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Exploring and identification of fish fauna of River Swat At District Charsadda, KPK, Pakistan

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Abstract

A preliminary survey was carried out in which Ichthyo diversity of river swat locally called river Khiali was determine, that flows through district Charsadda Khyber Pakhtunkhwa, during the year 2017. The current study was conducted from March to July 2017 in order to explore and identify the fish fauna of River Swat, Khyber Pakhtunkhwa, Pakistan. In this study, a total of 13 fish species belonging to 4 orders, and 7 families were collected. Cyprinidae was the richest family of present survey. The fish species collected are below as *Barilius vagra, Puntius sophore, Cirrhinus mrigala, Tor macrolepis, Carassius auratus, Glyptothorax cavia, Glyptothorax sufii, Gagata pakistanica, Mystus bleekeri, Clupisoma naziri, Channa punctatus, Ompok pabda and Mastacembelus armatus*. Hence, the result of our present study would provide useful information about the diversity of fish fauna of River swat that could be later valuable in the systematic, fisheries management and conservation.

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Introduction

Ichthyo diversity refers to the variety of fish species; depending on background and scale, it could refer to alleles or genotypes within Piscean population to species of life forms within a fish society and to species or life forms across aqua regimes (Burton *et al.*, 1992). Fishes are the Poikilothermic, aquatic chordate with appendages developed as fins, whose chief respiratory organs are gills and whose body are usually covered with scales (Berra, 2001). A fish is any member of a paraphyletic group of organisms that consist of all gill bearing aquatic craniate animals that lack limbs with digits. Included in this definition are the living hagfish, lampreys, and cartilaginous and bony fish, as well as various extinct related groups. Most fish are ectothermic (cold-blooded), allowing their body temperatures to vary as ambient temperatures change, though some of the large active swimmers like white shark and tuna can hold a higher core temperature (Goldman, 1997). 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, 2009).

Fish diversity is more apparent from their morphology. Fishes range in size from the very small to the very large, adult gobies (*Pandaka pygmae*) may be just 8 mm, whereas the whale shark, *Rhincodon typus* may reach 12 m, while heaviest bony fish in the world is ocean sunfish (*Molamola*) with having weight up to 2,235 kg, and is found in all tropical and subtropical waters(Nelson, 1994). They live in all the seas, rivers, canals, lakes, dams, ponds and in almost every place where there is water (Jordan and Verma,1965). Most fish, whether by species count or abundance, live in warmer environments with relatively stable temperatures (Bone and Moore, 2008). However, some species survive temperatures up to 44.6 °C (112.3 °F), while others cope with colder waters; there are over 200 finfish species south of the Antarctic Convergence (Hogan, 2011). Some fish species tolerate salinities over 10 percent (Bone and Moore, 2008).

Fish comprise half of the total number of vertebrates in the world (Rankhamb, 2011). A total of 8,411 freshwater fish species have been reported throughout the world, out of these 930 species live in freshwater aquatic system of India. India is one of the extra-large biodiversity countries in the world and occupies the ninth position in terms of freshwater extra-large biodiversity (Shinde *et al.*, 2009).

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, 2009). There are almost 28,000 known extant species, of which almost 27,000 are bony fish, with 970 sharks, rays, and chimeras and about 108 hagfish and lampreys (Nelson, 2006).About 180 species of fishes have been reported in Pakistan, including representatives from important groups such as loaches, carps and catfish. 28 fish species listed as living in cold waters of Pakistan. Most of the snow trout are restricted to the Trans-Himalayan Region of the Indus system (Mirza and Bhatti, 1999).In recent past valuable contribution have been made by the researcher like Butt who reported 94 species of fishes from the Khyber Pakhtunkhwa province (Khan and Hasan, 2011). Freshwater fish species are classified into two groups based on their ancestors postulated habitats. The First group is known as primary freshwater species because emergence for the first time in freshwater and accounts for 8,000 species. The second group comprised of 1,500 species supposed to be originated from marine ones and is termed as secondary freshwater species (Aleen, 1982). 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).

The aim of the current research work was to find out the Fish Fauna of River Swat At District Charsadda, KPK, Pakistan

Material and methods

Equipment

The equipment's include gill net, hooks (single and multi-hooks), formalin, gloves, Petri dishes, measuring tape, forceps, simple microscope, magnifying glass and digital camera.

Sampling of fish

Fish species were collected from the river Swat with the help of different types cast nets, hooks, automatic rod, gill nets and local fisherman etc.

Identifications

The fishes were then brought to the laboratory of Zoology department, government post graduate college Charsadda Pakhtunkhwa Pakistan.

Then collected fishes were then identified through available keys described by Mirza (2003).

Preservation

The collected fishes were preserved in 10% formalin solution. In order to preserve the fish in original form and to avoid spoiling the fishes were injected with 2% diluted formalin.

Results

In this study, a total of 13 fish species belonging to four orders, and seven families were collected. Cyprinidae was the richest family of present survey.

The fish species collected are below as *Barilius vagra, Puntius sophore, Cirrhinus mrigala, Tor macrolepis, Carassius auratus, Glyptothorax cavia, Glyptothorax sufii, Gagata pakistanica, Mystus bleekeri, Clupisoma naziri, Channa punctatus, Ompok pabda and Mastacembelus armatus.* Following table shows the classification of fishes.

Table 1. Species of Fishes collected during current study.

