

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Zooplankton Diversity in a Freshwater Body of Ketkawale Village.

Anju Yogesh Mundhe*, and Hemant Dhamke.

Zoology Department, Dr D Y Patil ACS College, Pimpri, Pune 18, Maharashtra, India.

ABSTRACT

Zooplankton can be potential bioindicators due to their sensitivity to changes in water quality and environmental conditions. Ketkawale village, located in the state of Maharashtra, is gradually gaining popularity due to its Balaji temple. Water samples from a local water body were collected and observed under the microscope. Zooplanktons were identified by their shape, size and locomotion. Total 16 zooplanktons were identified; belong to nine different phyla. The present study provides the baseline data on zooplankton diversity in Ketkawale village.

Keywords: Biodiversity, Pollution, Ketkawale, Arthropoda

**Corresponding author*

INTRODUCTION

Zooplanktons are eukaryotic organisms, free floating in the water body. Zooplanktons are microscopic organism shows heterotrophic mode of nutrition, feeding on microalgae, bacteria etc. In the food chain zooplanktons are primary consumers. Zooplanktons are food of other zooplankton, insects and fishes. In this way, zooplanktons play an important role in the food web and maintain the critical balance in the water body.

Zooplanktons are unicellular organisms. It is a diverse group in which different species belong to the different phylum like Arthropoda, Cnidaria, Mollusca, Chordata and Echinodermata. The waterbodies are contaminated with different chemicals and pesticides. It is resulted into the changed abiotic factors of water like pH, salinity, nutrient content etc. Zooplanktons are primary consumers that get exposed to the contaminants through water and algae, by the process of biomagnification high levels of contaminants are accumulated in them. Zooplanktons are important bioindicators of health status of the water body [1, 2].

Ketkawale village is located in the Purandar tehsil of Pune district in Maharashtra, India. It is a small village of 483 hectares. The Balaji Temple adds significant aesthetic value to the area. It is a popular tourist place. The village is situated over 585 meters above sea level. Many studies related to freshwater bodies showed biodiversity loss due to changes in abiotic factors like pH, dissolved oxygen, phosphorus etc. [3, 4].

Overall evaluation of zooplankton diversity is important to check the health status of the water body with respect to aquatic food web and pollution [5]. Research data related to this topic is currently unavailable for Ketkawale village. Hence the objective of present study is to evaluate the diversity of zooplankton in the local water body of Ketkawale village.

MATERIALS AND METHODS

The selected reservoir is the local water body of Ketkawale (18.26000, 73.93758), from Pune district. From this reservoir water samples were collected to observe diversity of zooplanktons. The study was conducted for the period of October 2023 to December 2023.

Zooplankton samples were collected with plankton net. After collection 4% formalin was added to preserve the samples. The collected samples were used for zooplankton observation in the laboratory under the microscope.

RESULT AND DISCUSSION

Table 1: List of Zooplankton species present in the water body of Ketkawale village, Pune Dist, Maharashtra, India

Sr No	Zoplankton Genus	Order	Family
1	<i>Amoeba proteus</i>	Protozoa	Amoebidae
2	<i>Daphnia</i>	Anomopoda	Daphniidae
3	<i>Bosmina longirostris</i>	Anomopoda	Bosminidae
4	<i>Potamocypis</i>	Podocopida	Cyprididae
5	<i>Simocephalus vetulus</i>	Diplostraca	Daphniidae
6	<i>Bacillaria paradoxa</i>	Bacillariales	Bacillariaceae
7	<i>Ceriodaphnia quadrangula</i>	Cladocera	Daphniidae
8	<i>Stentor</i>	Heterotrichida	Stentoridae
9	<i>Actinophrys</i>	Actinophryida	Actinophryidae
10	<i>Monostyla</i>	Ploima	Lecanidae
11	<i>Euglypha</i>	Euglyphida	Euglyphidae
12	<i>Rhabditis</i>	Rhabditida	Rhabditidae
13	<i>Paramoecium caudatum</i>	Peniculida	Parameciidae
14	<i>Paramoecium aurelia</i>	Peniculida	Parameciidae
15	<i>Vorticella</i>	Peritrichida	Vorticellidae
16	<i>Euglena</i>	Euglenales	Euglenaceae

In the present study 16 zooplanktons were observed. Water samples with formalin were used for microscopic observation at 10 and 40 magnification. A total of 13 water samples were collected from the local water body of Ketkawale village. From these water samples different freshwater protozoans like flagellates, ciliates, amoebae etc were observed (Fig 1).

