Diversity of Fish Parasites from fresh water fishes of Masooli Reservoir of Parbhani District

Ishrat Parveen and J.M. Gaikwad

Department of Zoology, Dyanopasak college, Parbhani
Department of Zoology and Fishery Science, Shri Shivaji College, Parbhani
E-mail:- Ishrat Parveen70@gmail.com and gaikwadjp_pbn@yahoo.co.in

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Abstract: This study aimed to investigate the incidence and abundance of the parasites of fresh water fishes. A total 209 specimen of Cultivable and Catfishes were sampled from Masooli Reservoir of Parbhani District during the period of Oct 2011 to Sep 2012. Recorded parasites were analysed and identified as *Senga* from Cestodes, *Argulus* from Branchiura and *Lamproglena* from Copepodes separately. The total incidence and abundance was observed higher 12.6% and 0.23 in Catfishes as compared to the cultivable fishes1 i.e 11.82% and 0.18

In conclusion, it was found that *Mystus seenghala* from Catfishes and Catla-catla from Cultivable fishes shows heavy infection with large number of parasites. The parasites were collected from different parts of the body. Their abundance and clinical lesions could eventually reduce performance and productivity of the species.

Key words: Fish parasites, incidence, Abundance, Cultivable and Catfishes, Masooli Reservoir

Introduction:-

Biodiversity is the short form of biological diversity. It is considered as an umbrella term referring to organisms found within the living world, i.e. the number, variety, and variability of living organisms.

Fishes are aquatic creatures, perfectly adapted for life in water. Among the organisms, fishes are the best known species of aquatic organisms and they are the only food source harvested from natural populations. Furthermore, fishes exist at or near the top of the food chain and can serve as an indicator of a balanced aquatic ecosystem (Gorman and Karr, 1978). Fishes are the keystone species which determine the distribution and abundance of other organisms in the ecosystem they represent and are good indicators of the water quality and the health of the ecosystem. Nearly 20 per cent of the world's freshwater fish fauna is already extinct or is on the verge of extinction due to parasitic impact (Moyle & Leidy, 1992)

Today the fish diversity and associated habitats management is a great challenge and the ability to evaluate the effects of habitat change and other impacts on the fish population required extensive surveying of the fish population before and after the change occur (Lester *et al*., 1996; Dudgeon *et al*., 2006).

Parasites and diseases reduce fish production by affecting the normal physiology of fish (Kabata, 1985) and which, if left uncurtailed, can result in mass mortalities of fish, or in some cases infection of man and other invertebrates that consume them (Fagbenro et al., 1993). Therefore, in the present investigation species diversity, occurrence of different parasites was studied from Masooli reservoir.

Materials and Methods:-

During present investigation period catfishes *(Clarius batrachus, Wallago attu* and *Mystus seenghala)* and Cultivable fishes (*Catla-catla* and *Labeo-rohita*) were collected from Masooli reservoir of Parbhani district with the help of local fisher man. The specimens were preserved in 4 % formalin and brought to the laboratory for the further study. Two Crustacean parasites that are *Lamproglena* and *Argulus* have found on gill filament and skin surface respectively. Both parasites were carefully removed with the help of needle and soft brush under a low power binocular microscope. Both parasites were preserved in 5% formalin. Identification and Classification of Crustacean parasites were done with the help of "Parasitic Copepod and Branchiura of Fishes" by Yamagutti (1963).

For helminth parasites fishes were dissected and intestine was removed from each fish and placed in petri dish with saline solution. The intestine was cut open to reveal the cestodes. Cestodes were removed from the intestine; washed in distilled water flattened between cover glass and slides, fixed in 4 % formalin until 24 hours, for specific identification. Then, were stained with Harris hematoxylin, destained in 1% acid alcohol, dehydrated through a series of ascending alcohol of 30%, 50%, 70%, 90%, and absolute alcohol, cleaned in xylene before mounting in D P X; and drawing were made with the aid of Camera lucida and measurement were recorded in millimeter unless otherwise mentioned. Identification was carried out by using Systema Helminthum Vol. II (Yamaguti - 1956).

