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REVIEW ARTICLE

A CRICITAL EVALUATION OF LITERATURE ON ZOOPLANKTON RESEARCH IN INDIA

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ABSTRACT

Zooplankton is defined as drifting ecologically important organisms that are an integral component of the food chain and also evaluate the ecological status of water bodies. Ecologically zooplankton are one of the most important biotic components influencing all the functional aspects of an aquatic ecosystem such as food chains, food webs, energy flow and cycling of matter. Zooplankton population is very useful indicator for biological, physical and chemical process of aquatic system because they are strongly affected by environmental conditions and respond quickly to changes in water quality. The most important types of zooplankton include the radiolarians, foraminiferans, dino flagellates, cnidarians, crustaceans (including larvae), molluscs, echinoderm larvae and chordates. Zooplankton are the intermediate link between phytoplankton and fish. Hence, diversity and seasonal variation studies of zooplankton are of great importance in water bodies. The present paper deals with the review of available published literature during the present century and that cover the above mention areas of zooplankton biology. The literature reviewed clearly suggests us to conclude that in spite of such a voluminous work done by many scientists, still there are some gaps in terms of geographical or biological aspects. Considering Rajasthan, and Hadoti region specifically, many river systems need extensive study and it may be safely expected to find out some new genera species and this information can be utilized to solve food scarcity problem in the world.

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INTRODUCTION

Sivakumar *et al.* (2001) made qualitative and quantitative analysis of copepods and cladocerans of the freshwater bodies in and around Dharmapuri district of Tamil Nadu. They recorded four copepod species and seven cladoceran species. They also observed the higher population density of copepoda and cladocera in winter season than in the summer season. Das (2002) studied the dynamics of net primary production and zooplankton diversity in brackish water shrimp culture pond in northern part of Ganjam district, Orissa. Significant negative correlation was noticed between net primary production and zooplankton population. Copepods and rotifers were found to be the dominant groups among zooplankton. The zooplankton population varied with different seasons of the year with rainy and summer seasons showing the minimal density in zooplankton population. Amita Arjaria (2003) studied Physico-Chemical Profile and Plankton Diversity of Ranital Lake, Chhatarpur, M.P. The zooplankton was represented by 10 genera covering different groups. Saha (2004) studied Zooplankton diversity in five major coalfield areas in Jharkhand and revealed seventy species of zooplankton. Cladocerans and rotifers were abundant groups (nine species each) followed by seven species of copepoda and one species of ostracoda. The evenness (J) showed insignificant relationship with species diversity index (H'), while species richness (S) showed negative relationship with species diversity index values. The overall diversity of plankton was low due to high alkalinity of water which results due to fly ash deposition. Zafer and Sulthana (2005) investigated the density of zooplankton in the River Ganga at Kanpur, India. They observed that the density of zooplankton was found to be high during summer and minimum in the monsoon season. Jayabhaye and Madlapure (2006) studied the zooplankton diversity in Parola Dam, (Hingoli), Maharashtra and reported 29 zooplankton species, out of which 14 species belong to rotifera, five species belong to copepoda, three species belong to ostracoda and six species to cladocera. Mathivanan *et al.* (2007) studied plankton of river Cauvery water (Tamil Nadu) The qualitative and quantitative evaluation of the variation in river water showed high quantity of zooplankton population throughout the study period and rotifers formed dominated group over other group's organisms. This study revealed that the water of River Cauvery is highly polluted by direct contamination of sewage and other industrial effluents. Gaikwad *et al.* (2008) studied the diversity of zooplankton in the water bodies of North Maharashtra region. They recorded a total of 19 species including six species of copepoda, five

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species of cladocera and eight species of rotifera. Rajashekhar *et al.* (2009) Zooplankton diversity of three freshwater Lakes with respect to trophic status from Gulbarga district, North East Karnataka and identified a total of 39 species of zooplankton. Dube *et al.* (2010a) investigated on Community structure of zooplanktonic groups of Kishore Sagar Tank. In this investigation they recorded total 36 species of zooplankton which belong to 7 groups. Dube *et al*. (2010b) have studied the occurance and seasonal variation of the plankton in Kishore Sagar Tank, Kota, Rajasthan and a total 60 species of plankton (twenty four species of phytoplankton and thirty six species of zooplankton) were recorded. Sharma and Mankodi (2011) studied the diversity of various types of plankton like, phytoplankton and zooplankton in Narmada River.

