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Copepod ecto-parasites of *Labeo rohita* from Dera Ismail Khan, Khyber Pakhtunkhwa Pakistan

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Abstract

In the present study two hundred rohu (*Labeo rohita*) from Dera Ismail Khan, Khyber Pakhtunkhwa were examined for ecto parasites, the copepod ectoparasites found were *Lernaea cyprinacea*, *L. arcuata*, *L. lophiara*. Out of 200 fish, 37 were infested (18.5%). In which the predominant parasite was *Lernaea cyprinacea*. An overall prevalence of ectoparasites was *Lernaea cyprinacea* (18.01%), *L. arcuata* (15.5%), *L. lophiara* (10.51). *Lernaea cyprinacea* is the most abundant ectoparasite in the overall study.

Keywords: Fishes, Copepod, ectoparasites, *Labeo rohita*

1. Introduction

External parasites are the most common parasites encountered in aquatic animals raised in both ponds and aquaria. The major groups of parasites include protozoans, monogeneses and crustaceans^[1]. Among crustaceans the copepods which parasitize fish, are the most commonly known pathogenic parasites of cultured fresh water fish in many Asian countries including Pakistan. Their injurious effects on the host are believed to be direct or indirect as their infestation causes formation of lesions and inflammation at the site of attachment which often leads to secondary infections by bacteria^[2]. In parasitic copepods, the body segments are often fused. The abdomen has four segments, which are usually all fused in the parasitic species as a result of adaptation to the host. These species are difficult to recognize as arthropods, let alone copepods. Approximately 8,000 species of copepods exist, most of which are free-living. Parasitic infection not only effects the normal growth of fish but also reduce fish population by increasing mortalities. Ecto-parasites attacks to the gills and skin resulting in localized hyperplasia disturb osmoregulation and ultimately kill the host^[3]. The incidence and intensity of parasite also varied with season^[4]. Young fishes are more prone to infection than old ones^[5]. For cultured fish population, the parasites are reported as to involve in the serious outbreak of disease^[6]. The crowded culture conditions, temperature and slow water flow increases the parasites multiplication and infestation^[7]. *Lernaea cyprinacea* parasitizes freshwater fish, attaching on the outside surface by boring into the underlying muscle tissues, although the greater part of the parasite body remains outside the host. Heavy infestation by *Lernaea* is fatal to the host^[8].

2. Methods and Materials

2.1 Study Area

District of D. I. Khan bounded on the east by the Bhakkar and Dera Ghazi Khan Districts, of Punjab, to the southwest by South Waziristan, and to the northwest by Tank and Lakki Marwat districts. The district has an area of 7,326 km² (2,829 sq mt) and a population of 852,995 as per 1998 Census (WWW.GOOGLE.COM).

2.2 Sample Collection

Host Fish (*Labeo rohita*) were collected live from River Indus of Dera Ismail Khan. Fish were collected twelve times during the year (2014-15).

2.3 Examination of specimen

A total of 200 fresh water fish, (*Labeo rohita*) were collected alive from River Indus. The necropsy technique of parasitological examination of skin, fins and gills was carried out for the

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presence of external parasites. The gills of fish were examined through magnifying glass and the recovered parasites were fixed and transferred it to 5% formalin light Microscope ^[9].

2.4 Parasites Identification

The overall parasites were identified by aquarists through the description given by Hopla in 1994 ^[10].

3. Results and Discussion

A total of 200, *L. rohita* were examined in order to study the prevalence of copepod ectoparasites. Three *lernaean* species *Lernaea cyprinacea*, *L. arcuata*, *L. lophiara* were found. Most of the fish species were only infected by a single copepod species. However, some host species acquired up to 5 copepod species. The predominant parasite was *Lernaea cyprinacea*. An overall prevalence of ectoparasites was *Lernaea cyprinacea* (18.01%), *L. arcuata* (15.5%). *L. lophiara* (10.51). *Lernaea cyprinacea* is the most abundant ectoparasite in all the observed parasites (Table; 1). The month wise study also shows great variance, the parasites on the peak in summer and low in winter as compared to other season ((Table; 2). The different species of the genus *lernaean* have also been reported from different parts of the world. Gnanamuthu *et al.* (1951) ^[11] have reported that *lernaean*

chackoensis n. sp from *Osphronemus goramy* and *Catla catla* in Madras. Fryer *et al.* (1956) ^[12] have reported the following copepod parasites from different fishes from Lake Nyasa, *L. bagri harding*, *L. tlapiae harding*, *L. palate harding*. Lewis *et al.* (1981) ^[13] have recorded *L. craciata* from the rock bass in the Ottawa River. Camburn *et al.* (1983) ^[14] have recovered *Lernaea sp.* from fishes belonging to the family *Cyprinidae* collected from the Mud River. Ho *et al.* (1997) ^[15] have reported five sp of the genus *Lernaea* from freshwater fishes of Thailand. Camburn *et al.* ^[14] have reported five sp of ectoparasites *Lernaea polymorpha*, *L. cyprinacea*, *L. oryzophylla*, *L. arcuata*, *L. lophiara*. The difference in the copepod ectoparasites in the present study with Gnanamuthu ^[11], Fryer ^[12], Lewis ^[13], may be due to climatic variation between the different localities and also due to different host examined.

Table 1: Overall prevalence of copepod ectoparasites of *Labeo rohita* from district Dera Ismail Khan, Khyber Pakhtunkhwa Pakistan

Parasites	No of fish examined	Infested	Prevalence (%)
<i>L. cyprinacea</i>	200	36	18.01
<i>L. arcuata</i>	200	31	15.5
<i>L. lophiara</i>	200	21	10.5

Table 2: Month wise rates of copepod ectoparasites from district Dera Ismail Khan, Pakhtunkhwa Pakistan

Months	<i>L. cyprinacea</i> (%)	<i>L. arcuata</i> (%)	<i>L. lophiara</i> (%)
April	2(66.66)	1(33.33)	0(0)
May	3(75)	1(25)	0(0)
June	4(57.14)	2(28.57)	1(14.28)
July	5(50)	3(30)	2(20)
August	5(35.71)	6(42.85)	3(21.42)
September	7(35)	8(40)	5(25)
October	4(40)	3(30)	3(30)
November	1(25)	2(50)	1(25)
December	1(20)	2(40)	2(40)
January	2(50)	1(25)	1(25)
February	1(33.33)	1(33.33)	1(33.33)
March	1(25)	1(25)	2(50)

4. Conclusion

The results demonstrated that copepod infestations in fresh water fish tend to peak in the summer and low during winter.

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