This data was obtained throughout the study period of one year (2011-2012). This was processed and analysed to know the incidence and abundance of parasites.

Incidence and Abundance of Helminth and Crustacean parasites were determined by using following formulae.

$$\text{Incidence \%} = \frac{\text{Infected Host} \times 100}{\text{Total Host examined}}$$

$$\text{Abundance} = \frac{\text{No. of Parasites}}{\text{No. of Host examined}}$$

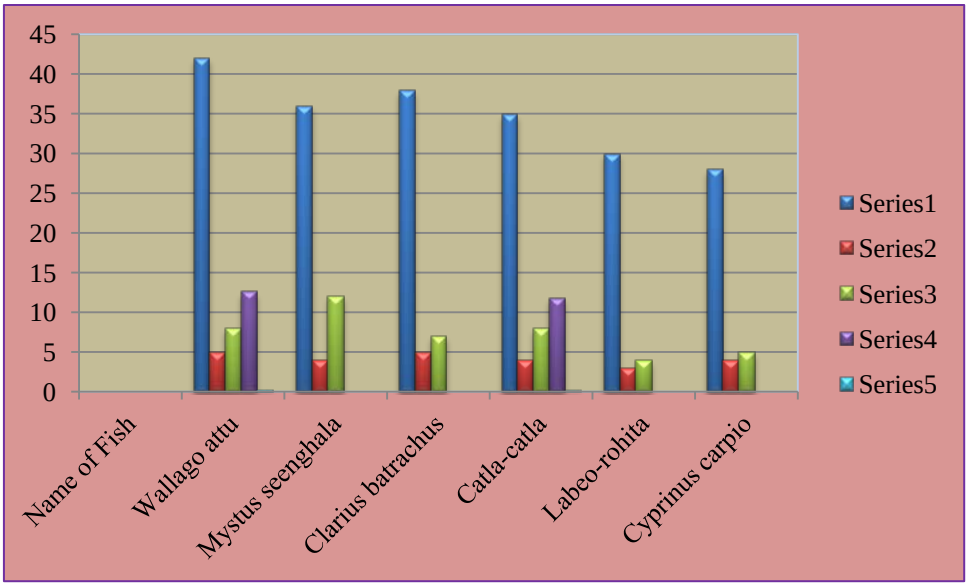
Table No.1:- Showing incidence and abundance and number of parasites collected from fresh water fishes

Sr. No	Name Of Fish	Number of fishes	Number of parasites	Incidence	Abundance

		Examined	Infected	collected		
1	Wallago attu	42	05	08	12.6%	0.23
2	Mystus seenghala	36	04	12		
3	Clarius batrachus	38	05	07		
Total		116	14	27	11.82%	0.18
1	Catla-catla	35	04	08		
2	Labeo-rohita	30	03	04		
3	Cyprinus carpio	28	04	05		
Total		93	11	17		

Table no. 2 showing different parasites collected from fresh water fishes

	Name of Host	Name of Parasite
Helminths	*Clarius batrachus, Wallago attu, Catla-catla, Cyprinus carpio*	*Argulus*
Crustaceans	*Clarius batrachus, Wallago attu, Mystus seenghala, Labeo-rohita*	*Senga, Argulus,Lamproglena*
	Clarius batrachus, Wallago attu, Mystus seenghala, Catla-catla	*Argulus, Lamproglena*



Graph -1 shows Intencity and Abundance of Cultivable and Catfishes.

