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Exploring and Identification of Fish Fauna of River Jindi at District Charsadda, KPK, Pakistan

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Abstract

A study on the fish fauna of River Jindi at Charsadda, Khyber Pakhtunkhwa, Pakistan was conducted, with an aim to determine fresh records of fish fauna from March to July, 2017. For fish distribution a 20 km belt of the river was explored for five months and every effort was made to collect the fish specimens by any legal mean. In this study, a total of 14 fish species belonging to 5 orders, 6 families and 9 genera was recorded. Cyprinidae was the richest family and was represented by 6 species, Sisoridae by 3 species, Channidae by 2 species, Mastacembelidae, Nemacheidae and Belonidae by single species. The fish species collected are *Barilius vagra, Barilius pakistanicus, Barilius modestus, Carassius auratus, Puntius ticto, Puntius conchonius, Schistura alepidota, Glyptothorax punjabensis, Gagata pakistanica, Gagata cenia, Mastacembelus armatus, Channa punctatus, Channa gachua* and *Xenentodon cancila*. The present studies was very helpful to evaluate the present fish fauna of River Jindi and also the need of conservation of different fish species in this river in future.

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Introduction

The study of fish is called ichthyology. Fish have been studied for centuries, beginning with the early Chinese, Egyptians, and Greeks. The study of fish and other aquatic animals is called aquaculture (Helfrich and Neves, 2005). Ichthyodiversity refers to the diversity of fish species; depending on scale, it could refer to alleles within fish population to species of life forms within a fish culture and to species or life forms across aqua regime (Burton *et al*., 1992). Fish diversity is more apparent than in their morphology. Fishes range in size from the very small to the very large, adult gobies may be just 8 mm, whereas the whale shark, Rhincodon types, may reach 12 m (Nelson, 1994).

The importance of fish in human diet is now well established. Various studies have shown that low fat fish meat is better than beef, mutton and even poultry for human health (Ali, 2010). Fish also contains important fatty acids which are antioxidants and increase the body resistance against cancer (Norrish *et al*., 1999). Studying fish fauna of an area is a very important task as it provides base line information about the species used for human consumption. Mostly people depend only on a few important species as food; hence faunistic studies could identify actual food and market potential of an area or a water body.

This type of study also provides information about the availability, abundance, population dynamics and conservation status of fish species of an area. Strategies can be developed on the basis of these studies to conserve and to culture a species from certain environment.

Fishes are one important group of vertebrates which influences the life of human in various ways. Fishes have a rich source of food and provide a meat, several by- products such as fish meal, fish glue, fish oil, etc. fish diet provides proteins, fat, vitamins A, B and D, minerals like Ca, Mg, P, Na, Fe, I, etc. They have good taste and are easily digestible and growth promoting value. Considerable studies on ichthyo faunal diversity from different fresh water bodies of India have been carried out during the last few decades (Shaikh *et al*., 2011).

Identification of fish fauna is a very important feature of studying a water body. Lot of work has been done in this regard on different lentic and lotic habitat of this province. In recent past valuable contribution have been made by the researcher like Butt who reported 94 species of fishes from the whole Khyber Pakhtunkhwa province (Khan and Hasan, 2011). Approximately 20% of the world's freshwater fish is currently either endangered or extinct. Throughout the world, freshwater life is disproportionately more at risk, compared with land based or terrestrial life, and this can be generally attributed to the degradation and destruction of habitat and are found in heterogeneous assemblage (Ali *et al*., 2010). They can be found thriving in vernal pools, intermittent streams, tiny desert springs, the vast reaches of open oceans, deep oceanic trenches, cold mountain streams, saline coastal embayment, and so on through or nearly endless list of aquatic environments.

Fishes show vast variety in their morphology, in the habitats they occupy and in their life. Unlike the other frequently documented vertebrates, fishes are a diverse group (Forese, R. and D. Pauly, 1998). Ichthyodiversity refers to the variety of fish species; depending on background and scale, it could refer to life forms within a fish society and to species or life forms alleles or genotypes within fish population to species of across aqua regimes (Burton *et al*., 1992).

