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Prevalence of crustaceanparasite (Argulus sp.) in Indian major carps, Darbhanga, India

Nitesh kumar mehta[1], Arti kumara[2]
[1]Research scholar, C.M.Sc. College, Darbhanga, LNMU, Darbhanga,. Email: nitesh.kumar456@gmail.com
[2]Associate professor & Head, C.M.Sc. College, Darbhanga, LNMU, Darbhanga

ABSTRACT

The current investigation was undertaken to*Argulus* sp. infestationintensity in Indian major carps collected from different ponds of Darbhanga district, Bihar, India. A total of 4080 specimens were examined for ectoparasite, *Argulus* sp. infestation out of which 572 specimens found to be infected. The observation revealed specieswisethat maximum prevalence of the *Argulus* was recorded in *L. rohita* (25.88%), *C. mrigala* (20.29%)and*C. catla* (13.23%) post monsoon season. The minimum prevalence of the *Argulus* was recorded in *L. rohita* (12.64%), *C. mrigala* (9.70%) and *C. catla* (3.52%) in the winter season. The prevalence (14.01%), abundance (2.22) and mean intensity (15.86) of parasitic infestation was recorded in a year. The bigger size specimen exhibited more parasites from the hosts.During monsoon and post monsoon seasons showed high prevalence of *Argulus*sp. infestation. So, fish health management should be in practice in hatchery and stocking ponds.

Keywords: Indian major carps,*Argulus,* crustacean parasite, fish ectoparasite,Darbhangacity pond.

INTRODUCTION:

India has second highest position in fish production worldwide. Fish is considered as good resources of nutrients and provides protein, vitamin and good fatty acids. Fisheries sector provides livelihood to more than 14 million people in India. Fishes are suffering from many parasitic diseases.

Darbhangadistrict is situated at North Bihar is called city of ponds due to having plenty of freshwater resources in form of thousands of Government and private ponds.These pondsare used for fish production.

Argulus sp. is commonly known as fish licedistributed worldwidecan be a major threat to fish health. Heavy infestation of *Argulus* is known as argulosis disease can cause morbidity and mortality.Genus, *Argulus* has more than 100 different species which includesin branchiuran crustaceans. There are three well studied freshwater species, *Argulusfoliaceus, A. japonicus,* and *A. coregoni*(Baker,2007).Argulus hasadapted to parasitic nature with organs like twoanteroventralsucking discsfor attachment organs to host,compound eyes, a suctorial proboscis, pairs of thoracic swimming legs, and a carapace that forms respiratory alae (Flick&Wiegertjes, 2005).

Parasitic diseases in fish play vital role in fish production. Parasitic infestations play a major role in disease occurrence (78%) in Indian freshwater aquaculture causing huge economic loss (Lakra, 2006).

Hence the objectives of the present study were to investigate the impact of seasonal variation in infestation of crustacean parasite in Indian major carp of different culture ponds of Darbhanga, Bihar.

MATERIALS & METHODS:

The *Argulus*sp. infected Indian major carps (*Catlacatla, Labeorohita* and *Cirrhinusmrigala*)were collected from different ponds Darbhanga in the period for one year from June, 2022 to May, 2023. The specimens were externally examined for the Argulus infestation collected monthly for once in month and samples brought into laboratory for isolation of parasite. The parasite could be seen with the naked eyes and brush and blunt forceps were used to remove parasite from body surface of hosts. In 70% ethanol parasites were preserved for further study. The aceto-carmine stained parasites were minutely observed under microscope. The identification of parasites was done using reference keys of Thomas and Devraj (1975); Wadeh*et al.* (2008) and Chandra (2008).

The season-wise prevalence percentage, mean intensity and abundance of the identified helminth parasites were determined by employing the following formulae (Margolis *et al.,* 1982).

$$\text{Prevalence} = \frac{\text{Total no. of host infected X 100}}{\text{Total no. infected host examined}}$$

$$\text{Mean Intensity} = \frac{\text{Total no. of collected parasites}}{\text{Total no. infected host examined}}$$

$$\text{Abundance (Relative Density)} = \frac{\text{Total no. of parasites}}{\text{Total no. infected host examined}}$$

RESULTS :

The results of the present study have been elaborated in Table-1. The specimens no.160 Indian major carp, *Labeorohita, Catlacatla*and *Cirrhinusmrigala*were found to parasitize there crustacean ectoparasite,*Argulus* sp.

