STUDY OF ICHTHYOFANAUL DIVERSITY IN RELATION TO PHYSICO-CHEMICAL CHARACTERISTICS OF LONDHARE DAM WATER, SHAHADA TALUKA, MAHARASHTRA, INDIA

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ABSTRACT

Aquatic ecosystems consist of physico-chemical and biotic components are directly affecting to diversity of flora and fauna of water bodies. Londhare dam, Maharashtra, India at 21°32’N, Latitude and 74°36’E Longitudes were mainly built as a storage reservoir. Study for a period of monthly variation of site ‘A’ and site ‘B’ during June, 2012 to May, 2013 to assess Ichthyofaunal and physico-chemical parameters like AT, WT, pH, DO and CO₂ analyzed by standard methods. 18 species of fishes which belongs to 5 families were reported during the course of study.

Key Words: Physico-chemical parameters, Ichthyofaunal, Londhare dam, Flora and fauna, Ecosystem

INTRODUCTION

Anthropogenic activities such as modification of the environment and effects of modernization have contributed to the pollution of water bodies which serve as habitat for fishes. The deterioration of water quality, loss of biodiversity and fast depletion of water resources and main challenges which need urgent attention. Biodiversity is a variety of life which encompasses different genus, species, community and ecosystem along with their relative abundance. Fresh water ecosystem includes primary producers as phytoplankton, algae and hydrophytes, primary consumers as fishes and some other organisms. Fish diversity has been declined to greater extent due to destruction of habitat has an adverse impact on aquatic ecosystems as well as on human population as it is one of the primary food sources. Fishes are widely used to evaluate the health of aquatic ecosystems because pollutants build up in the food chain and are responsible for adverse effects and death in the aquatic systems. The status of any river system can be determined by the quality and quantity of fish species. Water from Londhare Dam is used such as domestic, agricultural, drinking and fishery.

AIMS AND OBJECTIVES

To assess fish fauna along with their correlation with the physico-chemical parameters to understanding the structure and function of aquatic ecosystem.

MATERIAL AND METHODS

Water samples were collected from two sampling site at regular intervals of one month a period of one year from June, 2012 to May, 2013 during morning between 7am to 9am in the first week of every month. Analysis of various physico-chemical parameters like AT, WT, pH, DO and CO₂ was analyzed by methods.

Ichthyofaunal study

The entire study was undertaken mostly in morning hours. The samples were captured at intervals with the help of local fishermen. Drag net, caste net, scoop net, basket trap, hooks etc. for capturing fish samples from Londhare reservoir. Fishes were transferred in 5% formalin and preserved for further study in the Department of Zoology, Jijamata College, Nandurbar, Preserved, Maharashtra, India specimens were identified using taxonomic keys and Standard literatures.
Study area

Fig. 1 shows the location map of Londhare Dam built up during the decade of 1990 near the Londhare village constructed on Mhais River. The elevation of Mhais river is 210 m. above mean sea level and geographical location is 21°32’N, & 74°36’E. The catchment area is 21.00 sq. miles. This project is 646 meter long height is 20.48 meter and length 3.12 km.

RESULTS AND DISCUSSION

The data showing physico-chemical parameters (Fig. 2 to Fig. 6), while a systematic list of fish fauna (Table 1), during period of June 2012 to May, 2013. Seasonal variations in the physico-chemical parameters are the important constituents of the aquatic ecosystem.

Fig. 1 : Londhare map study area location, Maharashtra, India

Fig. 2 : Monthly variation of atm. temp. (°C) June, 2012 – May, 2013

Fig. 3 : Monthly variation of water temp. (°C) June, 2012 – May, 2013
**Fig. 4:** Monthly variation of pH - June, 2012 – May, 2013

**Fig. 5:** Monthly variation of DO June, 2012 – May, 2013

**Fig. 6:** Monthly variation of CO$_2$ June, 2012 – May, 2013
Table 1: List of fishes recorded from Londhare Dam water-2012-13

<table>
<thead>
<tr>
<th>S/N</th>
<th>Classification of fishes</th>
<th>S/N</th>
<th>Classification of fishes</th>
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<tbody>
<tr>
<td></td>
<td>Class: Pisces</td>
<td>6</td>
<td><em>Labeo boga</em> (Hamilton)</td>
</tr>
<tr>
<td></td>
<td>Sub-Class Teleostei</td>
<td>7</td>
<td><em>Rasbora daniconias</em> (Hamilton)</td>
</tr>
<tr>
<td>1</td>
<td><em>Notopterus notopterus</em> (Pallas)</td>
<td>11</td>
<td><em>Catla catla</em> (Hamilton)</td>
</tr>
<tr>
<td>2</td>
<td><em>Notopterus chital</em> (Hamilton)</td>
<td>12</td>
<td><em>Cirrhinus mrigala</em> (Hamilton)</td>
</tr>
<tr>
<td>3</td>
<td><em>Nemacheilus moreh</em> (Sykes)</td>
<td>14</td>
<td><em>Clarius batrachus</em> (Linnaeus)</td>
</tr>
<tr>
<td>4</td>
<td><em>Nemacheilus botia</em> (Hamilton)</td>
<td>15</td>
<td><em>Channa gachua</em> (Hamilton)</td>
</tr>
<tr>
<td>5</td>
<td><em>Labeo rohita</em> (Hamilton)</td>
<td>17</td>
<td><em>Channa punctatus</em> (Bloch)</td>
</tr>
<tr>
<td></td>
<td>Family-III: Balitoridae</td>
<td></td>
<td><em>Channa orientalis</em> (Schneider)</td>
</tr>
</tbody>
</table>

Air temperature

Fig. 2 was recorded maximum 31°C in the month of May 2013 at Site ‘A’ and 30°C at Site ‘B’ and minimum 14°C in the month of June 2012 at Site ‘A’ and 15°C at Site ‘B’. The air temperature ranges between 14 to 31°C at site ‘A’ and 15 to 30°C at site ‘B’. The low oxygen values coincided with high temperature during the summer.

