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# An Annotated Checklist of Fish Faunal Diversity of Sathiyamoorthy Sagar Reservoir, Tamil Nadu, India

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***Authors' contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## ABSTRACT

Sathiyamoorthy Sagar Reservoir, also known as Poondi Reservoir, is the reservoir built across the Kotralai River near Poondi, a small village in Tiruvallur district of Tamil Nadu State. An intensive survey was conducted on the fish faunal diversity of the reservoir for a period of 12 months from January 2022 to December 2022 and documented a total of 51 species including 49 species of finfish and 2 species of shellfish. In the finfish group, the order Cypriniformes was observed to have the highest contribution to the diversity (39.2% with 20 species) followed by Siluriformes (15.6% with 8 species). *Macrobrachium malcomsonii* and *Macrobrachium rosenbergii* are the two prawn species reported from the Sathiyamoorthy Sagar Reservoir.

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*Keywords: Fish faunal diversity; Sathiyamoorthy Sagar Reservoir; Tamil Nadu.*

## 1. INTRODUCTION

Inland fisheries operating in lakes, rivers, tanks, estuaries, floodplains and reservoirs are vital resources in India, provides food security and livelihoods to millions of people. Among these, reservoirs are the most important resources by virtue of their vast area and huge production potential. Although impounded waters are not specifically designed for fisheries, they are increasingly being used for such purposes, particularly in Asia. Reservoir fish farming is progressively becoming as a crucial prospect for enhancing fish production and also expanding several direct and indirect livelihood options. India has 19,370 reservoirs scattered across 15 states, covering an estimated 3.15 million hectares, with large reservoirs accounting for 1.14 million hectares; medium reservoirs for 1.49 million hectares and small reservoirs for 0.52 million hectares [1-4]. Indian reservoirs, being in the tropics, have high primary productivity and have the capacity to produce more fish than they now do.

The fish faunal diversity of any reservoir portrays its parent river system where from it gets an inflow of water. Fish faunal diversity varies from river to river, especially between east and west-flowing rivers. Among all commercially important species of Indian reservoirs, Indian major carps viz., *Labeo rohita*, *L. calbasu*, *L. fimbriatus*, *Cirrhinus mrigala*, *Catla catla*, hold a prime position followed by exotic species *Oreochromis mossambicus*, *Hypophthalmichthys molitrix*, *Cyprinus carpio specularis*, *C. carpio communis*, *Gambusia affinis*, *Ctenopharyngodon idella*.

Sathiyamoorthy Sagar Reservoir, also known as Poondi Reservoir is built across the Kotralai River near Poondi, a small village in Tiruvallur district of Tamil Nadu State. There have been several notable studies on the various aspects of Sathiyamoorthy Reservoir, but none on its fish faunal diversity, despite the fact that the reservoir sustains the livelihoods of hundreds of local fishermen families. Hence, the present study was carried out to document the fish faunal diversity of Sathiyamoorthy Reservoir.

## 2. MATERIALS AND METHODS

A preliminary survey was conducted for the selection of sampling stations. Based on the abundance of fish species and fishing activities, three sampling stations were selected along the Sathiyamoorthy Sagar Reservoir, namely, Krishnapuram (13.2123183'' N; 79.8669894'E), Arumbakkam (13.2081362' N; 79.8766936999' E), and Bangarampettai (12.198536299' N; 79.8406093' E) (Fig. 1).

