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# Diversity and Seasonal Fluctuation of Zooplankton in Fresh Water Reservoir Mongra Bairaj Rajnandgaon District, CG, India

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## Abstract

Present investigation has been conducted on Mongra Bairaj of Chhattisgarh with special references to its zooplankton diversity.18 zooplanktion species were identified from Mongra Bairaj which consisted of Protozoa 9 species (50%), Copepoda 5 species (28%) and Rotifera 4 species (22%). Among all the zooplanktion group, Protozoa recorded dominance. Maximum diversity of zooplanktion population was recorded at station 4 village Salhe in summer season.

Keyword: Zooplankton, Mongra Bairaj.

## Introduction

Zooplankton comes next to phytoplanktone, as this micro primary consumer wholly depends upon the micro primary producer. In this way, zooplankton seems to provide the base of aquatic life at first instance. That is why; the study of zooplankton has gained importance. Borgmann<sup>1</sup> *et al.* and Morgan *et al*; many others have studies zooplanktons of fresh water. This work also makes a new attempt to study the zooplanktons of Mogra Bairaj. Zooplanktons origin and growth is both natural and unnatural in fresh waster lakes of reservoir, in pure fresh water lakes of reservoir, its grow this natural, but in case of contaminated water, its growth is abnormal. It therefore acts as a bio-indicator that helps to measure fresh water quality. In this ways, it acts as link between energy flows of nutrient cycle in the aquatic ecosystem.

**Study Area:** The Mongra Bairaj fresh water reservoir sitated about 60km south of Rajnandgaon city. Mongra Bairaj is situated between 20.45"  $27.09^{0}$  N. latitude and 80.39"  $43.32^{0}$  E longitude. The reservoir was surrounded by hills from two sides. There water spread area of 697 hectors. Mongra Bairaj is used for irrigation and aquaculture practices. Present work has been conducted on four sampling sites of Mongra Bairaj for the estimation of its fish diversity. Site 1 was fixed at near the Mongra village, site 2 near the village Munjal, site 3 was near Khadkhadi village and site 4 was fixed near Salhe village.

# **Material and Methods**

This study is based on primary data which have been generated using sampling technique. Samples for all 12 months in this year 2011 have been taken. This would enable the researcher to carry out. Quantitative analysis for finding of seasonal variation. Trends of zooplanktons in term of variety, its abundance and percentage composition. The study has used Sedgwick Rafter method. The identification of zooplankton species has been done using text and monograph standard by  $Edmondson^3$  and  $Battis^4$ .

## **Results and Discussion**

A total of 18 zooplankton species were identified in Mongra Bairaj. Out of these 9 species (50%) were recorded from Protozoa, 4 species (22.22 %) from Rotifera, 5 species (27.77%) from Copepods. The class wise sequence of dominance of zooplankton in Mongra Bairaj was as: Protozoa > Copepods > Rotifers. During the present study period, Protozoa recorded its dominance at all the site in Mongra Bairaj. Maximum Protozoa 6 species were recorded at site 4 while minimum 4 species were recorded from the site 3. The presence of maximum zooplanktonic fauna at site 4 is due to the impact of agricultural waste and presence of macrophytic vegetetation which provides food and habitat for zooplankton population. At Site 3 zooplankton recorded maximum it may also due to agricultural in organic fertilizer came in the Bairaj water with rain water. Arcella vulgaris was recorded maximum in summer. At site 3 Actinosperium, Strobilidium gyrance, Tokophyra lemnarum was recorded in summer season. Protozoan species such as Coleps sp. and Vorticella species was recorded at site 2 in summer season. Euglena was recorded in all the site but maximum in site 1 and 4. Some protozoan species such as Arcella vulgaris, Difflugia sp. have been considered as indicator of nutrient rich water by various authors in some Indian fresh water habitat<sup>5-8</sup>. Maximum protozoan population in Mongra Bairaj was recorded in Summer season which is also confirmed by some authors (Ahangar<sup>9</sup> et al., 2010; Samuelsson<sup>10</sup> et al., 2006).

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4 Species of rotifer was recorded in summer at site 4. 2 species was recorded at site 3 and only one species was and 2 species was recorded at site 1. *Brachionus* and *Keratella cochlearis* was recorded its dominance during summer and post monsoon season and *Trichocera sp* was dominated in summer season. *Brachionus* specie was recorded at all the site. Among the documented information are the works of Lim and Wong<sup>11</sup> (1997).

Table-1 Diversity of Zooplanktonc Group in Mongra Bairaj of Rainandgaon District (CG)

Protozoa	Copepoda	Rotifera
Euglena	Daphnia	Brachinous
Strobilidium gyrans	Cypris	Keratella cholearis
Epistylis plicatilis	Cyclops	Lecane bulla
Tokophrya	Diaptomus sp	Trichocera sp.
lemnarum.		
Actinopherium	Nauplius	
Arcella vulgaris		
Coleps sp.		
Dillugia		
Vorticella sp.		

