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Exploring the fish fauna in water bodies of Hazara Division, Khyber Pakhtunkhwa, Pakistan

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Abstract

A preliminary survey of Ichthyofauna in water bodies of Hazara Division was carried out from March, 2013 to February, 2016. Among the major water bodies of Hazara Division, five Rivers were selected for fish collection, i.e., Indus, Siran, Kunhar, Dor and Harro. A total of 3311 fishes were collected from these water bodies and identified by using various keys and literature. Fishes collected and identified belong to 6 Orders, 10 Families, 22 Genera and 30 Species. In the present survey Cyprinidae was the richest Family which was represented by 16 Species; Bagridae was represented by 3 species; Nemacheilidae, Siluridae and Salmonidae by only two species, each while Schilbeidae, Channidae, Mastacembelidae and Cichlidae was consisting only one species of each.

Keywords: Water, Rivers, fish, family, identification, anthropogenic

1. Introduction

In Fish Base (2005), about 28,900 species were reported. The numbers of Freshwater fishes comprising till now are almost 13,000 species^[1]. Biogeographically the distribution of strictly freshwater species and genera are 4,035 species (705 genera) in the Neotropical region, 2,938 (390 genera) in the Afrotropical, 2,345 (440 genera) in the Oriental, 1,844 (380 genera) in the Palaearctic, 1,411 (298 genera) in the Nearctic, and 261 (94 genera) in the Australian region respectively^[2] listed only 11,952 strictly freshwater species. According to^[2, 3] about 40–43% of all fishes occur in, or almost always on, freshwaters. Fishes of the freshwater are the most imperiled vertebrate group with a predictable extinction rate of five times that of earthly fauna and three times that of oceanic mammals^[4-6].

More than 186 freshwater fish species have been reported from freshwater bodies of Pakistan^[7]. A significant quantity of economically essential fish is caught from rivers yearly. The local economically essential resident fish species comprise about 30 species which are: *Labeo rohita*, *Gibelion catla*, *Cirrhinus mrigala*, *Cirrhinus reba*, *Channa straita*, *Channa marulius*, *Sperata sarwari*, *Wallago attu*, *Rita rita*, *Bagarius bagarius*, *Tenualosa ilisha*, *Notopterus notopterus*, *Nemacheilus spp.*, *Tor macrolepis*, *Schizothorax spp.* and *Clupisoma spp.*^[8]. According to^[9] in Pakistan, there are 193 fresh water fish species present these fishes are categorized to class Actinoptergii, sub-class Teleostei, 3 cohorts, 6 super orders, 13 orders, 30 families and 86 genera^[9, 10]. According to Nelson (2006) about 32,000 fish species have been reported so far in the world. Among the global waters, only less than 0.3 % may constitute fresh water, which harbours more than 15,000 freshwater fish species. Whereas oceanic habitat, although, contains more species in total, freshwaters are far richer per unit volume of habitat. Here, freshwater fish species occur at one species per 15 km³ of water as compared to one per 100,000 km³ of sea water. This reflects the yield, physiographies variety and geological separation of freshwater habitats^[11]. In a global biodiversity, fresh water is an important component which has held just about 25% of all vertebrates^[12]. There are 198 fresh water fishes found in Pakistan, including introduced species. Ichthyofauna is chiefly south Asian, with some west Asian and high Asian. Snow trout's (Schizothoracinae) are also remarkable species of the area comprising 9 species which inhabit the colder water. The Indus river basin, the Kirthar Range and the Himalayan foothills are the species richness zones, while the highest level of endemism is found in the river systems of northwest Balochistan. Approximately 800 fish species have been reported in the coastal water of Pakistan; though, no

investigation of their inhabitant's rank and diversity level is obtainable [13]. Ichthyofauna of the water bodies of our country has been identified and reported by a number of relatively new researches [14-19]. These studies are useful in providing baseline information on species distribution and diversity in different areas, yet are deficient in many ways as

none of these studies exclusively encompass the species of special importance and their conservation status. The objective of our research work was to find out the exploring the fish fauna in water bodies of Hazara Division, Khyber Pakhtunkhwa, Pakistan.