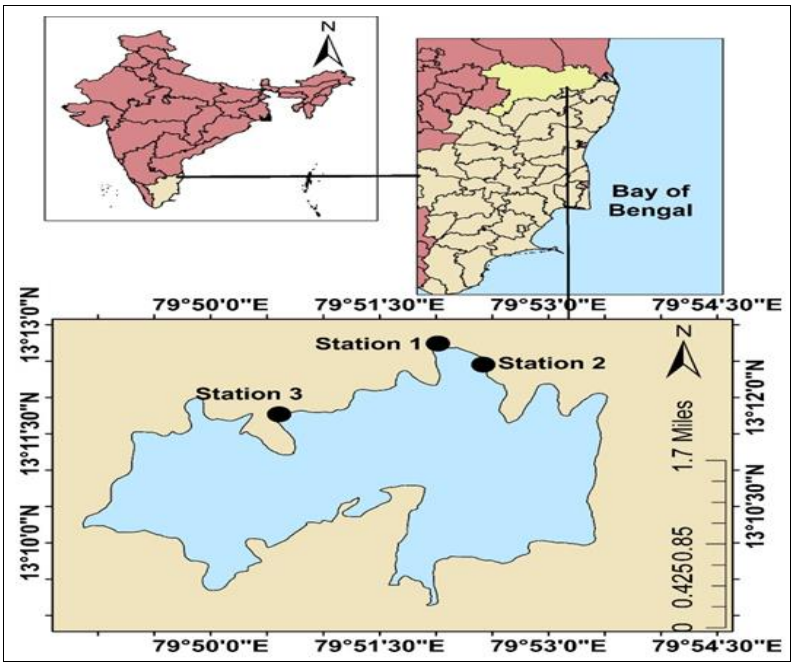


**Fig. 1. Map showing the sampling stations in Sathiyamoorthy Sagar Reservoir**

Sampling was carried out in these three selected stations from January 2022 to December 2022 on fortnight intervals. Representative specimens of various species collected were stored in ice boxes and brought to the laboratory. In the laboratory, the samples were washed thoroughly and images were captured. Fishes were identified up to species level with the aid of literatures like Day [5]; Talwar and Jhingran [6]; Jayaram [7,8] and FishBase [9]. Identification of shrimp was confirmed using SeaLifeBase [10].

## 3. RESULTS

The present study documented a total of fifty-one fish species including 49 finfish species and 2 species of shellfish from Sathiyamoorthy Sagar Reservoir (Table 1). Among the 10 finfish orders reported during the study period, the order Cypriniformes was found to have highest contribution to the diversity (with 2 families, 14 genera and 20 species) followed by Siluriformes (with 6 families, 7 genera and 8 species); Anabantiformes (with 3 families, 3 genera and 6 species); Cichliformes (with 1 family, 3 genera and 4 species); Beloniformes (with 2 families, 2 genera and 2 species); Perciformes (with 1 family, 1 genus and 2 species); Synbranchiformes (with 1 family, 2 genera and 2 species); Anguilliformes (with 1 family, 1 genus and 2 species); Osteoglossiformes (with 1 family, 2 genera and 2 species) and Gobiiformes (with 1 family, 1 genus and 1 species). The present study also reported two species of shellfish from the reservoir belonging to the family Palaemonidae and order Decapoda (Fig. 2).

**Table 1. Checklist of fish faunal diversity of Satiyamoorthy Reservoir**

| S.No. | Scientific Name | Common Name | Taxa | Fishery Status | IUCN status | CITES status |
|---|---|---|---|---|---|---|
| 1 | *Anabas testudineus* (Bloch,1792) | Climbing perch | Anabantiformes> Anabantidae | C | LC | NE |
| 2 | *Channa gachua* (Hamilton,1822) | Dwarf snakehead | Anabantiformes> Channidae | C | LC | NE |
| 3 | *Channa marulius* (Hamilton,1822) | Great snakehead | Anabantiformes> Channidae | C | LC | NE |
| 4 | *Channa punctata* (Bloch,1793) | Spotted snakehead | Anabantiformes> Channidae | C | LC | NE |
| 5 | *Channa striata* (Bloch,1793) | Striped snakehead | Anabantiformes> Channidae | HC | LC | NE |
| 6 | *Trichopodus trichopterus* (Pallas, 1770) | Three spot gourami | Anabantiformes> Osphronemidae | MC | LC | NE |
| 7 | *Anguilla bengalensis* (Gray, 1831) | Indian mottled eel | Anguilliformes> Anguillidae | C | NT | NE |
| 8 | *Anguilla bicolor* (McCllend,1844) | Indonesian shortfin eel | Anguilliformes> Anguillidae | MC | NT | NE |
| 9 | *Xenentodon cancila* (Hamilton,1822) | Freshwater garfish | Beloniformes> Belonidae | MC | LC | NE |
| 10 | *Hyporhamphus xanthopteruzs* (Valenciennes,1847) | Red tipped halfbeak | Beloniformes> Hemiramphidae | NI | VU | NE |
| 11 | *Etroplus suratensis* (Bloch,1790) | Pearl spot | Cichliformes> Cichlidae | C | LC | NE |
| 12 | *Oreochromis mossambicus* (Peters, 1852) | Mozambique tilapia | Cichliformes> Cichlidae | HC | VU | NE |
| 13 | *Oreochromis niloticus* (Linnaeus, 1758) | Nile tilapia | Cichliformes> Cichlidae | HC | LC | NE |
| 14 | *Pseudetroplus maculatus* (Bloch,1795) | Orange chromide | Cichliformes> Cichlidae | C | LC | NE |

