

# Protozoal diversity of Ghodpeth Lake of Bhadrawati, District Chandrapur (M.S.), India.

Khaparde Pooja I<sup>1</sup> and Harney Narendra V<sup>2</sup>

<sup>1</sup>Research Scholar, Department of Zoology, Nilkanthrao Shinde Science and Arts College, Bhadrawati, Chandrapur - 442902.

<sup>2</sup>Department of Zoology, Nilkanthrao Shinde Science and Arts College, Bhadrawati, Chandrapur - 442902.

Email: [narendra\\_harney2008@rediffmail.com](mailto:narendra_harney2008@rediffmail.com)

## Manuscript Details

Available online on <http://www.irjse.in>

ISSN: 2322-0015

## Cite this article as:

Khaparde Pooja I and Harney Narendra V. Protozoal diversity of Ghodpeth Lake of Bhadrawati, District Chandrapur (M.S.), India. Title of the article, *Int. Res. Journal of Science & Engineering*, February, 2020, Special Issue A7: 441-444.

© The Author(s). 2020 Open Access

This article is distributed under the terms of the Creative Commons Attribution 4.0 International License

(<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

## ABSTRACT

Protozoa are present in water body, constitute a major group, and can be used to monitor the water pollution. Ghodpeth lake is located near Bhadrawati tehsil in Chandrapur District of Maharashtra. In present study of Godhpeth lake Protozoal seasonal study is carried out to monitor the change in the population of protozoa from February 2014 to January 2016. In the present investigation, protozoa are represented by total 34 species at all the sampling sites of lake. In site A, Protozoa is represented by 34 species in 2014-15 and 33 species in 2015-16, in site B, Protozoa is represented by 31 species in 2014-15 and 27 species in 2015-16 and in site C, Protozoa is represented by 27 species in 2014-15 and 24 species in 2015-16.

**Keywords:** Protozoa, Ghodpeth Lake, Diversity, Seasonal variation.

## INTRODUCTION

Water pollution is caused by various human activities like industrial, domestic and agriculture. Clean water resources around the earth have been worn-out, polluted, fought over and squandered with little consider for human healthiness and environmental consequences [1]. Zooplanktons, which includes of Protozoa, Rotifers, Cladocerans, Copepods and Ostracod are highly sensitive to environmental modifications and their variation in occurrence indicates as the major indicator of the ecological status of water body.

Protozoa are heterotrophic microorganisms and form base of many food chains. Protozoa responds drastically to the change in environment of water bodies. Population of protozoa is changed with change in pH, temperature, and toxic substance entered in the lake. Present investigation has been undertaken to study the qualitative and quantitative analysis of Protozoal in the Ghodpeth lake near Bhadrawati, Dist. Chandrapur.

## METHODOLOGY

The Ghodhpeth Lake is fresh water lake situated near the Bhadrawati tehsil of Chandrapur district of Maharashtra state. Bhadrawati is about 25 Km North of Chandrapur and 125 Km South East from Nagpur. It is situated at about 211m above the mean sea level and is at 20°06'35.67" N latitude and 79°07'7.33" E longitude.

The samples were collected from three sites in the morning hours between 8:30 to 10:30 a.m. 50 lit of water sample was filtered through the plankton net made of bolting silk number 25 with mesh size 64 time. The collected samples were allowed to settle down by adding Lugol's iodine. Sedimentation requires 24 hrs. After which supernatant was removed and concentrate was made up to 50 ml and preserved in 5% formalin for additional studies. Plankton identification up to genera and whenever possible up to species level was classified according to keys given by Prescott [2], Sehgal [3], Edmonson [4], Adoni [5], and APHA [6] and standard analysis was undertaken as per Zar [7-8].

Quantitative study of plankton was done by Sedgwick- Rafter cell method.

### Sedgwick-Rafter cell method

The Sedgwick Rafter cell is a special kind of slide similar to the Haemocytometer. The cell has 50mm x 20mm x 10mm rectangular cavity that holds 1 ml sample. The cell is stimulated in horizontal directions on the stage of an inverted microscope and planktonic species encounter in the field are enumerated. A number of repeat samples are enumerated to analyze plankton/lit.