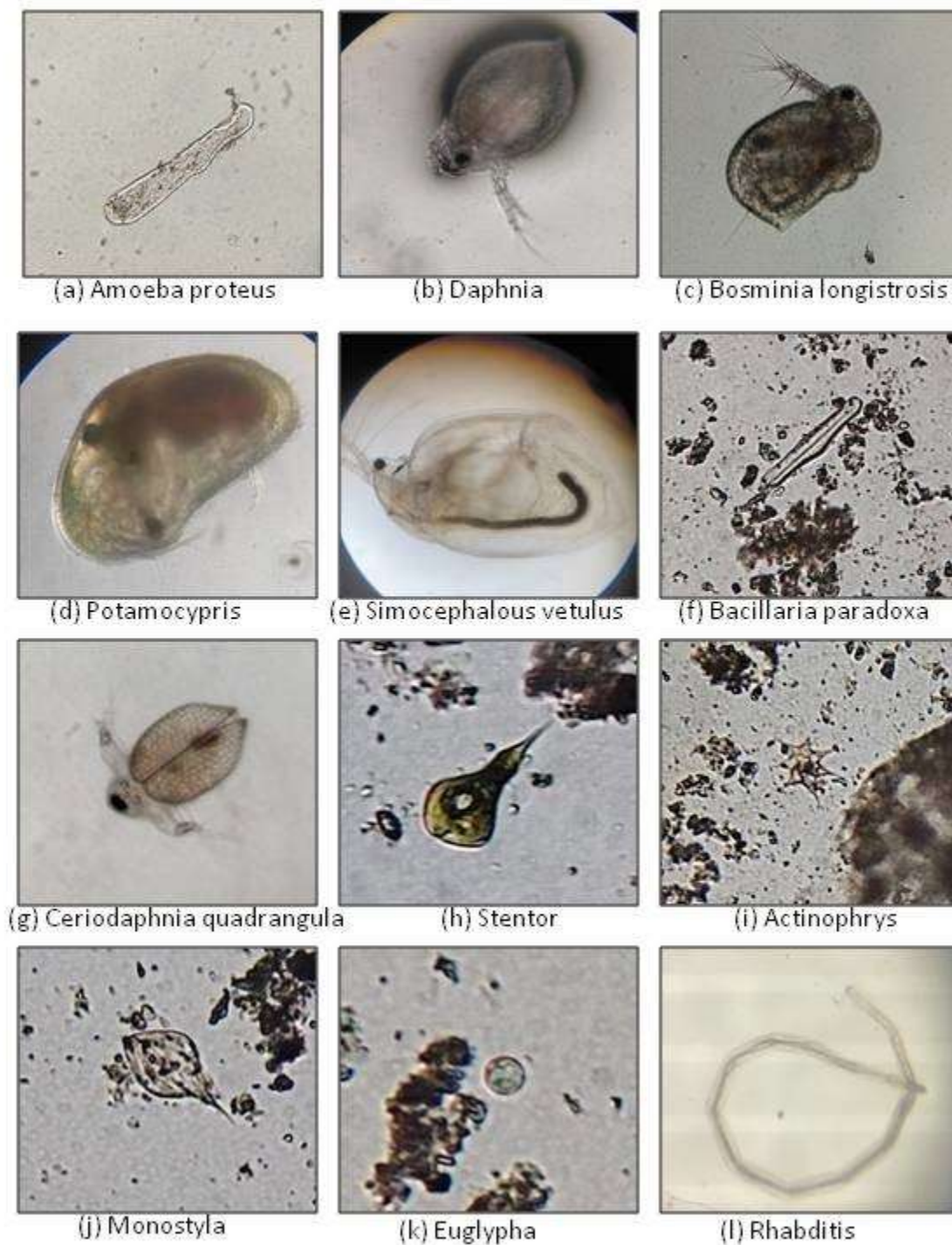


Figure 1: Diversity of Zooplanktons in the water body of Ketkawale village, Pune Dist, Maharashtra, India.

