

## **Fish Diversity of Fresh Water Bodies of Suleman Mountain Range, Dera Ghazi Khan Region, Pakistan**

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**Abstract.-** The present study synthesized information on fish biodiversity in the freshwater bodies of Suleman mountain range Dera Ghazi Khan, Pakistan at eight different sites an attempt to explore the diversity of the fishes of this unexplored region. 15 species belonging to 5 families under 13 genera were found during the study period from January 2004- December 2006. From the data for species richness and relative abundance it was found that the species richness was maximum at Hinglon (site 8) and minimum at Siri (site 6). It is evident from the results that the region is poor in diversity. However, it is concluded that fish diversity is very much conserved in the region.

**Key words:** Biodiversity, Suleman Mountain Range, species richness, Cyprinidae, ichthyofauna.

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### **INTRODUCTION**

Approximately 20% of the world's freshwater fish is currently either endangered or extinct. United States, generally, viewed as a center of biological diversity in the freshwater environment, and is thought to be losing freshwater species at a rate comparable to the rates observed for species loss in tropical forests. 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 (Postel, 2002).

Fish exhibit enormous diversity in their morphology, in the habitats they occupy, and in their biology. Unlike the other commonly recognized vertebrates, fish are a heterogeneous assemblage (Forese and Pauly, 1998). Fish occupied an extra-ordinary array of habitats. 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 embayments, and so on through or nearly endless list of aquatic environments (Moyle and Cech, 1996).

At least 180 species of fish are reported to exist in Pakistan freshwaters, including representatives from important groups such as

Loaches, carps and catfish. There are 28 fish species listed as inhabiting cold waters of Pakistan. Most of the snow trout are restricted to the Trans-Himalayan Region of the Indus system. The famous game fish Mahaseer and Schizothoracines are becoming rare due to over-fishing and the disappearance of spawning grounds, submerged by reservoirs such as Tarbela and the Ghazi Barotha. According to most recent and authentic information native fresh water fish fauna of Pakistan comprises 179 species belonging to 82 genera, 26 families, 10 orders, 5 super orders and 3 cohorts (Mirza and Bhatti, 1999).

The Suleman Mountain range is relatively an unexplored area regarding biodiversity. It has harsh environmental conditions both in winter and summer in most parts. The freshwater habitat consists of both running and standing waters. The present study is a pioneer attempt to explore the diversity of the fishes of this region.

### **MATERIALS AND METHODS**

#### *Study area*

It lies between 28° 28' to 31° 18' North latitude and between 69° 20' to 70° 55' East longitudes. Dera Ghazi Khan Region is divided into two parts. The mountainous area in the West and the plain in the East. The western half of the region is covered by the hills of Suleman Mountains. Most of these hills are seen in the tribal area known commonly as De-excluded area. The hills are higher in the North where they rise to peaks as high as 3000m above the sea level (Fig. 1, Table I).

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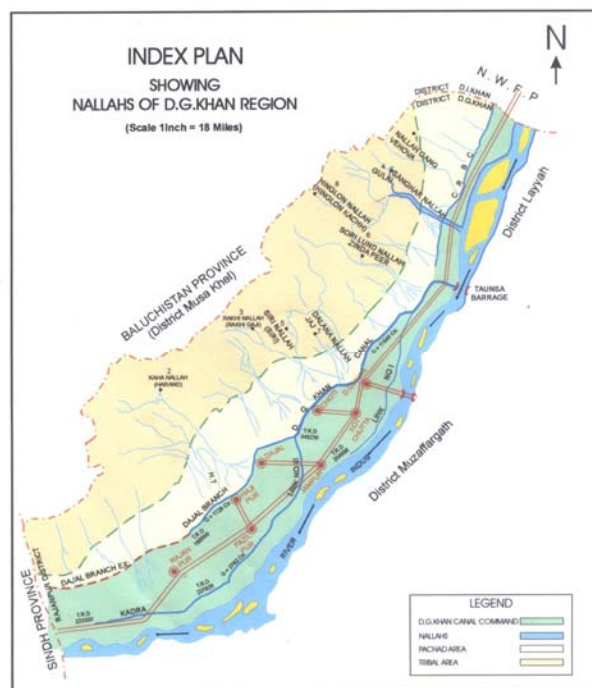


Fig. 1. Location map of sampling sites

Table I. Names and location of sampling sites.

