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FISH DIVERSITY IN SHANTHINAGAR POND OF BHADRAVATHI TALUK, KARNATAKA

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Abstract:

The fish fauna of the Shanthinagar pond, Karnataka in relation to physico-chemical parameters was studied from September 2009 to February 2010. The water of the pond is used for fishery and agriculture. Fish species were collected with the help of gillnets of standardized dimensions with several mesh sizes. A total of 14 fish fauna belonging to 03 orders and o4 families were recorded. Among fish families Cyprinidae consists of 11 species and Channidae, Ambassidae ,Clarridae with 01 species each respectively. The maximum species contribution was made by family Cyprinidae. The limnological parameters indicate the higher trophic status of the pond which can be attributed to anthropogenic pressure.

Key words: Fishfauna, Water Quality & Shanthinagar Pond

Introduction:

Fishes exhibit enormous diversity in terms of their morphology, habitat and biology (Harmer, 1999). Fish can be used for ecological assessments at all levels of biological organization; assessment procedures are available at the levels of ecosystem, populations, individuals, organs and at the cellular and molecular levels (Harris, 1995). Besides to these credits, fishes are considered as one of the important protein rich food source among the aquatic fauna (Sukla and Upadhyay, 2000; Shahnawaz Ahmad et al., 2011).

There are about 450 families of freshwater fishes globally. Roughly 40 are represented in India (warm freshwater species). About 25 of these families contain commercially important species. Number of endemic species in warm water is about 544. Freshwater fishes are a poorly studied group since information regarding distribution, population dynamics and threats is incomplete, and most of the information available is from a few well-studied locations only (Zooreach organization 2010; Sabuj Kumar Chaudhuri 2010). Therefore, it is the need to study the fish diversity in order to increase our national economy on scientific basis. Keeping this in view, the present study has been undertaken.

Materials and Methods:

Study Area:

Some important features of the Shanthinagar pond is given in Table 1. The pond has a maximum depth of 15 ft and minimum depth 03 ft. This water body is located in Bhadravathi taluk, in Shimoga district of Karnataka state ($13^0$45' N & $75^0$30' E). This pond is under the control of grama panchayat, Singanamane, B R Project. This water body is seasonal and receives water from rain water and surrounding areas. The water is used for agriculture and fish culture.

Table 1: Important features of Shanthinagar pond, Karnataka

Location	Bhadravathi taluk, Karnataka
Latitude	$13^0$45' N
Longitude	$75^0$30' E
Max. Depth (ft)	15

Min. Depth (ft)	03
Area (acres)	15
Source of water	Rain water, surface run off
Utilization	Fisheries, Agriculture, Cattle washing

The fishes were collected with the help of local fishermen during the year September 2009 to February 2010. The fishes were preserved in 10% formaldehyde solution for taxonomic analysis. Identification of fishes was carried out with the help of standard literature (Jayaram, 1999; Talwar and Jhingran, 1991). Water samples were collected between 8 AM to 10 AM and further transported to the laboratory immediately for further analysis. Water temperatures was measured at the spot using mercury thermometer, pH was measured with pH meter, while other parameters were analyzed in the laboratory according to the methods suggested by Trivedy and Goel (1986) and APHA (1998).

Results and Discussion:

A total of 14 fish fauna represented by 11 genera, 4 families of 3 orders were recorded in Shanthinagar pond. Among fish families Cyprinidae consists of 11 species and Channidae, Ambassidae ,Clarridae with 01 species each. The maximum species contribution was made by family Cyprinidae .Two species such as *Ctenopharyngodon idellus* (Valenciennes) and *Cyprinus carpio*(Linnaeus) were introduced species. The checklist of fishes is given in Table 2 and Table 3 depicts the abundance of fishes.

pH of the tank water was alkaline and ranged between 7.4 to 7.8. Water temperature fluctuated from 24 to 35^0C respectively, Total hardness was above 50 mg/l and the tank water is included under soft category. Free Carbon dioxide was fluctuated from 10-18 mg/l. Dissolved oxygen content ranged from 4.03-5.61mg/l. Based on water quality parameters the tank is mesotrophic in nature.

