

ZOOPLANKTON DIVERSITY IN A FRESHWATER LAKE OF SUPE, TALUKA-BARAMATI, DISTRICT PUNE(M.S)

Dr.Rahul Patil,

Department of Zoology,

Vidya Pratishthan's Supe Arts, Science and Commerce College, Supe, Tal-Baramati, Dist-Pune(M.S)

Abstract : Due to heterotrophic activity of zooplankton, play a key role in organic matter cycling in aquatic ecosystems and are used as a bioindicator of environmental quality. The present study was conducted between July 2018 to June 2019 and deals with the diversity and abundance of zooplankton. At Freshwater Lake in village Supe, Taluka-Baramati, District Pune. A total of 06 species of zooplankton were recorded, of which rotifers were more common with 3 species, followed by 1 species copepods and 2 species Cladocerans. The results showed that the Freshwater Lake is more productive.

Keywords: Diversity, Zooplankton

Introduction

For a better understanding of the role of zooplankton in the ecosystem. Seasonal fluctuations in zooplankton populations can be expressed by various quantitative parameters, such as Population Density, biomass and biochemical compounds. According to Riccardi and Mangoni (1999), each parameter emphasizes a particular characteristic, knowledge of which is essential to assess the role of zooplankton in that particular ecosystem. Substantial work has been done on the ecology and seasonal distribution of zooplankton in India compared to other tropical and subtropical countries (Battish, 1992; RangaReddy, 2001; Slathia and Dutta, 2013). Although much work on zooplankton diversity is reported in different parts of India, there are few reports of freshwater bodies from different parts of East and North India, except for some notable ones from Sharma and Sharma (2008); Kar and Barbhuiya (2004); Kar (2007); Kar and Kar (2013) and Kar (2013). Thus, the present study was an attempt to report zooplankton diversity of Lake in village Supe from Cachar district, South Assam.

Due to their heterotrophic activity, zooplankton play a key role in recycling organic materials in aquatic ecosystems and are used as a bioindicator of environmental quality. This paper deals with the diversity of zooplankton in the Freshwater Lake in village Supe, Taluka-Baramati, District Pune

I. MATERIALS AND METHODS

In the present study, water samples were taken from the Freshwater Lake in village Supe, Taluka-Baramati, District Pune between July 2018 and June 2019. The water was taken directly from each selected sampling station of the Lake. The samples were transferred to the bottle and taken to the laboratory. The water samples were taken at quarterly intervals over a period of one year at the sampling stations. The samples were collected in the morning hours using a 25 micron mesh net. The plankton net acts as a filter, it is the most common method of collecting zooplankton. In the Collected sample 5 ml of 4% formalin, 2 to 3 drops of glycerin was added. A pinch of washing powder has also been added to prevent zooplankton aggregation. Samples were collected in separate jars that were labelled with the name of the site, date of sampling, time of sampling, etc. Identification of zooplankton was performed using a compound microscope. The dissecting microscope is also used for sorting and counting. Specimens were mounted on glass slides and examined at 25x to 45x magnification, with their standard identification and monograph and keys proposed by APHA (1985); Tonapi (1980); Dodson and Frey (1991) and Williamson (1991) and according to the systematic key of Battish (1992) and Altaff (2004). The main features considered for identification are Lorica, a trophic rotifer species; antennae, post-abdomen, number and arrangement of spines, location of lateral setae and rostrum for Cladocera; Antennae, antennae, caudal bristles, and endopodite for copepods and antennae, valve shape and bristles for ostracods, used by Sontakke and Mokashe (2014). Population density was quantified using Lackey's (1938) drop count method and calculated using the following formula from Lackey (1938)

$$N = n \times v / V$$

Where,

N = Total no. of organisms/ lit of water filtered,

n = Number of zooplankton counted in 1 ml plankton sample,

v = Volume of concentrate plankton sample (ml),

V= Volume of total water filtered through (L)

III. RESULTS AND DISCUSSION

During this research we found a total of 06 species of zooplankton. Among them, 03 species belonging to Rotifera, 01 species belonging to Copepoda, 02 species belonging to Cladocera were identified. The rotifers identified were -1. Ascomorpha saltans (Bartsch, 1870), 2. Brachionus calyciflorus (Pallas, 1834), 3. Brachionus bidentata (Jokubsky, 1912). Diaphanosoma birgei (Korineck 1981) have been identified in the freshwater Lake in village Supe.

