

## Diversity of zooplanktons from jamb dam in yevatmal, district, Maharashtra, India

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### Abstract

The Jamb Dam located near Ghatanji Taluka in Yavatmal District of Maharashtra. The Dam is constructed on river Godavari and Painganga. Jamb Dam situated area between longitude 19°59' and latitude 78°24'. Zooplanktons are one of the important faunas in water body which is act as bio-indicators of pollution and provide direct role in food chain of fishes as animal food because it is rich source of nutrient to fishes.

In present investigation in the year of 2018-2019 were observed that a total 10 species of zooplankton among 06 species belonging to Rotifera, *Ascomorpha saltans*. (Bartsch, 1870), *Brachionus calyciflorus* (Pallas, 1834), *Brachionus bidentata* (Jokubsky, 1912), *Lecane leontina* (Turner, 1892), *Trichotria tetractis* (Ehrenberg, 1830) and *Trichocerca pusilla* (Jennings, 1903).

01 species of Copepoda, *Moina micrura* (Kurz, 1874) and 02 species belonging to Cladocera, *Ceriodaphnia quadrangular* (Müller, 1785) and *Diaphanosoma birgei* (Korineck 1981) from Jamb reservoirs freshwater body.

**Keywords:** rotifera, copepoda, cladocera, diversity, zooplanktons and jamb dam etc

### 1. Introduction

The freshwater zooplankton are comprised of three major groups of invertebrate animals: the rotifers, copepods, and cladocerans occurring abundantly in all types of aquatic habits and plays a vital role in energy transfer in an aquatic ecosystem and act as bio-indicators of pollution. It occupies an intermediate position in food web many of them feed upon bacteria and algae and in turn fed by numerous invertebrates, fishes and birds. Zooplankton diversity and their ecology greatly contribute to as understanding of the basic nature and general economy of aquatic habitats and physic-chemical factors are also regulating zooplankton population in water body. Various researches carried out work to study the zooplanktons of different fresh water bodies. Jayabhaye (2010) studied zooplankton diversity of river Kayadhu, near Hingoli city Maharashtra. Vanjare *et al.*, (2010) reported zooplankton from a polluted river, Mula of pune India, with record of *Brachionus rubens* (Ehrenberg, 1838) epizoic on *Moina macrocopa* (Straus, 1820) the occurrence of which coincided with lower dissolved oxygen (DO) content. Qualitative and quantitative studies of zooplanktons in Rajura Lake of Buldhana district were carried out by Joshi (2011) during February 2010 to January 2011. Tayade and Dabhade (2011) studied the rotifer community around Washim region and prepare a checklist of Rotifers in Washim region. Study of qualitative diversity of rotifer community of freshwater Katepurna reservoir, district Akola, Maharashtra, India was carried out by Pawar and Dabhade (2016) [15]. Zooplankton diversity reflects the water quality and they are the good indicators of changes taking place in the water resources, Kabra *et.al.*, (2016) carried out a research work to analyze zooplanktons of Fresh water ecosystem in Washim town, Maharashtra, India. Anirudhh D. Babar *et al.*, D. S. Dabhade. And S. G. Chhaba (2019) [8] carried out work on Diversity of Zooplanktons from Kurnur Dam in Akkalkot, Maharashtra and zooplankton diversity around washim region of

Maharashtra, respectively. The Biodiversity of aquatic life conservation today's an important task because day to day pollution is increase and their directly effect on aquatic life. Anirudhh D. Babar *et al.*, in 2019 concluded that the quantity of zooplanktons in water provided significant information about the available sources for supporting life for fishery development. In present days, the biodiversity is in danger because due to pollution and human activities. Conservation of biodiversity is essential so it is compulsory to keep update knowledge of every aquatic species diversity. The density of planktons in water body determined stocking rate of fishes because they were the chief sources of the food of commercially important fishes as well as development in production of inland fishery sector. The presence and dominance of zooplankton species played a very significant role in the functioning of freshwater ecosystem. Therefore, present investigation on zooplankton diversity from Jamb dam freshwater body, Yevatmal district Maharashtra, India with following aim and objective.

- 1) Collection and preservation of Zooplankton from Jamb dam freshwater body.
- 2) Identification of Zooplankton by using standard methodology previously used by Researcher.
- 3) Studies of diversity of zooplankton in Jamb dam water body.

