



## “Study of Rotifers Diversity in Pingali Lake from Dahiwadi village, Man Tehsil, Dist. Satara (M.S) India”

A. N. Dede

Department of Zoology, Dahiwadi College Dahiwadi Tal. Man, Dist. Satara, 415508, Maharashtra, India.  
Email - [dedeanand@gmail.com](mailto:dedeanand@gmail.com)

**Abstract:** The present studies investigate that rotifers diversity in Pingali Lake near Dahiwadi Dist. Satara, during Jan 2021 to Dec 2021. During present study period total 10 rotifers species were found belonging to 3 families namely Brachionidae, Filinidae and Asplanchnidae. Rotifers such as *Brachionus forficula*, *Brachionus calyciflorus* and *Filinia opolensis* considered as indicator of eutrophication.

**Key words:** Rotifers, Lake, Diversity, Species.

### 1. INTRODUCTION:

Freshwater bodies are very important for the continuation of dynamic ecosystem contributing immensely in shaping and evolving the biotic and abiotic system. Lakes and ponds play vital role to maintain ecological balance of flora and fauna. Planktonic species like rotifers are pollution indicator species. Rotifers are among the groups of zooplankton with the largest populations in continental waters, commonly dominate the fauna. Rotifers are one of the fascinating groups of zooplankton in aquatic ecosystem. They occur almost commonly in freshwater habitat and make an important group of zooplankton community. This minor phylum consists of approximately 2030 described species [1]. Zooplankton species are acting as bioindicators or not -demands further extensive study on the bioecology of the species.

Zooplankton significantly contributes in the assessments of trophic conditions. They exhibit immediate response to any kind of environmental change and they respond quickly to environmental change and possibly effective indicators of small change in water quality [2]. Several studies have been carried out on the diversity and distribution of zooplanktons in rivers and lakes. These studies provide the existing number of species, their diversity, ecological role and potential value as biological indicators. Biodiversity is the collection of life on globe and involve changes at all ranks of living group from genes to species and species to the ecosystems. Genetic, organism and ecological varieties are all segments of biodiversity including several elements. [20]. Alpha diversity is the variety of species, community, or ecosystem in a specific zone, and is calculated as (the number of species in that zone). Beta diversity can be defined as the variety of species within regions and includes the differentiation the number of species that are special to every zone. Gamma diversity can be defined as amount of total diversity in a zone [20]. Works on rotifer in India is very few, limited and scattered [3]. Therefore, aim of this paper is to study the diversity of rotifers and its play important role in food chain from the study area.

### 2. OBJECTIVES:

- To study Rotifers diversity
- To study pollution indicators species
- To awareness of water pollution.

### 3. MATERIAL AND METHODS:

**Study area:** The Pingali Lake is located in near Dahiwadi, Man taluka and Satara district. It is situated in Latitude 17°41'11"N and 74°32'1"E Longitude.

