

## DIVERSITY OF ZOOPLANKTON IN WAN RIVER FLOWING LOWER STREAM TO HANUMAN SAGAR DAM, WARI, DIST. AKOLA, MAHARASHTRA

R.S. Mankar

Shri Shivaji Arts, Commerce and Science College, Akot

M.V. Shirbhate

Shakaralal Khandelwal Arts, Commerce and Science College, Akola

### Abstract

The study was conducted during February 2021 to January 2023 to assess the biodiversity of zooplankton in Wan River Flowing Lower Stream to Hanuman Sagar Dam of Wari, Dist. Akola, Maharashtra, India. The effective protocol was adopted. The study revealed the rich zooplankton diversity. During the period of investigation, 51 species belonging to four groups namely Rotifera, Cladocera, Ostracoda and Copepoda were identified. The maximum number of individuals was observed during winter and lower by summer and monsoon. The Rotifers were obtained in maximum quantity while Cladocera, Copepoda and Ostracoda showed the moderate population.

**Keywords:** Diversity, Zooplankton, Wan River, Hanuman Sagar Dam, Wari.

### Introduction

Among entire aquatic biota, the zooplanktons are one of the important biological indicators that represent the health of water body. Zooplanktons are tiny animals suspended in the water column. Like phytoplankton, these species have developed mechanisms that keep them from sinking to deeper waters, including drag-inducing body forms and the active flicking of appendages such as antennae or spines (Singh *et al.*, 2021). Plankton are organisms drifting in oceans, seas, and bodies of fresh water. Individual zooplanktons are usually microscopic, but some are larger and visible to the naked eye. Zooplankton is a categorization spanning a range of organism sizes including small protozoans and large metazoans (Barskar and Kumar, 2022). It includes holoplanktonic organisms whose complete life cycle lies within the plankton, as well as meroplanktonic organisms that spend part of their lives in the plankton before graduating to either the nekton or a sessile, benthic existence. Although zooplankton are primarily transported by ambient water currents, many have locomotion, used to avoid predators or to increase prey encounter rate (Surachita, and Palita, 2023).

The study was conducted during February 2021 to January 2023 to assess the biodiversity of zooplankton of Wan River Flowing Lower Stream to Hanuman Sagar Dam of Wari, Dist. Akola, Maharashtra, India.

### Materials and Methods

Wan reservoir is also known as Hanuman Sagar. It is located between 21.183611°N and 76.804047°E on wan river at the site of Wari village in Telhara

Taluka of Akola District in Maharashtra, India. This is one of the largest irrigation projects in the Indian state of Maharashtra. The water is mainly used to irrigate agricultural land in the western Vidarbha. It also provides water for drinking to nearby towns, villages and Cities like Akola, Telhara and Shegaon. The surrounding area of the dam has a garden old Hanumana temple. The height of the dam above its lowest foundation is 67.65 m (221.9 ft) while the length is 500 m (1,600 ft). The volume content is 599 km<sup>3</sup> (144 cu mi) and gross storage capacity is 0.081 km<sup>3</sup> (0.019 cu mi). During monsoon reservoir gets enough water but in post monsoon period particularly March and April water level is very much reduced. The reservoir is surrounded by red laterite soil and black cotton soil. The inland reservoir is fed by seasonal drainage to its periphery and nearby local streams and springs (Gazetteer of Maharashtra, 2022).

After detailed survey of the lake, convenient stations were fixed for study. Water samples were collected from the flowing lower stream of dam from three different spots at early in the morning between 07.00 a.m. to 08.30 a.m. Water samples were collected separately for the study of all the zooplankton. Zooplankton were collected by filtering net known quantity (1000 liter) of water filtered from sampling site through zooplankton net which is made up of fine mesh and zooplankton collected in to 100 ml bottle which is attached at the bottom of net. The samples were preserved in 4% formaldehyde solution and studied for diversity by using standard key literature (Trivedy and Goel, 1986; IAAB, 1992).



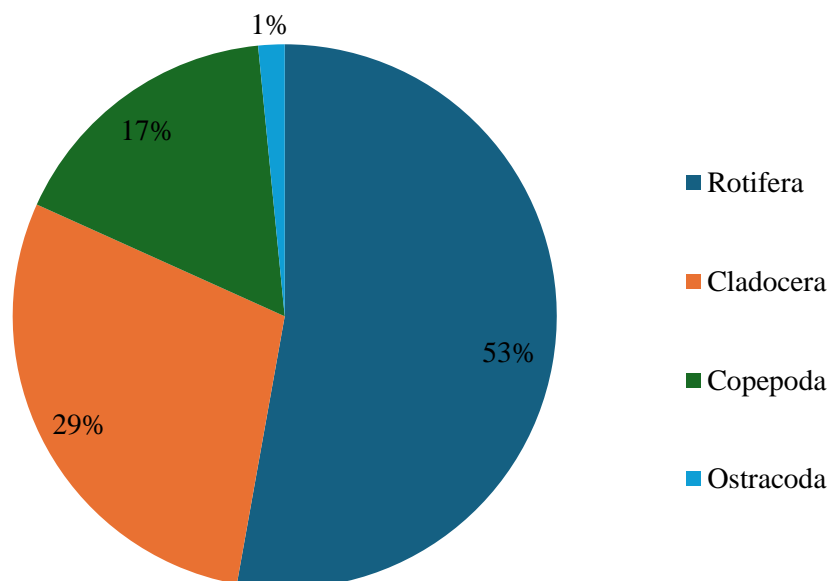
**Figure 1: Map of Hanuman Sagar Dam flowing lower stream**

