



# An Assessment of Fresh Water Piscine Diversity in Selected Wetlands in Coimbatore District, Tamilnadu, India—A Preliminary Study

**B. Dhanalakshmi, P. Priyatharsini**

PG and Research Department of Zoology, Nirmala College for Women, Coimbatore, India  
Email: dr.dhanalakshmi02@gmail.com

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## Abstract

In the present study, a survey was done to mainly focus on piscine diversity in the wetlands of Coimbatore District, because it is considered as a good indicator of balanced and healthy ecosystem. The present survey study has shown that selected sampling site (Perur, Muthanankulam and Kurichi) wetlands supported 40 species of fishes belonging to 4 orders 07 family and 21 species during the study. Among the species, Cyprinidae was the most dominant group representing 08 species, Siluridae with 03 species, Ophiocephalidae with 03 species, Bagridae 2 species, Anabantidae 1 species, Heteropneustidae 1 species, Clariidae 1 species and Cichlidae 1 species. It can be concluded that all the selected wetlands supported rich repository of indigenous fish population but still it needed proper management and sustainable steps to monitor and conserve fish wealth for utilization of consumers' health, fish industry producers and researchers and fishermen.

## Keywords

Ichthyofaunal Diversity, Wetlands, Freshwater Fish

**Subject Areas:** Aquaculture, Fisheries & Fish Science, Environmental Sciences

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## 1. Introduction

Planet earth, an ecosphere is made up of five components within which the biosphere water is an essential component which highly depends on water quality and biological diversity. According to Ehrlich and Wilson [1] biological diversity means stabilization of ecosystem, protection of overall environmental quality for understanding intrinsic worth of all species including the entire living organism (plants and animals) with their genetic ma-

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terial on the earth. In most of the urban ecosystems, ecologically wetlands are unique major life-supporting component having rich nutrient status with immense production potential, high population of birds, mammals, reptiles, amphibians, fish, invertebrate species and fodder resources for human and its related allies.

India, one of the mega biodiversity countries in the world occupies ninth position in terms of freshwater mega biodiversity having 2500 species of fishes of which 930 live in freshwater and 1570 in marine. Globally nature as well as animal diversity are affected due to increase in unwise anthropogenic activities mainly aquatic ecosystem gets adversely affected due to release of wastes in it. The wetlands (ponds, lakes and river) are the life-line of the people resides in nearby villages mostly for various domestic activities.

Noyyal River, a tributary of Kaveri River, was noted for its capricious nature as they supported different food chain, food webs, regulate hydrological cycle, recharging ground water, trapping of energy and shelter to large numbers of flora and fauna having great ecological and economical value. All the selected wetlands in the present study are Noyyal riverine in origin surrounded by 10 villages covering 8070 hectare area of wetland which includes 304 small wetlands (<2.25 hectare) to Natural wetland (44.30%) and Man-made (55.70%) of Coimbatore District geographic area providing water for cultivation in the nearby agricultural land but also maintain the ecosystem of the area through preservation of many species of aquatic plants, fishes, insects, birds, underwater animals and domestic as well as migratory birds.

From time immemorial millions of human are suffering from hunger and malnutrition for which fishes are provided in the form of rich palatable proteinous source of meal to tide over a nutritional difficulties of man. It is one of the good and cheapest sources of protein food for economic as well as high class people, so it is essential to study the distribution and the availability of fish from freshwater reservoirs and tanks. The objective of the present study was to make a surveillance of fish faunal diversity of wetlands and to present a documentary record of fish species in order to maintain sustainable development and stability of wetland ecosystem in Coimbatore District.

## 2. Materials and Methods

**Study area:** Coimbatore, the second largest city in the Indian state of Tamil Nadu is surrounded by the Western Ghats on all sides at 11°00'58"N 76°58'16"E 11.0161°N 76.971°E. This lovely industrial city is situated on the banks of the Noyyal River which originates from the Vellingiri Hills and flows towards the East and joins the river Cauvery. The city sits amidst Noyyal's basin area and has an extensive tank system fed by Southwest monsoon but the Northeast monsoon rainwater. The eight major lakes/wetland areas of Coimbatore are—Perur, Muthanankulam, Kurichi, Ukkadam, Singanallur, Sular, Selvachinthamani, and Kumaraswami lakes which are interconnected along the 173 km long river to rejuvenate ground water in this area which was known for scanty rainfall. These interconnected tanks, their canals and rivulets also formed an active flood buffer for the river. Over a period of time, these wetlands came to house a lot many species of birds, fish and other life forms in pristine glory.