| S.No. | Scientific Name | Common Name | Taxa | Fishery Status | IUCN status | CITES status |
|---|---|---|---|---|---|---|
| 15 | *Lepidocephalichthys guntea* (Hamilton,1822) | Guntea loach | Cypriniformes> Cobitidae | NI | LC | NE |
| 16 | *Lepidocephalichthys thermalis* (Valenciennes,1846) | Common spiny loach | Cypriniformes> Cobitidae | NI | LC | NE |
| 17 | *Amblypharyngodon melettinus* (Valenciennes,1844) | Attentive carplet | Cypriniformes> Cyprinidae | MC | LC | NE |
| 18 | *Amblypharyngodon mola* (Hamilton, 1822) | Mola carplet | Cypriniformes> Cyprinidae | NI | LC | NE |
| 19 | *Catla catla* (Hamilton,1822) | Catla | Cypriniformes> Cyprinidae | HC | LC | NE |
| 20 | *Cirrhinus mrigala* (Hamilton,1822) | Mrigal | Cypriniformes> Cyprinidae | - | LC | NE |
| 21 | *Ctenopharyngodon idella* (Valenciennes,1844) | Grass carp | Cypriniformes> Cyprinidae | MC | LC | NE |
| 22 | *Cyprinus carpio* (Linnaeus,1758) | Common carp | Cypriniformes> Cyprinidae | HC | VU | NE |
| 23 | *Dawkinsia filamentosa* (Valenciennes,1844) | Filament barb | Cypriniformes> Cyprinidae | C | LC | NE |
| 24 | *Hypophthalmichthys molitrix* (Valenciennes,1844) | Silver carp | Cypriniformes> Cyprinidae | C | NT | NE |
| 25 | *Labeo calbasu* (Hamilton,1822) | Orange fin labeo | Cypriniformes> Cyprinidae | C | LC | NE |
| 26 | *Labeo fimbriatus* (Bloch,1795) | Fringed-lipped peninsula carp | Cypriniformes> Cyprinidae | C | LC | NE |
| 27 | *Labeo rohita* (Hamilton,1822) | Rohu | Cypriniformes> Cyprinidae | HC | LC | NE |
| 28 | *Osteobrama cotio* (Hamilton,1822) | Cotio | Cypriniformes> Cyprinidae | NI | LC | NE |
| 29 | *Pethia conchonius (Hamilton,1822)* | Rosy barb | Cypriniformes> Cyprinidae | NI | LC | NE |
| 30 | *Puntius chola (Hamilton, 1822)* | Swamp barb | Cypriniformes> Cyprinidae | C | LC | NE |
| 31 | *Puntius mahecola (Valenciennes,1844)* | Mahecola barb | Cypriniformes> Cyprinidae | - | DD | NE |
| 32 | *Puntius sophore (Hamilton,1822)* | Pool barb | Cypriniformes> Cyprinidae | - | LC | NE |
| 33 | *Salmostoma bacaila (Hamilton,1822)* | Large razorbelly minnow | Cypriniformes> Cyprinidae | - | LC | NE |
| 34 | *Systomus sarana (Hamilton,1822)* | Olive barb | Cypriniformes> Cyprinidae | MC | LC | NE |
| 35 | *Glossogobius giuris (Hamilton,1822)* | Tank goby | Gobiiformes> Gobiidae | MC | LC | NE |
| 36 | *Chitala chitala (Hamilton,1822)* | Indian featherback | Osteoglossiformes> Notopteridae | MC | NT | NE |
| 37 | *Notopterus notopterus (Pallas,1770)* | Bronze featherback | Osteoglossiformes> Notopteridae | C | LC | NE |

