International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Diversity of Zooplankton in Vidani Dam of Phaltan Tehsil (MS) India

Kishor More[1], Priyanka Abhang[2]

[1]Assistant Professor, Department of Zoology, Tuljaram Chaturchand College, Baramati
[2]P.G. Student, Department of Zoology, Tuljaram Chaturchand College, Baramati

ABSTRACT
Zooplankton by their heterotrophic activity play a key role in cycling of organic materials in aquatic ecosystems and are used as bioindicators of environmental quality. The present study deals with zooplankton diversity in a reservoir of Phaltan Tehsil, Maharashtra. A total of 13 species belonging to two phyla, Arthropoda and Rotifera, were recorded. These were grouped into Rotifera, Copepoda, Cladocera and Ostracoda. The study highlights ecological importance of zooplankton in maintaining aquatic food chain and ecosystem balance.

Keywords: Reservoir, Zooplankton, Diversity, Ecosystem

INTRODUCTION

Zooplankton are a vital part of both freshwater and marine ecosystems, serving an important function in aquatic food webs by connecting primary producers to higher-level consumers like fish. They exhibit high sensitivity to environmental changes and are often utilized as dependable indicators of water quality and the health of ecosystems. The variety, distribution, and population size of zooplankton are affected by numerous biotic and abiotic factors, such as temperature, dissolved oxygen levels, nutrient availability, and seasonal changes. The classification, distribution, and ecological relevance of freshwater zooplankton in tropical regions have been thoroughly examined, underscoring their adaptive mechanisms and significance in aquatic ecosystems (Dussart et al., 1984). Numerous studies have pointed out that zooplankton communities show unique spatial and temporal changes influenced by environmental factors. For example, the patterns of emergence and seasonal fluctuations of zooplankton populations are closely linked to variations in the physico-chemical characteristics of water bodies (Gaikwad et al., 2008; Pawar, 2016). Freshwater ecosystems, including reservoirs, lakes, and wetlands, are home to a diverse array of zooplankton species. Research conducted across different freshwater habitats has shown differences in zooplankton composition attributed to varying ecological conditions and human impact (Goswami & Mankodi, 2012; Pradhan, 2014; Kar & Kar, 2016). Likewise, studies focusing on reservoir ecosystems indicate that the diversity of zooplankton serves as a key indicator of trophic status and water quality (Kadam, 2016).Zooplankton diversity is also significantly influenced by physico-chemical parameters such as pH, temperature, and nutrient levels, which regulate their distribution and abundance (Majumder et al., 2015; Siddique & Kale, 2018). Seasonal studies have further revealed that zooplankton populations fluctuate throughout the year, often showing peak abundance during specific seasons due to favorable environmental conditions (Pawar, 2016). Various researchers have documented the biodiversity of zooplankton in different aquatic habitats, emphasizing their ecological importance and role in maintaining

ecosystem stability (Kulkarni & Mukadam, 2015; Sehgal et al., 2013; Shinde et al., 2012). In addition, studies on coastal and marine ecosystems have indicated that zooplankton diversity is equally significant in saline environments, contributing to nutrient cycling and energy transfer (Santhanam & Perumal, 2003). The present investigation focuses on assessing zooplankton diversity in a reservoir of Phaltan Tehsil and evaluating its ecological status. Such studies are important for understanding local biodiversity patterns and for developing effective strategies for conservation and sustainable management of freshwater resources.

MATERIAL AND METHODS

The current investigation was carried out in a freshwater reservoir close to Vidani hamlet in the Satara district of Maharashtra's Phaltan Tehsil. A normal plankton net was used to capture zooplankton samples between 9:00 and 11:00 AM during the study period. The zooplankton species were concentrated by filtering surface water via the plankton net. To stop decomposition and preserve the organisms' structural integrity, the gathered samples were carefully placed into sterile sample bottles and preserved in a 4% formalin solution right away. The preserved samples were inspected under a microscope in the lab, and zooplankton were identified using available literature and standard identification keys up to the potential taxonomic level (Santhanam & Perumal, 2003).

RESULT AND DISCUSSION

The present investigation recorded a total of 12 zooplankton taxa belonging to four major groups: Rotifera, Copepoda, Cladocera, and Ostracoda from the reservoir of Phaltan Tehsil. Among these groups, Copepoda was dominant with 5 taxa, followed by Rotifera (3 taxa), Cladocera (3 taxa), and Ostracoda (2 taxa). Rotifera was represented by *Brachionus calyciflorus, Brachionus spp*., and *Trichocerca similis*. Copepoda showed higher diversity with *Calanus finmarchicus*, *Eucyclops spp*., *Cyclops spp*., and *Acritas typicus*. Cladocera included *Chydorus spp*., *Diaptomus spp*., and *Daphnia pulex*, while Ostracoda comprised *Cypridopsis pigra* and *Eucypris spp*.The dominance of Copepoda in the present study indicates their adaptability to prevailing environmental conditions, which is in agreement with earlier reports (Goswami & Mankodi, 2012; Shinde et al., 2012).