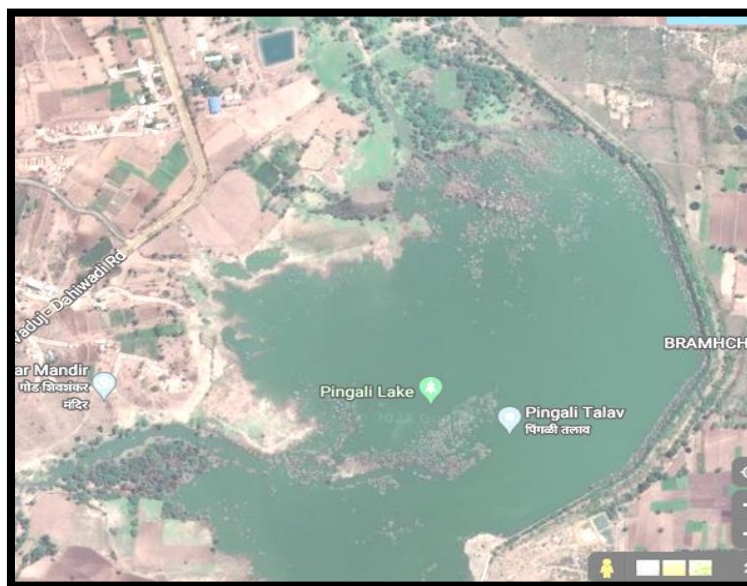


Fig.1. Satellite view of Pingali Lake

**Collection of Samples:** The survey of Pingali Lake near Dahiwadi was carried out from Jan 2021 to Dec 2021. Water Samples were collected from monthly during hours between 9 to 12 am. The water was filtered through plankton net, made of bolting silk cloth and concentrate was collected in glass bottle, fixed in 4% formalin and specimens were identified according to the key from Edmondson [5].

**Biological Identification:** Zooplankton were identified with standard literature up to generic level by using standard keys of [7], [5], [6]

#### 4. RESULT AND DISCUSSION :

The present study reveals that rotifers were show diversity species in pingali Lake, Dahiwadi. In this study period total 10 rotifer species of zooplankton were recorded belonging to 3 Families and 4 genera (Table no. 1). The species of zooplankton are contributed in study area i.e., *Brachionus*, *Filinia*, *Asplanchna*, *Keratela* species. Rotifers play a significant role as grazers, suspension feeders and predators within the zooplankton community. The difference in the periodicity and population density of different rotifers species can be analyzed by considering the nutritional ecology and biotic interactions. Rotifer species exhibit marked differences in their tolerance and flexibility to changes in physiochemical and biological parameters. Such changes are dramatic and sudden in case of urban ecosystem. The present study *Brachionus* species was dominant, similar observation seen in [8]. He has reported 6 genera and 5 families and rotifera was dominated group in the study area [9].

The *Brachionous* species was indicators of sewage and industrial pollution in the present study area the similar result was obtained by [10], [11]. Rotifer species have been identified as indicators of water pollution [12]. Several species of *Brachionus* are recorded from highly polluted fresh water lake. Hussainsagar, Hyderabad by [14]. He has reported eutrophication of water bodies on basis of *Brachionus* species [13]. Rotifers are sensitive indicator of water quality [15]. He has observed in enormous growth of rotifers in lakes and reservoirs indicating eutrophic conditions [16]. Presence of rotifers is also described as indicator of eutrophy by [17] as he observed it in Gandhi Sagar, Chhattri tank, Sawarkar sarovar and Matsya Sarovar in Gwalior. Rotifers are good indicators of lotic water to promote the status of water quality similar result observed in [18]. 52 taxa (49 species) belonging to 14 families and 22 genera are recorded presently. Out of these 14 families *Brachionidae* consisted of the highest number of species (18) followed by *Lecanidae* (10), *Asplanchnidae* and *Notommatidae* (3 each), *Euchlanidae*, *Trichocercidae*, *Synchaetidae*, *Filiniidae* and *Philodinidae* (2 each) while families like *Epiphinidae*, *Mytilinidae*, *Hexarthridae*, *Testudinellidae* and *Trochosphaeridae* represented by one species each [19].



**Table No.1: Species of Rotifers occur in study area during Jan 2021 to Dec 2021**

Family	Species
BRACHIONIDAE	<i>Brachionus caudatus</i>
	<i>Brachionus falcatus</i>
	<i>Brachionus forficula</i>
	<i>Brachionus calyciflorus</i>
	<i>Brachionus murrayi</i>
	<i>Keratella tropica</i>
	<i>Keratella crassa</i>
	<i>Keratella chochlearis</i>
FILINIDAE	<i>Filinia opolensis</i>
ASPLANCHNIDAE	<i>Asplanchna herricki</i>

## 5. CONCLUSION:

Rotifers are microscopic animals related to the suitable conditions for their survival. Rotifers have been used as bioindicator of water quality because of their diversity and cosmopolitan distribution. Rotifers such as *Brachionus forficula*, *Brachionus calyciflorus* and *Filinia opolensis* considered as indicator of eutrophication. In this study concluded that Pingali Lake water is polluted and future planning to avoid the pollution of water from near Agricultural waste and domesticated waste materials.