A number of scientists have made their observations on zooplankton, such as Arora<sup>12</sup> (1962), Nayar<sup>13</sup>, (1968), Tonapi<sup>14</sup> (1980), Nayak T.R.<sup>15</sup> (1981) and Nayak U.G.<sup>16</sup> (1989). According to Moitra and Bhowmick<sup>17</sup> (1963), Rotifera and two sub-class of crustacean, the Cladocera and Copepoda dominate group of the zooplankton component of fresh water. Muhammad<sup>18</sup> Ali et el. (2005) studies on monthly variations in biological and physicochemical parameters of Brackish water fish pond. He suggests the diversity of plankton life were used as a measure of water quality of a brackish water aquaculture pond.

## Conclusion

Zooplankton plays an important role in food chain and food web of any type of ecosystem. It is major connecting link between producers and secondary consumers. Mongra bairage also used for the fish cultivation by the local fisherman. Cultivated major carp depend on zooplankton for food. For the survival of young of cultivated major carps like *rohu, catla*, *mrigal, big head, tilapia, notopterus* and *wallago attu* may depend on the availability of abundant littoral and behthic zooplanktons. The presence of zooplanktons are thus cruicial to achieving high fish production during fish cultivation in fresh water rat<sup>9</sup>.



Figure-1 Zooplankton percentage composition in Mongra Bairaz



**Figure-2** Zooplanktonic dominance in different site in Mongra Bairaj

#### References

- 1. Borgman D., Shear H. and Moore J., Zooplankton and potential fish production in Lake Ontario, Can. Fish aqua. Sci., 41, 13031309 (1984)
- 2. Morgan M.D., Threlkeld S.T. and Goldman C.R., Impact of the introduction of Kokanee and opossum shrimp on a subalpine lake, J. Fish Res.BD.Ca., 35, 1572-1579 (1978)
- Edmondson, Fresh water biology, 2<sup>nd</sup> Ed. John Wiley and 3. sons New York, U.S.A. (1992)
- 4. Battis S.K., Fresh water zooplankton of India, Oxford and IBH Publishing Co. New Delhi, 233 (1992)
- 5. David A. and Roy S., Study on the pollutin on river Dana, North Bihar By sugar and Distillery wastes, Environ. Hlth., 8, 6-35 (1966)
- Agarkar M.S. and Goswami H.K. et al., Biology, 6. conservation and management of Bhoj wetland 1, Upper Lake Ecosystem in Bhopal, Bionature, 14(2), 1119 (1994)
- 7. Wanganeo A. and Wanganeo R., Variation in zooplankton population in two morphologically dissimilar rural lake in Kashmir Himalaya, Nat . Acard. Sci., 76(3), 222-239 (2006)
- preliminary Lomnological Study on Shershah Suri Pond, phytoplankton in the inchest 8. Sasaram Bihar, Asian J. Exp. Sci., 24(2), 219-226 (2010)

- 9. Ahangar I.A., Saksena D.N., Mir M.F., Seasonal variation in zooplankton Community Structure of Anchar Lake, Kashmir, University Journal of Environmental Research and Technology, 2(4), 305-310 (2010)
- 10. Samuelsson K., Berglund J. and Anderson A., Factors structuring the heterotrophic flagellate and ciliate community along a brackish water primary production gradient, J. Plankton Res., 28(4), 345-359 (2006)
- 11. Lim L.C. and Wong C.C., Use of the rotifer, Brachionus calvciflorus Pallas, in freshwater ornamental fish larviculture Hydrobiologia, 358(1/3), 273 (5) (1997)
- 12. Arora H.C., Studies on Indian Rotifera (Part I), On a small collection of illoricate Rotifera from Nagpur, India, with notes on their bionomics, Journal of the Zoological Society of India, 14, 33-44 (1962)
- 13. Nayar C.K.C., Rotifers fauna of Rajasthan, Hydrobiolia, 31, 168-185 (1968)
- 14. Tonapi G.T., freshwater animals of Indian (An Ecololgical Approach), Oxfort & IBH Publishing Co. New Delhi, 225-245 (1980)
- 15. Nayak T.R., Hydrobiological study of Dalhan Tal Panna Ph-D. Thesis A.P.S.U., Rewa, M.P. (1981)
- Phyciol. Eco., 14(4), 219-226 (1989)

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- **17.** Moitra S.K. and M.I. Bhowmik, Seasonal cycle of Rotifers in fresh water fish pond in Kalyani West Bengal, *Proceeding of Symposium on Recent Advances in Tropical Ecology*, 359-367 (**1963**)
- **18.** Muhammad Ali, Salam A., Iram C., Bohari T.Z., Studies on monthly variations in biological and Physicochemical parameters of Brackish water Fish pond, Muzaffar Garh Pakisatan, **16(1)**, 27-38 (**2005**)