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Icthyofaunal diversity of Telangkhedi and Ambazari lakes of Nagpur, Central India

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Abstract

The study was carried at two lakes of Nagpur City in Central India from July 2010 to Jun 2012 confirmed icthyofaunal diversity of 21 species belonging to 9 different orders, viz Cypriniformes, Anguilliformes, Beloniformes, Paraformes, Singuilliformes, Clupeiforimes, Mastacembaliformes, synganthiformes and Ophiocephalliformes. Maximum fish diversity was recorded in Telangkhedi lake (6.66) followed by Ambazari lake (5.33). Presence of carps like Catla-catla, Labeo rohita, Cirrihina mrigala and Silver carp showed good productive grounds for fish culture practice in two lakes.

Keyword: Nagpur, lakes, Fish fauna, fish culture

1. Introduction

The Indian Subcontinent is endowed with a vast expense of open inland fresh water bodies which includes a large number of rivers, ponds, dams, impoundments and lakes. These fresh water bodies provide source of bio-diversity and ecological assessment. It also provides a source of socio-economic development through various activities. Fishing is one of the ancient practices carried out since early period. Fish is a valuable source of protein and occupies a significant position in the socio-economical fabric of South Asian countries. For effective exploitation of any aquatic ecosystem basic information on its biodiversity is a must, thus there is a need to survey fish fauna associated with different freshwater habitats which will help in planning methods for their effective exploitation for fish production.

Many workers have studied taxonomy, bio- diversity and distribution of fishes found in various parts of Indian subcontinent provided that there is aneed for the survey of bio diversity of fishes in different types of habitats all over the country. Jayaram [1] studied fish diversity of Indian subcontinent. Yazdani [2] reported Icthyofauna from Krishna, Cauveri and Ganga River. In State of Maharashtra, icthyofaunal diversity was studied byAhirrao and Mane [3], Sakhare & Joshi [4], Yadaw [5] Jumma, Yadaw [6], Rathod et. al. [7], Tijare and Thosar [8] and Harney et al. [9]. However, very less information is available about ichthyofauna present in lentic and lotic habitat of Nagpur district. Present study aims to document the fish fauna of Two lakes of Nagpur city in Central India.

Study Area

Nagpur city [21°07'N & 79°07'E] the second capital of Maharashtra state lies in centre of India. The city has dry subtropical monsoon climatic condition with temperature range 060 C -450 C (Fig.1) [10]. Based on old records, city was boasted of about twenty-two water bodies, but rapid urbanization, load of population, widespread encroachment and continuous logging resulted into the existence of few water bodies in and around city. Primary aim of study is to investigate the ichthyofauna of two lakes namely Futala lake (Fig.2). As these lakes were used in many activities since time period, fishing is one of old practice. Fishing is carried out throughout the year and fish culture is done subsequently in respective Two lakes.

Futala lake - [21o09'N. & 79.09'E] also known as Telangkhedi lake is an ancient and historical lake exists for 200 years and situated beside the highways on western area of Nagpur city (Fig.3). The Futala Lake furnished with immense finery and magnificence is one of the must visit tourist attractions of the Nagpur city. Spread over an extensive are of 60 acres, the lake is enclosed by the guard walls on all the sides and encircled by a granite stone paving bequeathed with a fascinating garden.

Ambazari lake - [21°10'N & 79°05'E] is almost a natural reservoir formed in the basin of the Nag river situated on the western outskirts of Nagpur. The lake covers an area of 15.4 km 2 having storage capacity of 1837 lakh gallons of water. It is the largest lake in the city (Fig.4)

2. Materials and Method

The present study was carried out in two years from June 2010 to July 2012. After netting the fishes, photographs were taken and the specimen were preserved in 10% formalin after giving abdominal cut and brought to laboratory for identification. For identification of fishes standard keys of Days [11], Jayaram [1] and Talwar and Jhigran [12] were followed. Icthyofaunal diversity of Two lakes is reported in Table 1. Icthyofaunal frequency, abundance and diversity was calculated by following statistical analysis methods of Zar [13].

Frequency (%) = T1/T2

T1 = Total No. of pond in which speciesoccur

T2 = Total No. of ponds studied.

Abundance

= Frequency / 100

Diversity of lake = Ts/T2

Ts = Total No. of species found in lake T2 = Total No. of lakes studied

3. Results and Discussion

During the investigation of the study period, a total of 21 fish species belonging to 9 different orders were recorded from all the two lakes. The Futala lake showed high species diversity with 20 species while Ambazari lake showed 16 species. Sharma et.al [14] observed 15 fish species in Pinhole lake of Rajasthan.

Ten species of order Cypriniformes viz. *Ctenopharyngdon idella* (Grass carp), *Hypophthalmichtys molitrix* (Silver carp), *Catla catla* (Catla), *Labeo rohita*

(Rohu), *Cyprinids' carpio* (Common carp), *Cirrihina mrigala* (Mrigal carp), *Clarias batracus* (Walking cat fish), *Heteropneustus fossilis* (Stinging cat fish), *Barbus sp.* (Barbel) and *Wallago attu* (Mully cat fish) dominated the lakes. Similar findings were also observed by Shinde *et al*. [15] in Harsool- Savangi dam. The Cypriniformes are an order of ray-finned fish including the carps and minnows and are most diverse in southeastern Asia [16]. Cypriniform species are extremely variable morphologically and ecologically. The latter is evident from their wide distribution that includes virtually every type of freshwater habitat and an amazing diversity of reproductive and life- history strategies [17-18], Order Cypriniformes was followed by Ophiocephaliformes, Paraformes and Singuiliformes with 2 species while *Anguiliformes, Beloniformes, Clupeiformes, Mastacembaliforms, syngnathiformes* represented only 1 species respectively. Fish diversity was observed as maximum in Telangkhadi lake (6.66) followed by Ambazari (5.33).

