

Diversity of Zooplankton from Kapsi Lake in Akola District, (MS) India

Leena Bhimcharan Dongre¹, Dr. Prakash P. Ade²

¹Ph. D. Research Student, Shri Shivaji College of Arts, Commerce and Science
Email: leenameshram75[at]gmail.com

²Professor and Head Department of Zoology, Shri Shivaji College of Arts, Commerce and Science
Email: prakashlimnol[at]gmail.com

Abstract: Biological features of water of Kapsi lake, were studied during July 2023 to June 2024. Monthly water sample were collected from selected different 8 stations of Kapsi lake, from specific depth. The lake is located near Akola city it comes under Chikhalgaoon circle. Kapsi is one of the oldest water body in Akola district. The lake was constructed during British Government during 1930. Zooplankton are one of the important faunas in water body which act as a bio - indicator of pollution and provide direct role in food chain as it is a rich source of vitamins to fishes. In the present investigation in the year July 2023 – June 2024 were observed different species of zooplankton among 08 species belonging to Protozoa, Centropyxis, Diffugia, Trinema, Arcella, Paramecium, Glaucoma, Colpidium, Vorticella. 07 species of Rotifers Calciflorus, Angularis Quadridentata, Notholca, Mytilina, Lecane, Monostyla 04 species of cladocera Simocephalus, Scapholeberis, Moinodaphnia, Stenocypripis from Kapsi lake water body.

Keyword: protozoa, rotifers, Cladocera, diversity zooplankton and lake etc

1. Introductions

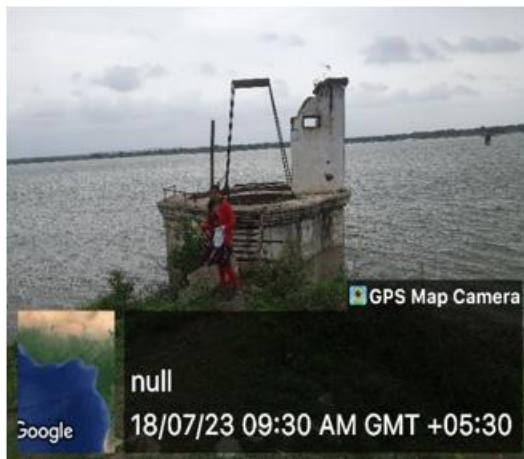
The freshwater zooplankton are comprised of three major groups of invertebrate animals: the rotifers, copepods, and Cladocera occurring abundantly in all types of aquatic habits and plays a vital role in energy transfer in an aquatic ecosystem and act as bio - indicators of pollution. Zooplankton diversity and their ecology greatly contribute to as understanding of the basic nature of zooplankton population in water body. Various researches carried out work to study the zooplanktons of different fresh water bodies. Jayabhaye (2010) studied zooplankton diversity of river Kayadhu, near Hingoli city Maharashtra. The quantity of zooplanktons in water provided significant information about the available sources for supporting life for fishery development. . Qualitative and quantitative studies of zooplanktons in Rajura Lake of Buldhana district were carried out by Joshi (2011) during February 2010 to January 2011. Tayade and Dabhade (2011) studied the rotifer community around Washim region and prepare a checklist of Rotifers in Washim region. Study of qualitative diversity of rotifer community of freshwater Katepurna reservoir, district Akola, Maharashtra, India was carried out by Pawar and Dabhade (2016) Zooplankton diversity reflects the water quality and they are the good indicators of changes taking place in the water resources, Kabra et. al., (2016) carried out a research work to analyze zooplanktons of Fresh water ecosystem in Washim town, Maharashtra, India. Anirudhh D. Babar et al., D. S, Dabhade. And S. G. Chhaba (2019) carried out work on In present days, the biodiversity is in danger because due to pollution and human activities. The presence and dominance of zooplankton species played a very significant role in the functioning of freshwater ecosystem. Therefore, present investigation on zooplankton diversity from Kapsi dam freshwater body, Akola district Maharashtra, with following aim and objective.

- 1) Collection and preservation of Zooplankton from Kapsi dam freshwater body.
- 2) Identification of Zooplankton by using standard methodology previously used by Researcher.
- 3) Studies of diversity of zooplankton in Kapsi dam water body.

