

Zooplankton diversity and seasonal variation of Banshelki Dam, Udgir Dist. Latur (MH)

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Abstract

The present study of zooplankton diversity and seasonal variation in Banshelki Dam was conducted to check the status in the area and provide its ecology. The study was carried out during the period of one annual cycle i.e. June 2008 to May 2009. A total of 23 species were found in this dam. Among these, Rotifers comprise of 07 species, Cladocera 08, Copepods 06 and Ostracoda 01 species. The season wise zooplankton analysis showed that the no. of population was highest during summer, followed by monsoon and lowest during winter.

Keywords: Banshelki Dam; Zooplankton; Seasonal variation; Diversity

1. Introduction

Zooplanktons are the smallest organisms present in almost all the water bodies. They are an integral component for fresh water communities and contribute significant to biological productivity. Zooplankton acts as main source of food for many fishes and plays an important role in the detection and monitoring the pollution of water. The study of zooplankton has been fascinating subject for a long time. Bio-indication of pollution, Environmental Impact Assessment (EIA), biological monitoring (Salve and Hiware, 2010). Zooplankton is good indicators of the changes in water quality because they are strongly affected by environmental conditions and respond quickly to changes in water quality. Zooplankton is the intermediate link between phytoplankton and fish. Hence qualitative and quantitative studies of zooplankton are of great importance in any water body.

2. Material and Methods

2.1. Study Area

Banshelki Dam is one of the good dam near Banshelki village Udgir. It is constructed on Mannodi River. The capacity of dam is 107.24 million cubic meters. The length and depth of this dam is 2290 m. and 800 m. respectively. The catchment area of dam is 22 sq.km. The dam is beneficial to Udgir city and remote area.

2.2. Collection of sample preservation, identification

Water samples were collected randomly in different three selected sites of the Dam on monthly basis for a period of one year from June 2008 to May 2009. Collection of zooplankton was carried out by using plankton net. Sampling was made between 8.00 a.m. to 10.00 a.m. by plankton net with mesh size 25 mm. During sample collection 100 lit of surface water were sieved through the net and filtered sample were transferred to plastic container and 4% formalin was added for sample preservation. These samples were then brought to laboratory for further studies. The systematic identification

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of plankton was made by using standard keys of Adonic (1985), IAAB (1998), Michael and Sharma (1988), Krishnaswamy (1973), Edmondson (1959), Pennak (1968), Dhanpathi (2000) etc.

3. Result and Discussion

A total 23 species of zooplankton were recorded from Banshelki Dam. Among these species Cladocera was dominant with 08 species followed by 07 species of Rotifera, 06 species of copepod and one species of Ostracoda. Monthly recorded variation of zooplankton population is given in table 1.

The occurrence of season wise zooplankton was dominant in the following order.

- Winter-Rotifera>cladocera>copepod>ostracoda
- Summer-Rotifera>cladocera>copepod>ostracoda
- Monsoon>Cladocera>copepoda>corpepoda>Rotifera

3.1. Rotifers

Rotifers play a vital role in the trophic structure of freshwater ecosystem and serve as nutritional value (Suresh Kumar et.al. 1999). In the present study cladocera dominated with 08 species as compared to other group of zooplankton. This result is common in lakes, ponds, dams and rivers (Neves et.al. 2003). The population density of Rotifer was rich in summer season and less in winter season. The no. of Rotifers increased in summer which may be due to the high population of bacteria and organic matter of dead and decaying vegetation (Majagi and Vijaykumar, 2009). Rotifers have very short life cycle under favorable conditions of temp., food and photoperiod. Since the rotifers have short reproductive stages, they increase in abundance under favourable environmental conditions (Dhanapathi, 2000). In the study the *Brachionus* species are very common in temperature and tropical water (Hutchinson G.E. 1967) indicates alkaline nature of water.

3.2. Copepods

Fresh water Copepods constitute one of the major zooplankton communities occurring in all type of water bodies. They serve as food to many fishes and play an important role in ecological pyramids. Copepods show higher population density in summer season and lower in winter. This is also observed by Mahor (2011) in Trigha reservoir of Gwalior.

3.3. Cladocera

Cladocera also constitute one of the major zooplankton community found in every type of water bodies. They serve as food for many fishes and aquatic animals. Cladocerans shows higher population density in monsoon and lower in winter.

3.4. Ostracods

Ostracods represented very low diversity and population density as compared to other groups of zooplankton. In this study single species of Ostracods were recorded. The population density was higher in summer and less in monsoon. This result has also been seen by Sukand and Patil (2004) in Fort Lake of Belgaum and Kedar et.al. (2008) in Rishi lake of Washim.

The present research study indicates seasonal variations in the distribution of zooplanktons. Rotifera, cladocera, copepod, ostracoda were found in maximum no. during summer followed by winter and minimum during monsoon. Ostracoda and Copepod were recorded maximum during summer followed by monsoon and winter with minimum numbers. Overall population of zooplankton was maximum in summer and winter and minimum in monsoon season. In this population rotifers and cladocera were dominated over copepod, ostracoda and protozoa throughout the year. Similar observations have been observed by Das (2002) and Dushyant Kumar et. al (2012). Generally in monsoon season founded dilution of water body and decreased photosynthetic activities by primary production, hence the population of zooplankton was minimum.