The fish species recorded so far were all economically important and having high commercial importance. Kumar, (1990) reported 51 fish species of 9 families in Govindsagar reservoir, Himachal Pradesh, out of which almost all were commercially important. The present fish study has also shown that most 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. Shahnawaz Ahmad et al.(2011) studied the fish diversity of Sogane and Santhekadur tanks, Shimoga and they identified about 17 fish species which were represented by 4 orders, 11 families and 14 genera. The family Cyprinidae dominated the other groups of fish in both the tanks.

As far as biodiversity status (IUCN, 1994) is concerned, out of 14 species, 05 species as lower risk-near threatened (35.71 %), vulnerable 03 species (21.44%), lower risk least concern is one (7.14 %) and remaining 05 (35.71 %) are included under the category of not assessed (Fig. 2).

The present study of fish fauna in Shanthi nagar pond showed that most of the fish species recorded were widely distributed in the lotic habitats of Western Ghats. In this water body Cyprinid fishes were dominant.

Fishing operations carried throughout the year with low catches in rainy season compared to high harvest in winter and summer seasons. Scientific fishing standard and fishing quotas are to be worked out this will play an important role in protection of the tank and its biodiversity. The fisherman's should make acquainted with proper fishing; proper training facilities should avail to the fish farmer society. Fishing of the spawn, fry and immature fish should be avoided. Subsidy loan facility may be provided on large scales, which may help in high yield of fish production. Thus it is need of every

individual who have to play an active role to achieve the goals of sustainable fishery development and handover the resources in healthy conditions to the future generations. Therefore, the present investigation revealed that Cyprinid fishes are found to be the more dominant group than others which is supported by Singh et al. (2006).

Conclusion:

The present study showed the record of 14 freshwater fish species from Shanthinagar pond of Karnataka. This investigation indicates that this water body has low fish diversity due to human activities and surface run off , which needs to formulate sustainable strategies to explore and save fish species. Hence, it is suggested to regularly monitor this pond in order to conserve fish fauna.

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Table 2: Fish diversity in Shanthinagar pond, Karnataka

Sl. No.	Species	Population status	Biodiversity status (IUCN,1994)
A.	**Order : Cypriniformes**	**Family : Cyprinidae**	
1	*Catla catla*	Common	VU
2	*Cirrhinus mrigala*	Fairly common	LR-nt
3	*Cyprinus carpio**	Common	LR-lc
4	*Labeo rohita*	Common	LR-nt
5	*Labeo fimbriatus*	Fairly common	NA
6	*Labeo calbasu*	Fairly common	LR-nt

7	*Puntius sp.*	Rare	LR-nt
8	*Salmostoma untrahi*	Common	NA
9	*Cirrhinus fulungee*	Common	LR-nt
10	*Ctenopharyngodon idella**	Fairly common	NA
11	*Hypophthalmichthys molitrix*	Common	NA
B.	**Order : Perciformes Family :Channidae**		
12	*Channa punctatus*	Fairly common	VU
C.	**Order : Perciformes Family : Ambassidae**		
13	*Ambassis kopsii*	Common	NA
D.	**Order: Siluriformes Family : Clarridae**		
14	*Clarias batrachus*	Rare	VU

* Introduced species

Table 3: Abundance of Fish fauna in Shanthinagar pond of Karnataka

Name of the fish	Abundance
Labeo rohita	+++
Catla catla	+++
Cirrhinus mrigala	+++
Cirrhinus fulungee	++
Cyprinus carpio	+++
Ctenopharyngodon idella	++
Channa punctatus	+
Salmostoma untrahi	++
Puntius Sp.	++
Ambassis kopsii	++
Labeo fimbriatus	+
Labeo calbasu	+
Hypophthalmichthys molitrix	++
Clarias batrachus	+