2. Materials and Methods

In the present investigation in the year July 2023 – June 2024 was observed different species of zooplankton as biological features were analysed. The sample were transferred to the bottle and brought to laboratory without disturbance. Samples were filtered with the help of net of mesh size of 25 micron. It is the most common method for collection of zooplankton. The concentrated samples were carefully transferred to another container. 5ml of 4 % formalin, 2 to 3 drops of glycerines were added to it. A pinch of detergent powder also added to avoid aggregation of Zooplankton. Identification of zooplankton with the help of compound microscope. A dissecting microscope is also handy for sorting and counting. Specimens are mounted on glass slides and examined at 25 - 100X magnification. with its standard identification and its monographs as well as keys which were suggested by APHA (1985); Tonapi (1980); Dodson and Frey (1991) and Williamson (1991) and following the systematic key by Battish (1992) and Altaff (2004). Main characters are considered for identification are lorica, corona and type of trophi for rotifers; antennules, post abdomen, number and arrangement of spines, location of lateral setae and rostrum for cladocera; antennules, antenna, caudal setae, and endopodite for copepoda and antenna, valve shape and setae for ostracods used by Gajanan Sontakke and Satish Mokashe (2014).

3. Study Area



The lake is located near Akola city it comes under Chicagoan circle. Kapsi is one of the oldest water bodies in Akola district. The lake was constructed during British Government during 1930. The latitude 20.5876787 and longitude is 76.960249 are the geocoordinate of the Kapsi lake. In the present investigation in the year July 2023 – June 2024 was observed different species of zooplankton as biological features were analysing.

4. Observations and Results

Present study made on Kapsi lake Kapsi Monthly water sample were collected from eight different of a Kapsi lake biological features were studied from July 2023 to June 2024 and the diversity of zooplanktons are observed as per phylum

are shown in the following observation table. Various researches carried out work on biodiversity of zooplankton Sharma and Srivastava (1986), carried out work on ecological fluctuation of rotifers and Shayestehfar (1995) also studied on biodiversity of zooplankton. Jindal and Thakur (2009) in these species' composition and population dynamics of phytoplankton, zooplankton, nekton and productivity have been correlated with seasonal variations in physico - chemical characteristics of water. Solanki and Dabhade (2016) studied the Rotifer communities in upper Morna reservoir of Medshi, Washim district and observed 18 species of rotifers belonging to 6 genera and 5 families among which Brachionus species were found in highest number and Dabhade and Chhaba (2019) [8] also studies on zooplankton diversity around Washim region of Maharashtra

Table 1: Monthly Zooplankton of Kapsi Lake from July 2023 to Jun2024

Phylum	Genera	July	Augh	Sept	Oct	Nova	Dec
Protozoa	Centropyxids	05	10	08	08	06	09
	Difflugid	06	08	03	09	07	06
	Trinema	05	07	02	04	08	07
	Arcella	03	04	05	02	01	03
	Paramecium	04	03	03	02	04	04
	Glaucoma	02	01	03	04	04	05
	Colpidium	03	03	04	01	02	04
	Vorticella	05	04	05	03	06	04
	Genera	July	Aug	Sept	Oct	Nova	Dec
	Calcofluors	04	08	06	04	03	02
Rotifers	Angularis	02	01	03	02	03	05
	Quadridentate	04	02	03	04	02	03
	Notholca	06	05	02	05	04	01
	Mytilina	07	04	05	05	03	01
	Lecane	06	04	03	04	06	02
	Monostyla	07	04	06	04	02	04
	Genera	July	Augh	Sept	Oct	Nova	Dec
Cladocera	Simocephalus	08	06	04	05	06	03
	Moinodaphnia	05	05	04	03	04	06
	Scapholeberis	06	07	07	06	05	03
	Stenocypris						
Monthly diversity in zooplankton of Kapsi Lake FROM July 2023 to June 2024							
	Genera	Jan	Feb	Mar	April	May	June
Protozoa	Centropyxis	04	06	04	06	05	03
	Diffugia	04	05	04	05	04	09
	Trinema	07	05	09	12	06	06
	Arcella	05	06	02	09	08	05
	Paramecium	06	04	05	08	08	03
	Glaucoma	05	04	03	05	08	04
	Colpidium	04	06	04	01	03	04
	Vorticella	04	05	04	03	04	02

Rotifers	Genera	Jan	Feb	Mar	April	May	June
	Calciflorus	06	07	05	02	03	02
	Angularis	03	05	04	06	03	04
	Quadridentate	05	06	04	02	04	03
	Notholca	04	04	03	01	03	02
	Mytilina	05	06	03	02	04	F3
	Lecane	03	05	03	04	02	04
	Monostyla	04	05	04	02	03	01
cladocera	Genera	Jan	Feb	Mar	April	May	June
	Simocephalus	06	03	05	02	04	03
	Moinodaphnia	02	04	03	02	04	02
	Scapholeberis	05	01	02	03	03	01
	Stenocypris	02	03	01	04	03	02

Images



Figure: Photo plate of some different species of Kapsi Lake during year July2023 to June 2024

5. Result and Discussion

In the present investigation in the year of July 2023 to June 2024 were observed that a total among 08 species belonging to Protozoa, Centropyxids, Diffugid, Trinema, Arcella,

Paramecium, Glaucoma, Colpidium, Vorticella.07 species of Rotifers Calcofluors, Angularis, Quadridentat, Notholca, Mytilene, Lacane, Monostyla 04 speies of cladocera Simocephalus, Scapholeberis, Moinodaphnia, Stenocypris from Kapsi lake water body. Various researchers carried out

work on biodiversity of zooplankton Sharma and Shrivastava (1986). Solanki and Dabhade (2016) studied the rotifers communities in upper morna reservoir of Medsi, Washim district.