Similar results were recorded by Salve and Hiware (2010) in Wanprakalpa Reservoir in Nagpur. The abundance of some zooplankton in the aquatic food web has been reported to indicate eutrophication (Halbach et.al. 1983). Sharma and Diwan (1993) studied plankton diversity of Yeshwant Sagar reservoir, reported with the Cladocera were in with maximum density in June. They reported Rotifers were dominant group during summer. Also Khare (2005) observed minimum population during monsoon and maximum during summer. Kadam et.al (2006) observed maximum number of Rotifers during summer season.

Four genera of Rotifers 06 genera of Cladocera and one genera of Ostracoda and 05 copepoda were observed during study period. In summer season the absence of in flow of the water brings stability to the water body. The availability of food is more due to production of organic matter and decomposition, Kiran B.R. et.al (2007). The seasonal variation and zooplankton diversity in Thigra Reservoir in Gwalior, reported that total 20 species recorded during the study period, Rotifers had 10 species, 4 species of Copepod and Cladocera and 1 species of Ostrapoda. Rotifera was the most dominant group throughout the study period. Seasonal variations were observed in the distribution of zooplankton. Seasonally, the no. was highest during summer, followed by monsoon and lowest during winter by Dushyantkumar Sharma (2012)

3.5. Checklist of zooplankton from Banshelki Dam

3.5.1. Rotifera

- *Asplanchaspe*
- *Monostyla*
- *Branchionus calciflorus*
- *Branchionus angularis*
- *Branchionus quatrientra*
- *Kerotella cochieria*
- *Kerotella tropica*

3.5.2. Cladocera

- *Daphnia carinata*
- *Daphnia similes*
- *cereodaphania reticulata*
- *chydrous*
- *Bosmina spe*
- *Moina spe*
- *Moina flagillata*
- *Simocephalus spe*
- *Cereodaphania spe*

3.5.3. Copepoda

- *Cyclops spe*
- *Mesocyclops leucarati*
- *Microcyclops*
- *Nauplus*
- *Diaptoms*
- *Sinodiaptomus spe*

3.5.4. Ostracoda

- *Cypris*

Table 1 Monthly variation of zooplankton (No/lit) at two sites of Banshelki Dam

Month/Stations	Rotifera		Cladocera		Copepoda		Ostracoda	
	SA	SB	SA	SB	SA	SB	SA	SB
June	16	22	25	30	15	25	20	25
July	12	20	20	20	20	30	10	20
August	13	20	25	25	15	20	15	25
September	10	18	20	25	20	25	05	30
October	20	25	20	20	15	10	10	20

November	15	20	20	15	20	15	10	20
December	30	25	20	20	25	10	10	20
January	25	30	20	15	05	05	15	20
February	25	35	20	25	15	10	15	15
March	25	35	10	10	10	10	06	10
April	30	50	20	20	10	15	04	25
May	20	30	10	10	15	15	05	20
Total	235	330	230	235	185	200	125	200

Table 2 Seasonal Variation of Zooplankton

Sr.No.	Seasons	Rotifera	Clodocera	Copepoda	Ostracoda
1	Monsoon	130	190	250	140
2	Winter	190	150	125	125
3	Summer	250	125	100	100
	Total	570	465	395	365
	Percent	17.1	13.95	11.85	10.95

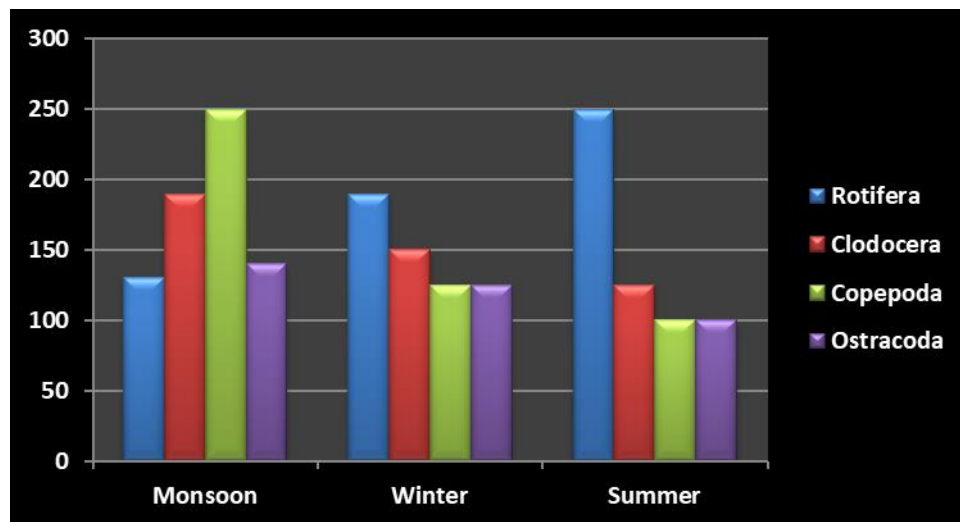


Figure 1 Seasonal Variation Graph

4. Conclusion

The present study shows seasonal variation in the diversity and distribution of zooplankton in Banshelki Dam. All groups of zooplankton were recorded throughout the study period. The no. were maximum during summer and minimum during winter. The study indicates that temp. has important role in the distribution of zooplankton in fresh water bodies.

Compliance with ethical standards

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