

# Ichthyo fauna of Kundal Dam district Swabi Khyber Pakhtunkhwa, Pakistan

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## ABSTRACT

Kundal Dam is small irrigation purpose dam, located in district Swabi that control flood and supply water to irrigate the fertile land of Swabi to full fill the scarcity of water. A field survey was conducted from May to August 2024 to investigate ichthyo fauna of Kundal Dam district Swabi, Khyber Pakhtunkhwa Pakistan. In this study, a total of eight species were documented including *Channa punctata*, *Channa gachua*, *Hypophthalmichthys molitrix*, *Labeo rohita*, *Carassius auratus*, *Ctenopharyngodon idella*, *Barilius Vagra* and *Mastacembelus armatus* representing the three families Channidae, Cyprinidae and Mastacembelidae respectively. We documented the ichthyo fauna of Kundal Dam for the first time and provided a baseline for future research to understand the fish diversity of this region. Fish fauna suffered various threats including climate change, habitat destruction, pollution, species invasiveness, overfishing and diseases. These threats can decline the fish population, reduce biodiversity and even cause extinction, therefore this study focused on the management and conservation of fish fauna of this area.

**Keywords:** Flood, Irrigation, Scarcity, Overfishing, Climate change, Fish Fauna

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## Introduction

The term “fish” is used for a group of cold blooded (poikilothermic), non-tetrapod, gills breathing vertebrates belonging to the phylum chordate that primarily depend on water as medium to live [1]. Fish is a diverse group of vertebrates having 32000 species that are mainly categorized to primitive jawless fish (Hang fish and Lamprey) through cartilages fish (Skates, Rays and Sharks) and the most abundant bony fish with extinct species [2]. Fish, the most diverse and abundant group of Chordate that make on half of the total vertebrate through out of the globe [3]. Of these 32500 fish species, 41% are marine, 58% fresh water and 1% is diadromous [4]. Globally, fish fauna belonging to approximately 515 taxonomic families, in which 77% of the fish families live only in freshwater. Pakistan is home of fish fauna that consist of 531 fish species, of which 233 are marine fish species and 186 are fresh water fish species. In 186 fresh water fish species 180 are found in Indus River which important groups are Loaches, Carps, and Cat fish [5]. The present study was conducted to investigate the fish fauna of Kundal dam, District Swabi Khyber Pakhtunkhwa, Pakistan. This study provide baseline for future research of this to manage the fish diversity of this region.

## Materials and Methods

**Study area:** The selected area for specimen collection was Kundal Dam that is situated in District Swabi, Khyber Pakhtunkhwa, Pakistan. The geographic coordinate of this Dam is 72°28'E (longitude) and 34°07'N (latitude), and the elevation is 305 meters above from the sea level. The dam is surrounded by Indus River in South, Tarbela Dam to the north, District Swabi to the east, and District Mardan to the west. Kundal Dam emanate from the Indus River and fed by many other smaller tributaries, including the Swabi River, Kundal River, local Nullahs and seasonal streams (Figure 1).

**Sampling:** The field survey was conducted May to August 2024, fish specimens were collected using cast net, hand net and trammel net . For further study, the collected specimens were preserved in 10% formalin .

**Taxonomic identification:** The collected fish specimens were morphologically identified by using the standard taxonomic keys, fresh water fishes of the Indian region [3] and inland fishes of India and adjacent countries [6] and fishes of Punjab [7].

## Results

In this study, a total of eight species were recorded including *Channa punctata*, *Channa gachua*, *Hypophthalmichthys molitrix*, *Labeo rohita*, *Carassius auratus*, *Ctenopharyngodon idella*, *Barilius Vagra* and *Mastacembelus armatus* representing the three families Channidae, Cyprinidae and Mastacembelidae respectively (Table1).

### *Mastacembelus armatus*

*M. armatus* common name is Zig-zag eel or Fresh water spiny eel and local name is Bam Michele or Marmahi is native to Pakistan, India, Bangladesh, Nepal and Malaysia. It has snake like elongated and serpentine body, Maximum Total length is 60-74cm, small pointed head and small terminal mouth with sharp zig-zag teeth. Elongated snout with oval shaped nostrils near to eyes. Gill rakers and Pelvic fin absent, spiny dorsal fin and anal fin is fused with emarginated caudal fin and small cycloid scales covered skin.

