

## CURRENT STATUS OF ICTHYOFAUNAL DIVERSITY OF TUNGA RIVER AT MANDAGADDE BIRD SANCTUARY, SHIVAMOGGA, KARNATAKA, INDIA

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### ABSTRACT

**Objective:** The objective of this study was to find out the diversity of fishes of Tunga river at Mandagadde bird sanctuary.

**Methods:** The fishes were collected with the help of fisherman by repeated netting from selected localities during the study period from April to October 2016. Fishes were photographed at first for documentation of the fresh color and then preserved in 10% formalin. Systematic identification of fish species was carried out using the standard keys.

**Results:** A total of 16 species of fishes belonging to 4 orders, 8 families, and 12 genera were recorded from the study area. Six species sighted in family *Cyprinidae*, *Channidae*, *Cichlidae*, and *Siluridae* were represented by two species each. Families *Bagridae*, *Heteropneustidae*, *Notopteridae*, and *Schilbeidae* had only a single species each.

**Conclusion:** This study highlights the rich concentration of fish species, economically important and of high commercial value.

**Keywords:** Ichthyofauna, Mandagadde bird sanctuary, Conservation status, Shivamogga, Karnataka.

### INTRODUCTION

Study of biodiversity of fish fauna and their identification is one of the interesting fields of biological research, which gives us an idea about the morphological variations and population diversity of fauna in polluted and nonpolluted site of any particular habitat [1]. Rich biodiversity of any ecosystem is absolutely essential to maintain their stability for proper function of their food chains [2]. From time immemorial, fish has been recognized as an important source of nutritious food as it constitutes high quality, balanced and easily digestible proteins and the much needed amino acids by human beings. Fishes are used as indicators of pollution as their presence in large number and variety in lentic bodies is a good indication that water is virgin and suitable for human consumption and utility [3]. The fish diversity of this region has not been explored earlier. This study was aimed to generate information on the fishes of Tunga river at Mandagadde bird sanctuary of Shivamogga.

### METHODS

#### Study area

The Mandagadde bird sanctuary is an island lies around 30 km from Shivamogga on the way to Theerthahalli. The island spans an area of 1.14 acres and it is surrounded by forest and river named Tunga. The latitude and longitude of Mandagadde bird sanctuary are 13.7407 and 75.4606, respectively.

#### Fish samples collection

The fishes were collected with the help of fisherman by repeated netting from selected localities during the study period from April to October 2016. Fishes were photographed at first for documentation of the fresh color and then preserved in 10% formalin. Fishes brought to the laboratory were fixed in solution in separate jars according to the size of fishes. Smaller fishes were directly placed in the formalin solution, while larger fishes were given an incision on the abdomen before they were fixed.

#### Fish identification

Systematic identification of fish species was carried out using the standard keys of Dutta [4-6].

### Conservation status and relative abundance

Red list of threatened fish species was made according to the report by IUCN (2014). The relative abundance of the fish was classified into three categories: Abundant (+ + +) constitute 71-100% of total catch, moderate (+ +) constitute 36-70% of the total catch rare (+) constitute 1-35% of the total catch, assuming the fish efforts constant for each catch.

### RESULTS AND DISCUSSION

Various researchers have done work on the Ichthyofaunal diversity of India. Joshi *et al.* [7] recorded 112 fish species belonging to 10 orders, 29 families and 73 genera from river Yamuna at 11 sampling sites from uppermost Badwala to Allahabad. Mathew and Ashim [8] recorded 12 species of cyprinid fishes belong to 11 genera and 3 families from Manimala river of Kerala. Rashmi *et al.* [9] recorded 49 species of fishes from selected sites of Narmada river at Jabalpur belonging to 7 orders and 14 families. Verma and Shriprakash [10] recorded 89 species of fishes belonging to 45 genera, 21 families and 9 orders from Alwara lake of Kaushambi, Uttar Pradesh. Owais and Uma [11] recorded 21 species of freshwater fishes belonging to 6 orders 11 families and 17 genera from the study sites of the Sagar lake of Madhya Pradesh. Yodha and Chaurasia [12] studied the fish diversity of river Narmada in Khedighat, Barwaha, Madhya Pradesh, and recorded 21 species of fish belonging to 4 orders and 6 families. Basavaraja *et al.* [13] recorded 25 fish species belonging to 4 orders, 9 families and 18 genera from Anjanapura reservoir of Karnataka. Bose *et al.* [14] recorded 57 species of fishes, belonging to 35 genera, 13 families, and 6 orders from middle stretch of river Teva, Madhya Pradesh.

Results of fish diversity of Tunga river near Mandagadde bird sanctuary are given in Table 1 and depicted in Figs. 1-16. A total of 16 species of fishes belonging to 4 orders, 8 families and 12 genera were recorded from the study area. Species composition of different families is depicted in Graph 1 and conservation status of fishes is depicted in Graph 2. Genus composition of families is depicted in Graphs 3-5.

