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An Ecological Study of Fish Diversity in Paddy Fields and Canals of Sakti District, (C.G.) India

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Abstract

The current investigation aims to examine the fish diversity in the paddy fields and associated canals of Sakti. The diversity of fish in paddy fields and canals is influenced by various factors such as water quality, vegetation, temperature, and human activities. Paddy fields and canals create unique aquatic environments that support a variety of fish species, contributing to overall ecosystem health. The diversity of fish in paddy fields has been inadequately explored, lacking proper documentation of the fish resources in the Sakti District. Paddy fields serve as a valuable food source and have the potential to address issues of malnutrition. It's essential to note that Sakti District is predominantly tribal in nature. This survey was made during the monsoon period September 22 to November 22 and August 23 to November 23. During the present survey, 23 species of freshwater fishes were identified and they belong to 15 genera, 11 Families of class Teleostomi.

Keywords: Fish diversity, paddy fields, canals

Introduction

Chhattisgarh state is situated at the centre of India. It is a tropical climate state popularly known as the 'Bowl of the Rice'. District Sakti is the leading rice-producing zone of the state. The soil is Kanhar with good water retention properties. Before the last two decades, the farmers were taking only a single crop of rice but after providing good irrigation facilities through the Hasdo-bango irrigation project a network of irrigation canals were established and farmers are producing double crop of rice. During the monsoon the paddy fields are prepared for sowing the first crop and the paddy is harvested mostly till November. During this period rice fields were filled with running as well as stagnant water. Several inland culture fish farming programs are going on but no investigations on capture fishes have been made in the area regarding their fish diversity. During the monsoon season, these captured fishes are spread in the paddy fields nearby. During monsoon and before harvesting the paddy crop, the farmers and villagers collect these fishes from the paddy fields and canals by using local contrivances like net, choriya and dheer. The farmers and the people of this area are aware of these fishes as they are economically very important to them. Investigation and identification of these fishes are very important, thus there is an urgent need for proper investigation and documentation of this fish diversity. The present study is made to identify the fish fauna of the paddy fields and other related canals of the Sakti.

Material and Method

The exploration of the variety of fish in Sakti Tehsil involves detailing, collection techniques, photography, conservation, identification, and the morphometric and meristic examination of gathered fish specimens from September 22 to November 22 and August 23 to November 23. The fishes obtained from 10 sampling locations within the paddy fields and irrigation. The fishes were collected with the help of groups of experienced fishermen by using variety of available sampling methods such as dheer, chorea and other local contrivances as per the requirement of habitat type. In addition, fishes were also purchased from the fishermen on the spot, from the hat, nearest fish markets, fishermen co-operative society (machhuwara samiti) and tried to collect all types of fish. Collections were made for all selected locations during 8:00-16:00 hour in day and 20:00-6:00 hour in night. canals of the study area underwent a gentle cleansing and a subsequent photo-shoot. Fishes captured in states of vitality, sedation, or lifelessness were carefully washed and conserved using a 10% diluted formalin solution right at the location of sampling. Each sample was carefully labeled and put into small containers, its date, place, time, color and other significant information's were recorded in the field diary. Preserved fishes so collected were brought to the laboratory for further study. The morphometric measurements and meristic counts were done and fishes were identified up to the species level, with the help of standard keys and books followed by Day (1878) ^[4]; Shrivastava (1968); Qureshi &

Qureshi (1983); Jhingran (1991); Talwar and Jhingran (1991)^[16]; Jayaram (1999)

Study Site and Sampling Site

Twelve prominent rice-producing regions were chosen for the examination of fish diversity in paddy fields. The study

focused on assessing the variety of fish species present in both paddy fields and canals within the selected areas, namely Sakati, Dabhara Sankarpali, Kotmi, Kirari, Jawali, Sapose, Tenganbhata, Saraipali, Dhurkot, Baghot, Kabaripali. Fish specimens were collected from approximately a 2 to 3 km radius of each study site.