Presence of carps like Catla catla, Labeo rohita, Cirrhina mrigala and Hypophthalmichtys molitrix shows good productive grounds for fish culture practise in two lakes. Presence of *wallago attu, Mystus seenghala* and *Clarius garripinnus* as cat fishes also provides embossing of healthy ecosystem in these lakes. The icthyofaunal diversity of Futala lake was dominant (6.66) followed by Ambazari lake (5.33). Abundance is due to the easy availability of protein rich invertebrates and other food such as macrophytes, macrobenthic organisms and planktons. Every organism maintains specific relation with the environment in which it lives. These relations entail different environmental parameters eg. temperature, humidity, diet requirements etc. [19].

Table 1- Icthyofaunal diversity of Two lakes in Nagpur. (+Present: - Absent)

Sr. no	Common Names	Scientific name	Order	Futala Lake	Ambazari Lake
1	Grass carp	*Ctenopharyngdon idella*	Cypriniformes	+	+
2	Silver carp	*Hypophthalmichtys molitrix*	Cypriniformes	+	+
3	Catla	*Catla catla*	Cypriniformes	+	+
4	Rohu	*Labeo rohita*	Cypriniformes	+	+
5	Common carp	*Cyprinus carpio*	Cypriniformes	+	+
6	Mrigal carp	*Cirrihina mrigala*	Cypriniformes	+	–
7	Walking cat fish	*Clarias batracus*	Cypriniformes	+	+
8	Stinging cat fish	*Heteropneustus fossilis*	Cypriniformes	+	–
9	Barbel	*Barbus sp.*	Cypriniformes	+	+
10	Mully cat fish	*Wallago attu*	Cypriniformes	+	+
11	Indian mottled eel	*Anguilla bengalensis*	Angulliformes	+	–
12	Needle fish	*Belone cancila*	Beloniformes	+	–
13	Common headed snake	*Channa striatus*	Ophiocephalliformes	+	+
14	Spotteheaded snake	*Channa punctatus*	Ophiocephalliformes	+	+
15	Bulls eye snake headed	*Channa nama*	Paraformes	+	+
16	Bulls eye gobby	*Glossogobius giuris*	Paraformes	+	+
17	Giant river catfish	*Mystus seenghala*	Singuliformes	+	+
18	Shrptooth catfish	*Clarius garipinnus*	Singuliformes	+	+
19	Clown knife fish	*Notopterus chitala*	Clupeiformes	–	–
20	Tire track eel	*Mastacembalus aramatus*	Mastacembaliformes	+	+
21	Mosabbique Tilapia	*Tilapia sp.*	Syngnathiformis	+	+

Table 2- Frequency and abundance of Fish Species

Sr. No	Common Names	Scientific name	Frequency	Abundance
1	Grass carp	*Ctenopharyngdon idella*	100	1
2	Silver carp	*Hypophthalmichtys molitrix*	100	1
3	Catla	*Catla catla*	100	1
4	Rohu	*Labeo rohita*	100	1
5	Common carp	*Cyprinus carpio*	100	1
6	Mrigal carp	*Cirrihina mrigala*	66	0.66
7	Walking cat fish	*Clarias batracus*	66	0.66
8	Stinging cat fish	*Heteropneustus fossilis*	66	0.66
9	Barbel	*Barbus sp.*	66	0.66
10	Mully cat fish	*Wallago attu*	66	0.66
11	Indian mottled eel	*Anguilla bengalensis*	33	0.33
12	Needle fish	*Belone cancila*	33	0.33
13	Common snake headed	*Channa striatus*	100	1
14	Spotted snake headed	*Channa punctatus*	66	0.66
15	Bulls eye snake headed	*Channa nama*	66	0.66
16	Bulls eye gobby	*Glossogobius giuris*	100	1
17	Giant river catfish	*Mystus seenghala*	100	1
18	Shrptooth catfish	*Clarius garipinnus*	66	0.66
19	Clown knife fish	*Notopterus chitala*	33	0.33
20	Tire track eel	*Mastacembalus aramatus*	66	0.66
21	Mosabbique Tilapia	*Tilapia sp.*	100	1

Table 3- Icthyofaunal Diversity of Two lakes

Lakes	Diversity
Futala	6.66
Ambazari	5.33

Fig. 1: Map showing location of Nagpur city Fig.2 –Google map location of two lakes in Nagpur city

The result of our survey highlight the fact that icthyofauna in these lake is abundant which indicate the favourable condition for their survival.

However, Now-a-days these lakes are getting deteriorated by the activities of urban development, idol immersions, resultant stress and encroachments ultimately causing threat to fish fauna. Therefore, the conservation of these fragile ecosystems rich with diverse fish fauna is an essential and urgent task which can be achieved by reducing anthropogenic activities and introducing safe, environment friendly fish culture practice.

Conflict of interest

No conflict of interest influenced in this research.

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