A Study of Fish fauna of Pokhraira pond of Samastipur: North Bihar

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ABSTRACT

Investigations were carried out on the fish fauna of Pokhraira pond of Samastipur: North Bihar during January 2014 to January 2016. It is a famous pond in Samastipur district just south of the Burhi Gandak River. Total 14 fish species from 7 families of order-Cypriniforms, class-Gnathostomata, Phylum-Craniata was identified. The fish were collect with the help of the local skilled fisherman using by Darwari (Drag Net), Banwarjae (Cast Net) and triangular Jali (Scoope Net). The fish were collected in 8% formalin solution for 48 hours and then transferred in 5% formalin solution and preserved for detailed study. The identification and classification of collected fishes were made in reference to previous works"

INTRODUCTION

The importance of fish fauna has been well recognized to its importance as biotic resources for providing protein rice food. About one billion people rely on different types of fishes as the source of protein and about 35 million people (out of which 94% belonging to developed countries) are directly related to the fishing profession and aquaculture activities. Apart from rivers, lakes, ponds as the different freshwater resources for fish protein in the developing world. Wetland also play important role for providing nutritional food protein mostly for the poor masses to stay them healthy. The increasing biotic and abiotic pressure to the water resources of the aquatic system threats its role in protecting the survival of inhabitants of the aquatic system amongst which fishes predominates as an important inhabitants.

Two measures namely (a) standing crop and (b) rate of removal are in common use and from the concept of fish production. The standing crop represents an instantaneous quality of an organism in a particular are. The term 'standing crop' has been rededicated as the usable stock in the case of fish population. He defined the usable stock as the weight of all fishes in a stock which lie within the range of size customarily considered usable. The rate of removal refers the yield of fishes per unit of time. The production of fishes in a unit area per unit time is called fish productivity. It is a fact that the fish productivity does not remains constant in any water body and it varies greatly from one year to another. The total inland fish production in Bihar was 222.16 tons in 2000-01, 240.40 tons in 2001-02, and 261.00tons in 2002-03 (Datta, S., Inland fisheries resources of India, CIFE, Kolkata).

According to market estimates, the Bihar state needs around 6.42 lake metric tons of fish annually against which it produces around 5.10 lakh metric tons. The state has 93,000 hectares of ponds, 9,000 hectares of oxbow lakes, 9.41 lakh hectares of Chaur (low) lands

which remain submerged in water for six to seven months in a year. Samastipur district has 1386 hectares pond (ICAR, New Delhi). Study of biodiversity of fish fauna and their identification, is one of the interesting field of biological research, which gives us an idea about the morphological variation and population diversity of fauna in polluted and non - polluted site of any particular habitat. So, the study of fish fauna of Pokhraira Pond of Samastipur: North Bihar was selected for observation of different species of fishes inhibiting in it.

MATERIALS AND METHODS

Ichthyological era since from Bloch (1785), large number of works have been dine by different workers around the world. Hamilton (1822) gave the illustrated account of fishes of gigantic system, Francis Day (1881) prepared and exhaustive cataloges of fishes in Fauna of British India, Burma and Cylon. Hora (1938) made a collection of fishes from Rajmahal hill Santhal Pargana (Bihar). Chauhan (1947) breifly describe the fish fauna of Patna, state Orissa only. Alikuhni (1957) described fish culture in india. The present study of fish fauna of Pokhraira Pond of Samastipur was selected for observation of different species of fishes inhibiting in it.
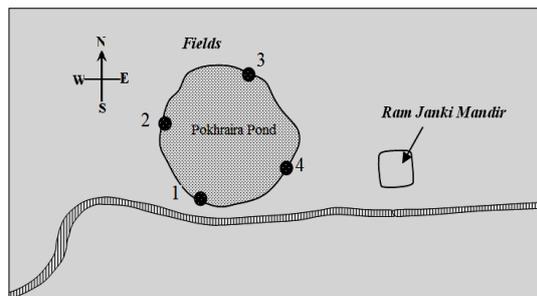