6. Conclusion

The present investigation reveals that the diversity of zooplankton plays significant role in the functioning of fresh water ecosystem. Were recorded among 08 species belonging to Protozoa. 07 species of Rotifers 04 species of Cladocera from Kapsi lake water body. Various researchers carried out work on biodiversity of zooplankton Sharma and Shrivastava (1986). Were recorded 10 species of zooplankton among 06 species belonging to Rotifera, Ascomorpha saltans. (Bartsch, 1870), Brachionus calyciflorus (Pallas, 1834), Brachionus bidentata (Jokubsky, 1912), Lecane leontina (Turner, 1892), Trichotria tetractis (Ehrenberg, 1830) and Trichocerca pusilla (Jennings, 1903). 01 species Copepoda, Moina micrura (Kurz, 1874) and 02 species belonging to Cladocera, Ceriodaphnia quadrangular (Müller, 1785) and Diaphanosoma birgei (Korineck 1981) from Jamb reservoirs freshwater body. In present days the biodiversity is in danger due to pollution and human activities, so conservation of biodiversity is essential to keep update knowledge of every aquatic species diversity.

References

- [1] Abdullahi HA, Azionu BC, Ajayi O. 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. 2007; 1: 284 - 90.
- [2] Adeyemi SO, Adikwu LA, Akombu PM, Iyela JT. Survey of zooplankton and macro invertebrates of Gbedikere Lake Bassa, Kogi State, Nigeria. Int. J. Salt Lake Res. 2009; 2 (1): 37 - 44.
- [3] APHA. Standard methods for the examination water and waste water American public health Association 19th Edition Washington, U. S. A., 1989.
- [4] Altaff K. A Manual of zooplankton, Sponsored by the University Grant commission, New Delhi, 2004.
- [5] Battish SK. Freshwater Zooplankton of India. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, i - iv, 1992, 233.
- [6] Balamurugan S, Mohideen BMG, Subramanyam P. Biodiversity of zooplankton in Cauveri River at Tirucherapalli, Tamilnadu. J. Aqua. Bio. 1999; 14 (142): 21 - 25.
- [7] Benarjee GK, Srikanth G, Ramu K, Narasimha R, Ravinder B. The Climatic Influence on Zooplanktonic Population in Historical Lake of Kakatiya Dynasty. Proc. of 8th Indian Fisheries Forum, 2008, 22 - 26.
- [8] Dabhade DS, Chhaba SG. Zooplankton diversity around washim region of Maharashtra. International Journal of Advance and Innovative Research. 2019; Volume 6, Issue 2 (II): 332 - 336.
- [9] Dodson SI, Frey DG. Cladoceran and other Branchiopoda in Thorp, J. H., and A. P. Covich (eds.). Ecology and classification of North American freshwater invertebrates. Academic Press, San Diego, 1991, 723 - 786.
- [10] Gajanan Sontakke, Satish Mokashe. Diversity of zooplankton in Dekhu reservoir from Aurangabad, Maharashtra Journal of Applied and Natural Science. 2014; 6 (1): 131 - 133.
- [11] Jindal R, Thakur R. Biodiversity and trophic status in relation to hydrobiological factors of Rewalsar wetland (District Mandi, Himachal Pradesh) India. J. Aqua. Biol. 2009, Vol. 24 (2): 50 - 56.
- [12] Lackey JB. The manipulation and counting of river of river plankton and changes in some organisms due to formalin preservation. Public Health Repts. 1938; 53: 2080 - 2093.
- [13] Tonapi GJ. Freshwater animals of India. An ecological approach, Oxford and IBH, 1980.
- [14] Williamson, Copepoda CE. In Thorp, J. H., and A. P. Covich (eds.) Ecology and classification of North American freshwater invertebrates. Academic Press, San Diego. 1991, 787 - 822.
- [15] Solanke MR, Dabhade DS. Study of rotifer communities in upper Morna reservoir, Medshi, District Washim. International journal of applied research. 2016; 2 (12): 99 - 102.