Table-1: Seasonal variation of parasite, *Argulus* sp. infestation in Indian major carps.

Season	Species	Examined Fish	Infected Host	Argulus infested	Prevalence	Mean intensity	Abumdance
Post monsoon	Catlacatla	340	45	351	13.23	7.8	1.03
	Labeorohita	340	88	2782	25.88	31.61	8.18
	Cirrhinusmrigala	340	69	1181	20.29	17.11	3.47
Winter	Catlacatla	340	12	28	3.52	2.33	0.08
	Labeorohita	340	43	259	12.64	6.02	0.76

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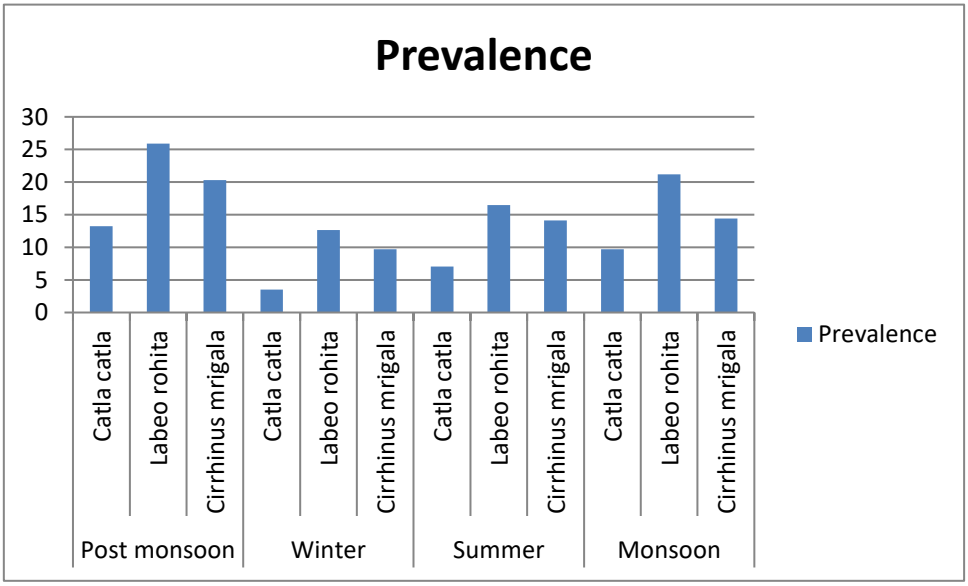
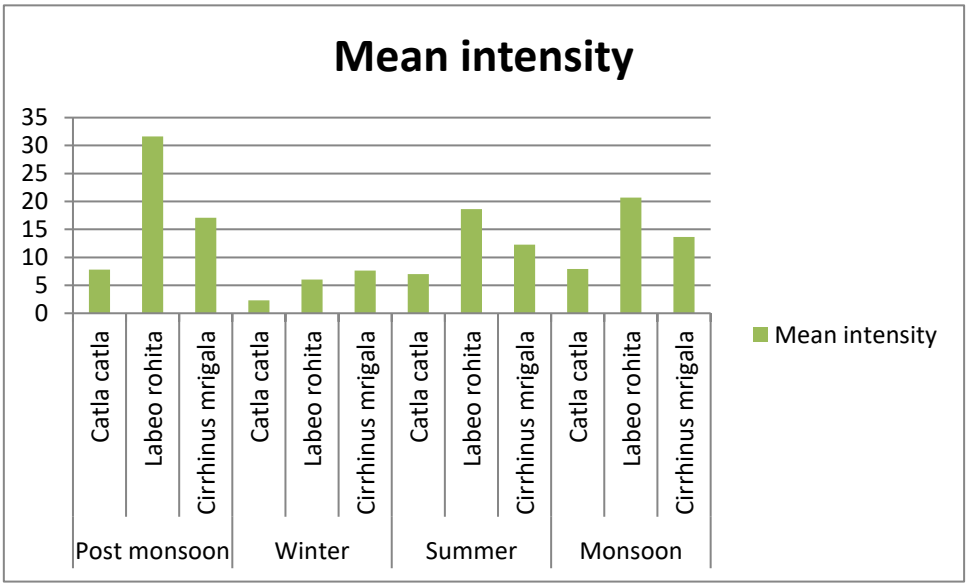
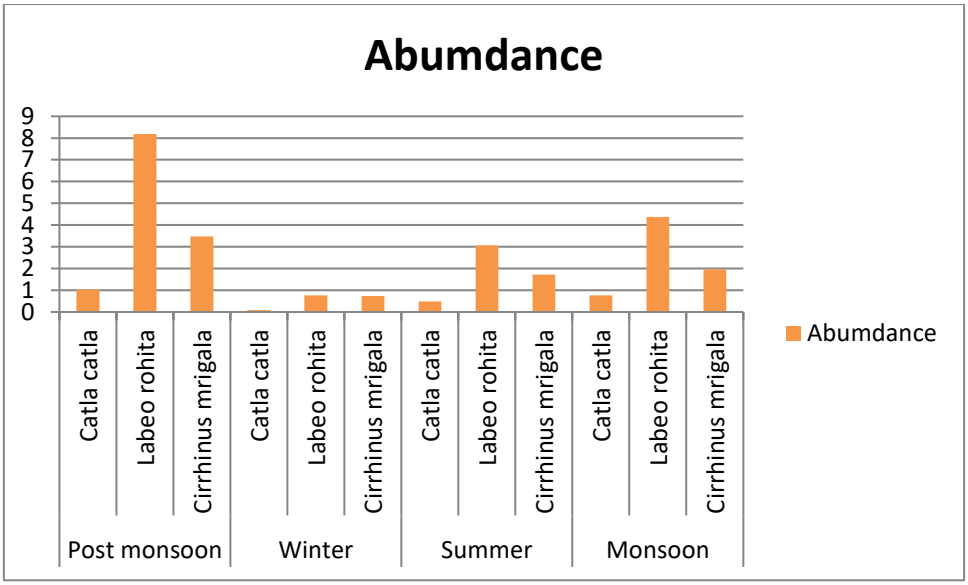
	Cirrhinusmrigala	340	33	252	9.70	7.63	0.74
Summer	Catlacatla	340	24	168	7.05	7	0.49
	Labeorohita	340	56	1043	16.47	18.62	3.06
	Cirrhinusmrigala	340	48	588	14.11	12.25	1.72
Monsoon	Catlacatla	340	33	262	9.70	7.93	0.77
	Labeorohita	340	72	1489	21.17	20.68	4.37
	Cirrhinusmrigala	340	49	669	14.41	13.65	1.96
		4080	572	9072	14.01%	15.86	2.22