The head is silver in color, body and belly is dull brown with three longitudinal zig-zag lines that are restricted to two-third of body. *M. armatus* is predator fish, mostly found in rivers with sandy, stony or gravelly substrates, the habitat and body color help in predation. Fin Formula is D. 32-39/74-90; P.21-27; A3/75-88; C. 14-17 (Figure 2).

***Channa gachua*** *C. gachua* common name is Dwarf snake head fish and Local name Kata Sar fish is fresh water fish native to South Asia including Pakistan, India, Iran, Bangladesh and Nepal. Body was cylindrical elongated and Total length id reach to 21-26cm. Head is pointed and depressed similar to snake, large eyes, terminal mouth with numerous small teeth. Fore head is flat and 12-15 gill rakers in first gill arches. Body color is olive-green or brown-green with dark vertical blotches. Belly was creamy in color with greenish tint. It is fresh water fish found in streams, pools, stagnant shallow water, lakes, rivers and mostly desire muddy water due to predacious in nature. Fin formula is D. 34-38; V. 6; P.15-16; A. 22-27; C. 14 (Figure 3).

### *Barilius verga*

*B. verga* common name is Bengal danio and local name is Lahore chalwa or Pepal is native to Pakistan (Khyber Pakhtunkhwa, Sindh, Punjab and Kashmir), India, Nepal and Bangladesh. Body was slender, compressed and elongated with maximum Total length is 11-15cm. Pointed head and snout, mouth was terminal and crescent shaped, large lateral eyes slightly dorsal to head. Lateral line is completed and skin is covered by cycloid scales. Ventral and pectoral fins were round and caudal fin were forked in shaped. Skin color is brownish- gray on back side, Silvery white belly and yellowish- white fins with reddish strips. It is fresh water fish found in river, lake and streams mostly desire to live in shallow water sandy substrate and submerged vegetation. Fin formula is D. 10-12; A.12-14; P. 12-14; V. 7-8; C. 19-21 (Figure 4).

### *Carassius auratus*

*C. auratus* common name is Gold fish and local name is Sona Machhli is native to Asia i.e. China, Japan and Korea. Body was elongated and stocky with total length reached to 4-10cm, blunted head and snout, large eyes and terminal mouth and barbels were absent. Lateral line were completed and skin was covered by metallic shiny scale with change color pattern olive, orange, gold to diamond. Fin formula is D. 16-21; A. 5-7; P. 15-16; V. 6-8; C. 19-23 (Figure 5).

### *Ctenopharyngodon idella*

*C. idella* common name is Grass carp and local name is Ghass Machhli is native to China imported to Pakistan. Body was elongated and cylindrical with maximum total length is 120cm. Flat snout with terminal mouth with pharyngeal teeth and relative large eyes. Lateral line was completed with large cycloid scale. Single dorsal in and forked shaped caudal fin with round Pelvic and Pectoral fin. Body color was olive-green to grayish-green with Silvery- white belly. Fresh water fish found rivers, lake, reservoirs, and mostly preferred sand, silt and mud. Fin formula was D. 8-10; P. 16-18; V. 8-9; A. 8-10; C. 19 (Figure 6).

### *Hypophthalmichthys molitrix*

*H. molitrix* common name is Silver carp and local name is Silver is native to China but it is introduced all over the globe. Body was elongated and

compressed, maximum Total length was 60cm. head was broad and flat, blunt snout and terminal mouth, large eyes located in lower half of head, large pharyngeal teeth, triangular mid dorsal fin with pointed tip, forked shaped caudal fin, large silver color cycloid scale. Body was olive-green to silver color with silvery whitish belly. Fin formula was D. 7-8; A. 7-8; P. 14-16; V. 8-9; C. 29-32 (Figure 7).

**Channa punctata**

*C. punctata* common name is Spotted snake head fish local name is Kata Mahi is to South Asia including India, Pakistan, Bangladesh, Nepal, Sri Lanka, Bhutan and Myanmar. Body was elongated with rounded belly, total body length reach to up to 21-25cm. Head was elongated with pointed snout, mouth was terminal with villiform mandibular teeth, and lateral line was completed with 55 cycloid scales and round caudal fin. Gills racker was 10-14 and supra baranchial organ was present. Skin color brown-green with darker bands with whitish belly. *C. punctata* is freshwater fish found in rivers, lakes, streams, pond, wetland, flood plains and marshes. Fin formula was D. XXXV-XXXVIII/8-10; A. XXIV-XXVII/8-10, V. 6; P. 16-18; C. 17-19 (Figure 8).

