



INVESTIGATION OF DIFFERENT VARIETIES OF ZOOPLANKTON IN KEENJHAR LAKE OF DISTRICT THATTA

KHALID HUSSAIN LASHARI¹, ZAMEER ALI PALH¹, SHAHARYAR BROHI², SUJO MEGHWAR³, AFTAB KHAND⁴, SHAHID ALI SHAIKH⁵, MUHAMMAD KHALID.SHAIKH⁶, JAVED ALI SOOMRO⁷,RAZIA SUHAG¹, SIRAJ AHMED BROHI¹

¹Department of Fresh Water Biology & Fisheries, University of Sindh, Jamshoro, Pakistan

²Department of City and Regional Planning, Mehran University of Engineering & Technology, Jamshoro, Pakistan

³Department of Geography University of Sindh, Jamshoro, Pakistan

⁴Department of Physiology University of Sindh Jamshoro, Pakistan

⁵Institute of Pure and Applied Geology University of Sindh, Jamshoro

⁶Department of Computer Science, Federal Urdu University of Arts Science and Technology Karachi Pakistan.

⁷Centre for Physical Education, Health & Sports Science, University of Sindh, Jamshoro, Pakistan

ARTICLE INFORMATION

Article History:

Received: 30th March 2021

Accepted: 20th May 2021

Published online: 15th July 2021

Author's contribution

All authors contribute equally.

Key words:

Zooplankton, Keenjhar lake, Rotifera, Cladocera, Copepoda

ABSTRACT

Zooplankton is a global organism that may be found in all freshwater tropical wetlands. The current study looks at the monthly variations in the diversity and thickness of Zooplankton in Keenjhar Lake. The work was completed over the course of a year, from January 2019 to December 2019. Zooplankton population status in Keenjhar Lake included 40 taxa divided into 03 primary collections. It is divided into three main groups: Rotifera, Cladocera, and Copepoda. A 53 percent Rotifera, 25 percent Cladocera, and 22 percent Copepoda zooplankton sample was collected. Rotifera dominated in terms of diversity and population density among the zooplankton species examined.

1. INTRODUCTION

Zooplankton is heterotrophic creatures that eat phytoplankton, replenish nutrients as well as the transmission via hydrolysis. It is necessary for nutrient recycling and the energy cycle within their habitats. These are the major natural food sources for fish, and their existence and growth are dependent on them. They also serve as the foundation for all aquatic environments have food chains and food webs. (Miah and colleagues) [1]. It is necessary for both omnivores and planktivores, to consume them (Alam *et al.*,) [2].

Zooplankton in a water body must be studied qualitatively and quantitatively when it comes to aquaculture (Boyd) [3]. Aquatic predators rely on zooplankton for energy transmission from producers (Thayer *et al.*,) [4]. A valuable pointer of water quality modified since it is significantly influenced by ambient factors and responds fast to changes in physical, chemical, or environmental properties. Zooplankton populations are affected by a variety of factors, including nutrient intake, pH, and sediment absorption. A great way to find out how much water has been contaminated (Contreras *et al.*,) [5]. There are limited reports from freshwater bodies in Pakistan.

*Corresponding Author: khalid.lashari@usindh.edu.pk

Copyright 2017 University of Sindh Journal of Animal Sciences

2. MATERIALS AND METHODS

Study Area

Keenjhar Lake was created by joining two natural lakes, "Keenjhar" and "Sunheri," "Green" and "Golden," respectively. In 1958, the two small depressions of Keenjhar and Sunheri were joined by dynamiting the intervening hills to create the "Kalri Lake." It was called "Keenjhar Lake," a man-made tropical lake, in 1972 (Michael) ^[6]. It's around 120 kilometres from Karachi, at 24°47' north latitude and 68°02' east longitude (Blatter et al.,) ^[7]. The length of this lake is 27.35 kilometres. The "Kalri Baghar Feeder," which starts at the Ghulam Muhammad Barrage, takes water from the Indus River. The lake's minimum depth is 4 metres, while its maximum depth is 12 metres.

Zooplankton Sampling

The research took place throughout a year, from January 2019 to December 2019. On a weekly basis, zooplanktons were collected from the location. These specimens were sifted and then put in a (100 ml) container, which was then set inside clarification and kept cool and dark.

