

ZOOPLANTONIC STUDY OF A WATER RESERVOIR AT RAIPUR DISTRICT PALI OF RAJASTHAN DURING MONSOON PERIOD

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ABSTRACT

The study of zooplankton is now become a fascinating field. The zooplankton community properties used as indicators of the reservoir trophic status and useful monitoring tool for environmentalists. Zooplanktons are good indicators of the changes in water quality because they are strongly affected by environmental conditions and respond quickly to changes in water quality criteria. Fish population also depends on Zooplankton since it is an intermediate link between phytoplankton and fish. Hence qualitative and quantitative studies of zooplankton are of great importance for all aspect, environmental as well as fishery industry. Raipur is the tehsil headquarter of Pali district of the Rajasthan state. It is situated on National Highway No. - 14 and in the nearby area of Aravali mountain range. It is situated at 26.01714 latitude and 74.06450 longitude on the globe. Water is a prime natural resource, a basic human need and a precious national asset and hence its use needs appropriate planning, development and management. In freshwater bodies, nutrients play a major role as their excesses lead to eutrophication. Owing to the high environmental sensitivity of planktonic species to the water quality, the study of their communities can indicate the deterioration of the environment. The zooplanktons are heterotrophic group of animals suspended in water with limitations of locomotion and migration; they are grouped in to four major animal groups. Protozoa, rotifers, Crustacea (cladocerans) and Crustacea (copepods). The water samples were collected for analysis and quantitative zooplankton at different sites in from the reservoir. The study of qualitative and quantitative analysis of zooplanktons has been carried out on this water body. The study revealed that 20 species belonging to four major groups identified viz. Protozoa (05) Cladocera (07), Rotifers (05), Copepods (03). The Cladocerans dominated having seven species followed by Rotifers and protozoa with five and copepods three species. Therefore, it can be stated that water reservoir is rich in zooplanktons.

Key Words: Natural resource, Diversity, Zooplanktons and Water reservoir.

1.0 INTRODUCTION

Water is one of the most priceless gifts of nature on the Earth. It can be safely stated that water is the life line of our planet. The evolution of life on the Earth and the development of human civilization could have not been

possible without water. Since the dawn of civilization, man had intimate relationships with water bodies. All the great civilizations of the world were centered around or near the water bodies. This is evident from the past civilizations like Nile valley civilization, Indus valley civilization, *Mohan-jo-daro* etc. which developed near the banks of perennial water bodies like lakes, rivers etc. Aquatic ecosystems are historically the sources of life on earth. Global aquatic ecosystems consist of two broad classes - the fresh water ecosystem and marine ecosystem. The study of fresh water ecosystems from the view point of limnological aspects is one of the fascinating areas in the field of aquatic ecosystem. In the last two decades much attention has been paid in tropical countries towards the study of biology, ecology and toxicology of zooplankton due to their important role in the rapidly emerging concepts in environmental management like Environmental Impact Assessment (EIA), bio indication of pollution and biological monitoring (Salve and Hiware, 2010). Due to tremendous development of industry and agriculture, the water ecosystem has become perceptibly altered in several respects in recent years and as such they are exposed to all local disturbances regardless of where they occur. The present role of human environmental preservation and human health is important factors. Animals of fresh water are extremely diverse and the indicators of water pollution and include representatives of nearly all phyla.

The health of reservoirs and their biological diversity are directly related to health of almost every component of the ecosystem. In freshwater bodies, nutrients play a major role as their excesses lead to eutrophication. Owing to the high environmental sensitivity of planktonic species to the water quality, the study of their communities can indicate the deterioration of the environment. The zooplanktons are heterotrophic group of animals suspended in water with limitations of locomotion and migration; they are grouped into four major animal groups. Protozoa, rotifers, Crustacea (cladocerans) and Crustacea (copepods). An increase in zooplankton biomass has been related by many authors to a rising level of eutrophication, since, to a large extent, a higher trophic state will lead to increased resource availability, which, in turn, leads to growth in the biomass of zooplankton populations (Bonecker *et al.* 2007). According to Silva, (2011) Water quality in tropical reservoirs can also be indicated by using specific species of cyclopoid as indicators.

Zooplanktons play an important role in the transfer of energy from primary producer (phytoplankton) to higher trophic levels. The herbivorous zooplanktons are efficient grazers of the phytoplankton and referred as living machines transforming plant material into animal tissue. The presence and diversity of zooplanktons influence the diversity of fishery potentials in the water reservoir. Thus, most fish larvae and many plankton-eating adult fishes feed upon zooplanktons. In fishery sector, zooplanktons are good food source for cultured fish especially fry, fingerlings juveniles and small adult fishes. Indeed, zooplanktons diversity and abundance as bioindicators are used as a tool for evaluating aquatic ecosystem health. Zooplankton is a valuable source of protein, lipids, and enzymes for numerous larval fishes (Kibria *et al.* 1997).

2.0 MATERIALS AND METHODS:

Samples were collected from surface water and littoral region in the monsoon season of 2018. The four locations of all directions of reservoir were decided to pick up the samples. The average values of all samples analyzed, were taken into consideration for discussion.

Towing Hensen's standard plankton net was used for qualitative analysis and the plankton samples were collected with gentle uniform speed. The plankton net was made up of no.25 bolting silk. The collected plankton samples were fixed in 70% ethyl alcohol and stored for analysis.

For quantitative estimation of the zooplankton, 50 litres of surface water was filtered through a small plankton net made up of the bolting silk number 25. Subsamples of small quantities (10 ml) were taken and counting of zooplankton was done in counting chamber under a C.Z. Inverted microscope. Zooplankton numbers were expressed as individuals per liter. Identification of zooplankton was done after (George, 1961; Edmondson, 1992; and Perumal *et al.*, 1998).

3.0 STUDY AREA

The qualitative and quantitative studies related to zooplanktons were conducted of water reservoir at Raipur of Pali district. Raipur is the tehsil headquarter of Pali district of the Rajasthan state. It is situated on National Highway No. - 14 and in the nearby area of Aravali mountain range. It is situated at 26.01714 latitude and 74.06450 longitude on the globe.

4.0 RESULT AND DISCUSSION

Zooplanktons are good indicators of the changes in water quality because they are strongly affected by environmental conditions and respond quickly to changes in water quality criteria. Fish population also depends on Zooplankton since it is an intermediate link between phytoplankton and fish. Hence qualitative and quantitative studies of zooplankton are of great importance for all aspect, environmental as well as fishery industry. Quantitative studies of zooplankton shows the average Zooplankton density 56 (no/l). The present investigations qualitative analysis has been carried out on water bodies identified 20 species belonging to four major groups viz. Protozoa (05), Cladocera(07), Rotifers (05) and Copepods (03). The Cladocerans dominated having seven species followed by Rotifers and protozoa with five and copepods three species. Most protozoans feed on bacteria-sized particles and thereby utilize a bacteria size zooplanktons and detritus generally not utilized by large zooplankton, most rotifers are sessile they form major parts of the zooplankton. Therefore, we can conclude that the water body is rich in zooplanktons.

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