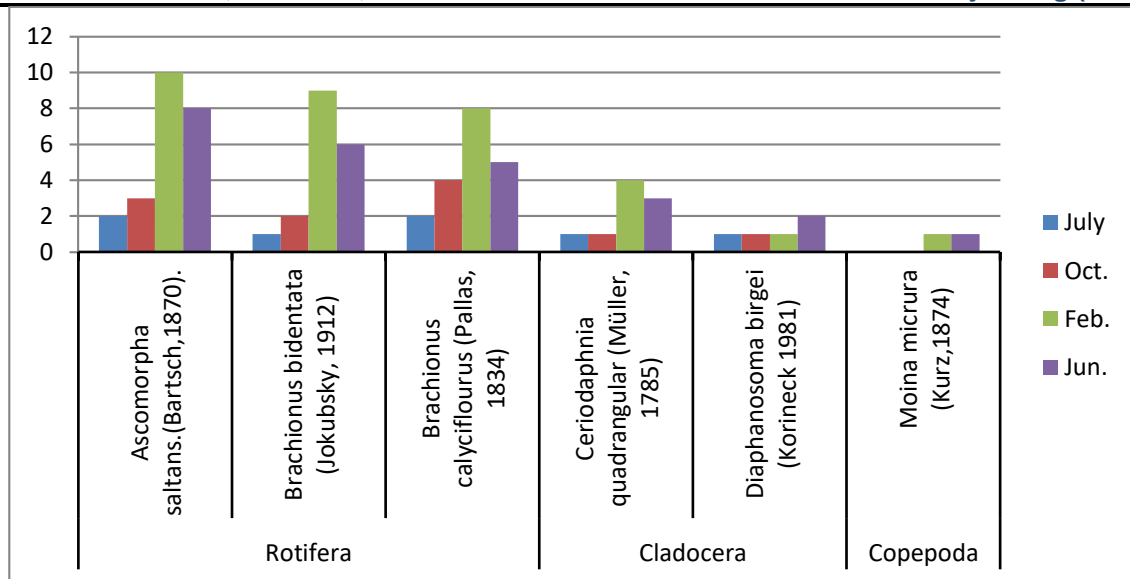
All species are morphologically distinct. The number of rotifers increased in summer, possibly due to the increased population of bacteria and organic matter from dead and decaying vegetation (Majagi and Vijaykumar, 2009). The population of copepods recorded in Lake in village Supe during the study period was satisfactory and less those recorded from July to October, and the population density of Cladoceran zooplankton was less in the month of July to October (Table.1). Several researchers carried out work on zooplankton biodiversity. Sharma and Srivastava (1986) carried out work on the ecological variability of rotifers. Shayestschar (1995) studied the biodiversity of zooplankton. Jindal and Thakur (2009),

The studied composition and dynamics of phytoplankton, zooplankton and nekton populations, as well as productivity, were correlated with seasonal variations in physicochemical properties of the water. observed 18 species of Rotifera belonging to 6 genera and 5 families, among which the species Brachionus was found in larger numbers. The distribution of some species depended on the physico-chemical parameters of the water (Tonapi G.1980) such as temperature, conductivity, pH, chloride and free CO₂ content.

During the present study, in all groups of zooplankton, rotifers were found to be dominant in all groups. Some results have previously been observed by many researchers (Banerjee et al. (2008), Abdullah et al. (2007), Adeyemi et al. (2009), APHA (1989), Balamurugan et al. (1999)

Phylum	Genera	July	Oct.	Feb.	Jun.
Rotifera	Ascomorpha saltans.(Bartsch,1870).	2	3	10	8
	Brachionus bidentata (Jokubsky, 1912)	1	2	9	6
	Brachionus calyciflorus (Pallas, 1834)	2	4	8	5
Cladocera	Ceriodaphnia quadrangular (Müller, 1785)	1	1	4	3
	Diaphanosoma birgei (Korineck 1981)	1	1	1	2
Copepoda	Moina micrura (Kurz,1874)	0	0	1	1

Table: 1 Quarterly distribution of Zooplankton at freshwater Lake in village Supe



Graph: 1 distribution of Zooplankton at freshwater Lake in village Supe

IV. CONCLUSION

The present study on the lake in Supe village shows a diversified zooplankton dominated by rotifers throughout the study period, showing that the wetland is very suitable for aquaculture as zooplankton, especially rotifers, are known to be the best food for this is aquaculture fish larvae. Therefore, taking into account the importance of the study, measures should be taken to conserve and care for the freshwater wetland.

V. ACKNOWLEDGEMENT

I am very much thankful to the Department of Zoology, Vidya Pratishthan's Supe Arts, Science and Commerce College, Supe, Tal-Baramati, Dist-Pune (M.S) for providing the laboratory for working and Management of Vidya Pratishthan, Baramati, Dist-Pune for the help and encourage during the study. I am also thankful to students of B.Sc.

