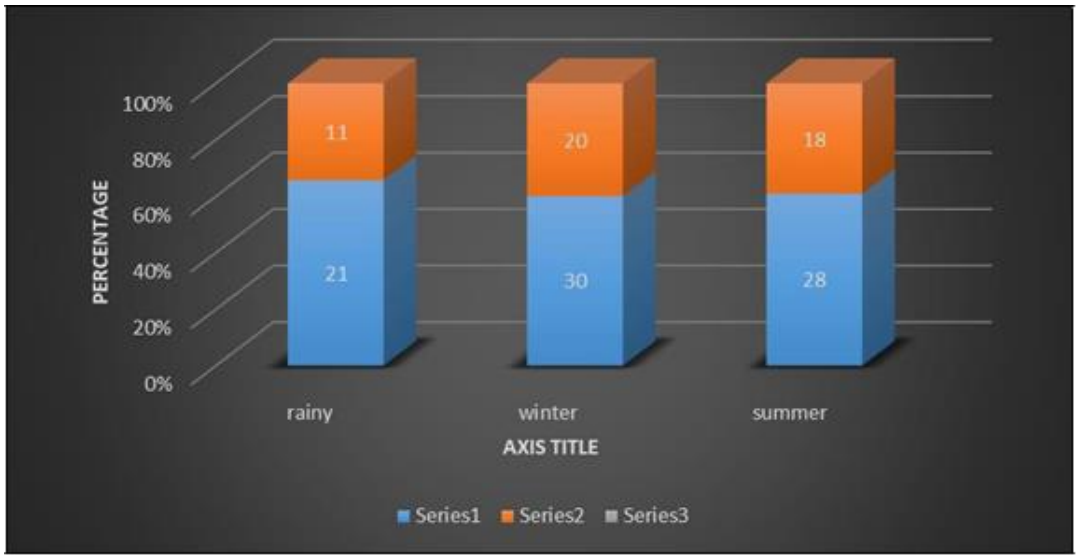


Table 2: Showing prevalence of helminthes *Molineria intestinalis* on *Wallago attu* during August 2019 to June 2020.

Season	No. of hosts examined	No. of Hosts infected	No. of parasites collected	Prevalence %
Rainy	21	11	13	52.40%
Winter	30	20	22	66.70%
Summer	28	18	31	64.30%

Table 3: Showing prevalence of helminthes *Ascardia* spp, on *Wallago attu* during August 2019 to June 2020.

Season	No. of hosts examined	No. of Hosts infected	No. of parasites collected	Prevalence %
Rainy	22	7	10	31.8%
Winter	30	19	16	63.3%
Summer	26	22	09	84.6%



Graph 1: Prevalence of *Molineria intestinalis & Ascardia* spp on *Wallago Attu* during August 2019 to June 2020

Results and Discussion

The study has established that the *Mastacembalus armatus* fish is one of the most heavily infected fish species as compare to *Clarius batrachus*, *Wallago attu* and *Channa punctatus* In Buldana region the fishes were heavily infected with the cestode and nematode while the other parasites occurred in low quantity. The current investigation suggests in given table no. 1 and 2. There were twohelminthes parasites were recorded as *Molnaria intestinals &Ascardia* spp. High incidence of infection found from that species of helminthes over fresh water fishes and recorded data season wise, in Summer (64.30% - 84.60%) followed by winter (66.70% - 63.3%) whereas infection was recorded low in Monsoon (52.40%- 31.8%). Through the seasonal analysis the highest rate of infection occurred in summer as compared to rainy and winter season (Krishna and Shreeramalu (1996); Laxma Reddy *et al*. (2006); Laxma Reddy and Bannergii (2008, 2012).

According to the Kennedy (1970, 1974 and 1977) [5, 3, 4] the temp, humidity and rainfall, feeding habits of host, availability of infective host and parasite maturation, and such factors are responsible for influencing the parasitic infections. Experimental studies by Kennedy (1971) have shown that the cestode *Caryophyllaeus lattices* can establish in fish and survive for longer period at low temperature. Hence he explained the temperature is major controlling seasonal periodicity of infection and the parasitization. He explained the infections are more in warm seas than in old ones. Jadhav, Bhure (2006) [2] explained the development of parasites should be needed high temperature, low rainfall and sufficient moisture. Hence the high prevalence occurs in summer followed by other season. Pennuyuick (1973), reported fishes and other animals were infected with large number of parasites in late winter to end of summer months, as environmental conditions are favorable in these months. Jadhav and Bhure, (2006) [2] reported high temperature, low rainfall and sufficient moisture are necessary for development of parasite. The parasites causes depletion of the nutritional contents in host's body and results in the low productivity & loss of weight in fish industry (Satish Saraf 2019) [13].

