

ICHTHYOFAUNA OF PAT FEEDER CANAL DERA MURAD JAMALI DISTRICT NASEERABAD BALOCHISTAN

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Abstract

*The current study was conducted to determine the fish fauna of Pat Feeder Canal, Dera Murad Jamali District Nasserabad, Balochistan. The research was conducted from September to November 2017 and April to May 2018 at seven various sampling stations to determine the diversity of fish and their pattern of distribution. In the present study overall, (17) species of fish were captured and a total of (678) specimens of fish were collected at the sampling stations of the canal from both downstream and upstream and by using a variety of fish nets. Identification of these fishes were made by using standard taxonomic keys on the basis of morphometric features. The study further indicated that the *Labeo rohita* was the leading species which was collected a total of (98) specimens and had a more relative abundance (0.144). The second dominated species was *Tenualosailishawith* (84) specimens were collected and had a relative abundance about (0.123) and the third most dominated species was *Catlacatla* with (74) specimens with high relative abundance about (0.109). The remaining species that were collected in the study, found moderate (or) low in numbers in the Pat Feeder Canal in the selected stations. The current review study will help the ichthyologists and conservationists in future for detailed investigations and conservation strategies for fish fauna of the region.*

KEYWORDS: Ichthyo-fauna, Biodiversity, Species abundance, Cyprinidae.

INTRODUCTION

Pat Feeder Canal is a well-known irrigation system situated in Dera Murad Jamali District Naseerabad Balochistan Pakistan. Pat Feeder Canal arises from GudduBeraj. The length of Pat Feeder Canal is approximately is (171) kilo meters (33) kilo meter of Pet feeder canal lies in the Province of Sindh while rest of the length runs throughout Balochistan. The discharge capacity is (6700) cusecs and total command area is (458425) acres. There are different types of fish species are found in Pat Feeder Canal. Freshwater fish diversity in highest number in world is found in the Neo tropics and (43%) approximately of this



diversity is found in the Brazil (Albert and Reis, 2011), Buckupet al., 2007). The described neo tropical freshwater fish species about (5617) was reported by (Reis et al., 2016) Certain that listed (4475) of described species, there has been a significant advance in the taxonomic knowledge of neo tropical ichthyofauna, with approximately (28%) of the ichthyofauna described in the last eleven years Reis et al., 2003.

The dynamics comprehension of ichthyofauna for management and evaluation needs integrated the analysis of biological, chemical and physical process in spatial and temporal scales, because of the life cycle of species to seasonal and regional variations (Yañez- Arancibia, 1978). The specific characteristics of a species which might be interrelated to the ability to scatter, like mobility of adult fish and reproductivity functional group and other categories which was described by (Elliott et al.,2007)

Fish and fish products are important sources of food, diet, earnings and source of revenue millions of people in the world. Marine and fresh waters resources recently and in future, have possible to contribute meaningfully to food security and suitable nutrition for a worldwide population estimated (9.7) billion (bn) through (2050). Rising and falling demand for fish and fish products will mainly be met by growing in farmed production, which is estimated to reach (102) million tons (mt) through (2025). For international fish accessibility to meet expected claim, it has been projected that rearing of aquaculture would want to added than increased by mid-century to crudely 140 (mt) by (2050).In earth biodiversity fresh water ecosystem is considered as the most important phenomena in which the harbor of earth biodiversity covers approximately (2%) of our land surface (Cosgrove et al., 2000).

In most of this diversity seems in lakes as well as rivers too which form a system. (Abell et al., 2008) On the other hand it is always spread at a small scale and harbors have a significant role of this biodiversity. This limited habitation which can be measures by great surroundings which was characterized with incidence of physic chemical stressors by the external variety generally qualified via tax on with needful expensive versions inattentive in carefully related taxa for the preservation by homeostasis (Townsend et al., 2003, Sibly et al.,1989). Biological system provided a great system for evolution research studying ecology and the effects in multiple levels (Waterman et al., 1999 – 2001).

LITERATURE REVIEW.

Ali et al., (2020) described that the present study was exhibited the fish diversity at Malakand. The fish specimens were collected from various five sites (Kharki stream,



Wartier stream, Meherdi stream, Dargai streams and Mahajar camp stream). In the study locations overall fourteen species were identified taxonomically such as *Danio devario*, *Channa punctata*, *Barilius pakistanicus*, *Mastacembelus armatus*, *Puntius chola*, *Carassius auratus*, *Acanthocobitis botia*, *Puntius sarrana*, *Ompok pabda*, *Crossocheilus diplocheilus*, *Barilius vagra*, *Puntius conchinus*, *Schizothorax plagiostomus* and *Tor putitora*. Thus, the most abundant family was Cyprinidae in the study area which was observed in the all-selected localities of the study area of Malakand Khyber Pakhtunkhwa, Pakistan.