Series1—Number of examined; fishes Series2—Number of Infected fishes;

Series3—Number of Parasites; Collected Series4—Incidence%; Series5—Abundance

Result and Discussion:-

During the present study total 209 fresh water fishes were collected from the Masooli Reservoir with the help of fisherman. From these 116 fishes are Catfishes and remaining 93 fishes are Cultivable fishes. The study was carried out during Oct 2011 to Sep 2012. Out of 116, total number of 14 catfishes is found to be infected with the different parasites (Table no.1). Among three species of catfishes, *Mystus seenghala* shows more number of parasites (12), followed by *Wallago attu* (08) and less number of parasites found in *Clarius batrachus* (07). At the same time Cultivable fishes were also examined which shows 11.82% incidence and abundance of infection found to be 0.18, which is slightly less than Catfishes in which the incidence is 12.6% and abundance of infection is found 0.23.

Apart from these, the identification of the parasites and their occurance from host to host, species to species and season to season was also recorded separately. The identification of *Argulus* and *Lamproglena* was done by following "Parasitic Copepod and Branchiura of Fishes" by Yamagutti (1963) and helminth (Senga) was identified with the help of Systema Helminthum Vol. II (Yamaguti - 1956).

Catfishes show large number of parasite (27) i.e each catfish is found affected with helminths as well as crustacean parasites. But among three species of cultivable fishes only *Cyprinus carpio* doesn't shows occurrence of *Lamproglena* and *Senga* parasites.

Argulus, *Lamproglena* and *Senga* parasites were collected from the different parts of the body of infected catfishes and cultivable fishes with. The *Argulus* and *Lamproglena* were collected from gill region and *Senga* parasite was collected from intestine. Oniye et al (2004) in Zaria, Nigeria, isolated five species of helminth parasites comprising of three cestode species, one nematode species, and one acnthocephalan species. Although both ectoparasites and endoparasites are common in fishes but it was found that the internal (endo) parasites are able to cause much greater damage to their hosts than external (ecto) parasites and the damage caused by helminth parasitest to their host is generally related to the intensity of the infection and the depth of penetration of the parasite within the host tissue. These findings are in agreement with Tonguthi (1997) and (Dezfuli et al. 2003)

Parasitic crustaceans found in the class copepod and Branchiura are invariably ectoparasites on fish and have a direct life cycle. Parasitic stages are usually blood feeders on gills, fins and skin on the host and large number can have serious pathogenic effects (Lester and Hayward 2006). Copepods occupy a special place in the world of parasitism because of their extraordinary ability to adapt to very diverse aquatic hosts ranging from simple shape, such as sponges to more complex forms, such as vertebrates.

The host fishes were examined carefully and parasites were collected by observing different clinical signs i.e *Argulus* fish lice attached to the skin, gill chamber, and mouth. Localized inflammation occurs at the contact site because of mechanical damage from hooks and spines on the style and appendages, causing irritation from digestive enzymes. In heavy infestations, the fish lice may be seen all over the skin and fins of the fish and in the water column fish without visible lice (non-specific signs) of infestation (Hoffman, 1999). The signs include spot or pinpoint hemorrhages, anemia, fin and scale loss, increased mucus production, lethargy, erratic swimming, reduced feeding, hanging at the surface (avoiding swimming into the water column) and poor body condition. Fish may "flash" or rub against surfaces in an attempt to relieve irritation or to remove the parasites. In some cases, there may be no obvious signs of disease other than presence of the parasite (Stoskopf, 1993).

In Iran, *Argulus spp.* were reported from different hosts between 1984 and 2010 (Azadikhah et al 2009; Behrouzfar et al 2009; Jaameei et al 2009; Mehdizadeh, 2009; Mokhayer 2006; Mokhayer and Ebrahimzadeh Mousavi 2009; Mosafer et al 2009).

Recently in 2009 Everts, L and Avent-Oldwageort (Department of Zoology University of Johansberg, South Africa) published a list of 28 species of *Argulus* in Malaysia (Applied Biology, 2009) with their host name and location; of these 09 species from India.

The most common lesions observed regarding helminth parasites were intestinal inflammation around the worm attachment surface and necrosis (cell death). Heavily infected fishes are often dark, emaciated, and lethargic. Necropsy may reveal liver enlargement and anemia. No obvious external signs can be seen

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