**Methodology:** The survey work on Perur, Muthanankulam and Kurichi wetlands of Coimbatore district was spanned from November (2014) to January (2015). Common fishes were recorded in the landing site, and a sample collection was made for certain species for further laboratory confirmation.

**Collection of Fish:** Fish samples were collected every month using cast nets (dia. 3.7 m and 1.0 m) for collecting fish in shallow areas, monofilamentous gill nets (vertical height 1.0 m - 1.5 m; length 100 m - 150 m), drag nets (vertical height 2.0 m) and a variety of traps during the study period from the fish landing centers with the help of skilled local fishermen. Sampling points were distributed throughout the site to cover its whole area.

**Laboratory Procedures:** Immediately photographs were taken prior to preservation since formalin decolorizes the fish colour on long preservation. Fish species which were not identified in the spot were brought to laboratory preserved in 10% formalin solution in separate specimen jar according to the size of specimen with proper spreading of their fins. Two changes of 10% formalin were adopted during the sampling time. Smaller fishes were directly placed in the formalin solution while, larger fishes were given an incision on the abdomen before they were fixed. Each container was labeled properly against the physical data sheet of sampling and brought to the laboratory for further taxonomic exercise.

**Identification of Fish Species:** All fish caught were identified to species level using standard taxonomic viz. Fishes of India, FAO identification sheets, ITIS (Integrated Taxonomic Information System) standard report (<http://www.itis.gov>), and other reference books using standard keys of Jayaram [2], Qureshi and Qureshi [3],

Talwarand Jhingran [4], Day Francis [5] and Shrivastava [6]. Fish Basewebsite was also referred for various aspects of fishfauna ([www.fishbase.org](http://www.fishbase.org)).

### 3. Results and Discussion

In the present study, the selected major wetlands were Perur, Muthanankulam and Kurichi belonging to Coimbatore district, Tamilnadu, India fed by Noyyal river were discussed below based on ichthyofaunal diversity. Wetland I (Perur) is situated close to Sundakkamuthur village with a catchment area of 2.227 Sq. Km with water storagecapacity up to 51.94 MCft and water level up to 4.51 m and lies in between Latitude-10°58'06"N and Longitude-76°55'41"E. This site is an important roosting site of Pelicans, Painted stork, Open-bill stork, Pond herons, Egrets, White-breasted waterhens, Purple Moorehens, Darters, Cormorants, Kingfishers, grebes, Spot-billed ducks and coots. Ichthyofaunal diversity surveillance of this particular wetland recorded a total of 11 species of primary freshwater fishes belonging to 5 families and 4 orders. Number of species and their relative abundance is given in **Table 1**. In the assemblage structure, cyprinidae constituted the dominant group and the cyprinid *Labeo rohita*, *Catla catla*, *Cirrhinus mrigala*, *Cyprinus carpio*, and *Cyprinus carpio carpio* were recorded in this study site. The family Cyprinidae dominated with 5 species followed Cichlidae, Bagaridae and Heteropneustidae family each with 1 species, beside other family as Ophiocephalidae, (**Figure 1**).

The present result was in accordance to many researchers like Kharat *et al.* [7], Galib *et al.* [8], Nagabhushana and Hosetti [9], Chandrashekhar [10], Biswas and Panigrahi [11]. In their investigation on ichthyofaunal diversity there was strong dominance of Cyprinidae family. Sakhare [12] reported 23 species belonging to 7 orders where Cyprinidae family was dominant with 11 species from Jawalgaon reservoir. Choube *et al.*, [13] reported 45 species in Rajnandgaon town of CG, India where Cyprinidae was the largest dominant family contributing 20, species and Bagridae formed the sub dominant family.