3. RESULTS AND DISCUSSION

Fourty species of Zooplankton from three groups were gathered from the wetland during the current investigation: Cladocera, Copepoda, and Rotifera. The Cladocera group has 14 genera, the Copepoda group has four, and the Rotifera group has 22 genera (Table 1). Similar observations were made by a number of researchers around the country. (Palh et al.,) ^[8] discovered 16 species of Zooplankton in Chicken Lake, and Fig. 1 shows the abundance status of the Zooplankton group in Keenjhar Lake. The most prominent groups in the freshwater body investigated were Rotifera accounting for 53% of sum Zooplankton, Cladocera for 25%, and Copepoda for 22% of sum Zooplankton. Various Zooplankton species were abundant depending on the good circumstances. During the current investigation, 40 taxa of Zooplankton from the three categories, Cladocera, Copepoda, and Rotifera, were collected from the marsh. 14 of the reported genera are Cladocera, 4 are Copepoda, and 22 are Rotifera (Table 1). Many researchers around the country have reported similar observations. (Palh et al.,) ^[8] identified 16 species of Figure 1 shows Zooplankton from Chicken Lake and the abundance status of the Zooplankton group detected in Keenjhar Lake. To date, Rotifera has dominated all other Zooplankton groups. The rotifera group's dominance is common in

tropical freshwater wetlands; Palh's research in 2020 found similar results. Research area Rotifera group population density fluctuates according on the season, according to the current study.

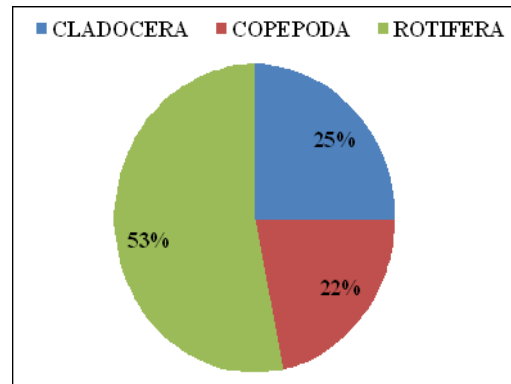


Figure 1: Abundance of Zooplankton of Keenjhar Lake

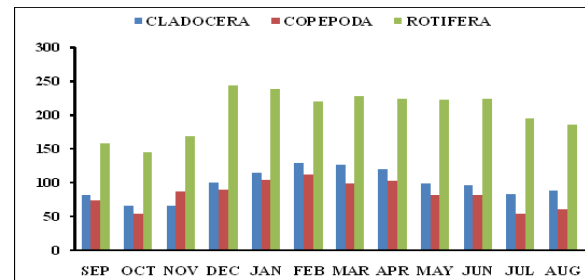


Figure 2: Population density status of Zooplankton of Keenjhar Lake

4. CONCLUSION

There was a large amount of Zooplankton present in Keenjhar Lake during the course of the research, with Rotifera dominating. Because Zooplankton is present, the wetland appears to be appropriate for aquaculture is recognized to be the most essential diet for fish larvae. Our understanding of the variety of Zooplankton in tropical floodplains, in general, is enhanced by this work, which is critical for aquaculture in natural floodplains in particular. Steps should be done to conserve and manage the freshwater wetland because of the study's value.

5. ACKNOWLEDGEMENTS

The corresponding author is very thankful to co-authors. Also, very thankful to faculty members of the Department of Fresh Water Biology and Fisheries, the University of Sindh Jamshoro, to support this research.

6. CONFLICT OF INTEREST

All authors have declared that there is no conflict of interest regarding the publication of this article.