Plankton (Units/lit)=  $n \times c/v$

Where,

n= number of plankton in 1 ml

C= Volume of concentrate

V= volume of sample in lit

## RESULTS AND DISCUSSION

In the present investigation, Protozoa species shows little variations as per sampling sites of the lake. In site A, Protozoa is represented by 34 species in 2014-15 and 33 species in 2015-16, in site B, Protozoa is represented by 31 species in 2014-15 and 27 species in 2015-16 and in site C, Protozoa is represented by 27 species in 2014-15 and 24 species in 2015-16.

Sharma *et al.* [7] observed 4 species in Pichhola lake of Jaipur, Rajasthan. Gadekar, [9] noted the 6 species of protozoa in Pangdi lake of Gondia, District Gondia, Maharashtra Sitre and Thakare, [10] observed the five species of protozoa in Balaji temple tank of Chimur city of Chandrapur District (M.S.), Sitre [10] reported 6 different species of protozoa in Naik lake of Nagpur city (M.S.). Sharma *et al.* [11] reported 2 species in two perennial ponds in Jammu region.

Among the different species of protozoa in site A of lake Amoeba proteus was dominant followed by *Chlamydomonas angulosa*, *Centropyxis hemisphaeria*, *Diffugia lobostoma*, *Diffugia corona* and *Arcella vulgaris*. In site B, *Centropyxis arcelloides* was dominant followed by Amoeba proteus, *Diffugia lobostoma*, *pelomyxa palustris*, *Diffugia alveolata* *Centropyxis arcelloides* and *Companella unbellaria*. In site C *Spasmostoma viride* was dominant followed by *Centropyxis arcelloides*, *Actinophrys sol*, *Diffugia lobostoma*.

Kedar [12] recorded *Spasmostoma viridae*, *Astramoeba radiosa* and *Paramecium aurelisa* a dominant species throughout the year in the water body of Vidarbha. Patil, *et al.*, [13] reported *Amoeba sp.*, *Bursariasp.*, *Diffugia*, *Paramecium sp.* And *Zygnema sp.* as a dominant species of the Protozoa at Rishi lake and *Paramecium sp.* and *Zygnema sp.* in Yedshi lake of Washim District of Maharashtra. Kadam *et al.*[14] reported *Arcella discoidea*, *Diffugia lebes*, *Centropyxis*

**Table 1: Yearly variation of zooplankton from sites of Ghodpeth lake during year 2014-15**

S.N.	Parameters	S1		S2		S3		Total	
1	Protozoa	77.92	± 18.49	68.33	± 16.94	66.00	± 9.85	70.75	± 3.76

**Table 2: Yearly variation of zooplankton from sites of Ghodpeth lake during year 2015-16**

S.N.	Parameters	S1	S2	S3	Total				
1	Protozoa	67.92	± 10.94	64.25	± 12.00	69.75	± 14.61	67.31	± 1.54

**Table 3: Two year variation of zooplankton from sites of Ghodpeth lake during year 2014-16**

S.N.	Parameters	S1	S2	S3	Total	
1	Protozoa	72.92±15.99	66.29 ±14.82	67.88 ±12.60	69.03 ±1.41	

*aculeate* and *Wailesella eboracensis* is dominant species in Pillowa Reservoir, District Morena, Madhya Pradesh, India.

In the present investigation, seasonally maximum Protozoa were recorded in the winter season and minimum during the monsoon season. Kedar [15] observed minimum population of Protozoa during the rainy season at Rishi lake in Karanja (Lad) of Maharashtra. Bhagat, *et. al.*, [16] observed maximum Protozoa in the winter season and minimum during the monsoon season in Ambadi irrigation dam of District Akola. Gadekar [17] recorded the maximum density of protozoa in winter season that is in December month while it was the minimum in monsoon in June month in Pangdi lake of Gondia of District Gondia, Maharashtra. Sitre, [18] reported that the peak of Protozoa population observed in summer months and their count remains low during monsoon period in Naik lake of Nagpur city (M.S.).