The phytoplankton were represented by Bacillariophyceae, Chlorophyceae, Cynophyceae and Euglenophyceae, out of which generic diversity of Bacillariophyceae was more. Sharma *et al.* (2012) studied fresh water Cladocera of South Rajasthan, India. This study shows cladocera are an important component of the crustacean zooplankton. Zooplankton samples from 77 different water bodies of South Rajasthan were analyzed to investigate the cladocera inhabiting these water bodies. During this study 54 species of cladocerans were reported, belonging to 6 families i.e. the Sididae, Daphinidae, Moinindae, Bosminidae, Macrothricidae and Chydoridae. It was noticed that rich nutrients, the presence of weeds and shallow waters favoured rich diversities of cladocerans. Negi and Mamgain (2013) studied Zooplankton diversity of Tons River of Utarkhand State India. A total of 23 genera of zooplankton belonging to 7 major groups viz. Ciliphore, Cladocera, Copepod, Porifera, Rotifera, Ostracod and Zooflagellate.

Priyanka Malhotra (2014) studied the variations in zooplankton population in relation to industrial effluents. Various pollution indicating physicochemical parameters have been correlated with zooplankton indicating the effect of DO, BOD and pH on zooplanktonic population and diversity. Zooplankton occurs in all water bodies and is of fundamental importance to nutrient recycling and regenerated primary production. Due to short life span and wide distributions of many zooplankton, these act as "ecological indicators." Kumar and Khare (2015) studied the analysis of diversity of plankton (i.e., phytoplankton and zooplankton) and their seasonal variation of density in the Yamuna River at Kalpi, District Jalaun, U. P.. Registered zooplankton were belong to 22 species of 16 genera of different groups like as protozoa (3 species of 3 genera), Rotifera (12species of 6 genera), Cladocera (5species of 5 genera) and Copepoda (2 species of 2 genera). Rotifers Population was dominant during entire study span. Shukla and Solanki (2016) studied the zooplankton composition, variation and diversity indices in River Narmada at Jabalpur region. Zooplankton diversity is one of the most important ecological parameters in water quality assessment and good indicator of the changes in water quality. Zooplankton formed important quantitative component of net plankton of the four parts; Protozoa dominantly contributed to their abundance while Copepoda> Rotifera> Cladocera> Ostracoda were sub-dominant groups. Due to their large density, shorter life span, drifting nature, high group or species diversity, different tolerance to the stress and often respond quickly to environmental change and water quality, zooplankton are being used as indicator organisms for the physical, chemical and biological process in the aquatic ecosystem. P.V. Krishna and Hemanth Kumar (2017) studied Seasonal Variations of Zooplankton Community in Selected Ponds at Lake Kolleru Region of Andhra Pradesh, India. A total number 16 species recorded with 9 Rotifera, 3 Cladocera and 4 Copepods. In the rotifers the genus Brachionus is the dominant group. In ecologically zooplankton is one of the most important biotic components influencing all the functional aspects of an aquatic ecosystem such as food chains, food webs, energy flow and cycling of matter. Manickam *et al.* (2018) studied impact of seasonal changes on zooplankton biodiversity was conducted in the Ukkadam Lake (Lat 10° 59′ N and Long 76° 57 ′ E), at Coimbatore city, Tamil Nadu, India. The population density of various group of zooplankton was observed, and it was found to be following order Rotifera > Copepoda > Cladocera > Ostracoda. The high and low population densities were recorded in summer and early monsoon season respectively. This higher zooplankton population density in summer might be due to the temperature acceleration in the Ukkadam Lake. It indicates that the temperature has influence on the zooplankton diversity. Therefore, increased temperature due to global climate change might have influence on the zooplankton production. Kamlesh Meena and Prahlad Dube (2018) studied A critical review of zooplankton of Lentic Water Bodies in India. Zooplankton are the plankton consisting animals and the immature stages of larger animals. Due to their large densities they are being used as the indicator organisms of physical, chemical, and biological process of aquatic system.

Conclusion

On the basis of above review we can say that a lot of work done by scientists on the zooplankton. So many species and genera season wise keep changing. Favourable conditions increase their number so they considered as a useful indicator for the health of aquatic system. Still, it is expected to search many more genera and species of zooplankton in India.

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