

Status And Diversity Of Fish Fauna In Shanthi Sagar Lake Of Davangere District, Karnataka

S.Thirumala¹, B.R.Kiran²

¹Dept of Environmental Science

²Research & Teaching Assistant, Dept of Environmental Science

¹Government First Grade College & P.G. Center,

Near Anubav Mantapa, Davanagere-577004, Karnataka.

²DDE, Kuvempu University, Shankaraghatta-577451, Karnataka

Abstract- The fish diversity of the Shantisagar lake was studied by monthly samples taken from January to September 2015. This lake supported 16 fish species belonging to 04 orders with 07 families and 13 genera. Among fish orders Cypriniformes was dominant with 52.94% followed by Perciformes with 23.53%. As far as biodiversity status (IUCN-1994) is concerned, 04 species is Not assessed (23.53 %), 08 species as lower risk-near threatened (47.06 %), vulnerable 01 species (5.88%), lower risk least concern is 03 (17.65%) and 01 species included under the category of Endangered with 5.88% respectively. Hence, proper management and utilization of this fish wealth is necessary to take up the sustainable steps to monitor and conserve fish health.

Keywords- Biodiversity status, Fish fauna, Shanthi Sagar lake, Davangere district

I. INTRODUCTION

Biodiversity is absolutely an essential in order to have the stability of different ecosystems for proper functioning of their food chains. Therefore, the recent thrust on biodiversity conservation necessitates the documentation of fauna and flora and identification of biodiversity hot spots in India. Various workers have contributed their notable studies on fishes from Western Ghats areas and studies on the endemic fishes from various types of rivers as well as streams have been compiled by Ponniah & Gopalakrishnan (2000) and Shahnawaz and Venkateshwarlu (2009). Fish fauna from Northern Karnataka (Arunachalam et al., 1997); Central Western Ghats (Arunachalam, 2000), fish fauna of Bhadra and Tunga reservoirs (Venkateshwarlu et al., 2002, 2005) have been reported.

Fishes are not only important indicators of ecological health and the abundance, but also maintain a balance in the food chain by consuming plankton and small animals and form food for many animals. This balance in food chain may be affected due to pollution in aquatic

system. In addition, there are many threats to fish diversity such as construction of dam, which block the spawning migrations and introduction of exotic species and over fishing. Therefore, knowing the status of fish fauna is indispensable to prevent the loss of particular species (Ramanjaneya and Ganesh, 2016).

However, the study of fish diversity with respect to Shanthi Sagar lake in particular is lacking. Hence, the present investigation is a scientific documentation of fish fauna of Shanthi Sagar lake of Karnataka.

II. MATERIALS AND METHODS

Study Area

Shanthi Sagara is the [Asia](#)'s second largest [irrigation water body](#). It is located in Kerebilchi of [Channagiri](#) taluk (Jal effect swells Sulekere) of [Davanagere](#) in [Karnataka, India](#) (Figure 1).

Shanti Sagara lake, created by an embankment with [sluice outlets](#), built in 1128, the lake has a history of 800 years. It took three years to construct the massive tank. The lake, which has a water spread of 6,550 acres (2,651 ha), has a [circumference](#) of 30 km (19 mi). It has a total [drainage basin](#) of 81,483 acres (32,975 ha). It [irrigates](#) 4,700 acres (1,900 ha) of land and more than 50 villages are benefited by it (A lake with a history of 800 years).

The lake receives the [drainage](#) of twenty square miles. All of the drainage pours into the [gorge](#) where it is built (the main stream bearing the name of Haridra, a tributary of the Tungabhadra). The [embankment](#) is constructed between two hills, and embankment is of no great length; it is around 950 ft (290 m), but it is of stupendous width (Max 120 ft (37 m), min 70 ft (21 m)), height and strength, though not quite straight. The main road connecting between [Channagiri](#) and [Davanagere](#) pass through on this embankment. It has resisted successfully the floods of centuries, but owing to the great pressure of the volume of the

water in tank ([Mysore: a gazetteer compiled for government, Vol 2 Page No. 482](#)).