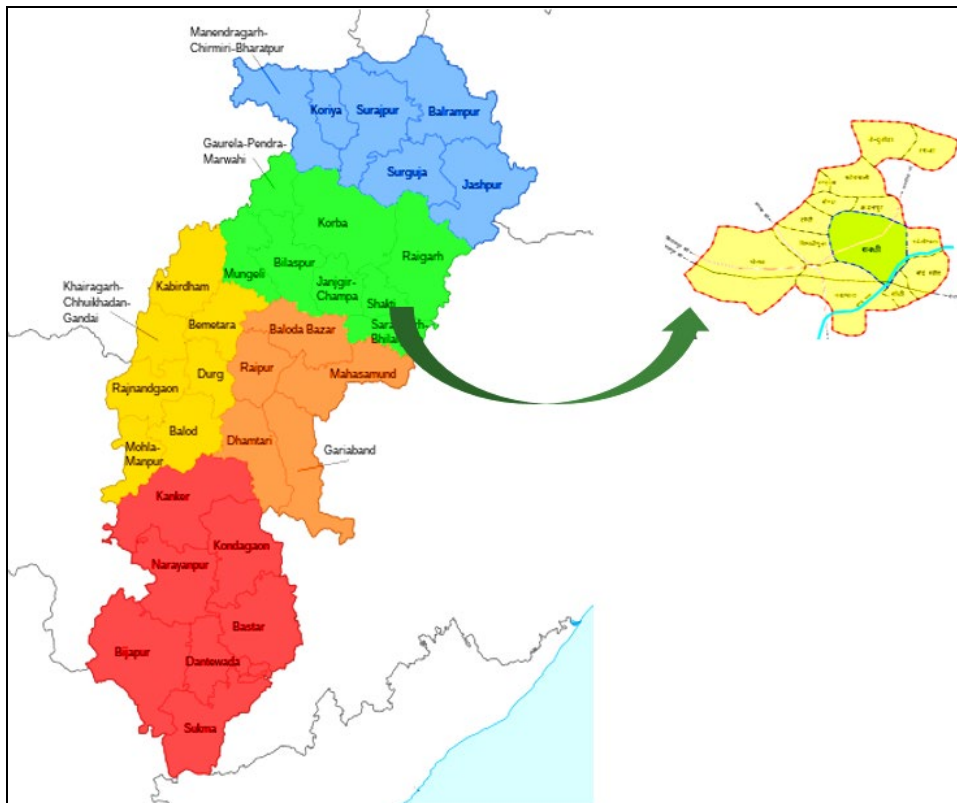


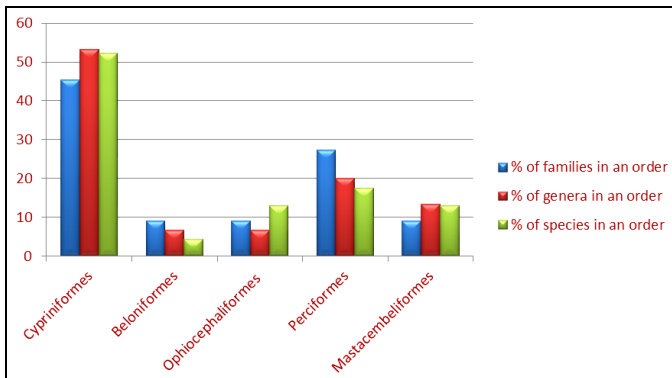
Fig 1: Diagrammatic Map Showing Chhattisgarh State of Sakti District

Table 1: Fish studied in paddy fields and streams during September 22 to November 22 and August 23 to November 23.