**Table 1.** List of ichthyofaunal diversity of selected wetlands.

S. No.	Order	Family	Species	Author	Status
1.	Cypriniformes	Cyprinidae	<i>Catla catla</i>	Hamilton, 1822	++++
2.			<i>Cirrhinus mrigala</i>	Hamilton, 1822	++++
3.			<i>Cyprinus carpio</i>	Linnaeus, 1758	++++
4.			<i>Labeo rohita</i>	Hamilton, 1822	++++
5.			<i>Cyprinus carpio carpio</i>	Hamilton, 1822	+++
6.	Ophiocephaliformes	Ophiocephalidae	<i>Tenopharyngdon idella</i>	Valenciennes, 1844	+++
7.			<i>Labeo fimbriatus</i>	Bloch	+++
8.			<i>Labeo calbasu</i>	Hamilton, 1822	+++
9.	Perciformes	Cichlidae	<i>Channa marulius</i>	Hamilton, 1822	++
10.			<i>Channa punctatus</i>	Bloch, 1793	++
11.			<i>Channa striatus</i>	Bloch, 1794	++
12.	Siluriformes	Heteropneustidae	<i>Oreochromis mossambicus</i>	Peters	++++
13.			Anabantidae	<i>Anabas testudineus</i>	Bloch, 1792
14.	Clariidae	Bagridae	<i>Heteropneuteus fossilis</i>	Bloch, 1974	+++
15.			<i>Mystus vittatus</i>	Bloch, 1794	+++
16.			<i>Mystus seenghala</i>	Skyes, 1839	-
17.			<i>Clarias batrachus</i>	Linnaeus, 1754	++

\*++++ Most abundant; +++ Abundant; ++ Less abundant; - Rare.

Wetland-II (Muthanakulam wetland) is situated West of Coimbatore city within the Latitude 11°00.283'N and Longitude 76°55.237'E with catchment area of 26 Sq. Kmand water storage capacity of 7.67 MCft. A good number of migratory birds like Pelicans, Painted stork, Open-bill stork, Pond herons, Egrets, White-breasted waterhens, Purple Moorehens, Darters, Cormorants, Kingfishers, grebes, Spot-billed ducks and coots roost in this wetland. During the present piscine inventory study at Muthanakulam wetland, 13 species of 7 different families and 4 orders were recorded. The members of the orders Cypriniformes were dominated by 6 species followed by order Ophiocephaliformes of members with 1 family with 2 species. Next to order Ophiocephaliformes order perciformes was more abundant with 2 family Cichlidae and Anabantidae followed by order Siluriformes with 2 families Bagridae and Heteropneustidae. *Catla catla*, *Cirrihinus mrigala*, *Cyprinus carpio*, *Labeorohita* *Channa marulius* *Channa striatus*, *Oreochromis mossambicus* fish species of Cyprinidae, Ophiocephalidae and Cichlidae were most abundant than the other fish species (Figure 2). Similar results were observed by Narsimha and Benarjee [14] and Nagma and Afzal Khan [15].

Wetland-III (Kurichi wetland) with catchment area of 4014 acres with water capacity of 60.00 M.cft and depth of 10.75 feet with Ichthy of aunal diversity of 15 fish species representing by 4 orders and 6 families was observed in the Kurichi wet land. Among the 4 order Cypriniformes was dominant with 7 species. Cyprinidae was dominant family in this assemblage composition in which fish species like, *Catla catla*, *Cirrhinus mrigal*, *Labeorohita* and *Cyprinus carpio* were found abundant. During the present investigation in the Kurichi wetland the order of dominance was as follows. Cypriniformes > Perciformes > Ophiocephaliformes > Siluriformes. The lake had a mixed fish culture of different fish species of different families. Among the families the Cyprinidae was recorded maximum with 7 species while the Bagridae with 2 species and Claridae with 1 species were recorded (Figure 3). The third major population of fish species was *Channa marulius*, *Channa striatus* and *Channa*