Site no.	Site name	Nallah name	Height	Location	
I	Vehova	Gang Nallah	1200 ft.	31° 10' N	70° 29' E
II	Harand	Kaha Nallah	1250 ft.	29°32' N	70°08' E
III	Rkhi Gaj	Rakhi Nallah	4200 ft.	29°58' N	70°04' E
IV	Gulki	Sanghar Nallah	847 ft.	30°43' N	70°27' E
V	Siri	Siri Nallah	1650 ft.	29°55' N	70°10' E
VI	Zinda Peer	Lund Nallah	1500 ft.	30°25' N	70°29' E
VII	Jaj	Dalana Nallah	1583 ft.	30°25' N	70°21' E
VIII	Hinglon Kuch	Nallah Hinglon	3043 ft.	30°25' N	70°30' E

The climate of region is exceedingly dry both in hills and plains and in summer as well as in winter. The summer season starts in April and continues till October. May, June and July are the hottest months. The mean maximum and minimum

temperature for this period are about 40.6 and 27.2 °C respectively. The winter season lasts from November to March. December, January and February are the coldest months. The mean maximum and minimum temperatures during these months are about 22.3 and 5.9°C respectively (Govt. of Pakistan, 1999).

#### Data collection and analysis

The fishes were collected by using scoop nets, cast nets and drag nets having mesh size of approximately 2 cm<sup>2</sup> with the assistance of local fishermen and fisheries department. Each catch was handled separately and sorted by species and counted. The fishes for purpose of identification were preserved in ice and then brought to laboratory. The fishes were identified with the help of keys (Mirza, 1970, 976).

The relative abundance (%) of the fish species at various sites was calculated by using the formula as given below;

$$\text{Relative abundance (R. A.)} = \frac{ni}{N} \times 100$$

## RESULTS AND DISCUSSION

Fifteen species belonging to thirteen genera, and five families were identified from the lentic and lotic water bodies of Suleman mountain range, Dera Ghazi Khan Region. There were eleven species of cyprinids and three of catfishes. The maximum species belongs to family Cyprinidae, which were eleven. While Sisoridae, Siluridae, Bagridae and Nemachelidae have one species each. The genus Barilius has maximum number of species, which were three (Fig. 5). The species richness was maximum at Hinglon Kutch (site 8) and it was minimum at Siri (site 5). A total of seven species were recorded from Hinglon Kutch (site 8). Six species were recorded from Harand (site 2) and Vehova (site 1) each. At Gulki (site 4) the number of species was three. Two species were recorded from Rakhi Gaj (site 3), Zinda Peer (site 6) and Jaj (site 7). Only one species was recorded from Siri (site 5). The species richness was minimum at Siri. The maximum number of fish individuals per catch was recorded from Hinglon kutch (site 8) and

minimum from Gulki (site 4) (Fig. 2).

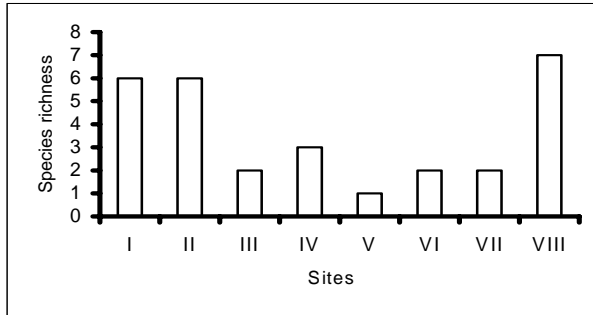


Fig. 2. Variation in species richness at various sites. Names and locations of sampling sites are given in Table I.

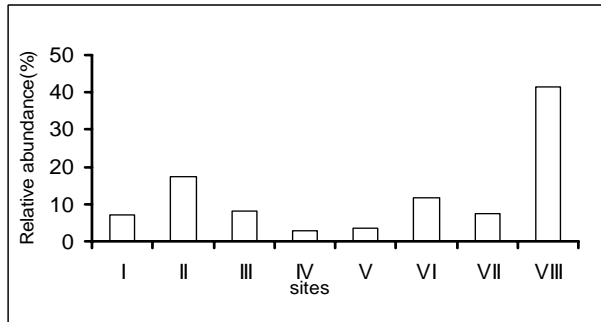


Fig. 3. Relative abundance (%) at different sites. Names and locations of sampling sites are given in Table I.