The studied area supported 4 genera and 6 species of *Cypriniformes*. If the diversity of *Cypriniformes* is considered, the genus *Puntius*

Table 1: List fishes of Tunga river at Mandagadde bird sanctuary

| Order             | Family           | Scientific name                               | Common name         | Abundance | IUCN status |
|-------------------|------------------|---|---------------------|-----------|-------------|
| Cypriniformes     | Cyprinidae       | <i>Cirrhinus reba</i> Hamilton, 1822          | Reba carp           | ++        | NE          |
|                   |                  | <i>Systemus sarana</i> Hamilton, 1822         | Olive barb          | +++       | LC          |
|                   |                  | <i>Osteobrama cotio cunma</i> Hamilton, 1822  | Ray fined fish      | ++        | NE          |
|                   |                  | <i>Puntius sophore</i> Hamilton, 1822         | Pool barb           | +         | NT          |
|                   |                  | <i>Puntius pulchellus</i> Day, 1870           | -                   | +         | NE          |
|                   |                  | <i>Puntius kolus</i> Sykes, 1839              | -                   | ++        | NE          |
| Perciformes       | Cichlidae        | <i>Oreochromis niloticus</i> Linnnaeus, 1758  | Nile tilapia        | +++       | NE          |
|                   |                  | <i>Mozambique tilapia</i> Peters, 1852        | Java tilapia        | ++        | NT          |
|                   | Channidae        | <i>Channa striatus</i> Bloch, 1793            | Snake head fish     | +++       | LC          |
|                   |                  | <i>Channa marulius</i> Hamilton, 1822         | Bullseye snake head | ++        | NE          |
| Siluriformes      | Heteropneustidae | <i>Heteropneustes fossilis</i> Bloch, 1794    | Fossil cat          | +++       | LC          |
|                   | Siluridae        | <i>Ompok bimaculatus</i> Bloch, 1794          | Butter catfish      | +         | NT          |
|                   |                  | <i>Wallago attu</i> Bioch and Schneider, 1801 | Wallago catfish     | +++       | LC          |
|                   |                  | <i>Mystus vittatus</i> Bloch, 1794            | Striped catfish     | ++        | LC          |
|                   | Schilbeidae      | <i>Silonia childreni</i> Sykes, 1839          | Schibid catfish     | +++       | NE          |
| Osteoglossiformes | Notopteridae     | <i>Notopterus chitala</i> Hamilton, 1822      | Feather back        | +         | NT          |

NE: Not evaluated, LC: Lease concern, NT: Near threatened, +++: Abundant, ++: Moderate, +: Rare



Fig. 1: *Systemus sarana*



Fig. 3: *Osteobrama cotio cunma*



Fig. 2: *Oreochromis niloticus*



Fig. 4: *Mozambique tilapia*



Fig. 5: *Puntius sophore*

was represented by 3 species. *Cirrhinus*, *Systemus*, and *Osteobrama* were represented by a single species. *Perciformes* were represented by 3 genera and 4 species. *Channa* was represented by 2 species. *Oreochromis* and *Mozambique* were represented by a single species. *Siluriformes* were represented by 5 genera and 5 species of fishes. *Heropneustes*, *Ompok*, *Wallago*, *Mystus*, and *Silonia* were represented by a single species. *Osteoglossiformes* was represented by a single genera and species (*Notopterus*).

Based on the frequency of sightings after catching, six abundant, six moderate and four rare fishes were recorded. Abundant fishes include



Fig. 6: *Heteropneustes fossilis*



Fig. 10: *Cirrhinus reba*



Fig. 7: *Puntius kolus*



Fig. 11: *Mystus vittatus*



Fig. 8: *Puntius pulchellus*



Fig. 12: *Wallago attu*



Fig. 9: *Ompok bimaculatus*



Fig. 13: *Notopterus chitala*

*Systemus sarana*, *Oreochromis niloticus*, *Channa striatus*, *Heteropneustes fossilis*, *Wallago attu*, and *Silonia childreni*. Moderate fishes include *Cirrhinus reba*, *Osteobrama cotio cunma*, *Puntius kolus*, *Mozambique tilapia*, *Channa marulius*, and *Mystus vittatus*. Rare fishes include *M. vittatus*, *Puntius pulchellus*, *Ompok bimaculatus*, and *Notopterus chitala*.

