



ZOOPLANKTON DIVERSITY OF KAPILESHWAR (ASHTI) LAKE DISTRICT- WARDHA (MAHARASHTRA), INDIA.

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ABSTRACT:

Zooplankton communities show quick response to environmental changes. As a change in their presence, diversity of species or productivity can provide important indications of environmental disturbance. The presence of zooplankton in aquatic ecosystem terms depends mainly the physico-chemical factors of water. The zooplankton forms of link between phytoplankton and micro invertebrates which in turn provide food to fishes and aquatic birds. Study area for the present investigation was Kapileshwar (Ashti) lake. It is situated near Ashti Taluka-Ashti District-Wardha. The Ashti Town mostly benefited by this lake. The lake is surrounded by agricultural fields, dense forest and the lake water is suitable for domestic purpose, irrigation and fishery activity. For my present investigation duration of 12 month from February 2017- January 2018. The aim of study to investigate zooplankton diversity of Kapileshwar (Ashti) lake. In my present investigation four group's of zooplankton were identified Rotifera, Cladocera, Copepoda and Ostracoda. Total 23 zooplankton were identified.

Keywords :- Zooplankton, Aquatic, Ecosystem, Kapileshwar, Diversity and Species.

INTRODUCTION :

Plankton is of massive value as food and plays a significant role in the discarding of sewage and in the natural purification of polluted waters. Phytoplankton plays an exceptional role in the biosynthesis of organic material while zooplankton forms important components of secondary production. The zooplankton forms of link between phytoplankton and micro invertebrates which in turn provide food to fishes and aquatic birds. Fresh water is essential in many spheres of human life and in general it is seen as an essential input to human production and an effective tool of economic development. Plankton population diversity observation may be used as a significant tool for bio-monitoring to assess the pollution status of aquatic water bodies. Zooplankton communities show quick response to environmental changes. As a change in their presence, diversity of

species or productivity can provide important indications of environmental disturbance. Zooplankton communities often respond quickly to environmental change because most species have short generation times (Brett, 1950). The zooplankton constitute major link in the energy transfer at secondary level in ecosystem. It stands as an intermediate position in aquatic food webs between autotrophs and heterotrophs.

Study area

Ashti lake is located 1 km away from Ashti town, It is a Tahsil place in Wardha district in the state of Maharashtra, India. Ashti lake named as Kapileshwar Talav and is a famous due to Kapilashwar Mandir built at the base of talav, so named as kapileshwar talav, now local name is Ashti lake. It was constructed in 1960 as a irrigation project by the Government of Maharashtra. It was constructed on and

impounds a local Nallah. It is good picnic spots and a popular tourist attraction for its scenic beauty. Catchment area of this lake is 6.68 sq. km. with a storage capacity 1.720 million cu. mt.

MATERIAL AND METHODS :

The research investigations were carried out for 12 months from February 2017- January 2018.

Collection, preservation and Identification of Plankton:

The plankton samples were collected by filtering 40 liters of water through plankton net silk bolting cloth No. 25, (Mesh size 56). The concentration of plankton samples were mixed and collected after adding 4% formalin and brought to the laboratory for analysis. After centrifugation take 1ml. sample in a sedwick rafter counting cell.

Zooplankton were identified with the help of keys' provided by Edmondson (1959), Needham and Needham (1962), Battish (1992), Tonapi (1980), Sehgal (1983), Pennak (1989), Adoni (1985) and APHA (1985).

Counting of the organisms was done by following formula.

$$n = \frac{(a \times 1000) \times C}{I}$$

When,

n = Number of plankton/litre of water.

a = Average of plankton in one small chamber.

C = ml. of plankton concentration.

I = Volume of original water filtered in litre.

Sedwick Rafter Cell Method

It has been named after the inventor of cell. The rectangular cavity slide (50 x 20 x 1 mm) contains exactly 1 ml (1000 mm³) of water sample. The sample is shaken well and 1 ml of sample is transferred quickly to the cavity with the help of graduated pipette. Then cover slip is adjusted properly so that air bubbles do not

remain inside. Binocular microscope is focused and slide examined.

