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Zooplankton Diversity in Imangaon Freshwater Reservoir of Beed District (M.S).

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Abstract: In the present study, we have recorded quantitative information on the zooplankton diversity from Imangaon Freshwater reservoir of Beed district during the study period 2017-2018. During the study period 13 species of Zooplanktons, of which 5 species belongs to Rotifera, 3 species belongs to Cladocera, 3 Species belongs to Copepoda and 2 species belongs to Ostracoda. During the study period Rotifera was the dominant group of Zooplankton. The results of present study show that diversity and density of Zooplankton species influenced reservoirs physical variables.

Index Terms – Zooplankton, Freshwater, Diversity, Reservoir, Physical variables.

I. INTRODUCTION

Freshwater is essential for life. Plants, animals, and humans all need freshwater to survive. We use for drinking water, to irrigate crops, as part of sanitation systems, and in industrial factories[1]. Reservoirs and lakes are becoming very important resources throughout the world because of the primary concern of man were thought to be for meeting his basic requirements. Around the world, freshwater habitats are being subjected to increased levels of human disturbance[2]. An overview of throughout the world, freshwater environments are experiencing serious threats to both biodiversity and ecosystem stability[3]. The major habitats in fresh water include the lotic bodies (Rivers and streams), lentic bodies (Ponds and lakes) ground water zones and of ecotonal water bodies where aquatic habitats meet. (e.g. wet lands, marshes and estuaries)[4]. Manmade lakes and reservoirs are becoming very important water resources throughout the world because of the primary concern of man were thought to be for meeting his basic food requirements[5]. Zooplankton forms the most important animal group of aquatic environment constituting a major portion of the diet of fish and other aquatic inhabitants. Many adult Fish species also rely on zooplankton for prey. Because of their intermediate trophic position and interactions with nutrient cycling, zooplankton play key roles in the functioning of lake ecosystems[6].

II. STUDY AREA

Imangaon freshwater reservoir were chosen for the study of diversity of zooplankton, Imangaon is located in the Asthi Tehsil of Beed district in Marathwada region of Maharashtra State in India.

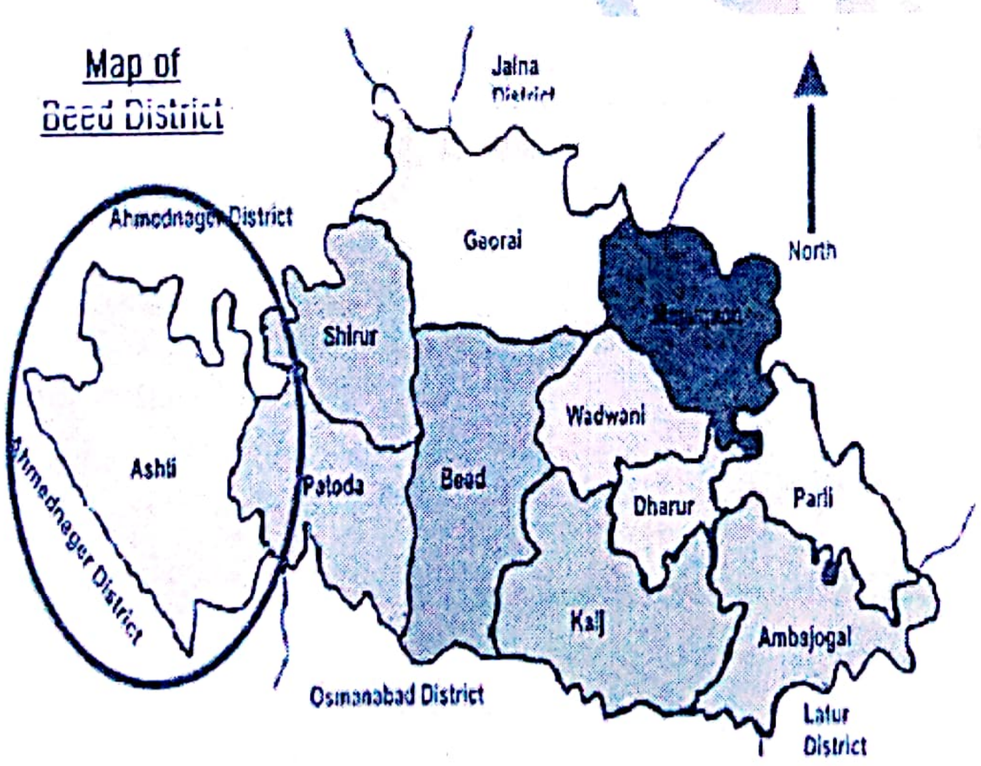


Figure 1. Map of beed district.