Haseeb et al., (2016) described the main objectives of the investigated work was to determine the fish fauna diversity from Naryab dam which is located in District Hangu, Khyber Pakhtunkhwa, Pakistan. During study a total of seven species were collected for identification such as, *Hypophthalmichthys molitrix*, *Labeo rohita*, *Catla catla*, *Hypophthalmichthys nobilis*, *Anguilla anguilla*, *Ompok pabda* and *Tor khudree*.

Hasan et al., (2015) described the fish fauna of Zhob River, Balochistan. They were collected about (200) specimens of fish during study. The fish that were collected in the study comprised only one order which was called Cypriniformes, a single family that was Cyprinidae and a total of five genera such as *Garra*, *Cyprinion*, *Barilius*, *Crossocheilus*, *Schizothorax*. A total of six species was reported. The relative abundance of species wise in order of *Schizothorax plagiostomus*, *Cyprinion watsoni*, *Barilius pakistanicus*, *Bariliusvagra*, *Crossocheilus diplocheilus* and *Garra gotyla*. The index of biodiversity showed that the river was low ichthyic diversity. Therefore, need to stop illegal and nasty fishing.

Froese and Pauly. (2015) reported freshwater fish species in different countries; such as (951) in India, (1643) in China, (277) in Iran, (250) in Bangladesh and (128) in Afghanistan.

Mirza and Mirza. (2014) There are not less than 193 freshwater fish species in Pakistan. But more than (180) fish species are found in Indus River in Pakistan. Many scientists have studied the fish fauna of Indus and its tributaries. A number of important papers on the freshwater fishes of various regions of Pakistan have been published. On the hill stream fishes of Kaghan and Swat, on the freshwater fishes of Baluchistan. In addition, several new species and subspecies have been described from various parts of this country. Thus, there is an urgent need for the preparation of a comprehensive report on the freshwater fishes of Balochistan, Pakistan. Shaikh. (2014) studied the diversity of ichthyofaunal, a well indicator of health from the ecosystem of aquatic. This diversity



represented the best balance ecosystem. Due to this point of view described the ichthyofaunal diversity of Ashti lake during the current study. This lake covered the large area about (1145km) areas per hectare. It is old and was constructed in (1881). A total of (23) species were collected for study, out of them belonging to (5) orders, (12) families and (21) genera were identified taxonomically from lake. Order of Cypriniforms was the dominated order as compared to other orders and most of the species of the fish belonged to same order Cypriniforms.

Abell et al., (2008) studied the biological system provided a great system for evolution research studying ecology and the effects in multiple levels. In The river system majority of this diversity seems in lakes as well as rivers too which form a system.

Singh. (2007) described the fish is the most important protein which can be obtained from the water sources such as fresh water as well as marine water too. Quality of water is very significant for the survival of living beings consequently this quality is day by day seems decreasing. Freshwater is important for animals as well as human beings too.

Gupta and Gupta. (2006) reported that water has dynamic part in the development of social civilizations and cultures. The earliest social civilizations and societies recognized nearby fresh water bodies i.e streams, rivers or ponds. Pakistan comprises a largest canal system which covers (780000) hectares at the whole marshland range of republic.

Townsend. (2003) described the biodiversity on the other hand, it is always spread at a small scale and harbors have a significant role of this biodiversity. this limited habitation which can be measures by great surroundings characterized through incidence of physic chemical stressors lying external the variety generally qualified via a tax on then needful expensive versions inattentive in carefully associated taxa for the conservation of homeostasis.

Cosgrove et al., (2000) for universal fish accessibility to meet expected demand, it has been expected that production of aquaculture will essential to further than double by about a half of century to unevenly (140) (mt) by (2050). In earth biodiversity fresh water ecosystem is considered as the most important phenomena in which the harbor of earth biodiversity covers approximately (2%) of our land surface.



METHODOLOGY

Present research was conducted at the Pat Feeder Canal from September to November 2017 and April to May 2018 in the same way the survey was showed in sunrise from (8:00 am to 11:00 am) the data of fish population was recorded from Pat Feeder Canal.

