

Original Article

A STUDY OF SEASONAL ZOOPLANKTON PROPORTION FROM SUNEGAON LAKE TALUKA LOHA DIST. NANDED (M.S.), INDIA

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ABSTRACT

The stability of the freshwater ecosystems around the world is being threatened by a number of different factors. Zooplanktons are extremely useful indicators of environmental stresses due to the fact that they are sensitive to disturbances from the outside world. Furthermore, this work provides a valuable resource for the management of the health of aquatic ecosystems and the preservation of aquatic biodiversity. At each of the five locations where samples were collected on an annual basis, seasonal variations were observed exhibiting themselves. Following an examination of the sample, it was discovered that there were zooplankton species present. These species included rotifers, copepods, cladocera, and ostracoda. The analysis of zooplankton is to be performed with the help of Sedgwick Rafter Cell Method in the laboratory.

Keywords: Ecosystems, Biodiversity, Zooplankton, and Sedgwick Rafter Cell Method

INTRODUCTION

The freshwater ecosystems, which include reservoirs, dams, lakes, ponds, and tanks, are indisputable proof that they are the most important sources of drinking water and irrigation water [Khiradkar et al. \(2017\)](#). During certain periods, a greater number of zooplanktons are consumed, and these zooplanktons function as environmentally beneficial indicators. It is imperative to have a comprehensive understanding of the abundance, distribution, and community composition of zooplankton in order to comprehend the operation of aquatic ecosystems and to enhance their functionality. The zooplankton community is composed of a variety of zooplankton types, in addition to phytoplankton. These enable primary producers and the upper trophic levels, including fish, to communicate directly with one another. The majority of fish depend on zooplankton as their primary source of nutrition during their larval stages [Ingale et al. \(2024\)](#). Additionally, certain fish continue to obtain their sustenance from zooplankton for the duration of their lives. The assessment of the variety to estimate the zooplankton proportion (rotifera, copepoda, cladocera, and ostracoda) from the freshwater Sunegaon lake can therefore provide insight into the ecological quality of aquatic environments. For the purpose of providing support for India's expanding economy and population, it is essential to ensure the sustainable management of lake water supplies [Pangul et al. \(2024\)](#).

MATERIALS AND METHODS

An examination of the zooplankton proportion of the water in Sunegaon lake is the subject of this research article. Sunegaon lake in Loha taluka, Nanded district is one of the important water body and as per our knowledge no literature is available on zooplankton

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Received: 10 February 2026; Accepted: 21 March 2026; Published 30 April 2026

DOI: [10.29121/JISSI.v2.i1.2026.59](https://doi.org/10.29121/JISSI.v2.i1.2026.59)

Page Number: 133-136

Journal Title: Journal of Integrative Science and Societal Impact

Journal Abbreviation: J. Integr. Sci. Soc. Impact

Online ISSN: 3108-2165, Print ISSN: 3108-1959

Publisher: Granthaalayah Publications and Printers, India

Conflict of Interests: The authors declare that they have no competing interests.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Authors' Contributions: Each author made an equal contribution to the conception and design of the study. All authors have reviewed and approved the final version of the manuscript for publication.

Transparency: The authors affirm that this manuscript presents an honest, accurate, and transparent account of the study. All essential aspects have been included, and any deviations from the original study plan have been clearly explained. The writing process strictly adhered to established ethical standards.

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study. Sunegaon lake water was chosen for the purpose of conducting research on the zooplankton proportion with five sampling stations (A, B, C, D and E). The sampling of water that was carried out between the months of July 2023 and June 2024 has been completed.

The monsoon, winter and summer seasons were the three main research periods. The process of gathering zooplankton samples at random involved passing 100 lit. of water over a zooplankton net composed of bolting silk. The zooplankton samples were preserved using a suitable glass container and 4% formalin. The sample should be placed in a "Sedgwick rafter counting cell" using the Sedgwick Rafter plankton method [Adoni \(1985\)](#). The sample should be one milliliter in volume. Zooplankton was examined using a binocular magnifying lens and a number of different intensities of magnification. During the process of counting zooplankton in the counting chamber, various standard keys that were proposed by [Needham and Needham \(1962\)](#) and [Altaf \(2004\)](#) were utilized to identify and differentiate specific zooplankton.

SEDGWICK RAFTER CELL METHOD

Counting of the organisms was done by following formula.

$$n = \frac{(a \times 1000) \times C}{I}$$

n = Number of plankton/litre of water.

a = Average of plankton in one small chamber.

C = ml. of plankton concentration.

I = Volume of original water filtered in litre.