### Materials and Methods

In present investigation water sample were collected from jamb dam water body in July 2018 to June 2019. The water was collected directly from each selected sampling station of Dam. The samples were transferred to the bottle and brought to the laboratory without disturbances. The water samples were collected by monthly intervals from the sampling stations for a period of one year. The samples were collected during morning hours with help of net of mesh size 25 micron as well as net numbers 25 bolting silk cloth. Plankton net acts as a filter, it is the most common

method for collection of zooplanktons. The concentrated zooplankton samples are carefully transferred to another container. 5 ml of 4% formalin, 2 to 3 drops of glycerins were added to it. A pinch of detergent powder was also added to avoid the aggregation of zooplankton. Samples were collected in separate glass phials with label containing name of site, date of sampling, time of sampling, etc. Identification of zooplankton with help of a compound microscope. A dissecting microscope is also handy for sorting and counting. Specimens are mounted on glass slides and examined at 25-100X magnification. with its standard identification and its monographs as well as keys which were suggested by APHA (1985); Tonapi (1980); Dodson and Frey (1991) and Williamson (1991) and following the systematic key by Battish (1992) and Altaff (2004). Main characters are considered for identification are lorica, corona and type of trophi for rotifers; antennules, post abdomen, number and arrangement of spines, location of lateral setae and rostrum for cladocera; antennules, antenna, caudal setae, and endopodite for copepoda and antenna, valve shape and setae for ostracods used by Gajanan Sontakke and Satish Mokashe (2014).

Population density was quantified by Drop count method of Lackey (1938), and was calculated using the following formula of Lackey (1938):

$$N = n \times v / V$$

Where,

N = Total no. of organisms/ lit of water filtered,

n = Number of zooplankton counted in 1 ml plankton sample,

v = Volume of concentrate plankton sample (ml),

V= Volume of total water filtered through (L)

### Result and Discussion

In present investigation in the year of 2018-2019 were observed that a total 10 species of zooplankton among 06 species belonging to Rotifera, *Ascomorpha saltans*. (Bartsch, 1870), *Brachionus calyciflorus* (Pallas, 1834), *Brachionus bidentata* (Jokubsky, 1912), *Lecane leontina*

(Turner, 1892), *Trichotria tetractis* (Ehrenberg, 1830) and *Trichocerca pusilla* (Jennings, 1903). 01 species Copepoda, *Moina micrura* (Kurz, 1874) and 02 species belonging to Cladocera, *Ceriodaphnia quadrangular* (Müller, 1785) and *Diaphanosoma birgei* (Korineck 1981) from Jamb reservoirs freshwater body. All species are morphologically different. Monthly diversity of zooplankton (Rotifera) population density recorded in summer month that was 467 org/10 litter of water and less in July to Dec.2018 that was 239 org/10 litters of water. The number of Rotifers increased in summer which may be due to the higher population of bacteria and organic matter of dead and decaying vegetation (Majagi and Vijaykumar, 2009).Copepoda recorded in Jamb dam during study that was 09 org/10 litters of water and less recorded in July to Dec.2018 that was 05 org/10 litters of water and also Cladocera zooplankton population density recorded in Jan. to Apr.2019 that was 49 org/10 litters of water and less in the month of July to Dec.2018 was 13 org/10L (Table.1).