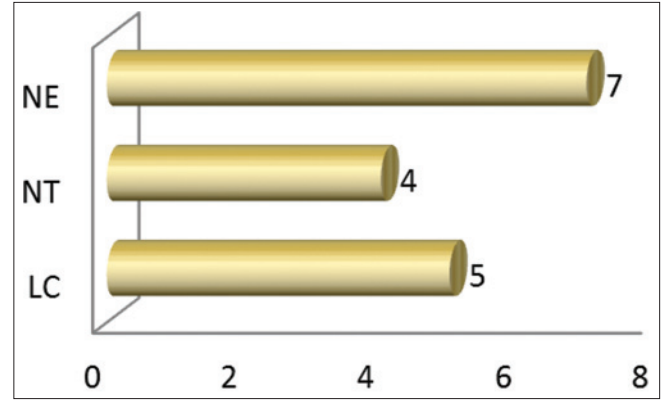
Based on IUCN status, 7 fishes are not evaluated, 5 species are least concerned and 4 species of fishes are nearly threatened.

#### CONCLUSION

The ecological status of the Tunga river at Mandagadde bird sanctuary of Shivamogga was found to be impoverished in terms of species



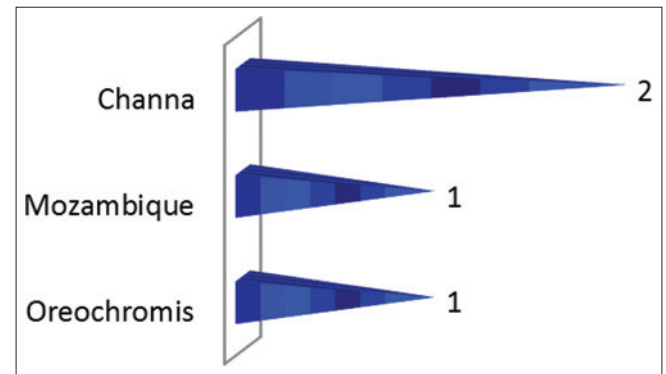
Fig. 14: *Channa striata*



Graph 2: Conservation status of fishes



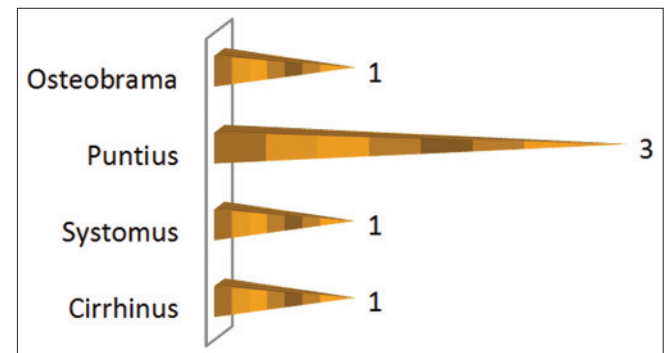
Fig. 15: *Sionia childreni*



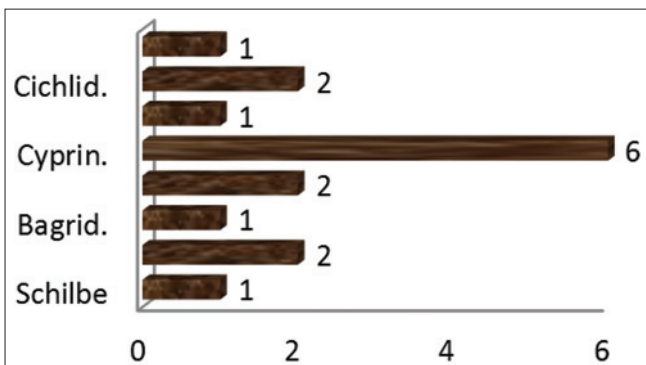
Graph 3: Genus composition of *Perciformes*



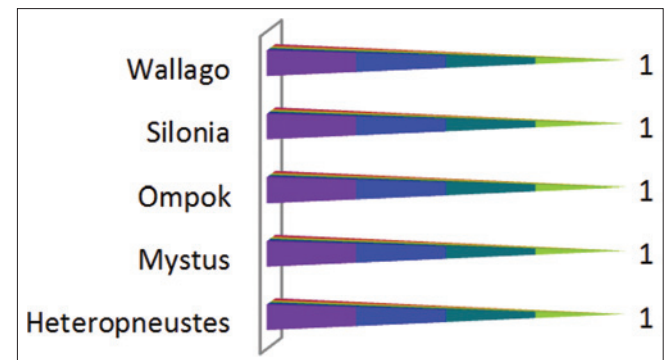
Fig. 16: *Channa moralius*



Graph 4: Genus composition of *Cypriniformes*



Graph 1: Species composition of different families



Graph 5: Genus composition of *Siluriformes*

composition. A rich fish fauna with 6 species of *Cypriniformes*, 5 species of *Siluriformes*, 4 species of *Perciformes*, and a single species of *Osteoglossiformes* were reported.

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