Fish show the greatest biodiversity of the vertebrates with over 22,000 species. Out of these, approximately 58 percent are marine, 41 percent are freshwater species, and 1 percent move back and forth between marine and freshwater. As estimated, marine fishes are the most diverse because saltwater covers 70 percent of the earth. Only 1 percent of the earth is covered by freshwater. This small area is home to 8,000 species of freshwater fishes (Helfrich and Neves, 2005).The aim of the research work was to

find out the exploring and identification of Fish Fauna of River Jindi at District Charsadda, KPK, Pakistan.

Materials and methods

Study area

Charsadda is a town and headquarter of Charsadda District, in the Khyber Pakhtunkhwa province of Pakistan. Pashtuns make up majority of the population of the district.

The district lies between 34-03' and 34-38' north latitudes and 71-28' and 71- 53' east longitudes. Charsadda is located in the west of the Khyber Pakhtunkhwa and is bounded by Malakand District on the north, Mardan district on the east, Nowshera and Peshawar districts on the south and the Mohmand Agency of the Federally Administered Tribal Areas on the west.

The total area of this district is 996 km2. If we talk about history of Charsadda District so we became to know that, Charsadda District was once part of the kingdom of Gandhara. The city of Charsadda originally known as Pushkalvati is first mentioned in the Hindu epic story the theramayana. The district is subsided into two which contained a total of 46 union councils (Inamulhaq, 2014).

River Jindi, also known as Kot and Manzari Baba, begins in the hills of Malakand Agency,in the northern district of Charsadda, in Khyber-Pakhtunkhwa, Pakistan. During the early months of each year, the River Jindi has a very limited water supply, but the summer months bring with them much needed rain to water the area.

As the river proceeds downstream, the local people use dams, similar to the Warsak Dam on the Kabul River, to take out water for irrigation; therefore, the amount of water flowing downstream decreases.

The area surrounding the Kabul and Jindi rivers is one of the largest irrigated areas within Khyber-Pakhtunkhwa. This coupled with an exponentially growing population alludes to problems in the future. The River Jindi used to have enough water to sustain the surrounding area, but over the last few years, due the environmental changes including massive droughts and rising global temperatures, the river does not. This, coupled with growing pollution of the water, is making the ability to acquire fresh clean water detrimental to the area and its surrounding population.

The river passes through other villages like Spankharo, Prang Ghar, Palay, and then through one of the tehsil of Charsadda Tangi, and it meets with the Swat River south of Charsadda. Jindi is becoming a visiting center nowadays. There is a main bridge on this river at Jindi bazaar made during British rule on this area. There are also some fish centers on the bank of this river.

The fish found in Jindi River are of strange kinds therefore, jindi is a fish hunting center for the whole district of charsadda. Local people often come in the evening and enjoy the beautiful natural scenes.

Collection of fishes

The fishes was collected through different methods like hand nets, cost nets, simple hooks, Patti nets and other local methods.

The collection was made from March 2017 to July 2017 about five months. The collection was made from different locations of the River Jindi i.e. Kaniwer, Sherpao, Umerzai etc.

Preservation of Fish

Fishes was caught alive was then directly dropped into a solution of 10% dilute Merck formalin. These preserved specimens was separated from rest of laboratory fish and placed in separate cupboard and was identified and labeled.

Fish identification

Fishes was identified up to specie level by using the methods of Jayaram (1999), Talwar and Jhingran (1991) and Mirza and Sandhu (2007).

Results

In the present study, a total of 14 fish species belonging to 5 orders, 6 families and 9 genera was recorded. Cyprinidae was the richest family and was represented by 6 species, Sisoridae by 3 species, Channidae by 2 species, Mastacemblidae, Nemacheidae and Belonidae by single species.