RESULTS AND DISCUSSION

For the purpose of determining the percentage of zooplankton that is present in Sunegaon lake, five sampling stations, namely A, B, C, D and E, were chosen [Figure 1](#) to [Figure 5](#). These sampling stations were chosen on the basis of four different groups, namely rotifera, cladocera, copepoda, and ostracoda. The findings of the current study indicate that the highest number of zooplankton was observed during the winter and summer season, while the lowest number was observed during the monsoon season. Additionally, a moderate proportion of zooplankton was recorded during the summer season from each of the five sampling stations. In which the station - C, B, A and D showing maximum proportion of rotifer and cladocera during winter season and station - C, D, A and B copepoda and station - C, A, D and B ostracoda showing maximum proportion respectively, while minimum zooplankton proportion at station - E during monsoon season with respective group of rotifera, cladocera, copepoda, and ostracoda. The present results corroborated with findings of [Ingale et al. \(2016\)](#), [Ingale et al. \(2018\)](#) and [Ingale et al. \(2024\)](#) from different lake ecosystem.

Figure 1

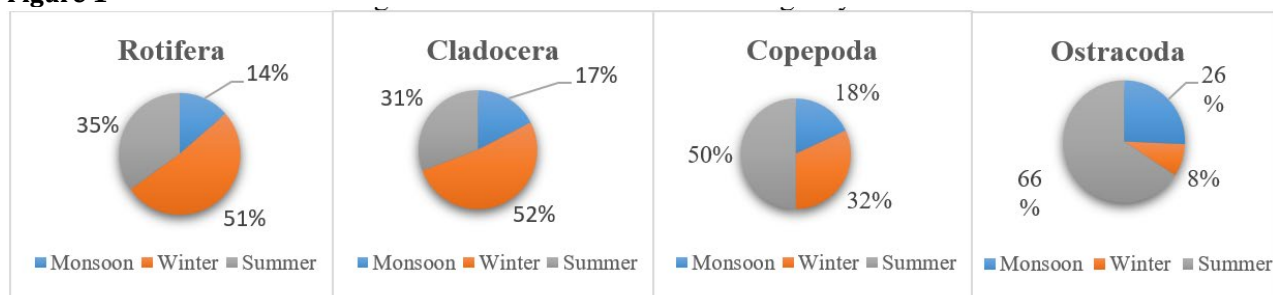


Figure 1 Pie Diagram Showing Seasonal Variation (%) of Zooplankton Group from Sunegaon Lake from Station - A during July 2023- June 2024.

Figure 2

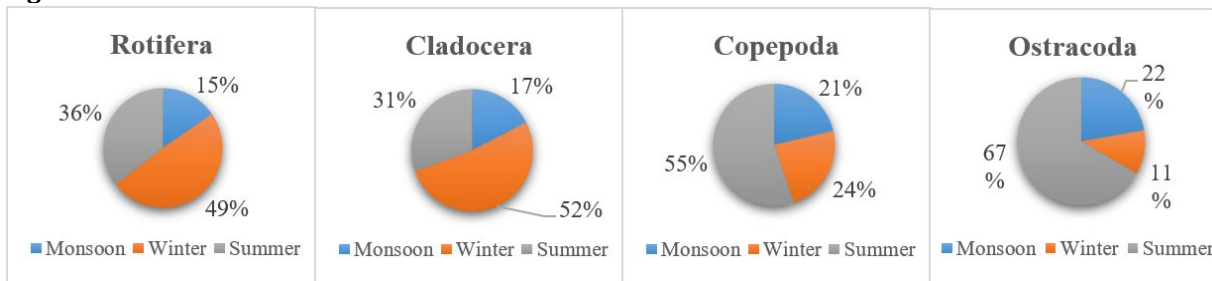


Figure 2 Pie Diagram Showing Seasonal Variation (%) of Zooplankton Group from Sunegaon Lake from Station - B During July 2023- June 2024.