| S. N. | Order | Family | Scientific Name of Fish | Local name | Source | |
|-------|--------------------|-----------------|-------------------------|----------------------------|----------------------|----------------------|
| 1. | Cypriniformes | Cyprinidae | Esomus danricus | Dadia | Paddy fields, canals | |
| 2. | | | Labeo rohita | Rohu | Canals | |
| 3. | | | Labeo bata | Bata | Canals | |
| 4. | | | Puntius sarana | Sarna | Canals | |
| 5. | | | Puntius ticto | Kotri | Paddy fields, canals | |
| 6. | | | Puntius sophore | Kotri | Paddy fields, canals | |
| 7. | | | Rasbora daniconius | Dadu | Canals | |
| 8. | | | Cobitidae | Lepidocephalichthys guntea | Gimna | Paddy fields, canals |
| 9. | | | Bagridae | Mystus tengara | Tangna | Paddy fields, canals |
| 10. | | | | Mystus cavasiys | Tangna | Paddy fields, canals |
| 11. | | | Heteropneustidae | Heteropneutes fossilis | Singhi | Paddy fields, canals |
| 12. | | | Claridae | Clarias batrachus | Kewai | Paddy fields, canals |
| 13. | Beloniformes | Belonidae | Xenentodon cancila | Sodhia | Canals | |
| 14. | Ophiocephaliformes | Chanidae | Channa gachua | Karajiya | Paddy fields, canals | |
| 15. | | | Channa punctatus | Khoksi | Paddy fields, canals | |
| 16. | | | Channa striatus | Saura | Canals | |
| 17. | Perciformes | Gobiidae | Glossogobius giuris | Ghesra | Paddy fields, canals | |
| 18. | | Centropomidae | Chanda nama | Chandani | Paddy fields, canals | |
| 19. | | | Chanda ranga | Chandani | Paddy fields, canals | |
| 20. | | Anabantidae | Anabas testudineus | Rukh chagha | Paddy fields | |
| 21. | Mastacembelidae | Mastacembelidae | Mastacembelus armatus | Baam | Paddy fields, canals | |
| 22. | | | | Mastacembelus puncalus | Choti Bami | Paddy fields, canals |
| 23. | | | | Macrognathus aculeatus | Baam | Paddy fields, canals |

Table 2: Number and present composition of families, genera and species under various order

| S. No. | Order | Families | Genera | Species | % of families in an order | % of genera in an order | % of species in an order |
|--------|--------------------|----------|--------|---------|---------------------------|-------------------------|--------------------------|
| 1 | Cypriniformes | 5 | 8 | 12 | 45.45 | 53.34 | 52.18 |
| 2 | Beloniformes | 1 | 1 | 1 | 9.09 | 6.66 | 4.34 |
| 3 | Ophiocephaliformes | 1 | 1 | 3 | 9.09 | 6.66 | 13.04 |
| 4 | Perciformes | 3 | 3 | 4 | 27.28 | 20 | 17.4 |
| 5 | Mastacembelidae | 1 | 2 | 3 | 9.09 | 13.34 | 13.04 |
| | Total | 11 | 15 | 23 | | | |

**Fig 2:** Showing Percent Contribution of families, genera and species under various orders

Result and Discussion

In the course of this study, we identified a total of 23 freshwater fish species belonging to 11 families and 15 genera within the Teleostomi class. Notably, a substantial migration of fish from irrigation canals and streams to paddy fields for both feeding and breeding purposes was observed, particularly during the rainy season. The fishes representing the families are Cyprinidae, Cobitidae, Bagridae, Heteropneustidae, Claridae, Belonidae, Chanidae, Gobiidae, Centropomidae, Anabantidae, and Mastacembelidae. The Genus are Esomus, Labeo, Puntius, Rasbora, Lepidocephalichthys, Mystus, Heteropneustes, Clarias, Xenentodon, channa, Glossogobius, Chanda, Anabas,, Mastacembelus and Macroganathus. The species are E. danricus, L. bata, L.rohita, P. sarana, P. ticto, P. sophore, R. daniconius, L. guntea,, M.cavasius, M. tengara, H. fossilis C. batrachus X. cancila,, C. gachua, C. punctatus, C. striatus, G. giuris C. nama, C. ranga A. testudineus, M.cavasius, M. tengara, M. armatus, (Table-1)

Conclusion

The migratory behaviour of fishes from streams and canals to paddy fields plays a crucial role in species dispersal for feeding, breeding, and shelter. Many of these migratory fishes are weed fishes, while others are predatory. However, agricultural practices and anthropogenic activities pose challenges to fish survival. During the monsoon period, the paddy fields of Sakti District boast a diverse fish population, with 23 species from 15 genera and 11 families. Air-breathing fishes are particularly dominant in paddy fields due to their high tolerance levels.

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