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Study of Zooplankton Diversity of Makani Reservior, Dist. Dharashiv (M.S) India

Dr. Vinayak Narayanrao Waghmare

Department of Zoology, Mahatma Basweshwar Mahavidyalaya, Latur Maharashtra (India)
Email : waghmarevn73@gmail.com

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Abstract

The present study was undertaken to investigate the monthly variation in zooplankton diversity and abundance. study was undertaken during the period of June 2025 - May 2026. From Makani reservoir water sample were collected by selecting three sampling sites S1, S2 and S3. zooplankton were analyzed to understand the ecological status of the reservoir. zooplankton - analysis revealed the occurrence of 28 species. belonging to *cladocera*, *Rotifera*, *Copepoda* and *Ostracoda*. Among the zooplankton group *Cladocera* was found to be dominant during study period. The maximum count of zooplankton was recorded during the months of February to May and minimum count recorded during the months of June to September which shows influence of Water quality and hydrological condition. The result indicate that Makani reservoir is moderately productive fresh water ecosystem and nutrient enrichment.

Keywords: Zooplankton diversity, Makani reservoir.

1. Introduction

Zooplankton Form a bulk of live food for variety of Secondary consumers including commercially important group of Crustaceans, Fishes and exhibits important link between primary producer and higher tropic level. zooplankton has been used as indicator for monitoring the water quality, tropic status and pollution level [1]. Use of variety of agro-chemicals in the Catchment and human pressure are causing depletion of aquatic biota due to water pollution in the case of lakes and reservoirs. During monsoon turbidity caused by agricultural surface runoff and soil erosion severely affect the plankton production [2]. Various ecological aspects of zooplankton have been subject of studied by several workers in India from last many years [3-5].

Present study was undertaken to assess the monthly variation of zooplankton diversity and abundance of Makani reservoir over one year period.

4. Methodology

Present study was conducted at Makani reservoir. Makani reservior is medium type reservoir in Dharashiv district, Maharashtra. The reservoir was constructed on Terna River. The reservoir provides a suitable environment for studying plankton diversity. The study was conducted for one year. Selecting three sampling sites S1, S2 and S3 zooplankton sample were collected from selected sampling sites using standard plankton net and preserved in Lugol's iodine solution for laboratory examination. The qualitative and quantitative analysis was carried out by taking 25ml of concentrate following Sedimentation technique. The zooplankton was observed and identified under phase contrast microscope. The identification was carried out by using methodology of Trivedy and Goel [6], Kodarkar [7] and recorded as Organisms per litre (org/L).

Results

A total 28 zooplankton species were recorded from Makani reservoir during study period. Indicate a considerable diversity and abundance. In terms of species composition, Cladocera emerged the most dominant group with 09 species, followed by Rotifera with 08 species, Copepoda with 07 species and Ostracoda with 04 species. The diversity and abundance of Makani reservoir suggest a productive aquatic environment as these organisms play an important role in food web. Productivity of zooplankton shows fluctuation seasonally. Total number of zooplankton and monthly variation are given in table 1

Table 1. Monthly Variation in Zooplankton Groups (Org/L) June- 2025 to May 2026

	Zooplankton	**Months**												
	Groups	**June**	**July**	**August**	**Sept.**	**Oct.**	**Nov.**	**Dec.**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Total**
Sampling Site S1	Cladocera	03	08	07	04	16	14	10	09	13	14	15	12	**125**
	Copepoda	06	03	02	04	06	08	07	08	14	11	13	13	**95**
	Rotifera	08	05	04	08	10	13	14	11	15	13	15	18	**134**
	Ostracoda	04	08	05	01	13	11	08	07	09	04	01	03	**74**
	Total	**21**	**24**	**18**	**17**	**45**	**56**	**39**	**35**	**51**	**32**	**34**	**36**	**395**
Sampling Site S2	Cladocera	04	05	02	08	11	15	10	10	15	14	11	12	**117**
	Copepoda	08	04	03	03	06	08	04	08	02	11	15	09	**81**
	Rotifera	03	03	04	02	08	10	11	08	11	14	18	07	**99**
	Ostracoda	03	08	03	10	02	02	03	07	04	02	01	08	**53**
	Total	18	20	12	23	27	45	28	33	22	31	35	26	**310**
Sampling Site S3	Cladocera	03	02	02	07	11	14	13	04	15	13	12	11	**107**
	Copepoda	10	04	02	04	08	05	01	09	11	18	14	11	**97**
	Rotifera	02	03	01	07	10	07	13	03	08	10	15	05	**84**
	Ostracoda	08	05	10	03	02	02	03	05	09	06	02	08	**63**
	Total	**23**	**14**	**15**	**21**	**31**	**28**	**30**	**21**	**33**	**37**	**33**	**25**	**309**