**Labeo rohita**

*L. rohita* common name Rohu and local name is Roho is native to Asia including Pakistan, India, Bhutan, Nepal, Myanmar and Bangladesh. Body was elongated and compressed with maximum Total length was up to 1meter. Head was flat and broad, mouth inferior with thick fleshy lips. Cycloid scales with 40-50 scales on lateral line. Barbels are present and

anterior spine in dorsal and anal fin. Body color was greysh-silver, red-brown fins with pale yellow belly. Fin formula was D. 12-14; A. 8-10; V. 8-10; P. 15-17; C. 17-19 (Figure 9).

**Discussion**

We conducted the first-ever survey on fish fauna of kundal Dam located in district Swabi, Khyber Pakhtunkhwa, Pakistan. In this study we document eighth fish species for first time which include *Channa punctata*, *Channa gachua*, *Hypophthalmichthys molitrix*, *Labeo rohita*, *Carassius auratus*, *Ctenopharyngodon idella*, *Barilius Vagra* and *Mastacembelus armatus* representing the three families Channidae, Cyprinidae and Mastacembelidae respectively. In this study, family Cyprinidae was the richest family followed by Chinnidae and Mastacembelidae.

**Conclusion**

Kundal Dam and their ichthyofauna is very important component of the ecosystem to providing irrigation and drinking water to the fertile land and animals. It is hot spot of tourist and source of food and income to local communities of District Swabi. Kundal Dam is home eight different fish species i.e. *Channa punctata*, *Channa gachua*, *Hypophthalmichthys molitrix*, *Labeo rohita*, *Carassius auratus*, *Ctenopharyngodon idella*, *Barilius Vagra* and *Mastacembelus armatus*. However the fish fauna of this Dam is affected by overfishing, pollution, agricultural wastes and other human activities to change water quality. We need the conservation and management of the ichthyofauna of this Dam.

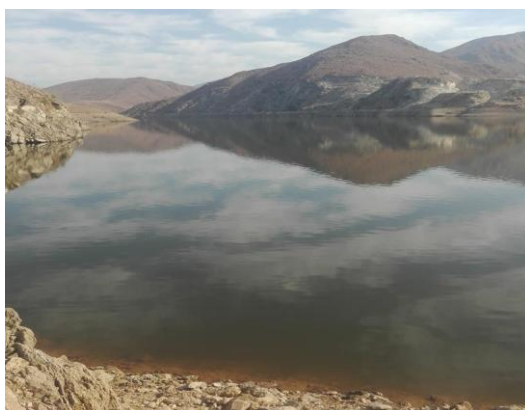


Fig. 1: Kundal dam located in District Swabi, Khyber Pakhtunkhwa, Pakistan.



Fig. 2: Lateral view of *Mastacembelus armatus*.



Fig. 3: Dorsal view of *Channa gachua*



Fig. 4: Lateral view of *Barilius verga*



Fig. 5: Lateral view of *Carassius auratus*



Fig. 6: Lateral view of *Ctenopharyngodon idella*



Fig. 7: Lateral view of *Hypophthalmichthys molitrix*



Fig. 8: Dorsal view of *Channa punctata*



Fig. 9: Lateral view of *Labeo rohita*

**Table 1.** Ichthyo-fauna of Kundal Dam district Swabi Khyber Pakhtunkhwa, Pakistan

Sr. No.	Order name	Family name	Common name	Scientific name
1	Mastacembeliformes	Mastacembelidae	Zig-zag eel	<i>Mastacembelus armatus</i>
2	Channiformes	Channidae	Dwarf snake head	<i>Channa gachua</i>
3	Cypriniformes	Cyprinidae	Bangal danio	<i>Barilius verga</i>
4	Cypriniformes	Cyprinidae	Grass carp	<i>Ctenopharyngodon idella</i>
5	Cypriniformes	Cyprinidae	Silver carp	<i>Hypophthalmichthys molitrix</i>
6	Cypriniformes	Cyprinidae	Gold fish	<i>Carassius auratus</i>
7	Cypriniformes	Cyprinidae	Rohu	<i>Labeo rohita</i>
8	Channiformes	Channidae	Spotted snake head	<i>Channa punctata</i>

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