

Diversity, Abundance and Population Status of Fish Fauna of River Jhelum

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ABSTRACT

Fishes plays an important role in the economy of many nations and forms an integral part of aquatic ecosystems. Present study was carried out to explore the fish fauna of River Jhelum, Kashmir valley. In order to assess the current status of fish fauna of the river Jhelum of Kashmir valley, Study was carried out from October 2017 to September 2018 .Monthly samplings were carried out at 4 study sites. During the present investigation a total of

eight species of fishes were recorded viz, *Schizothorax plagiostomus* Heckel 1838, *Schizothorax esocinus* Heckel 1838, *Schizothorax curvifrons* Heckel 1838, *Schizothorax labiatus* McClelland 1842, *Schizothorax niger* Heckel 1838, *Cyprinus carpio communis* Linnaeus 1758, *Cyprinus carpio specularis* Linnaeus 1758, *Crossocheilus diplochilus* Heckel 1838 and *Triplophysa kashmirensis* (Hora , 1922). Details for the collected material i.e. valid names, richness and abundance are discussed in this paper. The Kashmir valley is rich in fish biodiversity, the fish fauna of this valley needs to be further explored.

Keywords: fish fauna, river Jhelum, Kashmir valley

1. INTRODUCTION

Kashmir's scenic valley is blessed with tremendous potential for water resources in terms of upland rivers, streams, and high and low altitude natural lakes. The water in Kashmir's lentic and lotic water bodies is cold, crystal clear, has a high oxygen content, and these aquatic resources have a high biological productivity that may be used for fish culture. The Jhelum River's fish fauna is one of the oldest indigenous fish faunas known to science. Many countries rely heavily on fish for their development. It is also a cheap source

of highly nutrient protein, it also contains essential nutrients required by the human body (Sikoki and Otobotekere, (1999) [1]. Fish makes an important contribution to the survival and health of significant portion of world population as most of the portion of the diet comes from the fish and fisheries product (Miner et al. 2012) [2]. From the times immemorial fish is an important source of food for mankind all over the world. Humans eat a lot of fish, and it's a great source of animal protein. The importance of fish as a source of high quality, balanced and easy digestible protein, vitamins and polyunsaturated fatty acids is well understood now (Ravichandran et al., 2011)[3]. Fish is also a popular food item in the majority of cultures. Fish meal contains most important nutritional components and serve as a source of energy for human beings (Ojewala and Annah, 2006[4]; Sutharshiny and Sivashanthini, 2011[5]). Fish also forms an important role in the food of the Kashmiris, and those who inhabit near the river Jhelum and the floating population of boatmen depend for a considerable part of their sustenance on the prey of their nets or lines (Lawrence WR 1895) [6]. Several studies have been conducted in the past on the fish and fisheries of the Kashmir Valley. Yousuf et al (2006) [7] reported 13 species of fish belonging to Cypriniformes, Siluriformes, Cyprinodoniformes and Salmoniformes from river Jhelum and its tributaries. There is need to have many more studies, so as to develop a strategy for the overall improvement of the fishery resources of the region. The present study provides an updated status of the fish fauna of River Jhelum so as to assess the possible management strategies that need to be implemented.

2. Material and methods

2.1 Study Area

The Kashmir valley is mainly drained by river Jhelum (Fig.1) and its tributaries and has passed through various geological successions. River Jhelum the major river system of Kashmir rises from the spring called Verinag located in the foot of the Panjal Mountains in the district Anantnag. The river flows across the main valley of Kashmir in Northwest direction up to Bonyari in Bandipora district where it joins the Wullar Lake; upto which point it is navigable. Total length in valley is 177 km coming out of wular, it flows through Baramulla and then into Pakistan, where it joins river Sindh.