| S.No. | Scientific Name | Common Name | Taxa | Fishery Status | IUCN status | CITES status |
|---|---|---|---|---|---|---|
| 38 | *Chanda nama (Hamilton,1822)* | Elongated glassy perchlet | Perciformes> Ambassidae | MC | LC | NE |
| 39 | *Parambassis ranga (Hamilton, 1822)* | Indian glassy fish | Perciformes> Ambassidae | C | LC | NE |
| 40 | *Mystus gulio (Hamilton,1822)* | Long whiskers catfish | Siluriformes> Bagridae | C | LC | NE |
| 41 | *Mystus vittatus (Bloch,1794)* | Striped dwarf catfish | Siluriformes> Bagridae | MC | LC | NE |
| 42 | *Clarias batrachus (Linnaeus,1758)* | Walking catfish | Siluriformes> Clariidae | C | LC | NE |
| 43 | *Heteropneustes fossilis*(Bloch,1794) | Asian stinging catfish | Siluriformes> Heteropneustidae | HC | LC | NE |
| 44 | *Pterygoplichthys pardalis* (Castelnau,1855) | Amazon sailfin catfish | Siluriformes> Loricariidae | MC | NE | NE |
| 45 | *Pangasianodon hypophthalmus* (Sauvage,1878) | Striped catfish | Siluriformes> Pangasiidae | C | EN | NE |
| 46 | *Ompok bimaculatus* (Bloch,1794) | Butter catfish | Siluriformes> Siluridae | C | NT | NE |
| 47 | *Wallago attu* (Bloch&Schneider, 1801) | Freshwater shark | Siluriformes> Siluridae | C | VU | NE |
| 48 | *Macrognathus pancalus* (Hamilton, 1822) | Barred spiny eel | Synbranchiformes> Mastacembelidae | MC | LC | NE |
| 49 | *Mastacembelus armatus* (Lacepede, 1800) | Zig-zageel | Synbranchiformes> Mastacembelidae | C | NE | NE |
| 50 | *Macrobrachium malcolmsonii* (Milne- dwards,1844) | Monsoon river prawn | Decapoda> Palaemonidae | C | NE | NE |
| 51 | *Macrobrachium rosenbergii* (DeMan, 1879) | Giant river prawn | Decapoda> Palaemonidae | C | LC | NE |

*C: Commercial, MC: Minor Commercial, HC: Highly Commercial; NI: No Interest, DD: Data Deficient, EN: Endangered, NE: Not Evaluated, VU: Vulnerable, NT: Near Threatened, LC: Least Concern.*

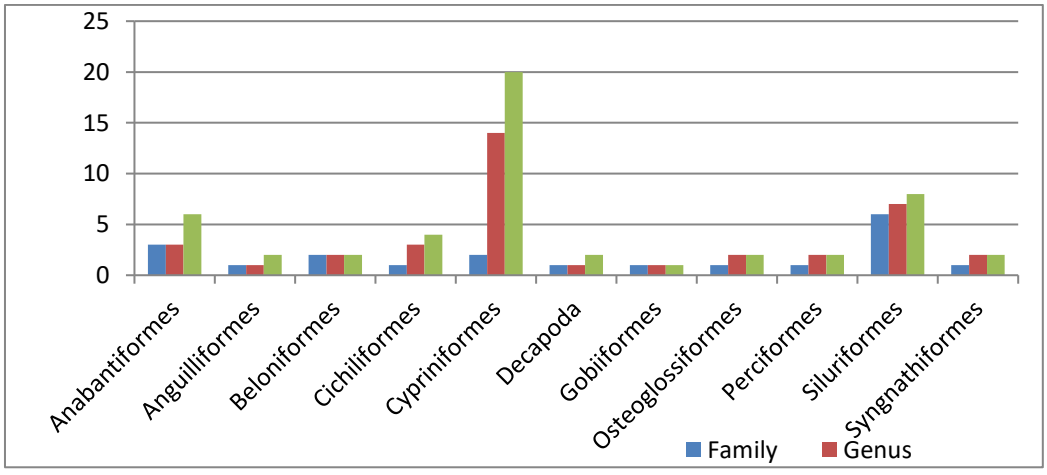


**Fig. 2. Order-wise representation of fish diversity of Sathiyamoorthy Sagar Reservoir**

The fishery status of the recorded species was found to be in the order of commercial (22 species), minor commercial (12 species), highly commercial (7 species), no interest (6 species) and data on the fishery status of the remaining 4 species were unavailable (Fig. 3). According to FishBase and SealifeBase [9,10] the IUCN status of the recorded species during the study was found to fall mostly under least concern (37 species), followed by near threatened (5 species), vulnerable (4 species), not evaluated (3 species), endangered (1 species) and data deficient (1 species) (Fig. 4); and the CITES status of the all documented species from this reservoir was found to fall under not evaluated category.