Fig.1: Satellite picture the Pond   **Fig.2: Selected sites at Pokhraira Pond**

Pokhraira pond is a famous and oldest pond in Pokhraira village just south of the Burhi Gandak river in Samastipur district. It contains water whole the year. It is about 12km north-west from Samastipur Railway Station. Its dimension is about 100m×80m (0.8hectare= 1.976acres) and depth varies between 1.5m-5m. (1 hectare=10000m^2= 107639.104ft^2 and 1 acre=0.405hectare or 1 hectare=2.47acres) (Fig.1).

In order to determine the fish fauna of Pokhraira pond four sites were chosen for main research activity namely-1, 2, 3, 4 as shown in Fig. 2. These sites were choosen keeping in mind pollution point of view. The distance between two sites was 25-50m. The fishes of different size of this pond were used to collect at the different collecting centers at intervals with the help of the local skilled fisherman using Darwari (Drag Net) of the size of 7m×3m, Banwarjae (Cast Net) with the mesh size 2.5cm. Jali (Scoope Net) with triangular shape. The fish were collected immediately in 8% formalin solution for 48 hours and then transferred in 5% formalin solution and preserved for detailed study. The identification and classification of collected fishes were made with the help of Francis Days (1881) "Fish and Fauna of British India" and Srivastava, G. J. (1997) "Fishes of U. P. and Bihar".

RESULTS AND DISCUSSION

In our investigation, total 14 species from different 7 families of order Cypriniforms, class-Gnathostomata, Phylum-Craniata) were identified which are listed in Table-1. Behera

(1975) reported the presence of 19 families from Sabalpurlake (Orissa). Motwani and Sehgal (1974) recorded the fishes of 16 species of 12 families form sagar reservoir of Pilibhit (U.P). Kumari and Singh (1991) collected 27 species of 19 genera of fishes belonging to 9 order and 14 family from Nawada lake, Muzaffarpur. Prakash *et al*. (1994) reported 20 species of weed fishes from Kanwar lake Begusarai, Bihar.

Table1
List of identified fish species at Pokhraira Pond

Sn	*Local name*	*Species*	*Genus*	*Family*
1	Rohu	*Labeo rohita*	Labeo cuvier	Cyprinidae
2	Barari	*Labeo calbasu* (Ham)	,,	,,
3	Bhakura	*Catla catla* (Ham)	Catla	,,
4	Naini	*Cirrhinus mrigala* (Ham)	Cirrhinus Oken	,,
5	Dhawi	*Amblypharyngodon microlepis*	Amblypharyngodon bleeker	,,
6	Rewa	*Cirrhina reba* (Ham)	Cirrhina Okeri	,,
7	Pothia	*Puntius sophore* (Ham)	Puntius Hamilton	,,
8	Boari	*Wallago attu*	Wallago Bleeker	Siluridae
9	Tengara	*Mystus tengara*(Ham)	Mystus Gronow	Bagridae
10	Bachwa	*Eutropiichthys vacha*	Eutropiicthys Bleeker	Schilebeidae
11	Singhi	*Heteropneustes fossilis*	Heteropneustes Muller	Saccobranchidae
12	Mangur	*Clarius batrachus*(Linn)	Clarius Gronow	Clariidae
13	Garai	*Channa punctatus*	Channa Gronow	Ophiocephaliformes
14	Bami	*Mastacembelus pancalus*	Mastacembelus Gronovius	Mastacembelidae