Conclusion

After the analysis of data the present study can be concluded that the high infection of *Molnaria* spp. Helminthes parasites *&Ascardia* spp. are occurred in summer season followed by winter where as low in monsoon season. This type of results indicated that environmental factors and feeding habitat are influencing the seasonality of parasitic infection either directly or indirectly. However, the above study can only be complete if it covers a whole season to investigate the variation in parasite fauna with the diet of the host and variation in infection with habitat type.

Regarding the parasitic diversity and population study cestode and Nematode indicates abundance population as compare to nematode parasites. The incidence of infection of nematode *Ascardia* spp, on *Wallago attu* during 2019-20 was maximum (84.6%) in summer season, followed by winter season (63.3%) and slightly lower in monsoon season (31.8%). The incidence of infection of nematode *Molnaria* spp, on *Wallago attu* during 2019- 20 was maximum (66.7%) in winter season, followed by summer season (64.3%) and slightly lower in monsoon season (52.4%). This report is beneficial for investigation and evaluation of prevalence of helminthes on freshwater fishes *viz*., *Mastacem bellusarmatus Wallago attu*, *Ophiocephalus punctatus and Clarius batrachus*. And distribution of Piscean helminthes *Molineria intestinalis*, *Ascardia* spp. *Trichursis* spp. *Syphaciella* spp, *Rhabdochona* spp *Polyoncobothrium* spp., *Eustrongylides* spp, *Circumoncobothrium* spp. *Lytocestus* spp *& Senga* spp in fresh water fishes of Vidarbha region of Maharashtra.

References

1. Anderson RM. Seasonal variation in the population dynamics of *Caryophyllacus lacticeps*. Parasitology. 1976:72:281-395.
2. Jadhav BV, Bhure DB. Population dynamics of Helminth parasites in freshwaterfishes from Marathwada region (M. S.) India. Flora and Fauna an International Research Journal. 2006:12(2):143-148.

3. Kennedy CR. A checklist of British and Irish freshwater fish parasites with noteson their distribution. J fish Biol. 1974:6(5):613-644.
4. Kennedy CR. The regulation of fish parasite populations. In regulation of parasitepopulation. 1977:(a):61-109.
5. Kennedy CR, Hine DM. Population biology of the cestode *Proteocephalus torulisus* (Bat Sch) in dace *Leucisus leucisus* (L) of the river Avon. Jr. Fish Biol. 1970:1(3):209-219.
6. Kennedy CR. Ecological aspects of Parasitology. North Holland publishing company. Amsterdam 10x ford, 1976.
7. Krishna, Sreeramulu K. The Prevalance and Intensity of Infection with Didymoziod parasite in Priacanthus hamrur, Waltair Coast, India, U P. J. Zool,1996:16(1):19-22.
8. Laxma Reddy, Bannergii G, Rajender G. Biostastical Indexes on the occurance of cestode parasite, *Lytocestus indicus* infection in the freshwater catfish, *Clarius batracus* at the Warangal region A P J. Natcon. 2006:18(2):343-348.
9. Laxma Reddy, Banarjee G. Population Dynamics of cestode parasite found in the freshwater fish,Channa punctatus, J Eco boil. 2008:22(4):349-355.
10. Laxma Reddy, Banarjee G. Histopathological Changes induced by cestode parasite in fresh water murrel, Biolife J. 2012;2:324-328
11. Nidhi Arora. Population dynamics of *caryophyllid cestode Lytocestus fossilisi* from *Clarias batrachus* in Meerut (U.P.).J. Env. Bio-Sci,2010:24(1):99-101.
12. Pennyuick KL. Seasonal variation in the parasite population of three spinedStickle backs,
13. Gasterosteusaculeatus L. Parasitology. 1973:63:373-388.
14. Saraf Satish. Studies on prevalence of *Cestode parasites* of freshwater fish *Mastecembalus armatus* (l.) In jayakwadi dam, paithan,2019:9(10):9-10.
15. Shakir. The prevalence of cestode infection in a freshwater catfish, *Sperata sarwari* Punjab Univ. J. Zool,2006:21(1-2):41-47.
16. Yamaguti S. Systema Helminthum. II. The Cestodes of Vertebrates. Inte. Science Publ., N.Y; c1959. p. 860.