**Result and Discussion**

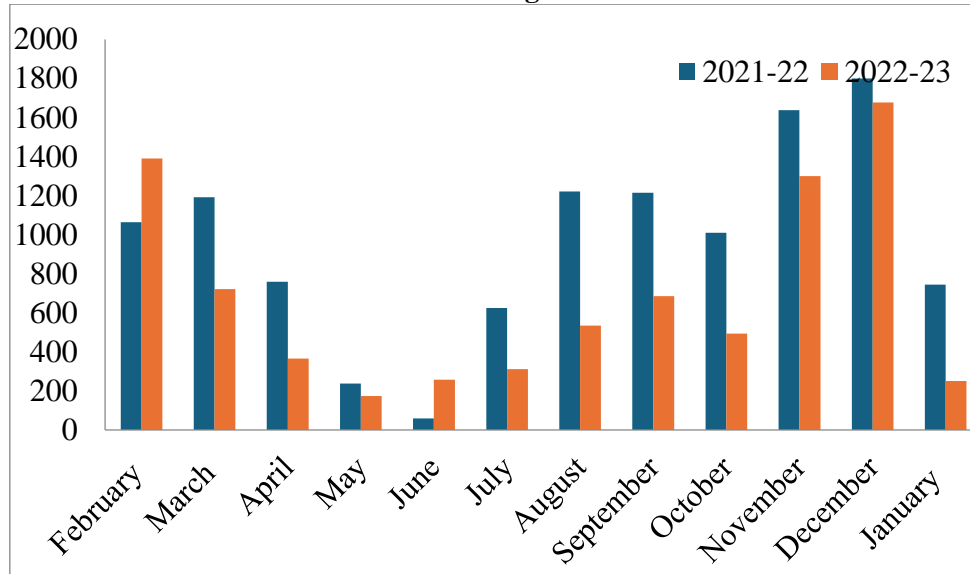
During the period of investigation, species belonging to four groups were identified. The maximum number of individuals was observed during winter and lower by summer and monsoon. The Rotifers were obtained in maximum quantity while Cladocera and Copepoda showed the moderate population. The observed Zooplankton groups with their respective genera composition is shown in Table 1. The observed species

composition was found to be in well agreement with many of previous studies that mainly deals with zooplankton diversity of similar ecosystem. These recent studies mainly included Patra *et al* (2011), Bhoopendra *et al* (2012), Shukla and Hassan (2013), Dutta (2014), Nair *et al.* (2015), Anand *et al* (2016), Kadam (2016), Sivalingam *et al.* (2016), Krishna and Kumar (2017), Narasimman *et al.* (2018), Sivalingam (2018) and name a few.

**Figure 2: Quantitative zooplankton composition at Wan River Flowing Lower Stram to Hanuman Sagar Dam**



**Figure 3: Quantitative analysis of zooplankton (org/L) at Wan River Flowing Lower Stram to Hanuman Sagar Dam**



**Table 1: Zooplankton groups with their respective genera composition**

<b>A] Rotifera</b>	<b>B] Cladocera</b>
1. <i>Ascomypha saltans</i>	1. <i>Bosmina longirostris</i>
2. <i>Asplanchna prodota</i>	2. <i>Ceriodaphnia laticaudata</i>
3. <i>Brachionus bidentata</i>	3. <i>Chydorus sphericus</i>
4. <i>Brachionus calyciflorus</i>	4. <i>Dadaya sp.</i>
5. <i>Brachionus caudate</i>	5. <i>Daphnia laevis</i>
6. <i>Brachionus plicatilis</i>	6. <i>Leydigia acanthocercoides</i>
7. <i>Cephalodella forficulla</i>	7. <i>Macrothrix sp.</i>
8. <i>Colurella obtuse</i>	8. <i>Moina brachiata</i>
9. <i>Conochilus uniformis</i>	9. <i>Moinodaphnia macleayli</i>
10. <i>Epiphanes senata</i>	
11. <i>Euchlanis sp.</i>	<b>C] Ostracoda</b>
12. <i>Filinia longiseta</i>	1. <i>Condonia ohioensis</i>
13. <i>Gastropus minor</i>	2. <i>Cyclocypris sp.</i>
14. <i>Gastropus stylifer</i>	3. <i>Cyprinotus glaucus</i>
15. <i>Harringia rousseleti</i>	4. <i>Cypris subglobosa</i>
16. <i>Hexarthra mira</i>	5. <i>Stenocypris sp.</i>
17. <i>Horella brahmi</i>	
18. <i>Keratella coachlearis</i>	<b>D] Copepoda</b>
19. <i>Keratella hiemalis</i>	1. <i>Cyclops sp.</i>
20. <i>Keratella quadrata</i>	2. <i>Diaptomus edax</i>
21. <i>Keratella tropica</i>	3. <i>Diaptomus marshianus</i>
22. <i>Keratella vulga</i>	4. <i>Eucyclops agilis</i>
23. <i>Lacane luna</i>	5. <i>Nauplii sp.</i>
24. <i>Lepadella ovalis</i>	6. <i>Senecel calanoides</i>
25. <i>Limnias melicerata</i>	
26. <i>Monommata grandia</i>	
27. <i>Monostyla lunais</i>	
28. <i>Monostyla mucronata</i>	
29. <i>Notholca acuminata</i>	
30. <i>Philodina roseola</i>	
31. <i>Trichocerca sp.</i>	