The present study recorded a total of 16 zooplanktons belonging to 12 orders and 15 families during the three months (Table 1). We observe 14 zooplanktons each belonging to 14 different families. While two species from the Parameciidae family. Pawar and Supugade (2017) reported 66 species of zooplanktons with their density in freshwater bodies around Satara, India [6]. Vanjare et al. (2023) reported the 73 species of zooplanktons from the urban riverine habitats of Pune, India [7]. In the *Potamocypis* red color pigmentation was observed. It denotes the low dissolved oxygen in the water [7]. This color change occurs due to haemoglobin production in response to low dissolved oxygen in the water. It shows the potential of zooplankton as a bioindicator [8]. Around 14 species of zooplanktons were documented from the ujani dam of Indapur Tehsil Maharashtra [9]. Kashyap and Paul (2024) identified 16 zooplanktons from the Gomti river, Lucknow [10]. Zooplankton diversity of Ganga lake and water parameter analysis carried out by Nanda et al (2020), and highlight the importance of study to know the status of water body [11].

CONCLUSION

Present study shows the different fresh water protozoans were present in the temporary water body site of Ketkawale village. As we know they are playing an important role in the maintenance of aquatic food web. There is a need to study the effect of seasonal variation of zooplankton diversity. In the current study five zooplanktons were belong to the phylum Arthropoda, three from phylum Ciliophora. *Amoeba*, *Bacillaria*, *Actinophrys*, *Monostyla*, *Euglypha*, *Rhabditis*, *Euglena* were belong to seven respective phylums Amoebozoa, Bacillariophyta, Ochrophyta, Rotifera, Cercozoa, Nematoda, Euglenozoa. Conducting such studies is important to understand the changing state of biodiversity with increasing anthropogenic activities.

ACKNOWLEDGMENT

Authors are thankful to Principal Dr. Ranjit Patil (Unitech Society, Dr D. Y. Patil ACS College, Pimpri, Pune -18) for his continuous support during project.

REFERENCES

- [1] Kar S, Das P, Das U, Bimola M, Kar D, Aditya G. Correspondence of zooplankton assemblage and water quality in wetlands of Cachar, Assam, India: Implications for environmental management. *Limnol Rev* 2018; 18(1): 9.
- [2] Boldrocchi G, Villa B, Monticelli D, Spanu D, Magni G, Pachner J, Bettinetti R. Zooplankton as an indicator of the status of contamination of the Mediterranean Sea and temporal trends. *Mar Pollut Bull* 2023; 197: 115732.
- [3] Padmavati G, Goswami SC. Zooplankton ecology in the Mandovi-Zuari estuarine system of Goa, west coast of India. *Indian J Geo-Mar Sci* 1996; 25(3): 268-273.
- [4] Arora J, Mehra NK. Seasonal dynamics of rotifers in relation to physical and chemical conditions of the river Yamuna (Delhi), India. *Hydrobiologia* 2003; 491: 101-109.
- [5] Ritchie H, Roser H. Urbanization. Published online at OurWorldInData.org. <https://ourworldindata.org/urbanization> Accessed on 1 March 2023.
- [6] Pawar SM, Supugade VB. Zooplankton diversity and density in some freshwater bodies around Satara (M.S.), India. *Int J Res Biosci Agric Technol* 2017; 5(3): 49-51.
- [7] Vanjare AI, Shinde YS, Padhye SM. Faunistic overview of the freshwater zooplankton from the urban riverine habitats of Pune, India. *Int J Res* 2023; 15(9): 23879-23888.
- [8] Jeppesen E, Nøges P, Davidson TA, Haberman J, Nøges T, Blank K, Lauridsen TL, Søndergaard M, Sayer C, Laugaste R, Johansson LS, Bjerring R, Amsinck SL. Zooplankton as indicators in lakes: a scientific-based plea for including zooplankton in the ecological quality assessment of lakes according to the European Water Framework Directive (WFD). *Hydrobiologia* 2011; 676: 279-297.
- [9] Kare S, Hole R. To study diversity of zooplanktons from Ujani dam of Indapur Tehsil Maharashtra. *Int J Multidiscip Res* 2025; 7(2): 1-6.
- [10] Kashyap K, Paul N. Isolation of freshwater protozoan from Gomati river, Lucknow. *Int J Sci Res Arch* 2024; 11(2): 1697-1701.
- [11] Nanda P, Sinha B, Muthu J, Sharma H. Study of Zooplankton Diversity of Ganga Lake (GyakarSinyik) of Itanagar, Eastern Himalayas, India, using Foldscope. *Bull Pure Appl Sci* 2020; 39: 516-523.