



PARASITIC INFESTATION IN GULFAM FISH (*CYPRINUS CARPIO*) CARP FROM KEENJHAR LAKE DISTRICT THATTA, SINDH, PAKISTAN

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ARTICLE INFORMATION

Article History:

Received: 3rd January 2019

Accepted: 25th Sept. 2019

Published online: 29th April 2020

Author's contribution

All authors contributed equally in this article.

Key words:

Parasitic; Gulfam Fish; Keenjhar Lake; Thatta; Sindh.

ABSTRACT

During the study period it was observed that few fishes were infected from the collected fishes, total 620 fishes were collected, mold (*Cyprinus carpio*) Silver carp (*Hypophthalmichthys molitrix*) 62 Morakhi (*Cirhinus madrigals*) 62 Thalla (*Catla Catla*) 62 and Rohu (*Labia Rohita*) 62 fishes were collected. The rate of infestation was higher in the summer season while rate of infestation was lower in the winter season, the rate of infestation is higher in the month of July 23% while lower in the month of February 06%, also in summer season when water is less present in the lakes the fishes are close to each other then parasites spread easily, while in winter season when the more water is present in the lakes the space between fishes are more than no more parasites are spread. When the temperature in summer season rises at this time the reproduction and development of parasites become rapid hence rate of infestation increases, while in winter season when temperature falls the reproduction of female parasites restricts, hence rate of infestation decreases. Rate of infestation increase with the increasing of temperature .Also in the summer season hardness of water increases and acidity of water increases, b while in winter season the hardness Decreases and base increases. The rate of infestation was higher in the summer season while rate of infestation was lower in the winter season, the rate of infestation is higher in the month of July 23% while lower in the month of February 06%, also in summer season when water is less present in the lakes the fishes are close to each other then parasites spread easily, while in winter season when the more water is pr The total infestation percentage of parasites are Argulus 30%, Lernaea 20%, Trichodnina 20% and Chilodonella 15% and the parasites attack on the fishes Gulfam 20%, Silver carp 16% , Morakhi 11% , Thallah 5% and Rohu 4%. Infested in the lakes the space between fishes are more than no more parasites are spread.

1. INTRODUCTION

The most significant group of vertebrates is fishes which are beneficial to people in various ways.

These are most usual as well as broadly distributed all over the world. Their quantity and quality can be different which are utilized by people all over the globe. Fresh fish flesh provides an excellent source of protein [1,2,3]. This protein is relatively of high digestibility, biological and growth promoting value for human consumption. Nutritional studies have

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proved that fish proteins rank in the same class as chicken protein and superior to milk, beef protein and egg albumen. Fish proteins are comprised of all the ten essential amino acids in desirable strength for human consumption, namely lysin (high concentration), arginine, histidine, leucine, isoleucine, valine, threonine, methionine, phenylalanine and tryptophane. This accounts for the high biological value of fish flesh. Fish flesh therefore becomes a valuable supplement to human diet for people who are habitually taking cereals, starchy roots and sugar as their principle diet [4-6]. Variable amounts of Ca, P, and fats as well as other various nutrients are present for human health and development. Fish oil contains high amounts of soluble fats. The products of fish are also used in the preparation of antiviral, antibiotic, and anticancer agents. Numerous products are manufactured from fish for production of printer ink, fertilizer, and medicine [7,8]. High quality protein is present in fish. According to the estimation of FAO that approximately one billion people all over the world depend upon fish as their primary source of animal protein [9]. Other than protein fish meat produces minerals, iodine, vitamins and fat. The most important minerals consist of Ca, Mn, K, Na, P, Fe, S, Cl, Cu, Mn, Br and I. Beside traces of strontium, zinc, barium, aluminum, molybdenum, cobalt, nickel, mercury and cadmium are also present. Phosphorus occurs in fish as phosphoproteins, phospholipid and complex adenosinopolyphosphate. The source of vitamins A and D is fish liver oil. For the growth of bones as well as healthy skin, vitamin A is the most important. For the use of Ca in body vitamin D plays an important role. There are several vitamins of B, such as vitamin B-complex. The chief byproducts are fish meal, fish manure, fish protein, fish flour, fish silage and soluble, fish skin, fish roes, fish glue, isinglass and other. Other benefits of fishes are their use as medicine for disease control, sport and for scientific study; fish is considered the major industry for the people [10,11,12].