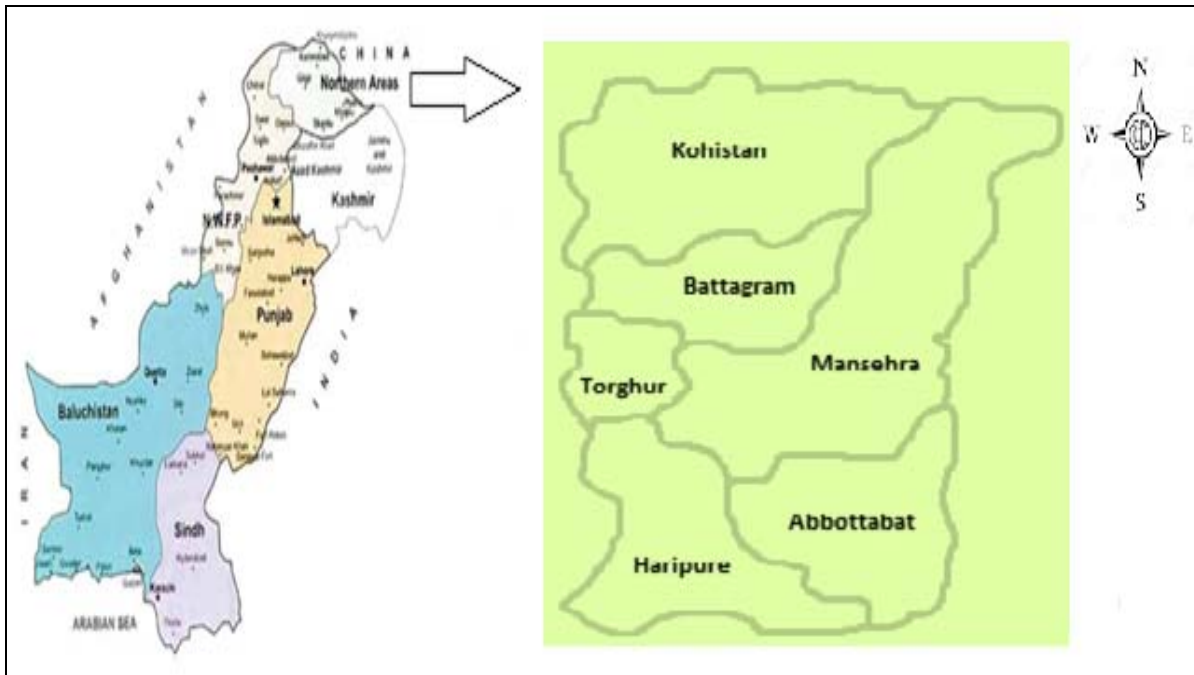


Fig 1: Map of Hazara Division Khyber Pakhtunkhwa, Pakistan.

2. Materials and Methods

2.1 Study Area

Hazara is a region in the North-Eastern part of the Khyber Pakhtunkhwa Province of Pakistan. It is located east of the Indus River ($34^{\circ}30'0''$ N and $73^{\circ}15'0''$ E) and comprises six Districts: Abbottabad, Battagram, Haripur, Mansehra, Kohistan, and New District Torghar. The total area of Hazara is 18,013 km². It is located at an elevation of 1,012 meters above sea level. In the present study five rivers were selected for collection of fish fauna viz River Indus, Siran, Kunhar, Harrow and Dor. These Rivers harbour the main water volume and fish diversity of Hazara Division showing in Fig.1.

2.2 Fish Collection

Fish collection was made from five main Rivers of Hazara Division Khyber Pakhtunkhwa Pakistan. The duration of the current study was three years, i.e. March 2013-February, 2016. Five collection sites were identified at each River with the help of local fishermen as they have the best idea about the presence and abundance of fish. The collection was done on a monthly basis. The collection was made with the help of different nets and locally adopted devices. The mesh sized used to capture fish was from 0.5 mm to 2.8 cm.

2.3 Preservation

Fishes were preserved in 10% formalin or 70% Alcohol. Specimens prior to storage in 10% formalin were injected with the same strength of formalin into their belly.

2.4 Caring the collection

The preserved fishes were brought to the laboratory and attached a label to each jar, indicating the name of locality,

date and time of collection.

2.5 Identification and classification

Identification and classification of fishes for scientific study were done through various taxonomic and systemic keys. For this purpose, the keys used are given below. The fresh water fishes of India, region [20]. Fishes of the Punjab, Pakistan Lahore [21]. Pakistan ki Taazapaniki Machliah [16]. Inland fishes of India and adjacent countries [22].

3. Results

3.1 Result

Out of 3311 fish specimens collected during the field study, from water bodies of Hazara Division, Family Cyprinidae was the richest Family which was represented by 16 species which were *Cyprinus carpio*, *Catla catla*, *Cirrhinus mrigala*, *Labeorhita*, *L. caeruleus*, *Hypophthalmichthysmolitrix*, *H. nobilis*, *Schizothorax plagiostomus*, *S. esocinus*, *S. labiatus*, *Tor putitora*, *Garra gotyla*, *Puntius Sophore*, *Barilius pakistanicus*, *B. vagra* and *Puntusticto*; Bagridae was represented by 3 species *Rita rita*, *Mystusbleekri* and *Speratarwari*; Nemacheilidae, Schilbeidae and Salmonidae comprised only two species of each which were *Schisturanalbanti*, *Triplophysa Kashmirensis*; *Clupisoma naziri*, *C. garua* and *Oncorhynchus mykiss*, *Salmo trutta fario*. Family Siluridae, Sisoridae, Channidae, Mastacembelidae and Cichlidae consisting one species of each which were *Wallago attu*, *Glyptothorax punjabensis*, *Channa gachua*; *Mastacembelus armatus* and *Oreochromis mossambicus* respectively.