RESULTS AND DISCUSSION

The present study was useful in providing baseline information on species distribution and diversity. The work was initiated to make the checklist of fish fauna of Pat Feeder Canal, Dera Murad Jamali, District Naseerabad.

Fishes of fresh water bodies are the essential source of nutrition and fresh water fishes are main source of nutrition and income of millions of people throughout the globe. Our country Pakistan is blessed with various fishes of fresh water bodies and having a variety of fish diversity. The current study showed that a plenty of fresh water fishes present in the Pat Feeder Canal located in Dera Murad Jumali, District Nasserabad. Overall,(17) fish species were recorded from seven various stations of Canal. A total of (678) specimens were collected from selected stations of the study area. Out of them, (134) species from the station of Naseer Shakh, (112) from station of Jhudair Shakh, (102) from station of Bedar Pull, (94) from station of Manjho Shori, (89) from station of Mir Hassan, (85) from station of Pat Feeder Pull and Tepul Shakh (62) in the study sites. Among them the site of Naseer Shakh, Jhudair Shakh and Bedar Pull have the maximum diversity of fish fauna. River Indus is the greatest reservoir of fish diversity. There are almost (193) freshwater fish species found in Pakistan (Rafique and Khan, 2012). But more than (180) fish species are reported from Indus River in Pakistan (Mirza and Mirza, 2014). The portion of river Indus in Balochistan has not been explored extensively like Punjab and Sindh, therefore, shows lesser diversity.

In the current study, a complete list of fauna was recorded about (17) species of fish. Generally, indicate values of relative frequency of fauna that was recorded, order (10%), family (14%), genus (38%) and (38 %) species respectively. Twenty-three (23) species were reported, in the previous studies from the various locations of Dera Ghazi Khan and Suleiman Mountain Range, Pakistan. The (17) recorded fish species in present study have also been frequently reported from other major mountainous, sub-mountainous and plain areas of Pakistan (Yousafzai et al., 2013, Akhtar et al., 2014, Hasan et al., 2014).

The current recorded species out of five species such as, *Labeo rohita*, *Mastacembelu sarmatus*, *Cirrhinus mrigala*, *Schizothorax plagiostomus* and *Sperata sarwari*



were shared similarity with the fauna of fish of Baran Dam, Bannu District, a major part of which is including at Suleman Mountain Range according to (Ullah et al., 2014). Among them, four species like *Catlacatla*, *Cyprinus carpio*, *Cyprinion watsoni* and *Glyptoster nonreticulatum* were common from Zhob river fish fauna, it is region of mountainous near to Suleman Mountain Range, Balochistan described by (Kakar Abdullahzai and Kakarsulemankhel, 2004). The remaining seven species such as *Aristichthys nobilis*, *Bagarius bagarius*, *Barilius vagra*, *Gargoyle*, *Puntius sarrana*, *Tenuilosailisha*, *Tor putitora* and *Wallaguattu* were common with the fauna of fish from Taunsa Barrage of River Indus (Khan et al., 2008), the drainage place near to Nallah Sanghar, hill flow of Dera Ghazi Khan Region and Suleman Mountain Range. It is evident from the above-mentioned account that this area has fewer connections of land with the adjacent regions. Consequently, only few species are common. In other words, that could suggest the isolation of water bodies and physical separation of these regions of sub mountainous not alone from the areas of adjacent but also within the area.

Most of the species of fish fauna were belonged to order of Cypriniforms and Siluriforms. On the basis of average family member density and relative frequency values out of (6) families, the most dominated family of the study was Cyprinidae with (11) species followed by Sisoridae with (2) species while the remaining species such as Mastacembelidae, Bagridae, Culpidae and Siluridae have single species each respectively in the sampling stations. Thus, the Cyprinidae has been observed as the most abundant fish family from this region in present study while other five fish families have low abundance. Therefore, many studies showed that the family Cyprinidae was the dominated family from different bodies of fresh water at various locations of Pakistan (Iqbal et al., 2013, Akhtar et al., 2014, Ishaq et al., 2014, Ullah et al., 2014). The dominance of Cyprinidae has been observed in lakes with small sized and high phosphate total wherever the number of species ranged between (5) to (12) (Olin et al., 2000) and in the lakes of eutrophic (Tammi et al., 1999). Correspondingly, the appearance of abundance of family Cyprinidae positively connected with eutrophic and productivity status of lakes (Persson et al., 1991, Jeppensen et al., 2000). The abundance of Cyprinidae family in the study area suggest the eutrophic nature of these water bodies. Although, nitrates, phosphates and other concentration parameters of nutrient require to be examined for confirmation.