S. No.	Family	Species	Common name
1	Cyprinidae	*Barilius vagra*	Lahori chilwa
2		*Carassius auratus*	Golden fish
3		Cirrhinus *mrigala*	Mori
4		*Tor macrolepis*	Indus golden mahseer
5		*Puntius sophore*	Sophora popra
6	Sisoridae	*Glyptothorax sufii*	Sulemani Khagga
7		*Glyptothorax cavia*	Sulemani Khagga
8		*Gagata pakistanica*	Sanglai
9	Schilbidae	*Clupisoma naziri*	Naziri Bashwa
10	Bagridae	*Mystus bleekeri*	Bleekri Tingara
11	Siluridae	*Ompok pabda*	Mountain Pafta
12	Mastecembelidae	*Mastacembelus armatus*	Marmahi
13	Channidae	*Channa punctatus*	Daula

Discussions

Many species collected the present investigation were also recorded earlier from Swat, for instance, *Garra gotyla,, Tor macrolepis, Puntius sophore, Schizothorax plagiostomus, Mystus bleekeri ,Ompok pbda, Clupisoma naziri, Gagata cenia, Glyptothorax stocki, Channa punctatus,* and *Mastacembelus armatus* species in the icthyo- survey of Butt and Mirza (1981) are also listed in the present study: on other hand species such as Salmostoma punjabensis, *Rasbora daniconius, Crossocheilus latius diplocheilus, Chela cochius, Amblypharyngodon mola, Tor zhobensis, Puntius ticto, Schizothorax plagiostomus, Glyptothorax cavia, Glyptothorax*

*punjabensis, Glyptothorax stocki, ,*and *Aspidoparia morar* were absent in our collections.Akhtar (1995), reported 18 fish species among which following fauna is common with our i.e., *Garra gotyla, Puntius sophore, Tor macrolepis, Clupisoma naziri, Mastacembelus armatus, Ompok pbda, Mystus bleekeri* and *Channa punctatus*, however *Schizothorax plagiostomus, Racoma labiata, Puntius ticto, Labeo dero, Aspidoparia morar, Salmostoma punjabensis, Rasbora daniconius, Glyptothorax punjabensis,* and *Puntius saran* were absent in present study. When compared with other downstream parts of River swat a number of formerly observed species were common with our fauna. We had in common with the work carried out by Latif (1999) which are Barilius *vagra, Garra gotyla, Tor macrolepis, Channa punctatus,* and *Mastacembelus armatus,* while the species not observed during the present survey are *, Puntius ticto, Schizothorax plagiostomus, Schizothorax Labiatus, Schizothorax esocinus, Glyptothorax reticulatum, Glyptothorax stocki, Schistura alepidota, Tryplophysa naziri, Crossocheilus latius, and Eutropiichthys vacha*. Our results also reveal the commonality in the fauna of cold upstream swat and warm downstream Swat. These common species (when compared with a prior study by Yousuf, 2004) are *Mastecembelus armatus, Puntius sophore, Tor macrolepis, carrassius auratus, Garra gotyla,* while there are other species that are restricted to upstream only for e.g. *Labeo dero, Puntius chola, Xenentodon cancila, Barilius pakistanicus, Tryplophysa naziri, Crossocheilus diplocheilus, Schizothorax plagiostomus Schizothorax esocinus, Racoma labiata,, Schistura alepidota, Glyptothorax cavia, Glyptothorax reticulatum,Channa gachua , Cyprinus carpio, Tryplophysa choprai and onchorhynchus mykiss*. Similar comparisons with another studies by (Ahmad, 2009), show that *carrassius auratus, Garra gotyla, Puntius sophore, Channa punctatus, Mastacembelus armatus,* and*Tor macrolepis* are mutual fish fauna of upstream and downstream except *Barilius pakistanicus, Crossocheilus diplocheilus, Puntius conchonius, Puntius chola, Racom alabiata, Schisturaa lepidota, Tryplophysa naziri, Glyptothorax reticulatum, Glyptothorax punjabensis, Channa gachua* and *Orienus plagiostomus*.Similarly comparison with another recent studies byAkhtar *et al* (2014) in which *Barilius vagra, Cirrhinus mrigala, Garra gotyla, Glyptothorax sufii, Mastacembelus armatus, Puntius sophore, and Tor macrolepis* are common with our study while *Crossocheilus diplocheilus, Cyprinus carpio, Glyptothorax cavia, Glyptothorax punjabensis, Glyptothorax sufii, Labeo rohita, Rasbora daniconius, Salmophasia bacaila, Salmophasia punjabensis, Schizothorax plagiostomus* and *Tor putitora a*re absent. These studies show that *Tryplophysa choprai, onchorhynchus mykiss, Salmotratta fario, Glyptothorax reticulatum,* and Schisturanaziri were exclusively found in the cold upstream parts of swat. On other hand the following species *Barilius vagra, Puntius sophore, Garra gotyla, Cirrhinus mrigala, Tor macrolepis, Carassius auratus, Glyptothorax stocki, Glyptothorax sufii, Gagata cenia, Gagata pakistanica, Mystus bleekeri, Clupisoma naziri, Channa punctatus,* and *Mastacembelus armatus* were more common in the lower warm waters of swat.

Conclusion

It was concluded from the current study that river Swat bears rich fish fauna, but it is facing the illegal human activities like; domestic and anthropogenic activities, agricultural runoff, introduction of vehicle oils, riverine flood etc.

The harmful and novel introduction of fishing gears by fisherman such as electrical shocks, chemicals also affects the fish population of river Swat. Water quality shows suitability for varieties of fishes such as *Tor macrolepis* (mahseer), *Mastacembelus armatus* (Marmahi), etc.

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