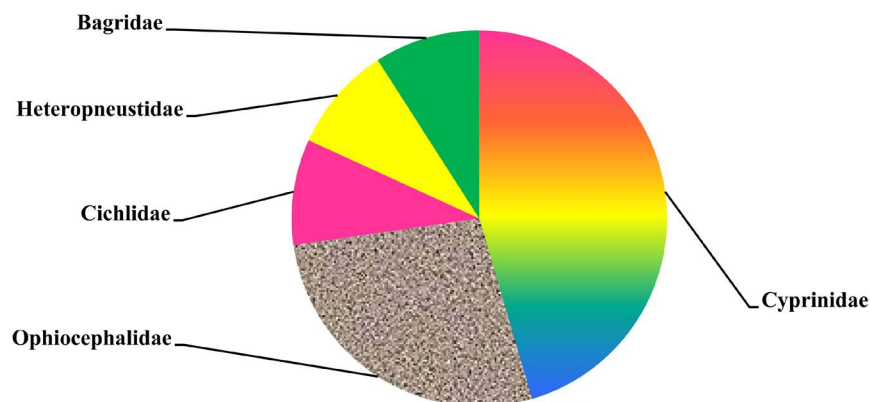


Figure 1. Family wise fish species composition of Perur wetland.

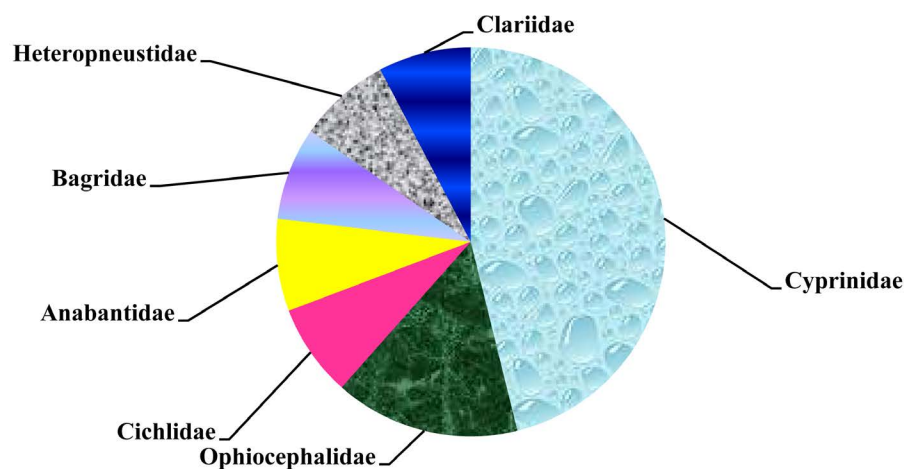
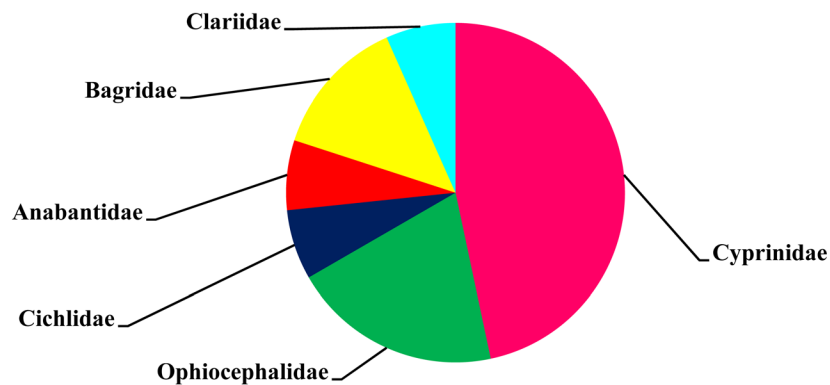


Figure 2. Family wise fish species composition of Muthanakulam wetland.



**Figure 3.** Family wise fish species composition of Kurichi wetland.

*punctatus* belonging to Ophiocephaliformes. The other 2 fish species belonging to the same family was less abundant followed by *Anabas testudineus*. Battul *et al.*, [16]; Sharma [17]; Ubharane *et al.* [18] also stated that Cyprinidae family was maximum during their study period in their study area.

#### 4. Conclusion

From the present piscine investigation data, it was concluded that all most all the selected wetlands for the present study even though considered to be healthy water bodies providing a good habitat for fresh water fishes of diverse type are still considered to be under constant threat to fish population due to eutrophication and illegal fishing activities. It is suggested that the illegal fishing activities should be banned to prevent depletion of fresh water fish resources further fishery authorities should practice the proper management of this inland fishery resources. Further studies should be conducted to generate more details regarding seasonal production and ecology of fishes to provide future strategies for the development and conservation of fish fauna. Thus it is necessity of every individual to play an active role to achieve the goals of sustainable fishery development and handover the resources in healthy conditions to the future generations.

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