Figure 2. Satellite image of Imangaon reservoir

2.1. Topological details Imangaon Reservoir

1. Name: Imangaon (Ruti Medium Project) 2. Place: Imangaon Tal. Asthi, Dist: Beed (M.S – India)
3. Rivers: Ruti, Sina River. 4.Types: Reservoir (Medium Project)
5. Location: Latitude - 18°47'34.7"N. Longitude - 75°06'34.8"E.
6. Details of Dam: a) Type of Dam – earthen. b) Max Height – 18.7 Mtr. c) Length – 2088 Mts.

III. MATERIALS AND METHOD

The qualitative water sampling of zooplankton was done with the plankton net of mesh size 60 -75µ in the early morning whereas quantitative samples were collected by one hundred liters of water was flited through a blotting silk plankton net number 25 with diameter of 25cm and length 50cm. Filtered water samples collected and in 50ml capacity of bottles and preserved in 4 percent formalin solution. The samples were taken to the laboratory observed and identified under research microscope and sorted in to different groups (zooplanktons were counted by counting device Sedgewick Rafter Cell) by suitable text keys given by Pennak (1946)[7]. Tonapi (1980)[8]. Trivedy (1984)[9]. Kodarkar (1998)[10]. Taxonomic identification was done.

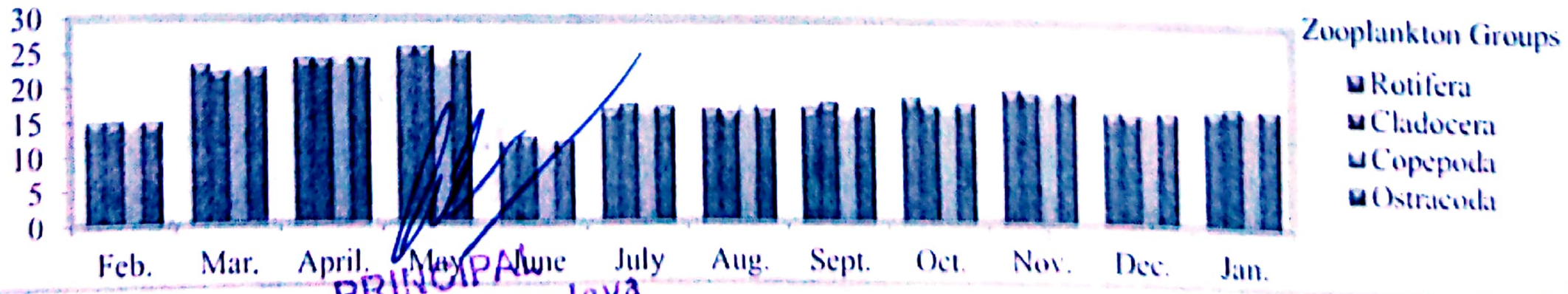
IV. RESULTS AND DISCUSSION

Rotifers were dominant with 5 species i.e. *Brachionus calyciflorus, Brachionus falcatus, Brachionus Caudatus, Brachionus calcyflorus,* and *Keratella tropica* in Imangaon reservoir throughout the study period. Cladocera was with 3 species i.e. *Moina macracopa, Dhapnia galeata, Diaphanosoma excisum*. Copepoda included 3 species *Diaptomus marshianus, Phylladiaptomus blanchi, and Mesocyclops hyalinus*. Ostracoda included just 2 species *Cypris obensa*. and *Cyclocypris globosa*. in Imangaon reservoir during study period. During the study period 2016 – 2017 Rotifers accounted for 41.95 % of the total zooplankton showing maximum (151 org./liter) in May during summer and minimum (56 org./liter) in September and October months during monsoon. During the study period 2016 – 2017 Cladocera accounted for 18.88 % of the total zooplankton showing maximum (78 org./liter) in April during summer and minimum (18 org./liter) in June during monsoon. During the study period 2016 – 2017 Copepoda accounted for 22.56 % of the total zooplankton showing maximum (81 org./liter) in April during summer and minimum (32 org./liter) in June during monsoon. During the study period 2016 – 2017 Ostracoda accounted for 16.61 % of the total zooplankton showing maximum (58 org./liter) in May during summer and minimum (25 org./liter) in June during monsoon at Imangaon reservoir. high rotifer density has been reported to be a characteristic of eutrophic lakes[11]. Among the zooplankton rotifers respond more quickly to the environmental changes and used as a change in water quality[12]. Ayyappan and Gupta (1980) observed seasonal and spatial distribution of copepods in the perennial tank situated in Dakshina Kannada, Karnataka[13]. Similar results were observed by Chavan (2003)[14]. Abdar M.R. (2007)[15].

Table. 1. Monthly Analysis of Zooplanktons Diversity in Imangaon Reservoir (Org / lit) (20016-2017).