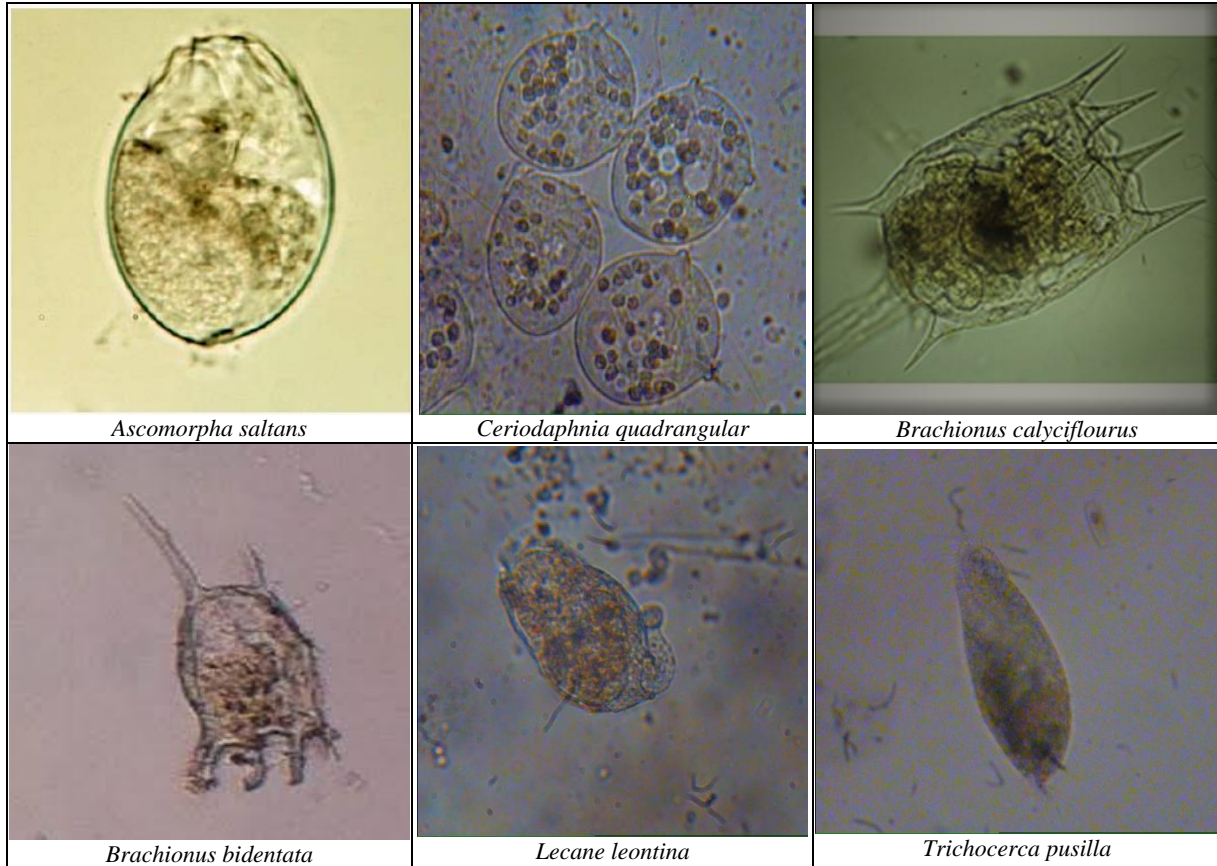
Various researches carried out work on biodiversity of zooplankton Sharma and Srivastava (1986), carried out work on ecological fluctuation of rotifers and Shyestchar (1995) also studied on biodiversity of zooplankton. Jindal and Thakur (2009) in these species' composition and population dynamics of phytoplankton, zooplankton, nekton and productivity have been correlated with seasonal variations in physico-chemical characteristics of water. Solanki and Dabhade (2016) studied the Rotifer communities in upper Morna reservoir of Medshi, Washim district and observed 18 species of rotifers belonging to 6 genera and 5 families among which Brachionus species were found in highest number and Dabhade and Chhaba (2019) [8] also studies on zooplankton diversity around washim region of Maharashtra and recorded different 27 zooplankton species were recorded from the different sampling site of Washim region comprising of 11 species of rotifers, 06 copepods, 09 cladocera and 1 ostracods. The community structure of zooplankton showed a mixed composition of mesotrophic to eutrophic species.