The diversity of fish to explained better of this region, many indices of biodiversity were measured in this study. If overall of the species built a community structure comprises equal abundance so than obtain the maximum diversity. Although,



diversity of an area also depends on the natural habitats. The older habitat had more diversity of species as compared to younger one. From other including factors are warmer temperature, stability and availability of food resulting in higher biodiversity. The longitude and latitude also effect the biodiversity (Mulder et al., 2004, Varrinet al., 2007, Wittebolle et al., 2009).

Population and diversity of fish has been declined in recent past because of increased anthropogenic activities, habitat degradation and reduce water discharge. Fisher men, local men and concerned other people Local men, fishermen and other concerned people established that has been reduced the diversity of fish. However, if proper and relevant fish steps for conservation would not take for the proper conservation of ichthyofaunal diversity as a result lead towards the fish fauna to endangered stage of the study area. Fisheries and aquaculture play an essential role in the economy of many countries as they have been maximum item in the diet of many people. The biodiversity of fresh water fish important component to the diversity of fish faunal and interactions as a level of trophic and dimensions of water body (Bashir et al., 2017). For the stability of ecosystem biodiversity is an essential form and protection of overall environmental quality to understanding inherent worth of all living things on the globe. For the identifications of fish faunal diversity, many researchers have been working to identified the fish species which are found in different parts of the world. Furthermore, some work had also made their contribution to the study of fish fauna found in fresh water resources of Pakistan.

Table. :Biodiversity of Fishes in Pat Feeder Canal from Dera Murad Jamali.

S.N	Species Name	Local Name	Genus	Family	Order
1	<i>Aristichthys nobilis</i>	Bighead	Aristichthys	Cyprinidae	Cyprinoforms
2	<i>Bagarius bagarius</i>	Fuji khaga	Bagarius	Sisoridae	Siluriforms
3	<i>Barilius vagra</i>	Sital	Barilius	Cyprinidae	Cyprinoforms
4	<i>Catlacatla</i>	Thela	Catla	Cyprinidae	Cyprinoforms
5	<i>Cirrhinus mrigala</i>	Moori	Cirrhinus	Cyprinidae	Cyprinoforms
6	<i>Cyprinus carpio</i>	Gulpam	Cyprinus	Cyprinidae	Cyprinoforms
7	<i>Cyprinion watsoni</i>	Indus lotak	Cyprinion	Cyprinidae	Cypriniformes
8	<i>Glyptosternon reticulatum</i>	Cat fish	Glypto sternon	Sisoridae	Siluriforms
9	<i>Labeo gonius</i>	Suhani	Labeo	Cyprinidae	Cypriniformes
10	<i>Labeo rohita</i>	Rahu	Labeo	Cypirinidae	Cyprniforms
11	<i>Mastacembelus armatus</i>	Baam	Mastacembelus	Mastacembelidae	Synbranchiformes
12	<i>Puntius sarrana</i>	Khatape	Puntius	Cypirinidae	Cypriniformes
13	<i>Schizothorax plagiostomus</i>	Sawati fish	Schizothorax	Cyprinidae	Cypriniformes
14	<i>Sperata sarwari</i>	Sengahri	Sperata	Bagridae	Siluriforms



15	<i>Tenualosa ilisha</i>	Palla	Tenualosa	Clupidae	Clupeiforms
16	<i>Tor putitora</i>	Golden masheer	Tor	Cyprinidae	Cyprinoforms
17	<i>Wallagu attu</i>	Malli	Wallagu	Siluridae	Siluriforms

Conclusion

Pat Feeder Canal an important river and supports a large number of ichthyodiversity of the country. During the current study a total of (17) species were recorded from the various stations of Pat Feeder Canal. Overall, (6) families were recorded, out of them the most dominated family of the study was Cyprinidae with (11) species followed by Sisoridae with (2) species while the remaining species such as Mastacembelidae, Bagridae, Culpidae and Siluridae have single species each respectively in the sampling stations. From the current work it was considered that an increase in the illegal fishing, anthropogenic activities, and lack intergovernmental department cooperation and water reduced flow at study site, causing the fish fauna indeclining state. Therefore, it is essential for the relevant authorities should take efficient conservation steps to protect the biodiversity especially fish fauna of this canal.

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