## ACKNOWLEDGMENT:

The authors are wishing to thank Principal of Dahiwadi College Dahiwadi for providing necessary laboratory facilities.

## REFERENCES:

1. Segers, H. 2007. Annotated checklist of the rotifers (Phylum Rotifera), with notes on nomenclature, taxonomy and distribution. *Zootaxa*, 1564 : 1-104.
2. Gannon JE, Stemberg RS (1978). Zooplankton (especially crustaceans and rotifers) as indicator of water quality. *Trans. Am. Microsc. Soc.* 97:16-35
3. Vanjare, A., Padhye, S., Pai, K. (2010): Zooplankton from a polluted river Mula (India) with record of *Brachionus rubens* (Ehrenberg 1838) epizoic on *Moina macrocopa* (Straus 1820). – *Opuscula Zoologica Budapest* 41(1): 89-92.
4. Gaston, K.J. and Spicer, J.I. (2004) *Biodiversity: An Introduction*. Wiley-Blackwell, Hoboken.
5. Edmondson, W.T.1959. *Freshwater biology*, Edward And Hipple (Eds), 2<sup>nd</sup> edn. John Willy & Sons Inc., Newyork, Pp.95189.
6. Pennak, R.W.1978. *Freshwater invertebrate of United States*, 2<sup>nd</sup> edn. John Wiley and Son, Newyork. 303 Pp.
7. Adoni, A.D., Joshi, G., Gosh, K., Chowasia, S.K., Vaishy, A.K., Yadav, M., Verma, H.G. 1985. *Workbook on limnology*, Prathibha Publishers, Sagar, India.
8. R.S. Virani and P.M. Makode ( 2011): Role of rotifer diversity in a tropical lentic ecosystem with reference to eutrophication. *Biosci. Biotech. Res. Comm.* Vol. 4, No. 1, PP.55-64.



9. Solanke M.R, Dabhade D.S.(2016) : Study of rotifer communities in upper Morna reservoir, Medshi, District Washim. International journal of applied research. 2(12): 99-102.
10. Nogueira, M.G. (2001). Zooplankton composition dominance and abundance as indicators of environmental compartmentalization in Jurumirin reservoir (Paranapanemma River) Sao Paulo, Brazil. Hydrobiol. 455: 1-8.
11. Sladeczek V. (1983). Rotifers as indicators of water quality. Hydrobiologia 100: 169-201.
12. Arora HC (1962) "Studies on Indian Rotifera – Part I" J. Zool. Soc India, 14: 33-44
13. Verma R.K. and J.S.Datta Munshi (1987) Plankton community structure of Vadua reservoir, Bharatpur, Bihar. Trop.Ecol.28: 2000– 2007.
14. Malathi.DS, Chandrashekhar VA and Kodarkar MS (1998): Studies on Brachionus from Hussainsagar, Hyderabad, India. J. Aqua. Biol. 13 (1 & 2): 7-12.
15. Sheeba, S. and Ramanujan N. (2005) Qualitative and quantitative study of zooplankton in Ithikkara river, Kerala. Poll. Res., 24(1), pp: 119-12.
16. Schindler, D.W. and Noven B. (1971) Vertical distribution and seasonal abundance of zooplankton in two shallow Ontario. Journal of Fisheries Research, Canada 28, pp:245-256.
17. Saksena, D.N. and Sharma S.P. (1981) Zooplankton fauna of some lentic water of Gwalior. I. Govind sagar, Chhattri tank, Sawarkar Sarovar and Matsya Sarovar. Environment, India, 4, pp:13-17.
18. Ghosh. D and Biswas J.K. ( 2014): Rotifer diversity indices Assessment of aquatic health an ox bow lake ecosystem in West Bengal. International Journal of current research. V.6, I.12 PP. 10554-10557.
19. Tayade S. N. and D.S. Dabhade ( 2015): rotifer communities of the ephemeral ponds in washim region of Maharashtra, India. ISRJ, V.5. I.11, pp. 1-5.
20. Gaston, K.J. and Spicer, J.I. (2004) Biodiversity: An Introduction. Wiley-Blackwell, Hoboken