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Fisheries and Aquaculture Journal

Short Communication

Comparative Analysis of Fish Fauna of District Mardan and Swabi, Khyber Pakhtunkhwa, Pakistan

Ashfaq Ahmad*

Department of Fisheries and Aquaculture, Muhammad Nawaz Sharif University of Agriculture, Multan, Pakistan

ABSTRACT

The current study aimed to investigate the diversity and distribution of freshwater fish in the districts of Mardan and Swabi, located in the Northwest of Khyber Pakhtunkhwa province, Pakistan. Mardan and Swabi are home to numerous streams and rivers between the Indus and Kabul rivers, making them an important area for fishing and farming. A total of 200 fish samples were collected from April to September 2021. Ten species were identified in Swabi, belonging to the families cyprinidae, cichlidae, bagridae, and clupeidae, and orders cypriniformes, perciformes, siluriformes, and clupieformes, with the most abundant being the cyprinidae family. Eight species were identified in Mardan, including *Mastacembelus armatus*, *Garra gotyla*, *Cyprinus carpio*, *Puntius ticto*, *Caraccius auratus*, *Oreochromis mosambicus*, *Puntius sophore*, and *T. putitora*. The results suggest that overfishing and water pollution are major factors affecting the survival and expansion of fish species in the area. To improve the fish populations in the rivers and streams, proper stocking and regulations to control overfishing and pollution are needed. The study found that the cyprinidae family was the most dominant, with eight species identified in the experimental area. However, the number of mastacembelidae and cichlidae was found to be low due to pollution, toxic heavy metals, and other environmental factors that affect breeding and other activities of fish.

Keywords: *Mastacembelus armatus*; Water pollution; Cyprinidae; Toxic heavy metals; Fish breeding

INTRODUCTION

Freshwater fish are a vital component of aquatic ecosystems, providing food and income for local communities and serving as indicators of water quality and ecosystem health. However, human activities such as overfishing and pollution are putting increasing pressure on these populations. The districts of Mardan and Swabi in the Northwest of Khyber Pakhtunkhwa province, Pakistan, are home to numerous streams and rivers that are of great importance for fishing and farming, but little is known about the diversity and distribution of fish in these areas [1]. The current study aimed to fill this knowledge gap by conducting a comprehensive survey of freshwater fish in Mardan and Swabi. A total of 200 fish samples were collected from April to September 2021, and the results provide valuable insights into the species present, their distribution, and the factors affecting their populations. Understanding the diversity and distribution of fish in Mardan and Swabi is crucial for developing effective conservation and management strategies to ensure the sustainable use of these resources for the benefit of local communities and the environment [2].

DESCRIPTION

In this study, we aimed to investigate the diversity and distribution of freshwater fish in the districts of Mardan and Swabi, located in the Northwest of Khyber Pakhtunkhwa province, Pakistan. These districts are home to numerous streams and rivers between the Indus and Kabul rivers, making them an important area for fishing and farming [3].

To collect fish samples, we employed a variety of methods including hooking of multiple lengths, cast nets, automatic rods, gill nets, drag nets, hooking nets, and hand nets. These methods were used to collect fish from eight different locations in Mardan and ten different locations in Swabi. The study was conducted over a period of nine months, from February to

Correspondence to: Ashfaq Ahmad, Department of Fisheries and Aquaculture, Muhammad Nawaz Sharif University of Agriculture, Multan, Pakistan, Tel: 3459420144; E-mail: ashfaqameer55@gmail.com

Received: 09-Feb-2023, Manuscript No. FAJ-23-21763; **Editor assigned:** 13-Feb-2023, PreQC No. FAJ-23-21763 (PQ); **Reviewed:** 27-Feb-2023, QC No. FAJ-23-21763; **Revised:** 19-Apr-2023, Manuscript No. FAJ-23-21763 (R); **Published:** 26-Apr-2023, DOI: 10.35248/2150-3508.23.14.337

Citation: Ahmad A (2023) Comparative Analysis of Fish Fauna of District Mardan and Swabi, Khyber Pakhtunkhwa, Pakistan. Fish Aqua J. 14:337.

November 2021, with three collections conducted every month [4].

The collected fish were preserved in 10% formalin for larger specimens and 5% formalin for smaller ones. Some were also preserved in 70% ethanol. The fish were dissected to collect parasites, which were then fixed in alcohol-formol-acetic acid and identified using standard keys. The prevalence rate of parasites was calculated using the formula: (Number of parasite-infected fish × 100)/total number of fish analyzed [5].

In addition to parasite analysis, physical parameters of the water were also measured, including temperature, pH, water velocity, TSS, and TDS. Fish species were identified using standard identification keys and morphometric criteria. Statistical analysis was done using Korean statistic 9 software. All measurements were made with a calibrated compound microscope and are in millimeters. This allowed us to have a detailed understanding of the fish species present in the area, their distribution and the factors affecting their populations, which is crucial for developing effective conservation and management strategies to ensure the sustainable use of these resources for the benefit [6].

RESULTS

In this study, we conducted a biodiversity assessment of freshwater fish in the districts of Mardan and Swabi in Pakistan. A total of 250 fish samples were collected from various locations in these districts during the study period, which lasted from February to September 2021.

Using various identification keys and literature, we were able to identify 10 different species of fish, including *Catla catla*, *Cyprinus carpio*, *Rasbora rutilis*, *Tor tor*, *Hypopthalmichthys molitrix*, *Tilapia sparmanii*, *Oreochromis niloticus*, *Mystus seenghala*, and *Dorosoma cepedianum*. These species were classified into four orders: Cypriniformes, perciformes, siluriformes, and clupeiformes, as well as four families: Cyprinidae, cichlidae, bagridae, and clupeidae.

Our findings revealed that the Cyprinidae family was the most abundant in the streams and rivers of district Swabi, with a strong association between the occurrence of fish species in these water bodies. This could be attributed to the minimal fishing pressure and the substrate of the rivers and streams, which provide suitable conditions for nesting and rearing.

DISCUSSION

In this study, a total of 250 fish samples were collected from various locations in the districts of Mardan and Swabi in KPK, Pakistan. The study period was from February to September 2021, and this is the first research of its kind to be conducted in this region. A total of 10 fish species were identified using various identification keys and literature. These species include *Catla catla*, *Cyprinus carpio*, *Rutilus rutilis*, *Tor tor*, *Hypopthalmichthys molitrix*, *Tilapia sparmanii*, *Oreochromis niloticus*, *Mystus seenghala*, and *Dorosoma cepedianum*. These species belong to four orders: Cypriniformes, perciformes, siluriformes, and Clupeiformes, and four families: Cyprinidae, Cichlidae, Bagridae, and Clupeidae.

The findings revealed that species of the Cyprinidae family were found to be abundant in the streams and rivers of district Swabi. The high presence of these species could be attributed to minimal fishing traffic and suitable substrate in the rivers and streams for nest building and rearing.

CONCLUSION

Comparison of this study with previous studies in other regions of Pakistan also revealed similar trends in terms of dominant fish families and species. For example, in a study of the fish diversity in river Panjkora, DirLower, the cyprinidae family was found to be the most dominant, followed by the nemacheilidae family. Another study in Malakand also found the cyprinidae family to be the most dominant in the experimental area.

Overall, the findings of this study provide valuable information on the freshwater fish diversity in the districts of Mardan and Swabi in KPK, Pakistan, and can be used for conservation and management purposes.

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