Figure 3

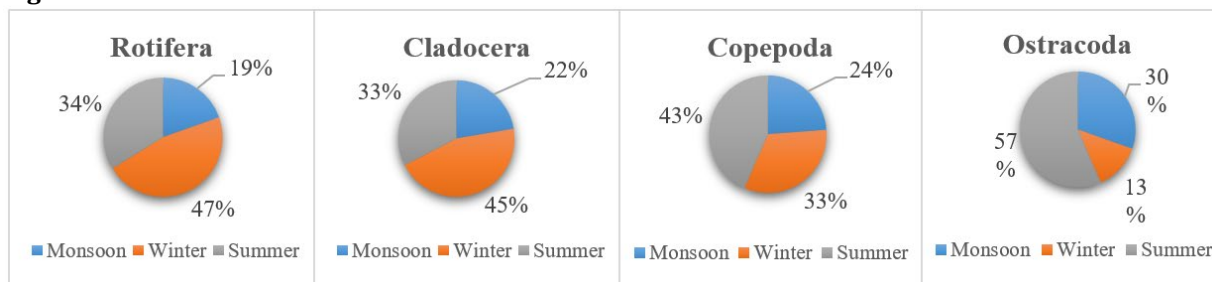


Figure 3 Pie Diagram Showing Seasonal Variation (%) of Zooplankton Group from Sunegaon Lake from Station - C during July 2023- June 2024.

Figure 4

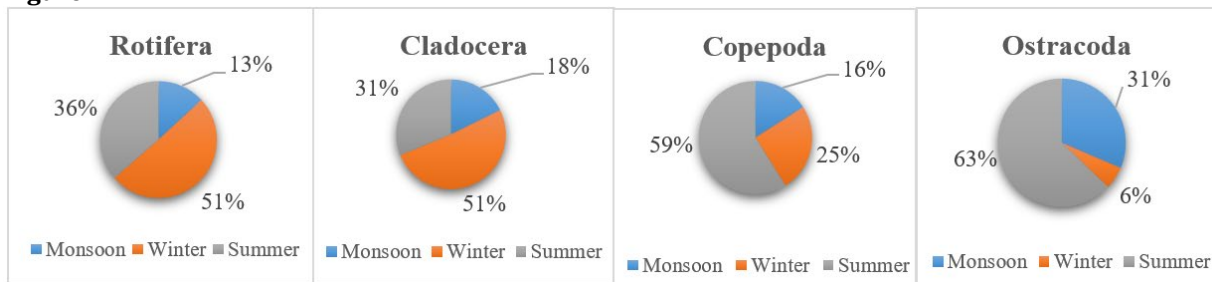


Figure 4 Pie Diagram Showing Seasonal Variation (%) of Zooplankton Group from Sunegaon Lake from Station - D during July 2023- June 2024.

Figure 5

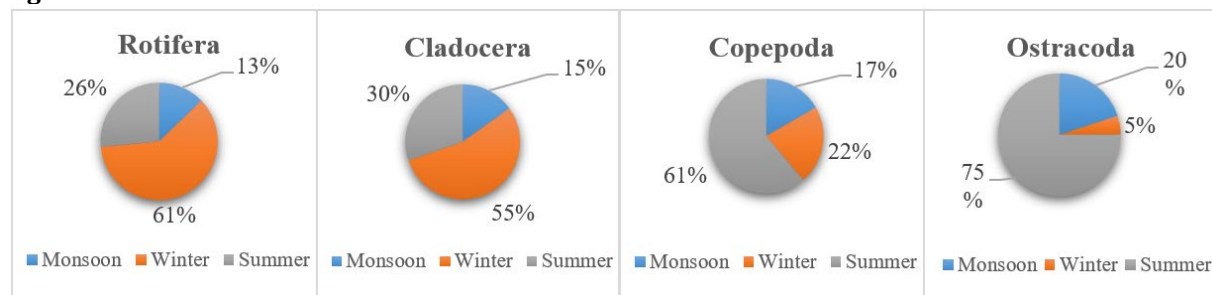


Figure 5 Pie Diagram Showing Seasonal Variation (%) of Zooplankton Group from Sunegaon Lake from Station - E during July 2023- June 2024.

CONCLUSION

The findings of the study indicate that this course of action is of great significance from an ecological and environmental point of view respectively. According to the findings of this research, the number of rotifers, cladocerans was at its highest during the winter and copepods and ostracoda during summer season, while went down to its lowest during the monsoon season. All through the year, the zooplankton make their niche there. Fish can benefit greatly from consuming them as a source of food. Consequently, there ought to be a great deal of fish in Sunegaon Lake.

ACKNOWLEDGMENTS

Mahajyoti supported this research with a grant. This research could not have been done without the support given by Mahajyoti. I would also like to acknowledge Mahajyoti due to their financial assistance and resources they gave me to help in the process of research. Additionally, I thanks to Prof. Dr. Vilas Aghav – Principal, Prof. Dr. B.S. Salve - Head, Dept. of Zoology, Prof. Dr. P. P. Joshi – Faculty Dept. of Zoology, and Dr. S. S. Nagarkar - Co-ordinator, Research center of Adarsha Education society, Arts, commerce and Science College, Hingoli, for providing research facilities in place of research.

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