## 4. DISCUSSION

The results of the present study revealed the comparability of the fish faunal diversity of Sathiyamoorthy Reservoir to those documented from other reservoirs and lakes in India. The dominance of cyprinids in the reservoir under study is also supported by fish diversity studies in other reservoirs.

The results are similar to those reported by Sudhan et al. [11] who recorded 60 species belonging to 8 orders, 17 families and 37 genera from the Pechiparai reservoir and reported the order Cypriniformes as the dominant group with 27 species; Ramya et al. [12] who documented a total of 52 species belonging to 35 genera, 13 families, and 6 orders and observed the dominance of fish belonging to the order Cypriniformes in the Stanley reservoir; Silambarasan and Senthilkumaar [13] who have reported the abundance of cyprinids in the fishery of Kolavai lake; Pawar [14] who documented the occurrence of 42 fish species in the Majalgaon reservoir, out of which 20 species are exclusively from the order Cypriniformes; Chinnababu et al. [15] who studied the fish fauna of Madduvalasa reservoir and recorded 14 species of fish belonging to the order cypriniformes and a total of 31 species of fish from the reservoir; Raja et al. [16] who recorded 48 species of fish represented by 8 orders, 14 families, and 35 genera from the Krishnagiri reservoir, with Cypriniformes accounting for 52.8% of the assemblage composition followed by Siluriformes accounting for 20.8 %.

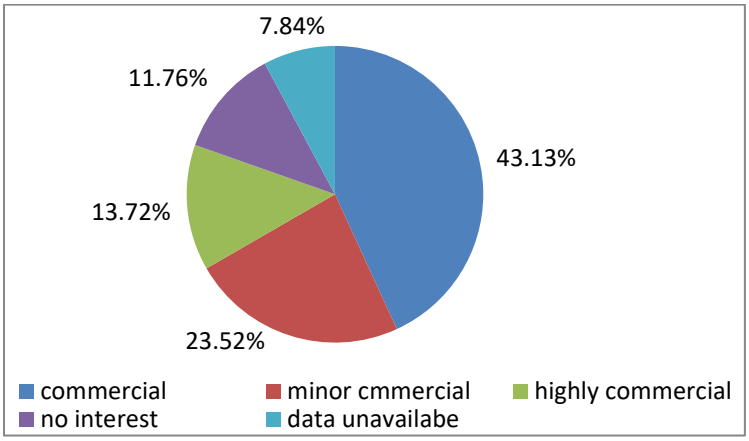


**Fig. 3. Fishery status of fish fauna diversity of Sathiyamoorthy Sagar Reservoir**

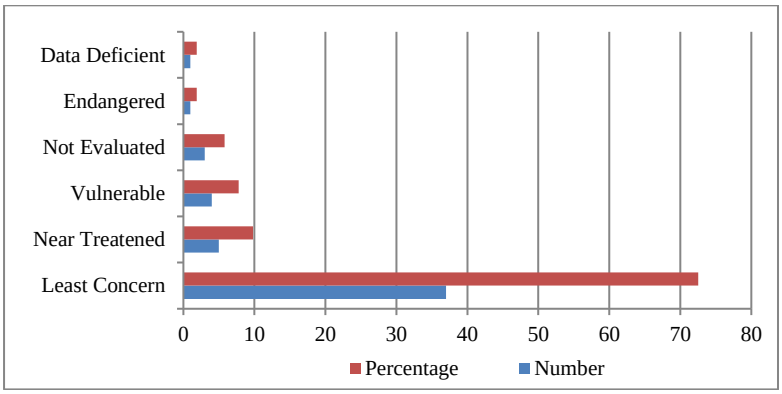


**Fig. 4. IUCN status of fish fauna diversity reported from Sathiyamoorthy Reservoir**

## 5. CONCLUSION

The conservation of global freshwater biodiversity is largely constrained by the lack of comprehensive information [17]. Hence, the urgent need of the hour is to document all living forms of various ecosystems before they get altered, destroyed or extinct. Freshwater ecosystems are severely threatened by anthropogenic pressure and climate change. They are disappearing or changing at a faster rate all over the world. Hence, the present study, which is the first documentation of the fish faunal diversity of Sathiyamoorthy Sagar Reservoir will serves as a database for reservoir authorities and the fisheries department to safeguard the rich fish faunal diversity of the reservoir.

## DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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