Fig.1 A view of River Jhelum

2.2 Study Sites

A total of four study sites were selected for the sampling. These sites are

Site 1 –Sumbal

Site 2- Sopore

Site 3- Baramulla

Site 4- Sheeri

2.3 Collection of Fishes

Fishes were collected from River Jhelum at different four sites with the help of local fisherman using different types of nets namely cast nets and gill nets. A digital camera was used to take the pictures. The samples were gathered in a bucket and taken to the lab for further analysis. The standard taxonomic works were used to identify the fish specimens (Kullander et al.) [8] Fishing was normally done early in the morning.

3. Results and Discussions

A total of 8 species were recorded from the River Jhelum (Table 1) which include *Schizothorax plagiostomus* Heckel 1838, *Schizothorax esocinus* Heckel 1838, *Schizothorax curvifrons* Heckel 1838, *Schizothorax labiatus* McClelland 1842, *Schizothorax niger* Heckel 1838, *Cyprinus carpio communis* Linnaeus 1758, *Cyprinus carpio specularis* Linnaeus 1758, *Crossocheilus diplochilus* Heckel 1838 and *Triplophysa kashmirensis* (Hora, 1922) reported from the Jhelum River.

Table 1: Fish species presently encountered from the river Jhelum

S. NO	Name of the Fish species	Local name
1.	<i>Schizothorax plagiostomus</i> (Heckel, 1838)	Khont
2.	<i>Schizothorax esocinus</i> (Heckel, 1838)	Chhurru
3.	<i>Schizothorax curvifrons</i> (Heckel,	Satter gad

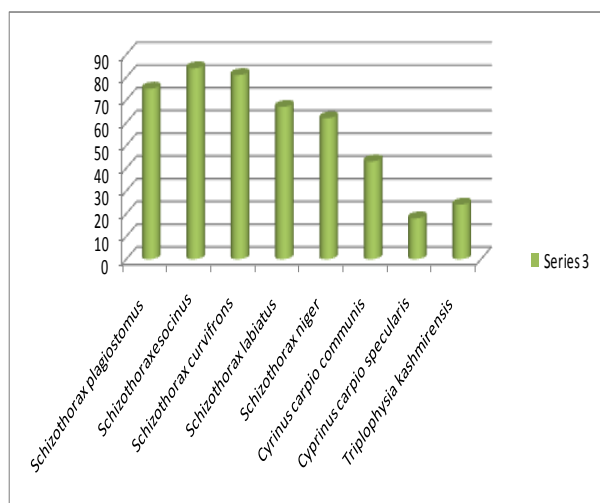
	1838)	
4.	<i>Schizothorax labiatus</i> (McClelland, 1842)	Chush
5.	<i>Schizothorax niger</i> (Heckel, 1838)	Ale gad
6.	<i>Cyprinus carpio communis</i> (Linnaeus, 1758)	Punjabe gad
7.	<i>Cyprinus carpio specularis</i> (Linnaeus, 1758)	Punjabe gad
8.	<i>Triplophysa kashmirensis</i> (Hora, 1922)	AraGurun

Table 2: Contribution of fish by number at different study sites at river Jhelum

Name of the Fish species	Site -1	Site -2	Site -3	Site -4	Total
Schizothorax plagiostomus (Heckel, 1838)	22	25	15	13	75
Schizothorax esocinus (Heckel, 1838)	26	23	20	15	84
Schizothorax curvifrons (Heckel, 1838)	27	20	16	18	81
Schizothorax labiatus (McClelland, 1842)	16	16	18	17	67
Schizothorax	18	19	10	15	62

<i>Schizothorax niger</i> (Heckel, 1838)					
<i>Cyprinus carpio communis</i> (Linnaeus, 1758)	9	12	8	14	43
<i>Cyprinus carpio specularis</i> (Linnaeus, 1758)	5	8	3	2	18
<i>Triplophysa kashmirensis</i> (Hora, 1922)	11	10	2	1	24
Total	134	133	92	95	454