OBSERVATION AND RESULT :

According to Onyema (2007) zooplankton is an integral component of aquatic ecosystem and comprises of microscopic animal life that passively float or swim freely. The zooplankton forms an important group as it occupies an intermediate position in the food web, many of them feeding on algae and bacteria and in turn being fed up on by fishes. They also indicate the trophic status of a water body. Their abundance increases in eutrophic water. They are also sensitive to pollution and many species are recognized as indicators of pollution. The most common organisms in zooplankton are Crustaceans like Cladocerans, Copepods, Ostracods and Rotifers.

In the present investigation, total 23 zooplankton species were identified, zooplankton were studied under four groups viz. Zooplankton was represented by Rotifera, Cladocera, Copepoda and Ostracoda. Similarly reported by Pathak and Mudgal (2002) studied zooplankton of Virla reservoir of Khargaon and observed the systematic position of 19 species of protozoa Copepoda, Cladocera, Ostracoda and Rotifera and found that the species of zooplankton population are observed in all the stations but Rotifers are dominant at station 2, 3 and 4. Moitra and Bhowmik (1968) observed members of 3 main zooplankton groups that are Rotifera, Cladocera and Copepoda in fresh water fish pond in Kalyani West Bangal. Malik and Bharti (2012) stated that rotifers, Cladocera, Copepods and Ostracoda constitute the major group of zooplankton.

In the present investigation, group Rotifera represented by 11 species. The higher concentration of Rotifers was found during winter season and least appearance during monsoon. Edmondson (1965) observed that high Rotifer population in winter could be attributed

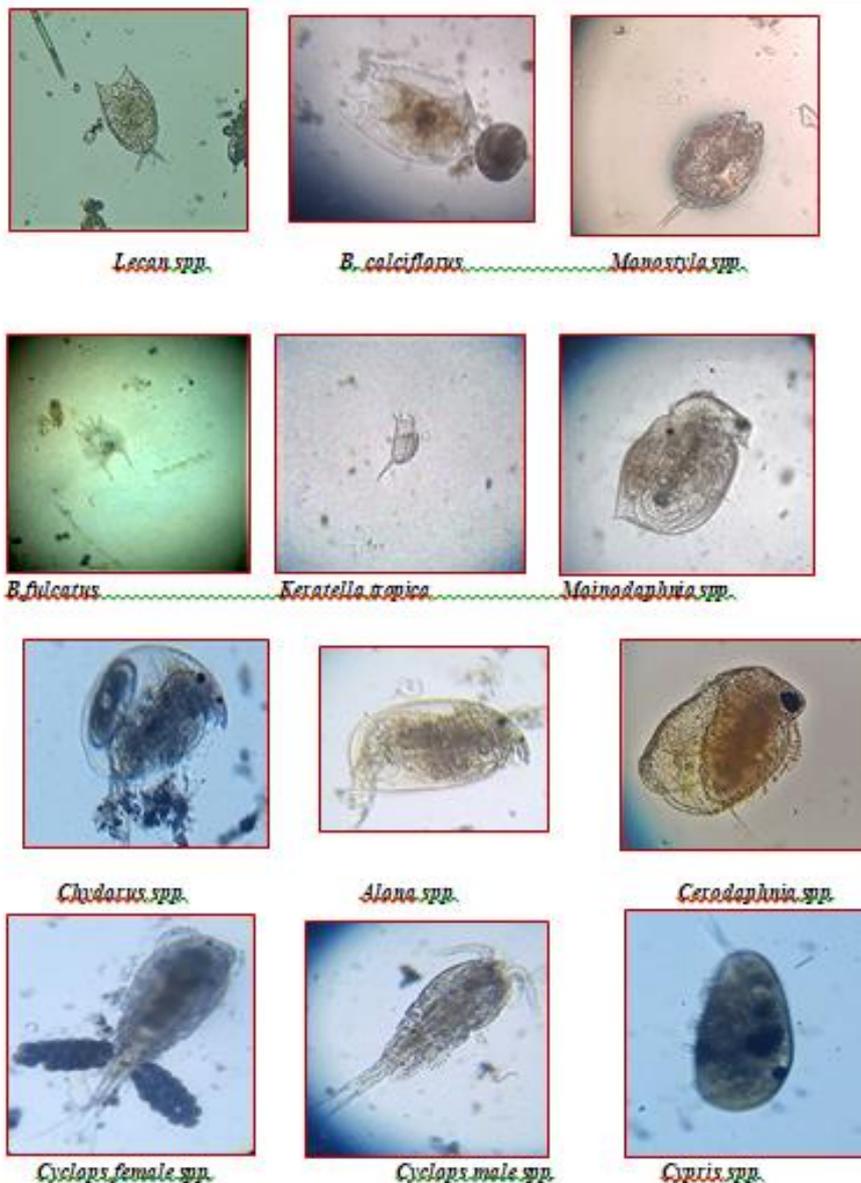
with the favorable temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus. In present investigation, the group Cladocera is represented by 06 species, In the alkaline pH found in the tank physico-chemical factors other than temperature did not apparently influence the periodicity and density of Cladocera. The similar observation was made by Rao (1982) in Manjira reservoir, Devi (1997) and Piska (2000). In present investigation, the group Copepods is represented by 05 species, among the total Copepods, maximum density of copepod was during winter and minimum concentration during monsoon season. In present