2. MATERIALS AND METHODS

Currently, Keenjhar Lake is found to be attractive blue water lake located near Thatta. The Lake is about 80 km away from Hyderabad, 122 km from Karachi and only 22 km away from Thatta. It is also known as Kalri Lake. For Indus River basin, it plays vital ecological role. The lake is found to be financial source of different fish varieties, very important for broad range of migratory birds, passage as well as for breeding, good fish fauna means source of export of

fishes in all over the Sindh province. Drinking water is got by thickly populated city of Sindh, Karachi from the Lake, Thatta. **Fish Sampling** the sample was collected on monthly bases during, July 2017 to June 2018. Total 620 carp fishes were collected. Identification was done by the keys given by [13,14]. **The parasitic** infestation was studied by [15,16]. **Measurement** was done by the way of the length of fish was followed as 0.1 cm from the tip of the nose to the subsequent tip of caudal fin. In total, 620 fish samples were collected from Keenjhar Lake which were brought into laboratory of Endocrinology, all fish samples were examined for parasitic infection, out of 620 fish samples, 372 of Gulfam carp, 62 Silver, 62 Morakhi, 62 Rohu and 62 fish samples of Thelhi fish were captured during sampling seasons. Fishes were examined for the sites of attack of parasite, selected fish samples were examined by naked eyes and also used magnifying glasses, scalpel to observe the various ectoparasites infested in different parts of fish species. Forceps and scissor was used to remove the gills and fins randomly for investigating the parasites properly collected ectoparasites were preserved in vials containing 4% formalin. The outer surface of the each fish species was investigated after measurement of the length of the fish. The abnormalities in fish species for instance, laceration, skin discoloration, skin erosion, and ectoparasites presence was observed. To recognize the parasites literature of [17], was followed. Different slides were made for investigating the parasites present in caudal fins and gills in each fish species. Scissor was employed for removing extra fluid. To measure average intensity and prevalence, equations given below were followed as mentioned by [18-26]. Prevalence was measured as no: of infected fish species divided by total no: of investigated fish multiplied by hundred. No: of parasites divided by total no: of infected fish species. This method is used for the prevalence percentage and mean intensity.

3. RESULTS AND DISCUSSION

During study it was observed that the fishes are also affected by ectoparasites like that Argulus, Lernaea, Trichodina and Chilodnella, however as compare to other parasites Argulus and Lernaea more infect to the fishes and damage the tissues, muscles and gills of the fish body, like other fishes carp fishes are also

infected by the different parasites. The infestation of parasites on fishes is high in summer season and less in winter season, because infestation rate is increase with the increasing of temperature, that's why rate of infestation is higher in the month of May and June and lower in the month of December and January, because water will reduce in the month of May and June that's why fishes come at the surface of water from beneath then parasites comes from old trees and environment. Secondly that when the temperature in summer is between 20 to 30 centigrade in this temperature the parasites reproduce and develop rapidly, while the parasites reproduction and development restricts when temperature is below 20 centigrade. Also in summer season less water is present in the lake as compare with winter season because there is less space between the fishes and the parasites spread easily in summer season, while in winter season there is more space between the fishes then no more parasites will spread, however in the month of June hardness of water increase and ph of water reduces (acidity become increases). During the study it was also observed that Gulfam fish (*Cyprinus carpio*) was more infected then other fishes such as Silver carp, Thalhi, Morakhi and Rohu.