Table 1. Shows the collected fishes their order, family, genus, specie and local names.

S.No	Order	Family	Genus and Species	Local name
1	Cypriniformes	Cyprinidae	*Barilius vagra*	Lahori chalwa
2			*Barilius pakistanicus*	Lahori chalwa
3			*Barilius modestus*	Lahori chalwa
4			*Carassius auratus*	Golden fish
5			*Puntius ticto*	Tapaha
6			*Puntius conchonius*	Tapaha
7		Nemacheidae	*Schistura alepidota*	Sudali
8	Siluriformes	Sisoridae	*Glyptothorax punjabensis*	Sulemani Khagga
9			*Gagata pakistanica*	Sanglai
10			*Gagata cenia*	Sanglai
11	Mastacembeliformes	Mastacemblidae	*Mastacembelus armatus*	Marmahi
12	Channiformes	Channidae	*Channa punctatus*	Daoly machlee
13			*Channa gachua*	Daoly machlee
14	Beloniformes	Belonidae	Xenentodon cancila	Kann mach

Discussion

Ali Muhammad *et al* reported the fish fauna of River Swat. The fish fauna of River Jindi is nearly similar to River Swat. He reported a total of 38 fish species belonging to; 6 orders, 9 families and 24 genera was recorded. Cyprinidae was the richest family and was represented by 20 species, Nemacheidae by 4, Sisoridae by 6, Channidae and Schilbidae by 2, Mastacemblidae, Schilbidae, Belonidae and Channidae by single species.

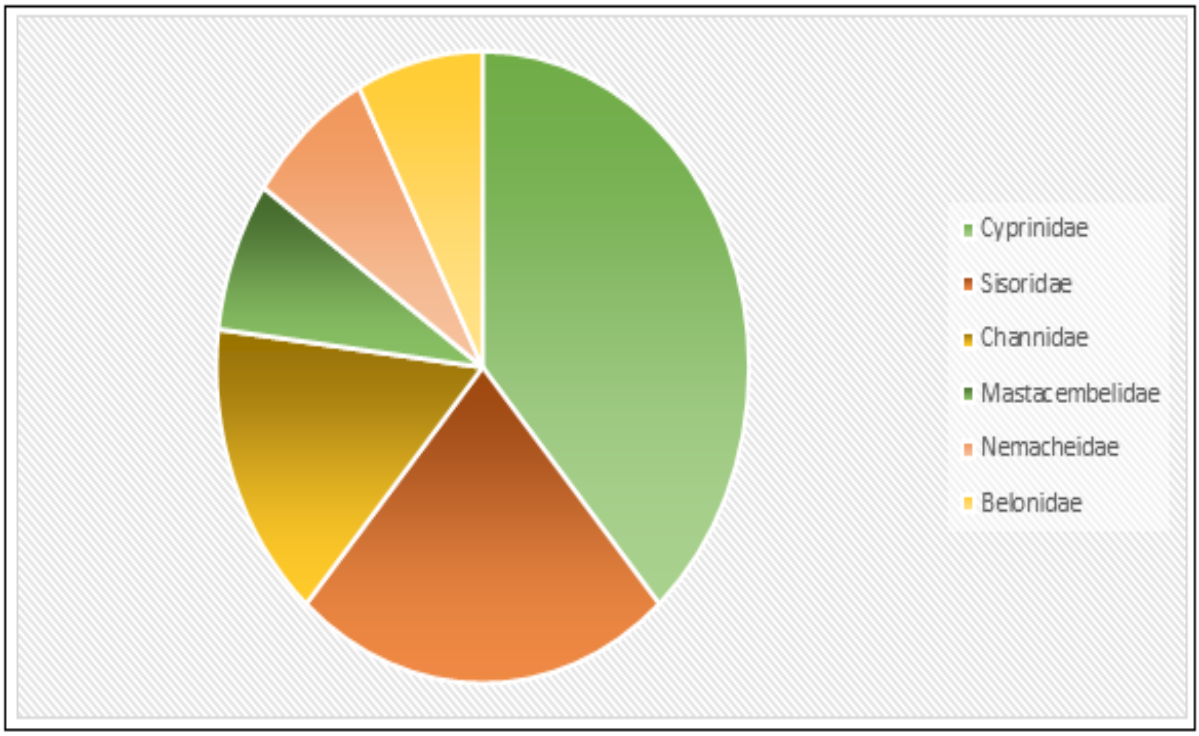

Fig. 1. Abundance of Fish Families collected during current study period.