investigation, the group Ostracoda was the least group available in the lake. Only *Cyprinus spp.* was found in the tank.

The observations made on the density of plankton in the tank indicated that it could support Indian major carps and other fishes. Major carps showed preference for phyto and zooplankton as major items of food. In addition exotic common carp can also stocked, as its natural food items are also available in sufficient quantities. Srinivas *et al.*, (2003) reported that Hussainsagar lake has been subjected varying degrees of pollution and consequent eutrophication.

Zooplankton Diversity of Kapileshwar (Ashti) lake, Ashti

Rotifera	Cladocera	Copepoda	Ostracoda
<i>Brachionus fulcatus</i>	<i>Bosmina longirostris</i>	<i>Cyclops spp.</i>	<i>Cypris spp.</i>
<i>B. rubens</i>	<i>Chydorus sphaericus</i>	<i>Eucyclops spp.</i>	
<i>B. calciflorus</i>	<i>Macrothrix rosea</i>	<i>Mesocyclops spp.</i>	
<i>B. diversicornis</i>	<i>Moinodaphnia spp.</i>	<i>Diaptomus spp.</i>	
<i>B. plicatus</i>	<i>Ceriodaphnia</i>	<i>Nauplius spp.</i>	
<i>Filinia longiseta</i>	<i>Alona sp.</i>		
<i>Tricocera longiseta</i>			
<i>Monostyla bulla</i>			
<i>Lecane spp.</i>			
<i>Keratella tropica.</i>			
<i>Asplanchna priodonta</i>			

**CONCLUSION :**

In the present investigation, total 23 zooplankton species were identified, zooplankton were studied under four groups viz. Zooplankton was represented by Rotifera, Cladocera, Copepoda and Ostracoda. In the present investigation, group Rotifera represented by 11 species. the group Cladocera is represented by 06 species the group Copepods is represented by 05 species and group Ostracoda was the least group available in the lake represented by only 01 species.

The present investigation on Kapileshwar lake of Ashti show the rich biodiversity throughout the year. No pollution indicator species found at sampling stations, its indicated that water is utilized for agricultural, fisheries and domestic purpose. Such kinds of investigation form a baseline for monitoring a water body for future effective conservation and management. The parameters of Kapileshwar lake indicate that by adopting and implementing technological measures, including chemical, biological and mechanical etc., the lake can be

reconstituted and its water can be utilized for a variety of purposes.

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