Table.1 Total fishes collected during the study period July 2017 to June 2018

Fishes	Collection
Gulfam (<i>Cyprinus carpio</i>)	372
Silver carp (<i>Hypophthalmichthys molitrix</i>)	62
Morakhi (<i>Crrhinus mrigala</i>)	62
Thalla (<i>Catla catla</i>)	62
Rohu (<i>Labeo rohita</i>)	62

Table.2 Percentage of parasites on body parts of fishes.

Parasites	Fins	Gills	Scales
Argulus	40%	35%	25%
Lernaea	35%	35%	30%
Trichodina	35%	35%	30%
Chilodonella	30%	40%	30%

Table.3 Total fishes and infected by percentage

Fishes	Collected	Infected	Percentage
Gulfam	321	61	20%
Silver carp	76	12	16%
Morakhi	70	07	11%
Thallah	67	03	5%

Rohu	62	02	4%
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Table.4 Total infestation % of parasites on fishes from January 2018 to June 2018

Months	Percentage
January	6.5%
February	06%
March	08%
April	14%
May	16%
June	23%

Table.5 Total infestation percentage of parasites on all fishes

Parasites	Percentage
Argulus	30%
Lernaea	20%
Trichodina	20%
Chilodonella	15%

4. CONCLUSION

During the study period it was observed that few fishes were infected from the collected fishes , total 620 fishes were collected, from these fishes 67 were infected , the rate of infestation was higher casued by the argulus parasites and the infection on gulfam fish was more than other fishes such as silver carp and Morakhi , the rate of infestation was higher in the summer season mostly in the month of may June and July, in the month of May total 58 fishes were collected , 09 fishes were infected , in the month of June 58 total fishes were collected , from these fishes 15 were infected , 66 fishes were collected in the month of July , 17 fishes were infected , while rate of infestation was slow in the winter season mostly in the month of November , December and January , in the month of November 48 fishes were collected , from these fishes 04 were infected , 48 fishes were collected in the month of December , 04 of them were infected , in the month of January total 50 fishes were collected , 03 of them were infected. More fishes were collected in summer season because in summer season no more water is present in lake, less fishes were collected in the winter season because more water is present in the lakes. The rate of infestation is higher in winter season because between 22 to 30 centigrade the reproduction and development of parasites become more rapid and also in this temperature the development cycle of parasites

will complete in 17 to 25 days, and in winter season when the temperature falls from 20 centigrade the female parasite restricts its reproduction and development hence infestation rate decreases during the winter season. Also in summer season when water is less present in the lakes the fishes are close to each other then parasites spread easily, while in winter season when the more water is present in the lakes the space between fishes are more than no more parasites are spread, the young fishes are more infected than the old ones. During the study period it was observed that few fishes were infected from the collected fishes, total 620 fishes were collected, Gulfam (372), Silver carp (62), Morakhi (62), Thalla (62) and Rohu (62) fishes were collected. The rate of infestation was higher in the summer season while rate of infestation was lower in the winter season, the rate of infestation is higher in the month of July 23% while lower in the month of February 06%, also in summer season when water is less present in the lakes the fishes are close to each other then parasites spread easily, while in winter season when the more water is present. The total infestation percentage of parasites are Argulus 30%, Lernaea 20%, Trichodina 20% and Chilodonella 15% and the parasites attack on the fishes Gulfam 20%, Silver carp 16%, Morakhi 11%, Thallah 5% and Rohu 4%. Percent in the lakes the space between fishes are more than no more parasites are spread.

5. CONFLICT OF INTEREST

All authors have declared that there is no conflict of interest regarding publication of this article.

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Fig.1& 2: Keejhar Lake an overview and water sampling for analysis



Fig.3 &4 Showing the infested Gulfam fish, analysis at the site.



Fig. 5&6 Samples were processed in research laboratory at Dept. of Zoology



Fig. 7 & 8 Observation and identification of parasites under stereoscopic microscope at Advanced Endocrinology lab