Water temperature

Fig. 3 shows the temperature is one of the most ecological factors which control the physiological behavior, distribution of organisms and some chemical reactions in aquatic ecosystem. Water temperature ranges between 15 to 29°C at site ‘A’ and 16 to 31°C at site ‘B’. The maximum air temp. was recorded in summer 31°C and minimum in winter 15°C. The result shows that water temperature varies with the atmospheric temp. may be due to different timings of collection and influence of season.

Hydrogen ion concentration (pH)

Fig. 4 shows the maximum pH was recorded in summer may be due to decreased volume of water by evaporation and monsoon and minimum in winter season may be due to short day length and decrease in photosynthetic activity. The range of pH was 7.7 to 8.6 at site ‘A’ and 7.3 to 8.7 at site ‘B’. The maximum pH 8.6 and 8.7 recorded site ‘A’ and ‘B’ respectively in the month of May and minimum pH 7.5 and 7.3 recorded at site ‘A’ and ‘B’ in the month of December in the year 2012. The observations indicate that the water was alkaline throughout the study period. An acceptable pH of drinking water is in between 6.5 to 8.5.

Dissolved Oxygen (DO)

Fig. 5 shows the maximum DO was recorded in winter this may be due to the solubility of DO increases with the decrease in water temperature and minimum in summer this may be due to higher the rates of respiration, temperature organic decomposition where the rate of photosynthesis is high and decay of micro and macro-vegetation during the study period. DO levels are important in the natural self purification capacity of the water bodies. The range of DO was 5.9 mg/l. to 10.5 mg/l at site ‘A’ and 5.7 mg/1 to 10.4 mg/1 at site ‘B’. The maximum DO 10.4 mg/l and 10.3mg/l recorded at site ‘A’ and ‘B’ in the month of December, 2012 and minimum DO 5.9mg/l and 5.8 mg/l was recorded at site ‘A’ and ‘B’ in the month of June, 2012. DO is most important abiotic parameters and its effect on metabolic activities of organisms.

Free carbon dioxide (CO₂)

Fig. 6 shows maximum CO₂ was recorded in summer and minimum in winter. The range of CO₂ was 1.9 mg/l to 5.0 mg/l at site ‘A’ and
1.7 mg/1 to 4.8 mg/1 at site ‘B’ respectively. The maximum CO$_2$ 5.0 mg/1 and 4.8 mg/1 recorded at site ‘A’ and ‘B’ in the month of June, 2012 and minimum CO$_2$ 1.9 mg/1 and 1.7 mg/l was recorded at site ‘A’ and ‘B’ in the month of January, 2013. During present study it was observed the relationship between CO$_2$ and DO was an inverse. Atmospheric CO$_2$ may enter surface water by absorption, but only when its concentration in water is less than its equilibrium. CO$_2$ content depend upon water temperature, depth, rate of respiration, decomposition of decaying organic matter and chemical nature of bottom.

In the present study among 18 fish species 05 families were grouped under three orders.

1. Order- Clupeiformes contained a two species- Notopterus notopterus and Notopterus chilota.
2. Order- Cypriniformes contained 11 species - Nemacheilus moreh, Nemacheilus botia, Labeo rohita, Labeo boga, Rasbora daniconias, Puntius sophore, Gara goyla goyla, Cyprinus carpio, Catla catla, Cirrhinus mrigala, Garramullahy. 3. Order- Channiformes contained 05 species - Clarius batrachus, Channa gachua, Channa marulius, Channa punctatus, Channa orientalis. Fish species are an economic value, provide approximately 25 percent protein rich nutritious food from fish sources of both marine and fresh water ecosystem. Fish research has become an increasingly important study area, as fish population is declining throughout the world. Over fishing, pollution by flood and soil erosion etc. has also been responsible for the depletion of fish fauna. It has an adverse impact on aquatic ecosystems as well as a significant impact on human population as food sources. In the field of Ichthyology valuable contribution were made. Seasonal dynamics of the fish population showed that high value of fish diversity during rainy and winter months in the present study, which implied that reservoir receive large volume of less polluted and high oxygenated water which favouring the improvement of fish growth and most of the fishes migrate for breeding. During summer when water flows is greatly reduced in to reservoir appears to be devoid fish. 35 species from Shirsathwadi, Mohari and Manikdaundi reservoir of Nagar Dist. Maharashtra state, India. They further illustrated species form order Cypriniformes, five species in order Siluriformes, four species in Perciformes, one species each for order Clupeiformes, Channiformes, Mugiliformes and Beloniformes Mastacembeliformes, order Cypriniformes was dominant.

CONCLUSION

Londhare reservoir being a medium project is concerned poor attention towards systematic investigation on diversity of fish fauna. It was undertaken to prepare a check list of fishes. The fish community in the lake includes the native species and introduced species for the purpose of fish production. Many fish species are endemic to prevent drainage of pesticides and fertilizers from surrounding crop fields.

REFERENCES