The presence of rotifers, particularly *Brachionus calyciflorus*, suggests nutrient-rich conditions, as these organisms are commonly associated with eutrophic water bodies (Dussart et al., 1984; Kadam, 2016). Cladoceran species such as *Daphnia pulex* indicate favorable ecological conditions and play a significant role in aquatic food chains, supporting findings by Kulkarni and Mukadam (2015). The occurrence of Ostracoda, though limited, reflects their tolerance to a range of environmental conditions (Siddique & Kale, 2018). Overall, the zooplankton composition observed in the present study suggests that the reservoir is moderately productive with slight eutrophic characteristics, influenced by environmental and seasonal factors, as also reported in similar freshwater ecosystems (Majumder et al., 2015; Pawar, 2016).

Sr. No.	Group	Genus	Species
1	Rotifera	*Brachionus*	*Brachionus calyciflorus*
2	Rotifera	*Brachionus*	*Brachionus spp.*
3	Rotifera	*Trichocerca*	*Trichocerca similis*
4	Copepoda	*Calanus*	*Calanus finmarchicus*
5	Copepoda	*Eucyclops*	*Eucyclops spp.*

6	Copepoda	*Cyclops*	*Cyclops spp.*(2)
7	Copepoda	*Acritas*	*Acritas typicus*
8	Cladocera	*Chydorus*	*Chydorus spp.*
9	Cladocera	*Diaptomus*	*Diaptomus spp.*
10	Cladocera	*Daphnia*	*Daphnia pulex*
11	Ostracoda	*Cypridopsis*	*Cypridopsis pigra*
12	Ostracoda	*Eucypris*	*Eucypris spp.*

Table no. 1: Observed zooplankton species

CONCLUSION

The present study revealed a moderate diversity of zooplankton (12 taxa) belonging to four major groups, with Copepoda as the dominant group, followed by Rotifera, Cladocera, and Ostracoda. The occurrence of indicator species such as *Brachionus calyciflorus* and *Daphnia pulex* suggests that the reservoir possesses moderately productive conditions with slight eutrophic characteristics. Overall, the zooplankton assemblage reflects a relatively stable aquatic ecosystem influenced by environmental and seasonal factors. The findings highlight the importance of zooplankton as bioindicators for assessing water quality and ecological status, and emphasize the need for regular monitoring and sustainable management of the reservoir to maintain its ecological balance.

REFERENCES

1. Dussart, B. H., Fernando, C. H., Matsumura-Tundisi, T., & Shiel, R. J. (1984). A review of systematics, distribution and ecology of tropical freshwater zooplankton. Hydrobiologia, 113, 77–91.
2. Gaikwad, S. R., Ingle, K. N., & Thorat, S. R. (2008). Study of zooplankton emergence pattern. Journal of Environmental Biology, 29(3), 353–358.
3. Goswami, A. P., & Mankodi, P. C. (2012). Study on zooplankton of freshwater reservoir. ISCA Journal of Biological Sciences, 1(1), 30–34.
4. Kadam, S. S. (2016). Zooplankton diversity of reservoir. International Journal of Research and Review, 3, 53–59.
5. Kar, S., & Kar, D. (2016). Zooplankton diversity of freshwater wetland. International Journal of Advanced Biotechnology, 7(2), 614–620.
6. Kulkarni, A., & Mukadam, M. (2015). Zooplankton diversity study. International Journal of Scientific Research Publications, 5(6), 1–3.
7. Majumder, S., et al. (2015). Zooplankton diversity influenced by parameters. International Journal of Advanced Research, 3(5), 354–368.
8. Pawar, R. T. (2016). Zooplankton diversity and seasonal variation. International Journal of Environmental Sciences, 6(5), 718–725.
9. Pradhan, V. P. (2014). Zooplankton diversity in freshwater lake. International Journal of Life Sciences, 2(3), 268–272.
10. Santhanam, P., & Perumal, P. (2003). Zooplankton diversity in coastal waters. Journal of Marine Biological Association of India, 45(2), 144–151.
11. Sehgal, K., et al. (2013). Studies on zooplankton diversity. Advances in Applied Science Research, 4(1), 417–420.

12. Shinde, S. E., Pathan, T. S., & Sonawane, D. L. (2012). Zooplankton biodiversity. Journal of Environmental Biology, 33(4), 741–745.
13. Siddique, K. F., & Kale, M. K. (2018). Zooplankton diversity and parameters. International Journal, 4(6), 308–319.