+++ = Most abundant ++ = Abundant + = Less abundant

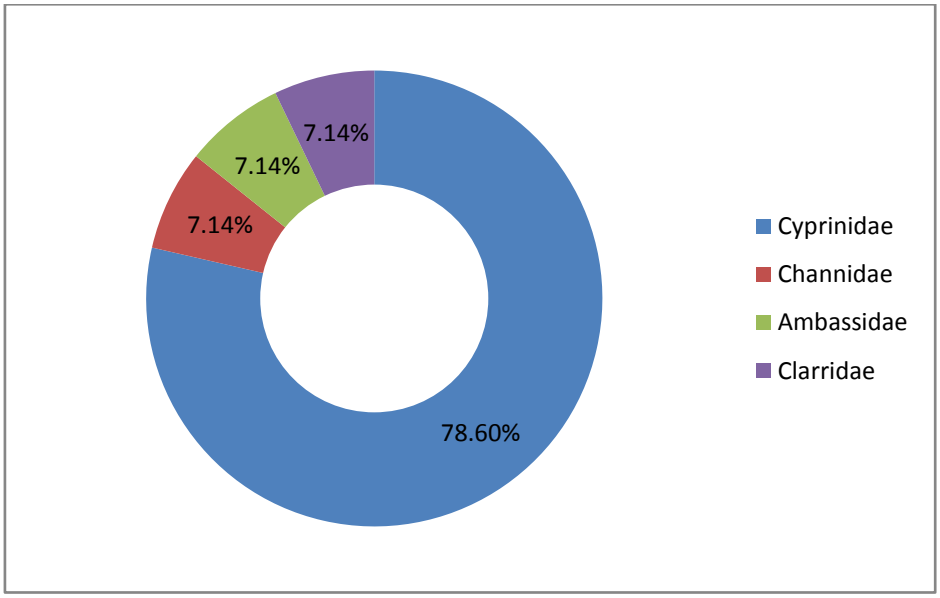

Figure 1: Percentage of Fish families of Shanthinagar pond, Karnataka

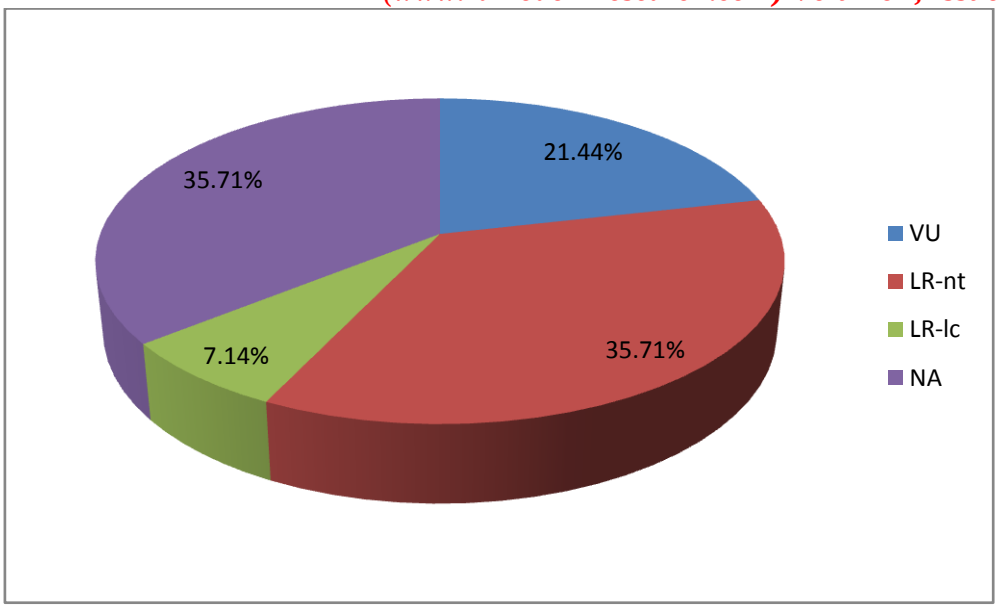

Figure 2: Biodiversity status (IUCN) of fishes during the present study
VU= Vulnerable; NA = Not assessed; LR- lc = Lower risk - least concern; LR- nt = Lower risk-near threatened