Histogram-1: Seasonal variation of *Argulus*sp. infestation in Indian major carps.







DISCUSSION:

During the present study *Argulus* infestations in fish culture ponds of Darbhanga region were observed to occur throughout year. Das *et al.* (2016) has reported that prevalence of Argulus was significantly ($p<0.01$) higher in rainy season than the other seasons. They have also found that Rui (*Labeorohita*) was more susceptible of Argulosis disease than other Indian major carps. Rainy season was the most susceptible period of the year when*Argulus*found abundant. The factors have been makes favorable for *Argulus* abundant in rainy season are water temperature, depth, stocking density along with other physico-chemical parameters and poor pond management. The present study showed that *Argulus* infection was highest in post monsoon and lowest in winter season. This result agrees with others Banu and Khan (2004) Akter*et al.* (2007); Ahmed *et al.* (2009) and Das *et al.* (2016).

Argulus infestation in carp hatcheries and seed production centers causes heavy loss in production have been reported by many authors Banu and Khan (2004); Ahmed *et al.* (2009)and Das *et al.* (2016). Heavy mortality in major carp fry and fingerlings was reported by Subasinghe (1992) in hatcheries in Sri Lanka.

CONCLUSION:

This study concludes that water bodies of Darbhanga region need proper management particularly during post winter and summer which are pick months of parasites infection causing heavy mortality to fishes and fingerlings in nursery leading to loss of production. During monsoon and post monsoon seasons showed high prevalence of *Argulus*sp. infestation. So, fish health management should be in practice in hatchery and stocking ponds.

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