Some species were recorded from single site *Glyptothorax cavia* was recorded from Vehova, *Ompok pabda* from Harand, *Schizothorax* from Hinglon; *Mystus cavasius* from Gulki, *Salmostoma bacaila* from Harand and, *Schistura* sp. from Hinglon. Some species were recorded from two sites. *Tor macrolepis* was recorded from Vehova and Harand, *Barilius vagra* from Jaj and Vehova, and *Barilius modestus* from Harand and Vehova and *Barilius pakistanicus* from Hinglon and Rakhi Gaj. Some species were recorded from three sites. *Labeo dero* was recorded from Hinglon, Harand and Vehova. *Garra gotyla* was recorded from Hinglon, Zinda Peer, Jaj and Vehova. *Cyprinion watsoni* was recorded from Rakhi Gaj, Zinda Peer and Hinglon. *Crossocheilus diplocheilus* was recorded from Hinglon, Siri and Gulki.

*Cyprinion watsoni* was relatively most

abundant fish species during whole study period. *Garra gotyla*, *Labeo dero* and *Crossocheilus diplocheilus* were relatively less abundant. While *Mystus cavasius*, *Glyptothorax cavia* and *Schistura* sp. were rarely found. Maximum relative abundance was found at Hinglon followed by Harand and Zinda Peer. While Gulki and Siri were least in relative abundance (Fig.3).

The present study area lies in the oriental region. Ichthyogeographically, it lies at the borderline of Yaghistan (western) division and Mehran (eastern) division. Most of its fish fauna is South Asian origin (*Puntius sophore*, *Tor macrolepis*, *Mystus cavasius*, *Barilius vagra*, *Barilius modestus*, *Barilius pakistanicus*, and *Ompok pabda*). Among others are South Asian and West Asian (*Glyptothorax cavia*, *Schistura* sp.), West Asian (*Cyprinion watsoni*), High Asian (*Schizothorax plagiostomus*), Oriental (*Salmostoma bacaila*) and Paleotropical (*Labeo dero* and *Garra gotyla*) (Mirza, 1989; Ahmed and Niazi, 1998).

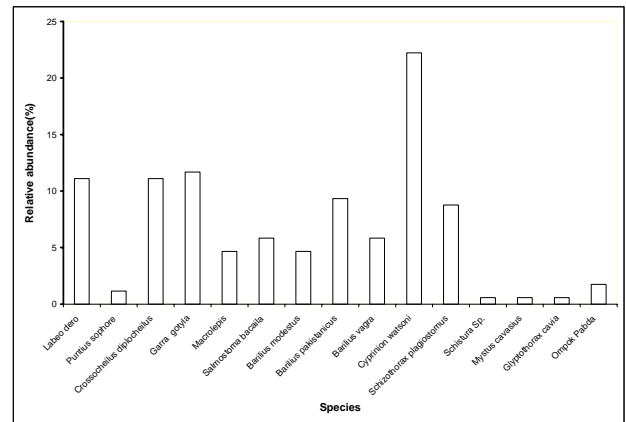


Fig. 4. Relative abundance (%) of different species during study period

The relative abundance (%) of fishes at different sites range from 2.9 to 41.52. the minimum relative abundance is found at Sanghar Nallah, Gulki which may be due to human population pressure which was observe to be maximum at this site. While at Hinglon Nallah, Hinglon Kutch, the maximum relative abundance (%) observed may be due to very low and dispersed human population in the territory and may also due to availability of food in large amount as was observed (Fig. 4).