REFERENCES

- [1] Miah, Md. F., Roy, S., Jinnat, E. and Khan, Z.K. (2013). Assessment of Daphnia, Moina and Cylops in Freshwater Ecosystems and the Evaluation of Mixed Culture in Laboratory. *American International Journal of Research in Formal, Applied & Natural Sciences*, 4(1): 1-7.
- [2] Alam, A.K.M.N, Islam, M.A, Mollah, M.F.A. and Haque, M.S. (1987). Status of zooplankton in newly constructed ponds and their relation to some meteorological and limnological factors. *Bangladesh Journal of Fisheries*, 14(1): 83-88.
- [3] Boyd, C.E. (1982). Water quality management of pond fish culture. *Elsevier Sci. Pub. Co. Amsterdam- Oxford, New York*.
- [4] Thayer, G.W., Hoss, D.E., Kjelson, M.A., Hettler, W.F. Jr. and Lacroix, M.W. (1974). Biomass of Zooplankton in the Newport River Estuary and the Influence of Post larval Fishes. *Coastal and Estuarine Research Federation*, 15(1): 9-16.
- [5] Contreras, J.J., Sarma, S.S.S., Merino-Ibarra, M. and Nandini, S. (2009). Seasonal changes in the rotifer (Rotifera) diversity from a tropical high altitude reservoir (Valle de Bravo, Mexico). *Journal of Environmental Biology*. 30:191-195.
- [6] Michael, A.A. (1967). *The Indus River: A Study of the Effects of Partition*. New Haven, CT: Yale University Press, London, 328 pp.
- [7] Blatter, E., Mc. Cann, C. and Sabnus, T.S. (1929). The flora of Indus delta. *Ind. Bot. Soc. Methodist. Pub. House, Madras*, 173 pp.
- [8] Palh, Z.A., Brohi, S., Abro, N.A., Sujo M., Brohi, S.A., Lashari, K.H. and Suhag, R. (2021). Zooplankton Variety in Saline Water: A Case Study of Chickan Lake, District Dadu, Sindh. *Univeristy of Sindh Journal of Animal Sciences*, 5 (1): 13-18.

Table 1: Abundance of Zooplankton species of Keenjhar lake

ZOOPLANKTONS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
CLADOCERA												
<i>Diaphanosoma sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scapholeberis sp.</i>	+	-	-	+	+	+	+	+	+	+	+	+
<i>Sida sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Simocephalus sp.</i>	+	-	-	+	-	-	-	-	+	-	-	+
<i>Macrothrix sp.</i>	-	+	-	-	+	-	-	+	+	+	+	+
<i>Chydorus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ceriodaphnia sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Bosmina sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Bosminopsis sp.</i>	-	-	-	+	-	-	-	-	+	-	+	-
<i>Alona sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Alonella sp.</i>	+	-	-	-	+	-	-	-	+	-	-	-
<i>Daphnia sp.</i>	-	-	-	+	-	-	-	-	-	-	+	-
<i>Moinodaphnia sp.</i>	-	-	-	+	-	-	-	-	+	-	-	-
<i>Moina sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
COPEPODA												
<i>Mesocyclops sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Thermocyclops sp.</i>	+	+	+	+	+	+	-	+	-	+	+	+
<i>Neodiaptomus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Heliodiaptomus sp.</i>	+	+	+	-	+	+	-	+	+	+	+	+
ROTIFERA												
<i>Brachionus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Polyarthra sp.</i>	-	+	-	+	-	-	-	-	+	-	-	+
<i>Plationus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lecane sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lepadella sp.</i>	+	-	-	-	+	-	-	-	-	+	-	-
<i>Keratella sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Anuraeopsis sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Asplanchna sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ascomorpha sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Testudinella sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Trichocerca sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Cephalodella sp.</i>	+	-	+	+	-	-	+	-	+	+	+	+
<i>Macrochaetus sp.</i>	-	-	+	-	-	-	-	+	-	-	-	+
<i>Mytilina sp.</i>	-	-	-	-	-	-	-	-	-	+	-	-
<i>Horaella sp.</i>	-	-	-	-	+	-	-	-	-	+	-	+
<i>Filinia sp.</i>	+	+	+	+	+	+	+	-	+	-	+	+
<i>Colurella sp.</i>	-	+	+	-	-	-	-	-	+	-	+	+
<i>Conochilus sp.</i>	-	-	-	-	+	-	-	-	-	+	-	+
<i>Rotaria sp.</i>	-	+	-	-	-	-	-	+	-	-	+	+
<i>Scaridium sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pompholyx sp.</i>	-	+	-	-	+	-	-	-	-	+	+	+
<i>Platias sp.</i>	-	-	-	-	-	-	-	-	-	-	-	-