**Table: 1** Monthly diversity in Zooplankton of Jamb dam from July 2018 to Dec.2019

Phylum	Genera	July	Aug	Sep.	Oct.	Nov.	Dec.
Rotifera	<i>Ascomorpha saltans</i> . (Bartsch, 1870).	07	11	09	10	08	10
	<i>Brachionus calyciflorus</i> (Pallas, 1834)	06	09	04	10	09	07
	<i>Brachionus bidentata</i> (Jokubsky, 1912)	05	08	04	07	05	07
	<i>Lecane leontina</i> (Turner, 1892)	05	04	03	02	01	02
	<i>Trichotria tetractis</i> (Ehrenberg, 1830)	05	03	02	02	04	05
	<i>Trichocerca pusilla</i> (Jennings, 1903)	03	02	04	05	07	09
Copepoda	Genera	July	Aug	Sep.	Oct.	Nov.	Dec.
	<i>Moina micrura</i> (Kurz, 1874)	01	01	02	01	02	02
Cladocera:	Genera	July	Aug	Sep.	Oct.	Nov.	Dec.
	<i>Ceriodaphnia quadrangular</i> (Müller, 1785).	01	01	03	02	01	02
	<i>Diaphanosoma birgei</i> (Korineck 1981)	....	01	----	01	...	01
Monthly diversity in Zooplankton of Jamb dam from Jan.2019 to March 2019							
Rotifera	Genera	Jan.	Feb	Mar.	Apr.	May	Jun.
	<i>Ascomorpha saltans</i> . (Bartsch, 1870).	04	10	19	21	17	10
	<i>Brachionus calyciflorus</i> (Pallas, 1834)	05	08	15	23	19	12
	<i>Brachionus bidentata</i> (Jokubsky, 1912)	09	06	11	18	11	07
	<i>Lecane leontina</i> (Turner, 1892)	07	06	12	15	14	11
	<i>Trichotria tetractis</i> (Ehrenberg, 1830)	05	04	09	13	15	10
Copepoda	Genera	Jan.	Feb	Mar.	Apr.	May	Jun.
	<i>Moina micrura</i> (Kurz, 1874)	.....	01	.....	03	02	.....
Cladocera:	Genera	Jan.	Feb	Mar.	Apr.	May	Jun.
	<i>Ceriodaphnia quadrangular</i> (Müller, 1785).	02	01	04	05	08	06
	<i>Diaphanosoma birgei</i> (Korineck 1981)	01	03	03	05	07	04

**Table 2:** Zooplankton Population Density (org/10 lit) in July 2018 to Dec.2019

<i>Rotifera</i>	239
<i>Copepoda</i>	09
<i>Cladocera</i>	13
Zooplankton Population Density (org/10 lit) in July 2018 to Dec.2019	
<i>Rotifera</i>	467
<i>Copepoda</i>	05
<i>Cladocera</i>	49



**Fig: 1** Photo plate some different Rotifer found in Jamb Dam freshwater body in 2018-19

The distribution of various species depended on the physico-chemical parameter (Tonapi GJ.1980)] such as temperature, conductivity, pH, chloride, and free CO<sub>2</sub> content of water. In the present study, among all groups of zooplanktons, the Rotifers was found dominant in all groups due to its distribution and similarity of results was previously observed by many researchers Abdullahi *et al.*2007 <sup>[1]</sup>; Adeyemi *et al.*2009; APHA (1989) <sup>[3]</sup> Balamurugan *et al.* (1999) <sup>[6]</sup> and Benarjee *et al.* (2008) <sup>[7]</sup>.

**Conclusion**

The present investigation reveals that the diversity of zooplanktons plays very significant role in the functioning of freshwater ecosystem. Were recorded 10 species of zooplankton among 06 species belonging to *Rotifera*, *Ascomorpha saltans*. (Bartsch, 1870), *Brachionus calyciflorus* (Pallas, 1834), *Brachionus bidentata* (Jokubsky, 1912), *Lecane leontina* (Turner, 1892), *Trichotria tetractis* (Ehrenberg, 1830) and *Trichocerca pusilla* (Jennings, 1903). 01 species *Copepoda*, *Moina micrura* (Kurz, 1874) and 02 species belonging to *Cladocera*, *Ceriodaphnia quadrangular* (Müller, 1785) and *Diaphanosoma birgei* (Korineck 1981) from Jamb reservoirs freshwater body. The Diversity and population of

zooplanktons in water provided significant information about the available sources for supporting life for fishery development. In present days, the biodiversity is in danger because due to pollution and human activities. So, Conservation of biodiversity is essential so it is compulsory to keep update knowledge of every aquatic species diversity. The density of planktons in water body determined stocking rate of fishes because they were the chief sources of the food of commercially important fishes as well as development in production of inland fishery sector. The presence and dominance of zooplankton species played a very significant role in the functioning of freshwater ecosystem.

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