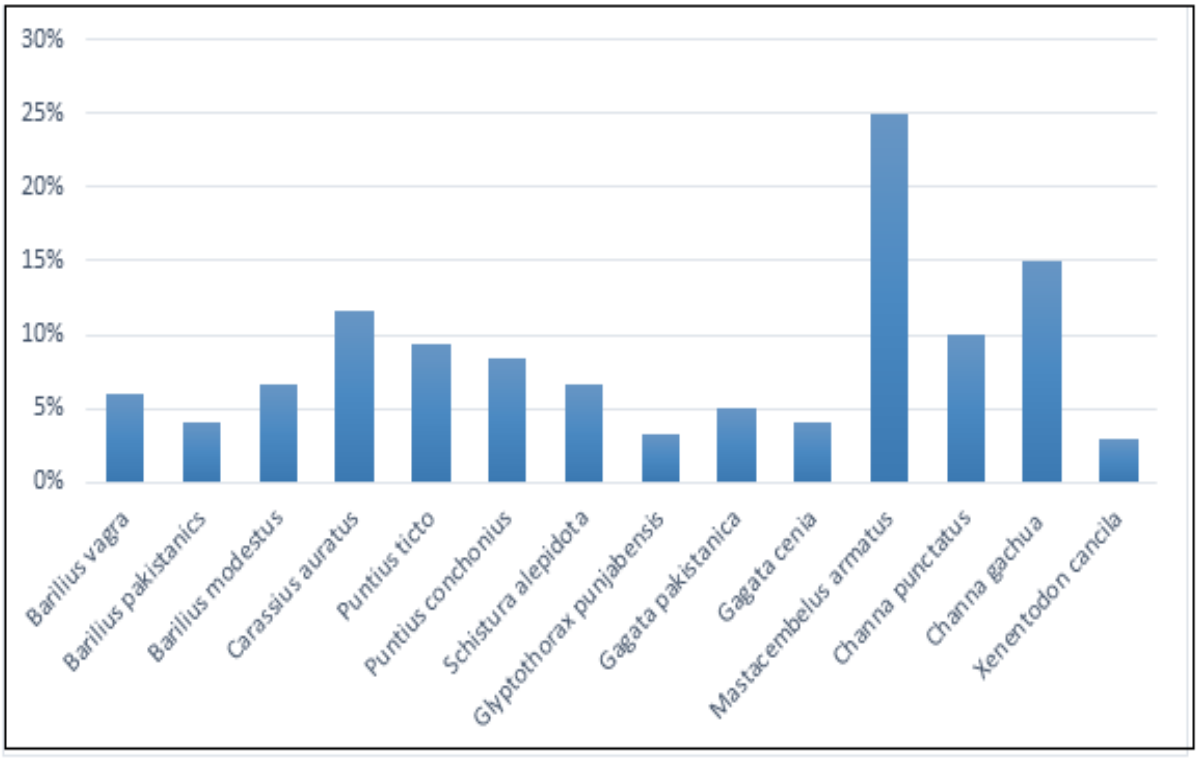

Fig. 2. Percentage of Fish Species collected during current study period.