Cladocera : During present study Cladocerans were represented by 09 species. Cladocera showed higher abundance during winter and summer months and declined during monsoon months. It may be due to increased rainfall, and water dilution. The highest Cladoceran density 16 (org/L) was recorded in October at sampling site S1 may be attributed to favorable post monsoon condition, including moderate temperature and improved nutrient availability supporting this group. The lowest value 02 (org/L) of Cladocera was recorded during the months of July and August at sampling sites S2 and S3.

In case of cladocera, Alona rectangula richardi, Ceriodaphina laticudata, Ceriodapnia cornuta, Daphnia carinata, Moina brachiata, Moina micrura, Simocephalus species, Daphnia pulex and Bosmina longirostris were recorded during investigation period.

Copepoda: Copepoda were represented by 07 species and shows greater abundance during summer months. Peak density of Copepoda was recorded during March, 18 (org/L) at site S3 while lower values were observed during monsoon 02 (org/L) at site S1 and S2 in August. Highest value during summer may be due to favorable temperature and copepoda responded positively to the higher temperature and food availability. During monsson lowest value may be due to increased suspended sediments and turbidity can reduce feeding efficiency affect reproduction. Water temperature and availability food affect the Copepoda population. [2].

The Copepoda species as Cyclop species, Canthocamptus species, Diaptomus species, Mesocyclops species, Limnocalanus species, Neo diaptonus species and Macrocyclops albidus were recorded throughout study period.

Rotifera: Rotifera were represented by 08 species. Rotifera plays an important role as grazers, suspension feeder and predators in zooplankton community. Nanoplankton biomass exert direct effect on Rotifer fertility by Radwan [8]. The highest values of Rotifer 18 (org/L) during the months of April and May at site S2 and S1 increased values in summer may be due to nutrient enrichment while their reduced density 01 (org/L) in August may be due to higher rainfall. In case of Rotifera Asplanchna species, Brachionus falcatus, Brachinous forcipulata, Brachinous plicatilis, filinia longiseta, Philinia boryi, Keratella cochlearis and Keratella serrulata were recorded during study period.

Ostracoda: During investigation Ostracoda population were found to be higher during the months of October 13(org/L) and in August, September 10(org/L) at sites S1, S3 and S2 respectively. Higher density of Ostracoda in winter and monsoon may be due to favourable temperature, increased organic matter and food availability while lower values during summer may be due to less dissolved Oxygen, high temperature and feeding pressure of stocked fishes. Ostacoda were represented by 04 species Cypris subglobosa, cypris obesa, Stenocypris and Metacypris was recorded during study period. Thermal stratification and seasonal climatic condition significantly regulate metabolism and ecological productivity in reservoir Mishra [9]. Edmondson [10] reported that warmer water, better food availability and stable limnological condition favor zooplankton multiplication.

Conclusion

The present study conclude that the reservoir support a diverse zooplankton community and exhibited distinct seasonal variation. A total 28 zooplankton species were recorded during study period which shows rich and varied planktonic community in the reservoir. Among these species Cladocera as dominant group, followed by Rotifera, Copepoda and Ostracoda indicate their ecological significance in food web. Ecological condition of Makani reservoir indicate that the reservoir is biologically active fresh water ecosystem. Regular Monitoring of zooplankton diversity is essential for ecological maintenance of the reservoir.

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Correspondence and requests for materials should be addressed to **Dr. Vinayak Narayanrao Waghmare**

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