Species/Month	Feb.	Mar.	April.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.
Rotifer												
Brachionus flacatus (Zacharias, 1898)	21	32	20	26	09	13	16	17	18	21	26	24
Brachionus calyciflorus (Pallas,1776)	23	25	29	35	15	05	05	08	15	10	20	26
Brachionus caudatus (Barrios and Daday,1894)	18	22	21	23	25	20	14	12	22	19	18	23
Brachionus rubens (Ehrenberg, 1838)	22	20	23	32	30	25	21	14	16	20	22	20
Keretella tropica (Apstein ,1907)	23	30	34	35	15	10	05	05	05	12	11	18
Total	107	129	127	151	94	73	61	56	56	82	97	111
Cladocera												
Moina micrura(Kurz, 1874)			28	26	05	04	02	10	13	14	11	16
Daphania Galeta (Richard, 1895)	12	20	24	06	10	05	10	15	16	21	24	26
Diaphanosma sarsi(Richard, 1895)	14	22	26	29	03	10	18	05	06	05	10	16
Total	43	67	78	61	18	19	30	30	35	40	45	58
Copepoda												
Diaphanosma sarsi(Richard, 1895)	16	23	29	21	10	16	14	10	20	12	15	19
Phyllodiaptomus blanchi (Guerene & Richard, 1896)	12	20	24	06	10	15	20	15	16	21	24	26
Mesocyclops hyalinus (Rehberg ,1880)	15	23	28	18	12	21	24	11	12	18	16	14
Total	43	66	81	45	32	52	58	36	48	51	55	59
Ostracoda												
Cyprinotus nudus(s Brady, 1885)	15	27	25	26	10	15	18	15	22	21	18	16
Cyclocypri leavis (Brady, 1885)	16	21	23	32	15	19	14	22	18	20	15	18
Total	31	48	48	58	25	34	32	37	40	41	33	34

Fig. 3. Average Monthly population density of rotifers, Cladocera, copepod. Ostracoda Zooplankton group of Imangaon Reservoir (20016-2017).



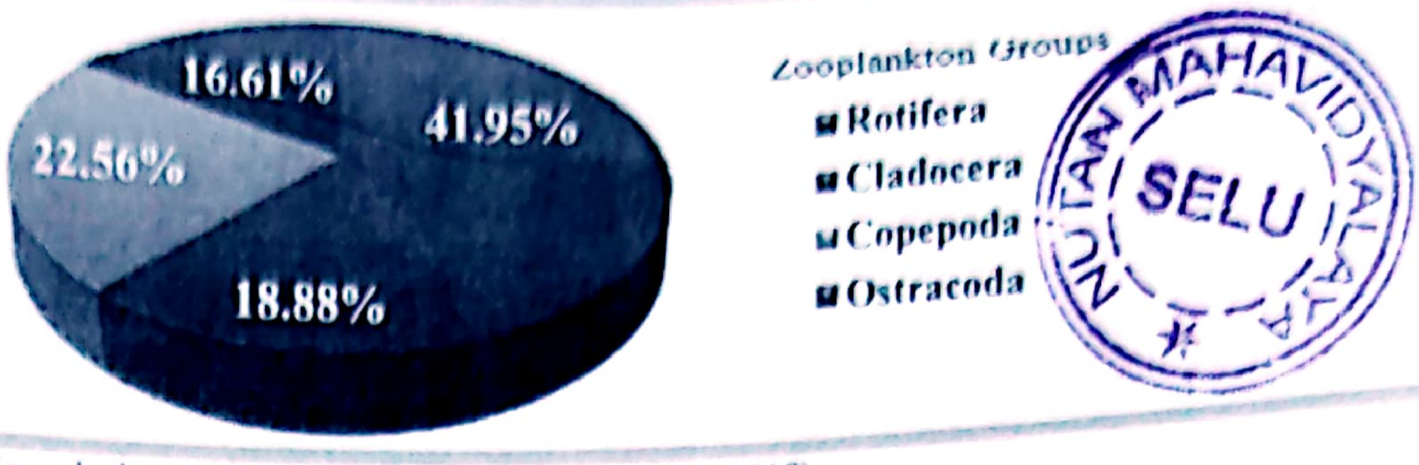


Figure 4. The percentage of composition of zooplankton in Imangaon Reservoir during (2016-2017)

V. CONCLUSION

The current research disclosed that, zooplankton's abundance and biomass was shows their existence in reservoir of Imangaon. Therefore, this research indicates that zooplankton abundance and biomass may be a useful measure of the differences in the water quality of the ecosystems investigated in these two reservoirs. Zooplankton abundance and biomass were discovered to be greater during the summer season. The current research would provide a preliminary understanding of the variety and productivity of zooplankton and the reasons for the variability in reservoir of Imangaon. During the implementation of leadership policies, this data can be used to enhance reservoir productivity.

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