Fig.2 Shows fish catch from the river Jhelum Oct 2017-2018



During the present study, a total of 8 species of fish were encountered at 4 different sites from the river Jhelum. In the river Jhelum, *Schizothorax curvifrons* was found to be the most abundant *Schizothorax* species at the site-I Sumbal (Table 2) followed by *S.*

esocinus, *S. plagiostomus*, *S. niger*, *S. labiatus*, *Cyprinus carpio communis* and *C. carpio specularis* and *Triplophysa kashmirensis*. At site 2 *Schizothorax plagiostomus* was found abundant followed by *S. esocinus*, *S. curvifrons*, *S. niger*, *S. labiatus*, *Triplophysa kashmirensis*, *Cyprinus carpio communis* and *Cyprinus carpio specularis*. At site 3 the most abundant fish was *Schizothorax esocinus* followed by *S. labiatus*, *S. curvifrons*, *S. plagiostomus*, *S. niger*, *Cyprinus carpio communis*, *Cyprinus carpio specularis* and *Triplophysa kashmirensis*. At site 4 *Schizothorax curvifrons* was found to be the most abundant fish species followed by *S. labiatus*, *S. niger*, *S. esocinus*, *S. plagiostomus*, *Cyprinus carpio communis*, *Cyprinus carpio specularis* and *Triplophysa kashmirensis*. Some of the species which might be present in these area but could not be captured during the survey. During the present study *Schizothorax esocinus* was found to be the most abundant *Schizothorax* species (Fig.2)

Kullander et al.1999, obtained fourteen native and four introduced fish species over a period of eight years, along the River Jhelum and associated lakes in Kashmir valley. Four of the five *Schizothorax* species are specialised lotic forms, while one (*Schizothorax niger*) is mostly found in lentic. While examining the river Jhelum and its main tributaries in Kashmir, various fish species such as *Carassius carassius* Linnaeus 1758, *Gambusia affinis* Girard 1859, *Puntius conchonus* Hamilton 1822, and *Banganadiplostoma* Heckel 1838 were discovered. From the River Jhelum, Yousuf et al. (2006) collected 13 fish species (*Schizothorax plagiostomus*, *Schizothorax labiatus*, *Schizothorax esocinus*, *Schizothorax*

curvifrons, Schizothorax xniger, Gambusiaaffinis, Triplophysasp, Crossocheilusdiplochilus, Glyptothorax kashmirensis. However, certain fish species in river Jhelum viz. Rainbow trout, Brown trout, *Gambusia holbrooki*, *Bangana diplostoma*, *Botia birdi* and *Puntius sophore* were not observed in the present study. As per Khan, 2004, the anthropogenic pressure along the catchments has poorly affected the fish production in the lentic and lotic water bodies of Kashmir.

4. Conclusion

The present study partially reflects that the fishes of the Jhelum and their niche might be destroyed and due to this reason the diversity has apparently got reduced in the river Jhelum. Population of some of the species is declining due to habitat loss and degradation, water abstraction, drainage of wetlands, sewages and garbage's, pollution and eutrophication. These factors have caused substantial declines and/or changes in inland fish species (Khan et al., 2012). Most probably the river ecosystem is under great threat and is not getting the adequate time to recover its natural community structure. Efforts need to be oriented to preserve this important lotic fish habitat which has tremendous economic and ecological significance.

5. Suggestions

One of the main concerns for the depletion of fishery resources in the river Jhelum is over-fishing and encroachment, therefore, monitoring needs to be carried out regularly. In order to manage fisheries in the river Jhelum, immediate steps need to be undertaken e.g.; fishing in the river Jhelum should be regulated so as to avoid over

exploitation of this fisheries resource. Domestic sewage, solid wastes, and agricultural wastes must all be adequately handled and regulated before entering these bodies of water. Thus, proper management strategies and environmental monitoring of river Jhelum water quality is very important and highly recommended in order to control its further deterioration. The river Jhelum's physico-chemical and biological features must be monitored by a separate authority. It is suggested that the fishery authorities should investigate the water body and practice the proper exploitation management of this inland fishery resources according to ecological principals properly. Scientific fishing standards and quotas will be developed, which will aid in the conservation of the environment and biodiversity. Thus it is essential of every citizen in the society to take an active part to realise the goals of sustainable fisheries development and handover the resources in healthy circumstances to the future generations.

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