The present study was conducted for a period of one year from January to September 2015 and fishes were collected with the help of fishermen by using a variety of fishing nets of varying mesh sizes- gillnets, cast nets and dragnets. The fishes were identified as per Jayaram (1999); Talwar and Jhingran, (1991) and Dutta Munshi and Shrivastava (1988).

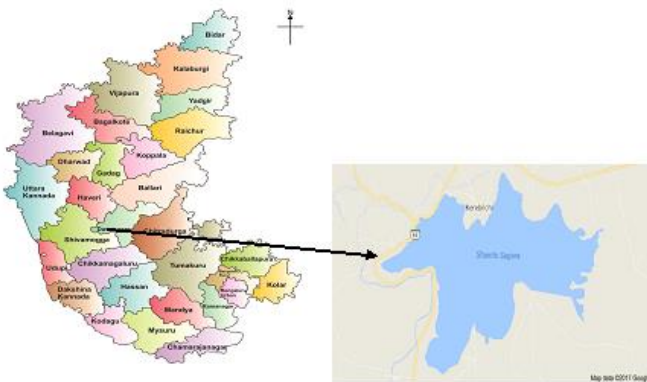


Figure 1 : Location of the study area (Source: Karnataka agri portal; www.google.co.in (Google map)

III. RESULTS AND DISCUSSION

Among 17 species of fishes, the family Cyprinidae was the most dominant in the assemblage composition with 09 species followed by Bagridae and Channidae with 02 species each respectively. While, Siluridae, Mastacembalidae, Ambassidae, Cichlidae, each with 01 species respectively (Table 1). The present results get support from other workers like Wakid and Biswas(2005) and Venkatshwarlu et al,(2007).

Figure 2 and 3 depicts biodiversity status and economic importance of fishes in Shanthi Sagar lake.

As far as biodiversity status (IUCN-1994) is concerned, 04 species is Not assessed (23.53 %), 08 species as lower risk-near threatened (47.06 %), vulnerable 01 species (5.88%), lower risk least concern is 03 (17.65%) and 01 species included under the category of Endangered with 5.88% respectively (Figure 2). Among the fish orders, Cypriniformes was dominant with 09 species (52.94%), followed by Perciformes and Siluriformes with 04 and 03 species (23.53% and 17.65 %) and Cyprinodontiformes with one species each respectively (5.88% ; Figure 4).

Besides exotic species, construction of water bodies, and over fishing are other detrimental factors

affecting the native fish population. *Puntius* species forms the dominant species followed by *Mystus cavasius* and *Channa* sp. *Ompok bimaculatus* is found to be endangered species (Kharat et al 2001).

The species of *Channa*, *Mastacembelus* have air breathing organs and fetch good market value as live fish. *Puntius* species have ornamental value due to small size and bright colors and are used as aquarium fishes. Though commercially important species are available they are not abundant to make fishery commercial and economical.

The present investigation of ichthyofauna in Shanthi Sagar lake showed that most of the fish species recorded were widely distributed in the streams and rivers of Western Ghats. The fish species like *Garra mullya*, *Cirrhinus* sp, *Salmostoma* and *Puntius* groups were more dominant. Therefore, the present study indicates that cyprinid fishes are found to be the more dominant group than others which is supported by other studies also (Singh et al., 2006).

Anish Dua and Prakash (2009) studied distribution and abundance of fish populations in Harike Wetland A. Ramsagar site in India. Pawar and Pandarkar (2011) studied on water quality in relation to pisciculture of Kelewadi lake, Maharashtra. Narasimha Ramulu and Benarjee (2013) recorded the fish fauna of Nagaram tank , Warangal (AP state) and they reported 30 species belonging to 13 families. Among them 13 species of Cypriniformes, order Siluriformes consists of 7 species, Channiformes consists of 03 species, Perciformes 05 species, Osteoglossiformes 01 and order Atheriniformes consists of 01 species. Thirumala and Kiran (2016) reported 18 fish species from Kudligere tank of Bhadravathi taluk, belonging to 04 orders, 07 families and 15 genera. Among fish families Cyprinidae was dominant with 08 species followed by Bagridae with 03 species, Siluridae and Channidae with 02 species. While, Clariidae, Notopteridae and Cichlidae each with single species respectively.