In our study, the maximum population of *Labeo rohita* (Ham.) has been recorded in winter while the maximum population of *Catla catla* (Ham.) and *Mystus tengra*(Ham) was noted in the rainy season. However, the maximum population of *Cirrhinus mrigala* (Ham.) has been found during the summer months. Population of *Labeo rohita* (Ham.) shows positive correlation with transparency, dissolved oxygen and exchangeable calcium contents of the water bodies, while the population of *Catla catla* (Ham.) and *Channa punctatus* shows positive correlation with pH of the water and exchangeable calcium contents of water or soil. However, statistical positive correlation of the population of *Cirrhina mrigala* (Ham.) has been found with temperature, total dissolved solids of the water bodies, water. The population of *Labeo rohita* (Ham.) shows negative correlation with air and water temperature, specific turbidity, magnesium hardness, total hardness, TDS of the water bodies and with zooplankton population. The population of *Catla catla* (Ham.) shows negative correlation with dissolved oxygen, specific turbidity magnesium hardness, TDS and zooplankton population. The population of *Cirrhinus mrigala* (Ham.) shows negative correlation with turbidity, pH, Dissolved oxygen, calcium hardness, magnesium hardness, TDS. Puntius species and the ornamental fishes were found common in whole the investigation.

Ecosystem functioning is dictated to a large extent by diversity and the community structure that results from factors such as richness and evenness of diversity. Thus, recent studies in biology focus more on the quantitative aspects of biodiversity that can be used to understand fluctuations in ecosystem functioning and help in prioritization of areas for conservation.
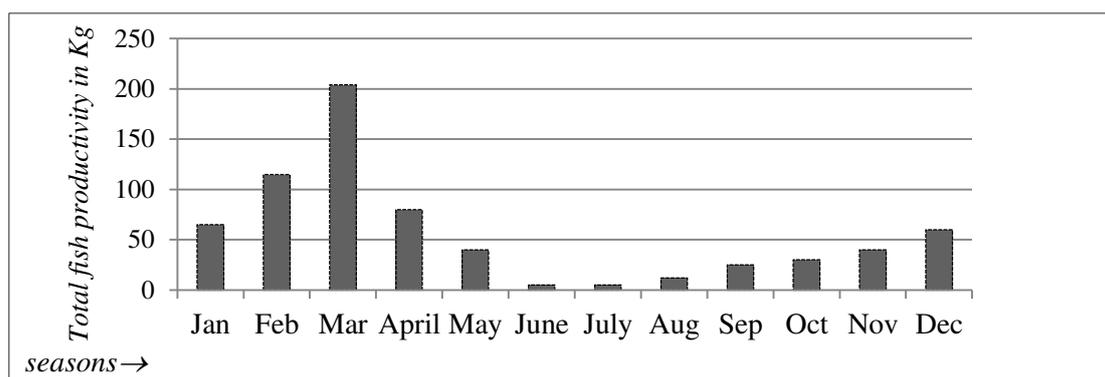
Fig.3. Fish production in Kg/month in year 2015-16

Culture of fish in pond is usually measured with the help of productivity. Productivity of a water body is regarded as the net result of interaction among abiotic factor, biotic factor, soil condition and aquatic animals and plants. In our study fish production was found maximum in the month of March. Minimum fish production was found in June-July probably due to chance of flood occurrence. Total 681 kg of fish production from this pond was recorded during year 2015−16. This shows that total productivity was 344.63 kg per acre in this period. Total production of 1456kg was recorded whole of the investigation in two years 2014−16 (Fig. 3). The productivity of this pond was found low in respect to its size and climatic condition.

So, lastly there are some recommendations as:
1. Awareness regarding pollution and its measures should be created in and around this area.
2. Regular analysis of biotic and biotic parameters and soil condition should be done by the skilled person maintaining the productivity of the pond.
3. Pond must be cleaned of its aquatic weeds and it may not be beyond a desirable.
4. Washing, bathing should be avoided at here.
5. Fisherman must get proper training of fish culture in the light of modern techniques.
6. State Government Department of 'Fish and Fisheries' should be consulted for its all around development.

CONCLUSION

On the basis of aforesaid discussion it may be concluded that Pokhraira pond yields 14 types of fish species during our investigation period from one year from January 2015 to January 2016. The productivity of this pond was found low in respect to its size and climatic condition.

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