



STUDIES OF ZOOPLANKTON DIVERSITY IN JANALA DAM, DIST-CHANDRAPUR (M.S)

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ABSTRACT:

Biological monitoring based on ecology of the zooplankton has been recognized as an excellent and in-expensive tool for measuring pollution level in water. The study of aquatic ecosystem without the study of its zooplankton is incomplete. Many zooplankton play a key role in food chain. The present study is carried out to study zooplankton in Janala lake in the year 2016-17. In the present investigation, zooplankton population was found to be comprised of 27 genera belonging to 04 different classes, viz. Rotifera, Copepoda, Cladocera and Ostracoda. Group Rotifers represented by 11 species, Copepoda represented by 05 species Cladocera by 10 and Ostracoda by only one species.

Keywords :- Janala Dam, Macrobenthos, lake, Water, Quality, bio-indicator.

INTRODUCTION :

Biological monitoring based on ecology of the flora and fauna has been recognized as an excellent and in-expensive tool for measuring pollution level in water. Biological data of a particular location reflects the conditions existing at the time of monitoring as well as past conditions. The physico-chemical characteristics give about the type of a substance or pollutant and its concentration, while biological characteristics indicate their general effect. Hence study of zooplankton abundance and behavior shows the better understanding of the effects of pollution and integrated picture of water body. Zooplankton incorporates primary and partly secondary microfaunal consumer operative system. Zooplankton study in view of their composition, abundance and seasonal variations help in planning and successful fishery management. A large number of reports and descriptions about the zooplankton organisms from Indian waters are available viz. Nygaard (1949), Hutchinson (1957), Jhingran, (1975), Hillebrand (1977), Kohli *et al.*, (1982),

Barnese and Schelske (1994), Sunkad and Patil (2004), Mishra *et al.*, (2010), Tijare and Shastrakar (2018) and Singh and Talpade (2018)

STUDY AREA :

Janala Village is located near Mul Taluka, District Chandrapur. Janala village is 29 km away from Chandrapur city surrounded by dense forest. Janala Dam was constructed by British peoples for the purpose of agricultural irrigation and domestic purposes of villagers. Dam's catchment area is not known. Maximum / Gross storage capacity is 2.01 MCM. Live storage capacity is 1.86 MCM. Janala village has Latitude- 20°04'11.53' N and Longitude- 79°40'41.74"E.

MATERIALS AND METHODS :

Collection of plankton was carried out by using a plankton net made up of bolten silk cloth having a mesh size 56 μ m. The free end of the net was attached by a Plastic bottle having 50-mL capacity. Collected samples were brought to the laboratory and preserved in 4% formalin. For qualitative analysis a compound binocular

microscope was used, as far as possible plankton were identified up to generic level. The identification of plankton was done using standard key books Edmondson (1959), Dhanpati (1974), Tonapi (1980), Pennak (1989) and Kodarkar (1994),

RESULT AND DISCUSSION :

In the present investigation, zooplankton population was found to be comprised of 27 genera belonging to 04 different classes, viz. Rotifera, Copepoda, Cladocera and Ostracoda. Group Rotifers represented by 11 species, Copepoda represented by 05 species Cladocera by 10 and Ostracoda by only one species. Among the four groups, Rotifera showed its dominance on all the sites. Total zooplankton showed its higher concentration during winter season and least during monsoon. Sitre (2014) reported that 27 different species were identified from all the forms 15 spp. belonged to Rotifer, 08 spp. to Cladocera, 02 spp. to Copepod, 01 spp. of Ostracoda and 01 of protozoa in a Fresh water pond near Bhadravati Town.

The Rotifers are found in maximum number and Ostracoda in less number similar observation was noted by Nasar (1977). In present investigation, seasonally zooplankton shows its dominance during winter season and followed by monsoon and summer season. Similarly, Sharma and Kumari (2018) reported that maximum density of zooplankton was recorded during the winter season and minimum during monsoon season of Sacred lake, Prashar Himachal. Seghal *et al.*, (2013) reported seven species of zooplankton were recorded during winter as well as summer season, of which only one species belongs to Rotifer, one species of Cladocera, four species of Copepods and only one species of Ostracoda was present in Dimbhe Reservoir M.S. In present investigation among the rotifers the *Brachionus* spp. was maximum in total number; similar findings reported by Somani and Pejver (2003) *Brachionus* spp. was

represented by 07 species thus making it significant genera, in Masunda lake Thane, Maharashtra. The Rotifera and particle feeder Cladocera were higher in winter can be linked to favorable temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus (Baker and Inniss 1979).