VI. REFERENCES

- Battish, S.K. (1992). Freshwater zooplankton of India. Oxford and IBH publishing Co., New Delhi.
- Kar, D. and Barbhuiya, M.H. (2004). Abundance and diversity of zooplankton in Chatla Haor, a floodplain wetland in Cachar district of Assam. *Environment and Ecology*, 22 (1):247-248.
- Kar, D. (2007). *Fundamentals of Limnology and Aquaculture Biotechnology*. Daya Publishing House, xiv+609.
- Kar, S. and Kar, D. (2013). Studies on zooplankton diversity of an oxbow lake of South Assam, India. *International Journal of Current Research*, 5(12):3652-3655.
- Kar, D. (2013). *Wetlands and Lakes of the World*. Springer, London.
- Sharma, B.K. (1998). Freshwater Rotifers (Rotifera: Eurotatoria). *Fauna of West Bengal. State Fauna Series*, 3(11): 341-461.
- Sharma, B.K. and Sharma, S. (2008). Zooplankton diversity in floodplain lakes of Assam. *Records of Zoological Survey of India. Occasional paper no 290*: 1-307.
- Abdullahi H.A, Azionu B.C, Ajayi O. (2007). Checklist of zooplankton in culture tanks at NIFFRI Green House, New Bussa. *Proceedings of the 22nd Annual Conference of Fisheries Society of Nigeria (FISON), Kebbi*. 1:284-90.
- Adeyemi S.O, Adikwu L.A, Akombu P.M, Iyela J.T. (2009). Survey of zooplankton and macro invertebrates of Gbedikere Lake Bassa, Kogi State, Nigeria. *Int. J. Salt Lake Res.* 2(1):37-44.
- APHA. (1989). *Standard methods for the examination water and waste water* American public health Association 19th Edition Washington, U.S.A.
- Altaff K. A.(2004): *Manual of zooplankton*, Sponsored by the University Grant commission, New Delhi, 2004.
- Battish S. K.(1992): *Freshwater Zooplankton of India*. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, i-iv, 233.
- Balamurugan S, Mohideen BMG, Subramanyam P.(1999): Biodiversity of zooplankton in Cauveri River at Tirucherapalli, Tamilnadu. *J. Aqua. Bio.* 14(142):21-25.

14. Benarjee G.K, Srikanth G, Ramu K, Narasimha R, Ravinder B. (2008): The Climatic Influence on Zooplanktonic Population in Historical Lake of Kakatiya Dynasty. Proc. of 8th Indian Fisheries Forum, 22-26.
15. Dabhade D.S, Chhaba S.G. (2019): Zooplankton diversity around washim region of Maharashtra. International Journal of Advance and Innovative Research. Volume 6, Issue 2 (II):332-336.
16. Dodson S.I, Frey DG. Cladoceran and other Branchiopoda in Thorp, J.H., and A.P.Covich (eds.) (1991): Ecology and classification of North American freshwater invertebrates. Academic Press, San Diego, 723-786.
17. Jayabhaye, U.M. (2010): Studies on zooplankton diversity of river Kayadhu, Near Hingoli city, Hingoli, Dist. Maharashtra. Int.Res.J.; 11(12): 47-49.
18. Jindal R, Thakur R. (2009): Biodiversity and trophic status in relation to hydrobiological factors of Rewalsar wetland (District Mandi, Himachal Pradesh) India. J. Aqua. Biol. Vol. 24 (2):50-56.
19. Kabra, P.D, Somatkar J.R, Dabhade D.S. (2016): Quantitative analysis of zooplanktons of fresh water ecosystems in Washim town, Maharashtra, India. Indian Streams Research Journal. 6 (5): 1-11.
20. Lackey J. B. (1938) : The manipulation and counting of river plankton and changes in some organisms due to formalin preservation. Public Health Repts. 53:2080-2093.
21. Pawar R.J, Dabhade D.S. (2016) : Study of Qualitative diversity of rotifer community of freshwater katepurna reservoir, district Akola, Maharashtra, I J R B A T, , Vol. IV : 23-47.
22. 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.
23. Sontakke, Mokashe. (2014): Diversity of zooplankton in Dekhu reservoir from Aurangabad, Maharashtra Journal of Applied and Natural Science. 6(1):131-133.
24. Tayade, S.N. Dabhade D.S. (2011) : Checklist of rotifers in Washim District of Maharashtra, India. International Journal of Innovations in Bio-Sciences; Vol. 1, 27- 31
25. Tonapi G.J. (1980) : Freshwater animals of India. An ecological approach, Oxford and IBH, 1980.
26. Williamson, Copepoda C.E. (1991) : In Thorp, J.H., and A.P. Covich (eds.) Ecology and classification of North American freshwater invertebrates. Academic Press, San Diego., 787-822.

