



# Study of Zooplankton Community in a Freshwater Pond in Jammu and Kashmir

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## Abstract

Zooplanktons are diverse in nature and they are found in almost all water bodies. This paper presents a study of zooplanktons in a freshwater pond situated at Shastri Nagar area in Kathua city of district Kathua, Jammu & Kashmir. The study was carried to analyse the composition, abundance and interrelationship of zooplankton with phytoplankton and physico-chemical factors in the pond. The composition of zooplankton was studied at monthly intervals from January 2022 to September 2022. Planktons occupy the centre of the freshwater food chain. Total twenty-four species of micro and macro zooplanktons were observed in the pond and showed their seasonal association. The common group of zooplankton includes, Cladocera, copepods, rotifers and protozoans. The environmental condition of the pond and the surrounding area shows the dominancy of rotifers zooplankton. The investigation clearly showed that the maximum density and diversity was observed in summer and minimum was seen in rainy seasons.

**Key Words:** Physico-chemical, zooplankton, phytoplankton, community, pond

## Introduction:

Zooplanktons are considered as important component of aquatic food chain and play a key role of food as source for planktivorous fishes and are thus source of energy allocation in food chain. They are small animals or animal like organism that are unable to swim effectively along the water current and found near water surface as they feed on phytoplankton and other microorganism which are found in shallow water.

The change in environmental condition affects the growth of zooplankton as the water pollution causes problem such as eutrophication. They show rapid change in their population growth when water is contaminated due to

industrial and human activities. Therefore, zooplanktons are good indicator of water pollution. It is seen that protozoan zooplankton are less studied as compare to cladocerans, copepods and rotifers in terms of density and nutrition. The method of separation of protozoa is also difficult as they cannot be separate by standard micro-zooplankton net.

The present research was done to determine the number of species, composition, abundance and interrelation with phytoplankton and physicochemical factors of the location.

### **Material and Methods:**

Water sample for the investigation was collected from January 2022 to September 2022 at monthly intervals from the freshwater pond at Shastri Nagar. Water sample collected in a large bucket using a tow net near surface area as they feed on phyto-planktons which are abundant near the surface area. The water sample was collected from three different points for qualitative and quantitative analysis. The sample was then fixed in 5-10% formalin on the spot. The counting was done by Lackey's microtransact method (APHA, 1989) and using a Sedgwick rafter counting cell (Welch, 1952). Chemical analysis of water was done according to standard method (APHA, 1989). Anova test and coefficient of correlation between zooplankton and physicochemical parameter were determined by standard method of (Trivedy *et.al.*, 1987).

### **Result and Discussion:**

The total number of zooplankton taxa in pond identified, are twenty-four taxa of four main groups viz. protozoa, rotifera, Cladocera and copepoda. The maximum population of zooplankton were observed in August and minimal in March.

Qualitatively and quantitatively, rotifers are the rich zooplankton group found in the pond. The present analysis agrees with the other studies (Saler, 2004) that dominance of rotifers was seen in freshwater ecosystem, followed by protozoans, cladocerans and copepods.

Rotifers were observed as the dominant group of zooplankton with 11 species. They showed seasonal peaks in February, May and August. The minimum population recorded during January. The dominant species of the rotifers are *Brachionus* spp., *Cephalodella* spp. and *Notholca* spp. The dominancy of rotifer was seen because of the growth of algae in the pond.

Total 6 species of protozoan zooplanktons are seen in the water samples. Protozoans were found as dominating in the month of May. The lower counting is seen during September. The sample shows the dominancy of *Arcella*, and *Diffugia* spp. Any significant relation of protozoan- zooplankton is not found.

The total number of Cladocera species in sample found is 4. Cladocera community is dominant during January and May and minimum during July. *Moina* and *Kurzia* found as dominant species. Cladocera species respond in unfavourable condition sauch as rise in water level and temperature.

Only 3 species of Copepoda was founded in the sample. They are dominant during April and July while minimum during March.

**Conclusion:**

At present, water body source is slightly polluted due to religious reasons. Presence of fish in the pond shows the variation in the counting or number of zooplankton. An overall study indicates the seasonal presence of different zooplankton species is there in the pond.

During summer season, rate of moulting and production of phytoplankton also increases. As zooplanktons feed on phytoplankton, they also grow faster in this season. Increase in zooplanktons might be due to high temperature, high availability of food and rich in nutrient.

**Acknowledgement:** We are highly thankful to Himani Dutta resident of locality for assisting us in the field exercise.

**Grant Support Details:** The present research did not receive any financial support.

**Conflict Of Interest:** The authors declare that there is not any conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/ or falsification, double publication and/or submission, and redundancy has been completely observed by the authors. No life science threat was practiced in this research.

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