Introduction of *Oreochromis mossambica* is slowly gaining its phase. Due to least demand for this fish in local market, fishermen treat this fish as an unwanted catch. Scientifically, this fish is regarded as a hardy, territorial and a powerful competitor in nature. Ecologically, these fishes have adverse effect on the native fish species.

The present fish study has also shown that some of fish species recorded were predatory in nature. Sukumaran and Das (2005) have also made the same observation and stated that majority of the reservoirs of Karnataka state have a large population of predatory fish

species. Habitat loss and environmental degradation has adversely affected the fish fauna. Human anthropogenic activities also contribute towards the disruption in the balance on aquatic ecosystem. This work will provide future strategies for development and conservation of fish species. Conservation measures require plantation in catchment area and information on illegal fishing. Shivashankar and Venkataramana (2012), Thirumala et al.(2011) and Thirumala and Kiran (2016 & 2017) have studied fish diversity in relation to physico-chemical variables.

IV. CONCLUSION

Conservation of fish diversity assumes top most priority under changing circumstances of steady habitat degradation. Knowledge of available resources and the biological characters of species serve the baseline information for further studies on resource protection and maintenance. The findings of this study are expected to benefit the planning and management towards sustainable fishery and conservation programmes of Shanthi Sagar lake. In addition, human anthropogenic activity and surface run off might also influence the fish diversity in the water body. Nevertheless, it is suggested to monitor the water regularly in this lake and appropriate control measures are required to conserve the fish diversity.

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Table 1 . Fish abundance and Biodiversity status in Shanthi Sagar lake of Channagiri taluk, Karnataka

Scientific Name	Abundance	Biodiversity status	Economic value
I. Order: Cypriniformes Family: Cyprinidae			
<i>Salmostoma untrahi</i>	A-2	NA	Food fish
<i>Salmostoma novacula</i>	A-1	LR-lc	Food fish
<i>Catla catla</i>	A-(3-4)	VU	Food fish
<i>Cirrhinus mrigala</i> (Ham)	A-2	LR-nt	Food fish
<i>Labeo rohita</i> (Ham-Buch)	A-2	LR-nt	Food fish
<i>Cyprinus carpio cummunis</i> (Linnaeus)	A-2	LR-lc	Food fish
<i>Puntius ticto</i>	A-2	LR-nt	Ornamental
<i>Puntius sophore</i>	A (3-4)	NA	Ornamental
<i>Garra mullya</i>	A-2	LR-nt	Ornamental
II. Order: Siluriformes Family: Bagridae			
<i>Mystus cavasius</i> (Ham-Buch)	A-(3-4)	LR-nt	Food fish
<i>Mystus armatus</i>	A-1	NA	Food fish
Family: Siluridae			
<i>Ompok bimaculatus</i> (Bloch)	A-2	EN	Food fish
III. Order: Perciformes Family: Cichlidae			
<i>Oreochromis mossambica</i> (Peters)	A-(3-4)	NA	Food fish
Family: Ambassidae			
<i>Parambassis ranga</i>	A-1	LR-lc	Ornamental
Family: Channidae			
<i>Channa marulius</i> (Ham-Buch)	A-2	LR-nt	Ornamental/ Food fish
<i>Channa punctatus</i>	A-2	LR-nt	Ornamental/ Food fish
IV. Order :Cyprinodontiformes Family: Mastacembelidae			
<i>Mastacembalus armatus</i>	A-(3-4)	LR-nt	Food fish

LR-nt= Lower risk Near threatened; NA-Not assessed, VU- Vulnerable, EN- Endangered ; LR-lc- Lower risk least concern.