He reported the following fish species from river swat at Charsadda, *Barilius pakistanicus, Barilius vagra, Barilius modestus, Crossocheilus diplocheilus, Puntius sophore, Puntius conchonius, Puntius chola, Puntius ticto, Garra gotyla, Schizothorax plagiostomus, Racoma labiata, Cirrhinus mrigala, Rasbora daniconius, Tor macrolepis, Cyprinus carpio, carrassius auratus, Salmophasia bacaila, Salmophasia punjabensis, Amblypharyngodon mola, Labeo diplostomus, Schistura alepidota, Schistura prashari, Tryplophysa naziri, Aconthocobitis botia, Glyptothorax punjabensis, Glyptothorax stocki, Glyptothorax cavia, Glyptothorax sufii, Gagat cenia, Gagata pakistanica, Mystus bleekeri, Clupisoma naziri, Clupisoma garua, Channa punctatus, Channa gachua, Mastacembelus armatus, Xenentodon cancila, and Chanda nama.*

All the species present in River Jindi is a part of River Swat also but River Swat fauna is rich than Jindi. (Ali Muhammad *et al.).*

The fish fauna of River is also nearly similar to River Kabul (Khiali) at charsadda. Faiza qazi carried out a preliminary survey during the year 2011, (Sep---Dec) to determine the extant fish fauna of "river Khiali" (a name locally used for the strip of river swat that flow at district Charsadda, Khyber Pakhtunkhwa).

A total of 18 fish species belonging to five orders (Cypriniformes, Siluriformes, channiformes, Mastacembeliformes, and performs) and seven families (Cyprinidae, Nemachelidae, Sisoridae,

Channidae, Mastecembelidae, Cichlidae) was collected.

The reported fish species from River Khiali are *Barilius pakistanicus, Barilius vagra, Crossocheleilus diplocheilus, Puntius ticto, Garra gotyla, Schizothorax plagiostomus, Cyprino carpio, Carassius auratus, Acanthocobitis botia, Wallgo Attu, Channa punctatus, Glyptothorax suffi, Glyptothorax stocki, Mastacembelius armatus and Oreochromis mossambicus.*

In this study the species like *Barilius pakistanicus, Barilius vagra, Puntius ticto, Channa punctatus,* and *Mastacembelius armatus* are similar to River Jindi.