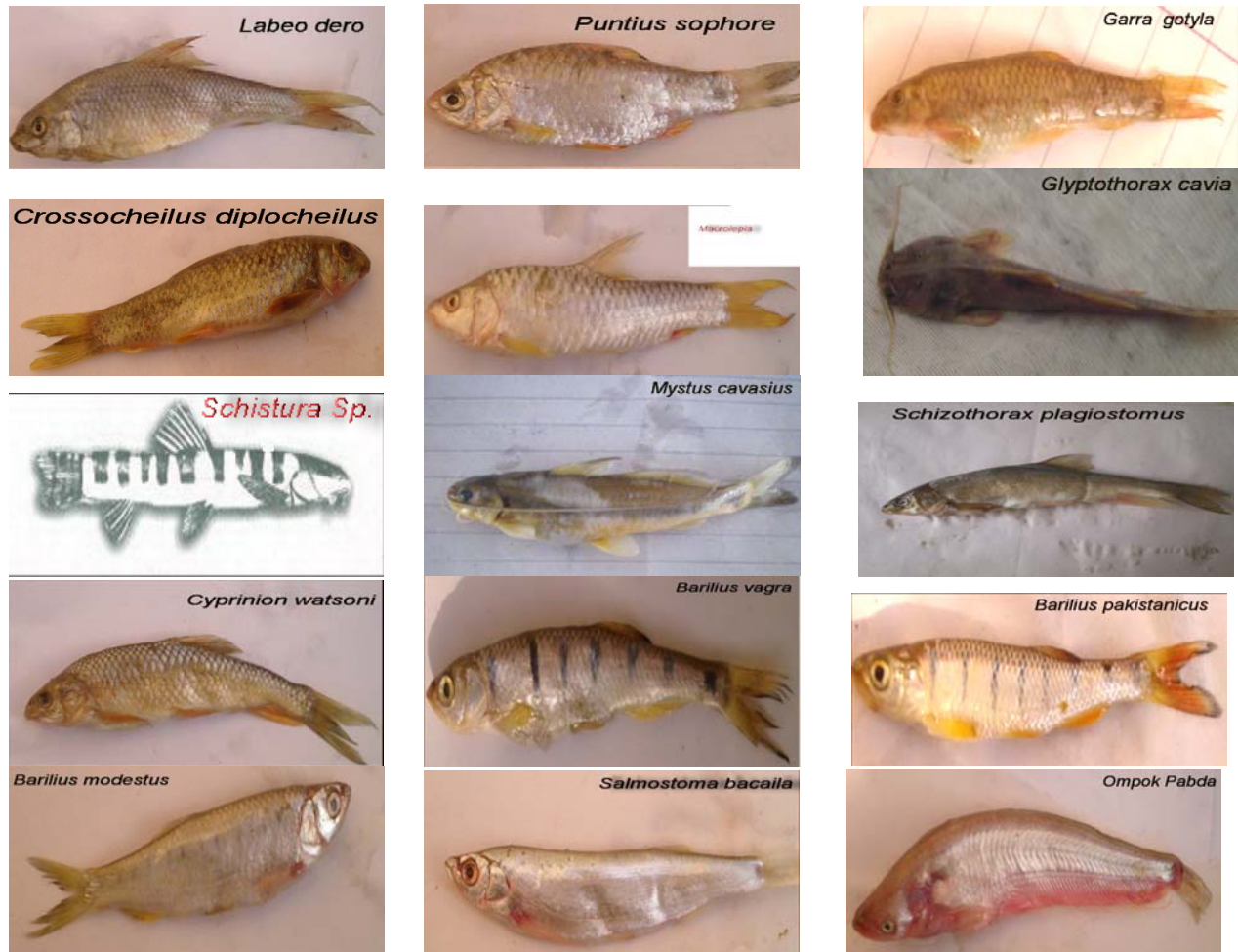


Fig. 5. Different fishes found in study area.

The biodiversity particularly aquatic life is conserved very much in this area. The main factor in this conservation is the behavior of Baloach Tribe. Baloach normally do not like to consume aquatic life for example fish. Their internal territorial behavior rarely allows other people to hunt the wildlife specifically fish. Due to this reason very unique species such as mahasheer (*Tor macrolepis*) and snow carp (*Shizothorax plagiostomus*) are easily found in this area. Especially *Shizothorax plagiostomus* is very good indicator of the richness of the biodiversity of this area. This particular species normally associated with very cold water and high altitude (Lagler *et al.*, 1977).

The fisheries potential of the study area needs to be investigated in detail so that it can be utilized

by humans in future. The area receives lot of water in the form of irregular seasonal rains which is mostly wasted as there is no management of its storage. There is need to adopt measures for the storage of water so that it can be wisely utilized for the fish production and agriculture. Further, it is suggested that the nutritional status and market value of the fishes of this area should be thoroughly assessed. Further, there is need for the analysis of water quality parameters to check the suitability of water for commercial fisheries.

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