## Conclusion

During the period of investigation, 51 species belonging to four groups namely Rotifera, Cladocera, Ostracoda and Copepoda were identified. The maximum number of individuals was observed during winter and lower by summer and monsoon. The Rotifers were obtained in maximum quantity while Cladocera, Copepoda and Ostracoda showed the moderate population. The study revealed the rich zooplankton diversity. The observed status of zooplankton diversity was mostly related to the studied physicochemical parameters.

## References

- Anand YA, Linz BG and HN Highland (2016). Study of Physico-Chemical Parameters Ahmedabad, Gujarat, India. *International Research Journal of Environment Sciences* 5(7): 1-6.
- Barskar K and J. M. Kumar (2022). Assessment of Zooplankton Diversity of New Constructed Reservoir Bisnoor Pachdhar Reservoir in District, Betul, MP. *Uttar Pradesh Journal Of Zoology*, 43(17): 12-19.
- Bhoopendra K, Vipul S, Kuldeep G and M Sharma (2012). Studies on Phosphate in Reference to Zooplankton: a Short Review. *Bulletin of Environment, Pharmacology and Life Sciences*, 1(5): 71-81.
- Dutta S (2014). Monthly variations in physico-chemical characteristics of water, MPN index and zooplankton of Devak stream, at Shiv temple complex, Udhampur, Jammu, India. *Journal of Applied and Natural Science* 6 (2): 816 – 824.
- IAAB (1999). *Methodology for water analysis*, IAAB publication Hyderabad, pp 89.
- Kadam SS (2016). Zooplankton Diversity of Bhogaon Reservoir in Parbhani District Maharashtra, India. *International Journal of Research & Review* 3(6):52-60
- Krishna P and H Kumar (2017). Seasonal Variations of Zooplankton Community in Selected Ponds at Lake Kolleru Region of Andhra Pradesh, India. *Int.J.Curr.Microbiol.App.Sci.* 6(8): 2962-2970
- Manickam N, Saravana B, Santhanam P, Muralisankar T, Srinivasan V., Vijayadevan K. and R Bhuvaneswari (2015). Biodiversity of freshwater zooplankton and physico-chemical parameters of Barur Lake, Tamilnadu, India. *Malaya Journal of Biosciences* 2(1):1-11
- Nair MS, Reshma JK, Anu M and A Ashok (2015). Effect of Water Quality on Phytoplankton Abundance in Selected Ponds of Nedumangad Block anchayat, Kerala. *Emer Life Sci Res* 1(2): 35-40.
- Narasimman M, Periyakali S and P Santhanam (2018). Impact of seasonal changes in zooplankton biodiversity in Ukkadam Lake, Coimbatore, Tamil Nadu, India, and potential future implications of climate change. *The Journal of Basic and Applied Zoology* 79 (15): 1-10.
- Shukla SK and N Hassan (2013). Water Quality Assessment Of Gorama Dam Of Hanumana Rewa (M.P.) India, With Special Reference To Zooplankton. *International Journal of Innovative Research in Science, Engineering and Technology*, 2(6): 2362-2363.
- Singh S., Kumari V., Monalisa M., Gupta B. K. and M. Mohommad (2021). Study on Zooplankton Diversity in A Fresh Water Pond (Raja Bandh) of Jamtara, Jharkhand, India. *International Journal of Advancement in Life Sciences Research*. 4(2) 05- 13.
- Sivalingam P (2018). Physico-Chemical Parameters and Plankton Diversity of Manchiryal Town Lake Adilabad District, Andra Pradesh, India. *Journal of Biotechnology and Bioresearch*. 1(2):1-3
- Sivalingam P Swamy M and T Reddy. (2016). Zooplankton Composition Correlation With Physico Chemical Parameters Bangal Lake, Nirmal, Adilabad District Telangana state. *World Journal Of Pharmacy And Pharmaceutical Sciences*, 5(5): 897-904
- Surachita, S and S Palita (2023). "Evaluating the Effect of Physico-Chemical Parameters on Ichthyofaunal Diversity of a Lentic Waterbody in Eastern Ghats, India." *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences*, 93: 935 - 944.
- Trivedi RK and PK Goel (1986). *Chemical and biological methods for water pollution studies environmental Publications, Karad.* 129 pp.