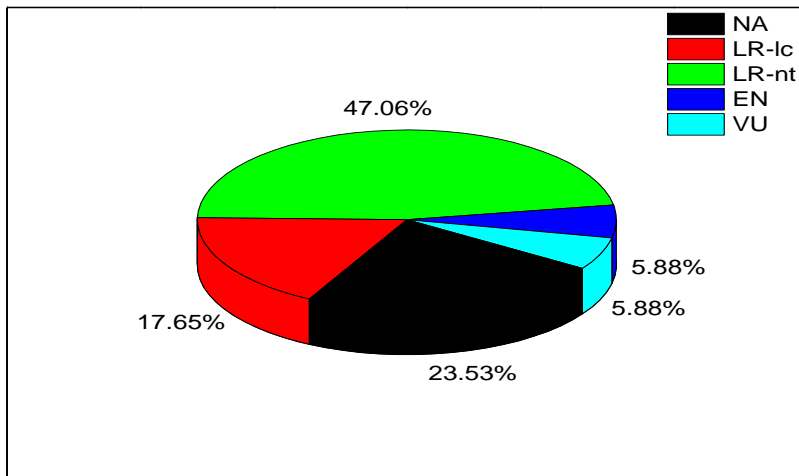


Figure 2: Biodiversity status (IUCN-1994) of fishes of Shanthi Sagar lake, Karnataka

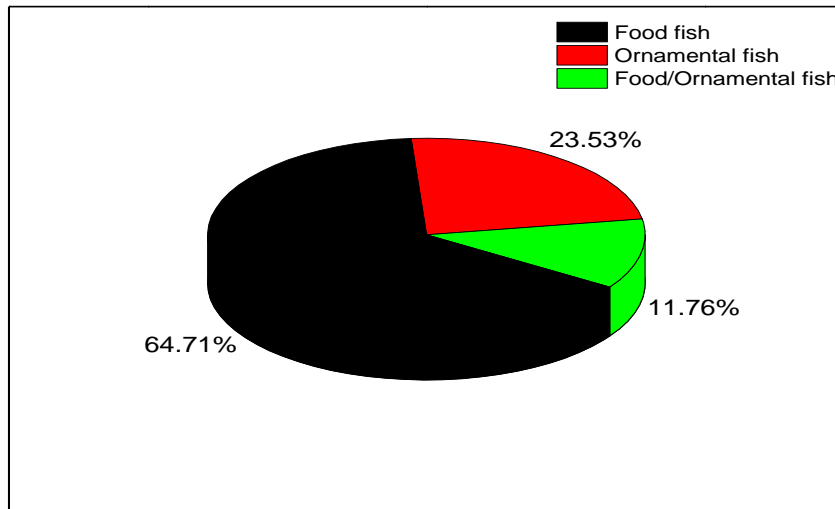


Figure 3: Economic importance of fishes in Shanthi Sagar lake of Karnataka

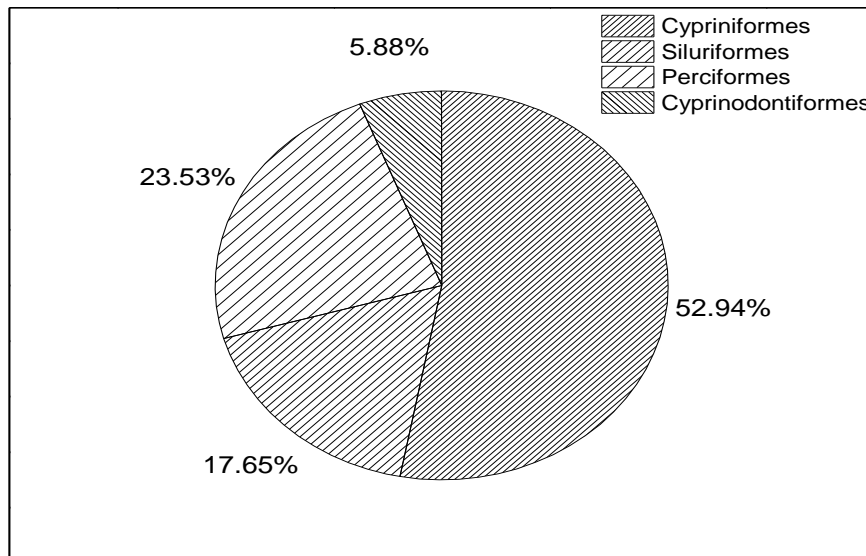


Figure 4: Percentage of fish orders of Shanthi Sagar lake, Karnataka