In present investigation, Cladocera maximum density was observed during winter, minimum density during monsoon and moderate density during summer. In winter the numbers of Cladocera starts increasing due to luxuriant growth of phytoplankton in the pond, which may be due to favorable environmental conditions. Similarly, Panwar (2016) reported that maximum density was observed during winter, minimum density during monsoon and moderate density during summer in Bhimtal lake of Umaun Region, Uttarakhand.

In the present investigation, group Copepoda showed 05 species. The high density of copepod was during winter and least concentration during monsoon season. Similarly, Tyor *et al.*, (2014) reported that maximum density of copepod was during winter and minimum concentration during monsoon season in shallow lake of Sultanpur National Park, Gurgaon Haryana.

In the present investigation, Ostracoda was represented by only one species Cypris spp. Similarly, Sitre (2013) reported that abundance of organic detritus the Ostracoda group represented by cypris spp. was present in the lake water which is abundant in monsoon at Ghotnimbala Reservoir near Bhadravati Town.

CONCLUSION :

To summaries on the basis of water quality and the zooplankton studied, Janala dam water can be described as a free from domestic activities. In the present investigation maximum density of zooplankton was recorded during winter season and minimum during monsoon. The high

density of zooplankton population during winter season may be due to higher productivity of the pond during winter through nutrient enrichment, which might promote suitable food for the development stages. However the decrease in zooplankton population in summer may be attributed to the higher temperature, decrease in nutrient and phytoplankton population. The pattern of algal distribution and its density is the main biological factor affecting the density and diversity of zooplankton population. DO and organic matter are the important factors which control the zooplankton growth (Hanazato and Yasuno, 1985). The zooplankton forms a link between phytoplankton, macro-invertebrates which in turn provide food to fishes and aquatic birds.

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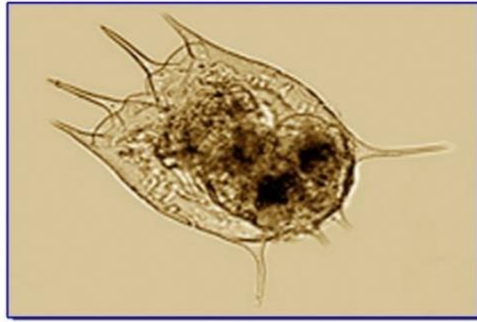
TableNo:1.1 YearlyseasonalvariationofZooplanktoninJanaladamduringyear2016-17

S.N.	Zooplankton	Site-S1	Site-S2	Site-S3	Site-S4	Total
1	Copepoda	18.33 ± 10.5	19.1 ±10.3	17.2 ± 8.2	22.5± 16.0	19.3± 2.9
2	Cladocera	23.75 ± 13.5	19.3 ±9.7	17.9 ± 12.9	21.4± 15.6	20.6± 2.1
3	Rotifers	39.00 ± 25.7	52.1 ±26.2	32.3 ± 17.2	35.7± 20.9	39.8± 3.7
4	Ostracoda	7.17 ± 7.5	8.4 ±6.6	7.3 ± 6.3	5.7± 7.0	7.1± 0.4

Zooplanktondiversityof Janaladamduring2016-17



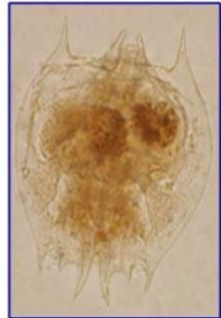
Brachionus angularis



Brachionus calyciflorus



Brachionus falcatus



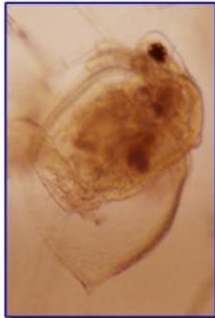
Brachionus caudatus



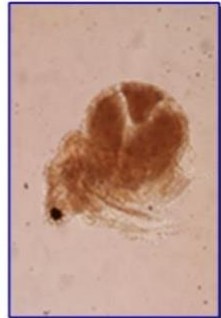
Trichocera spp.



Filinia spp.



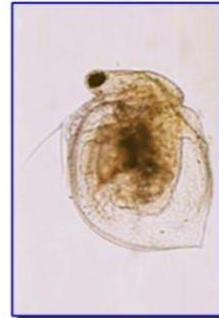
Ceriodaphnia spp.



Moina spp.



Bosmina longirostris



Ceriodaphnia spp.



Cyclops spp.



Nauplius



Keratella spp.



Cypris spp.