Table 1: Fish fauna collected for identification during March, 2013-February, 2016 in the water bodies of Hazara Division Khyber Pakhtunkhwa, Pakistan.

Order	Family	Species	Number of individuals	
Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	187	
		<i>Catla catla</i>	145	
		<i>Cirrhinus mrigala</i>	211	
		<i>Labeorohita</i>	277	
		<i>Labeo caeruleus</i>	47	
		<i>Hypophthalmichthys molitrix</i>	78	
		<i>Hypophthalmichthys Nobilis</i>	69	
		<i>Schizothorax Plagiostomus</i>	356	
		<i>Schizothorax Esocinus</i>	68	
		<i>Schizothorax Labiatus</i>	42	
		<i>Tor putitora</i>	155	
		<i>Garagotyla</i>	126	
		<i>Puntius Sophe</i>	86	
		<i>Barilius pakistanicus</i>	23	
		<i>Barilivagra</i>	43	
		<i>Puntius ticto</i>	13	
		Nemacheilidae	<i>Schisturanalbanti</i>	288
<i>Triplophysa Kashmirensis</i>	156			
Suliriformes	Siluridae	<i>Wallago attu</i>	29	
	Sisoridae	<i>Glyptothorax punjabensis</i>	60	
	Bagridae	<i>Rita rita</i>	59	
		<i>Mystesblekeri</i>	69	
		<i>Mystes Bleekeri</i>	49	
	Schilbeidae	<i>Clupisoma naziri</i>	59	
		<i>Clupisoma garua</i>	29	
Chinniformes	Channidae	<i>Channa gachua</i>	82	
Synbranchiformes	Mastacembelidae	<i>Mastacembelus armatus</i>	133	
Perciformes	Cichlidae	<i>Oreochromis mossambicus</i>	27	
Salmuniformes	Salmunidae	<i>Oncorhynchus mykiss</i>	187	
		<i>Salmo trutta fario</i>	158	
06 Orders	09 Families	Genus 22	30 Species	3311 Specimens

4. Discussion

In the present study, collection and identification of the fish fauna in water bodies of Hazara Division, Khyber Pakhtunkhwa, Pakistan were conducted during March, 2013 to February 2016. Akhtar *et al.* (2014) [23] studied and highlighted 18 fishes under 3 orders and 3 families in Valley of river Swat, total number of the 18 fishes belonging were recorded. In the present research, 30 species under 6 order and 10 families were recorded from water bodies of Hazara Division. However, both studies showed differences in the diversity of the fish fauna due to differences in the climatic factors of two areas. Almost climate of the Hazara division remains cold in all districts as compared to other parts of the country. Hussain [24] reported 6 fishes from river Swat. While, in the present research total 30 species were reported. Therefore, one can argue that both studies have different biodiversity. Moreover, the environmental factor, play a vital role in such a great variety. Furthermore, in the present study 5 rivers were selected for exploring of fish fauna, while in the previous study only one river (Swat) was selected for identification of fish fauna. Nisar [25] explores 23 species of fishes from Tanda Dam Kohat. While in the present study 30 species of fishes were collected from water bodies of Hazara Division comprising River Indus, Siran, Kunhar, Dour and Harrow respectively. Factors responsible for diversity differences in both studied areas were geographical features because each fish having their own specific geographical range. Shahjehan and Khan [26] reported 26 fishes belonging to 8 families from Baran Dam, Bannu. The minute variation in the diversity of fish fauna was due to the change of fish habitat, because almost diversity occurs due to the habitat variation. Globally habitat varies from place to place which

provide basic home ground for fishes where they freely interbreed in the aquatic environment. The first attempt to explore Ichthyofauna of river Swat was carried out by Ahmad and Mirza [15] who record 8 species of fish from Swat, including two new Icoches. While the result of the present study is quite different from the two areas studied in which 30 species of the fishes were explored. The huge variation in diversity of fishes in the both areas was because in the present study 5 rivers were studied for fishes collection which make a great water body zone. While Ahmad and Mirza [26] selected just one river (Swat). Furthermore, climatic factors of the both studied area almost similar because Swat and Hazara include in cold areas in Pakistan.

5. Conclusion

From the current study it was concluded that the increase in the anthropogenic activities in water bodies of Hazara Division is threatening the fish fauna. If the necessary fish conservation steps are not taken to save the fish fauna, it will result in the endangering of fish fauna in the rivers of Hazara Division

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