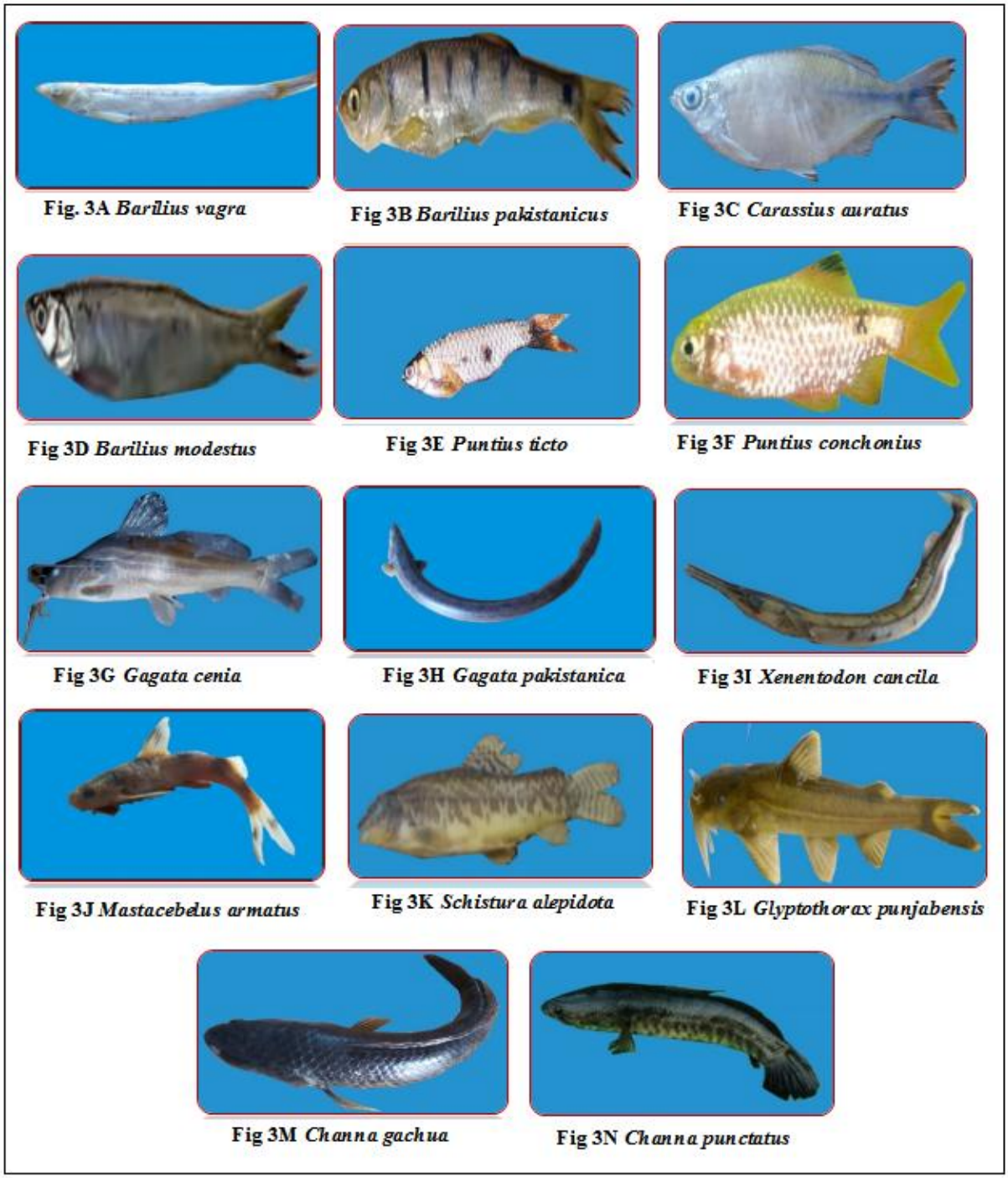

Fig. 3A-N. Collected fishes.

Conclusion

It is concluded from the current study that river Jindi has a rich fish fauna including 14 species, 5 orders, 6 families and 9 genera and water shows suitability for various fish species such as Mastacembelus armatus (Marmahi), Channa gachua (Kata sar), etc. The collected fish, species was preserved, identified and labelled. Minimum fish species was collected, which belong to families: Nemacheidae and Belonidae. Maximum fish species collected belong to family: Cyprinidae. Widely distributed fish species was; Mastacembelus armatus, Gagata cenia and Channa gachua.

Recommendations

River Jindi is facing the human illegal activities like sewage from homes, marble factories at certain areas, illegal fish hunting that include:

Blasting (dynamiting)
Electrical shocks (electrocuting)
Killing chemicals (poisoning)
Nonstandard nets
Hunting in breeding season
Hunting throughout the year.

Following suggestions were recommended for concerned authorities for the conservation of fish fauna of River Jindi.

Fish habitats destruction should be avoided. It means that, water pollution should be controlled.

Small size nets and should be not used because fingerlings are captured which decrease the fish population.

Washing of automobile and clothes near bank of river should be avoided which, causes water pollution.

Rules and laws should be refined and they should be implemented in its true spirit for fish conservation.

Seminars and workshops should be arranged in Schools, Colleges and Universities to aware teachers and students about the importance of fish and their conservation. Training programs should be arranged for professional fisherman and local watchers.

Grazing should also be avoided on the bank of rivers which increase soil erosion.

Standardized Nets should be used to minimize the capturing of small fish.

Professional fishermen should be convinced not to capture brooder which reduce the fish population.

Government should pay attention to fish culture and establishment of small dams in the areas.

Illegal and inhuman fishing techniques such as dynamiting, poisoning and electrocuting should be avoided for fish capturing.

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