In the present study, the dilution of water caused by rainwater which results in minimum population of Protozoan in monsoon season. The maximum population of protozoa during in winter season indicates clear water transparency, intense sunlight and increased light penetration and sufficient amount of sulphates and nitrates.

**Conflicts of interest:** The authors stated that no conflicts of interest.

## REFERENCES

1. Lavado, R., Thibaut, R., Raldua, D., Martin, R. and Porte, C. First evidence of Endocrine disruption in feral carp from the Ebro river [2004]. *Toxicology and Applied Pharmacology*, **196**: 247-257.
2. Prescott, G.W. The fresh - water algae [1954]. W. M. C. Brown company. Dubuque, USA.
3. Sehgal K.L. (1983). Planktonic Copepod of Fresh Water System. ITCR print, New Delhi.
4. Edmondson, W. T. Freshwater Biology [1959], John Wiley and Sons Inc. N.Y. pp. 420-494.
5. Adoni, A.D. Work book on limnology [1985], Dept. of Environment, Govt. of India, Bandana printing service, New Delhi. pp. 88.
6. APHA Standard Methods for the Examination of Water and Waste Water [1985], American Public Health Association, New York. 16th Edition.
7. Sharma, L. L., N. Sarang and B.K. Sharma, Occurance of macroinvertebrates in relation to water and sediment characteristics in three seasonal ponds of southern Rajasthan [2007]. *J. Aqua Biol.* Vol. 22 (2): 49-54
8. Zar, J.H. Biostatistician Analysis (4th Ed.) [2005], Pearson Education Inc., Delhi.
9. Gunwant, P. Gadekar., Kalpana P. Ghoshal and Ashish S. Gadwe, Studies on zooplankton diversity of Pangdi Lake, Gondia, Dist. Gondia, Maharashtra [2014]. *International Journal of Environmental Biology*. Vol. 4 (1): 47-50.
10. Shashikant R. Sitre and Mahendra G. Thakare, Zooplankton fauna of Balaji Temple Tank of

Chimur city of Chandrapur District (M.S.) during summer season[2013] *Lokavishkar International E-Journal*. Vol. 2 (4): 20-24.

11. Sharma, K. K., Sarbjeet Kour and Neha Antal Diversity of Zooplankton and Macrobenthic Invertebrates of Two Perennial Ponds in Jammu Region, India[2015]. *Jou. of Global Biosci.*, Vol.4(2): 1382-1392.
12. Kedar, G. T. and G. P. Patil, Studies on the biodiversity and physico-chemical status of the Rishi lake, Karanja. (M.S.) [2002] Ph.D. Thesis, Amravati University, Amravati.
13. Patil, G. P., Kedar, G. T. and Yeole, S. M. Zooplankton biodiversity study of two water bodies in Washim District (M.S.) [2008]. *J. Aqua. Biol.* Vol. 23 (1): 13-17.
14. Kadam, C.P., H.S. Dandolia, S. Kausik, D.N.Saksena and V.P. Shrotriy Biodiversity of Zooplankton in Pillowa Reservoir District Morena Madhya Pradesh, India[2014]. *Int. J. of Life Sci.*, Vol. 2(3): 263-267.
15. Kedar, G. T. and G. P. Patil, Studies on the biodiversity and physico-chemical status of the Rishi lake, Karanja. (M.S.) [2002] Ph.D. Thesis, Amravati University, Amravati.
16. Bhagat, V. B., Meshram, C. B., Bobdey, A. D. and Sawane, A. P. Diversity of microfauna in Ambadi irrigation dam, of District Akola (Maharashtra) [2010]. *Biosci. Biotech. Res. Comm.* Vol. (3 and 1): 104-106.
17. Gunwant, P. Gadekar., Kalpana P. Ghoshal and Ashish S. Gadwe, Studies on zooplankton diversity of Pangdi Lake, Gondia, Dist. Gondia, Maharashtra[2014]. *International Journal of Environmental Biology*. Vol. 4 (1): 47-50.
18. Sitre, Shashikant R. Zooplankton fauna assessment of Naik lake of Nagpur City (M.S.) India[2014], *Online International Interdisciplinary Research Journal*, Vol. 4 (2):118-123.