

A preliminary study of zooplankton diversity of Ramala lake District Chandrapur, Maharashtra

Rajlaxmi R. Kulkarni, Dr. Suresh Zade*, S.B. Patharde

Department of Zoology, S. P. College, Chandrapur

*P. G. Deptt. of Zoology & Co-ordinator,

P. G. Deptt. of Sericulture. Manoharbai Patel College, Sakoli Dist. Bhandara (M. S.)

Abstract

The present study reports the zooplankton community of Ramala lake in Chandrapur city, Maharashtra for period of 12 months from June 2006 to May 2007. The study showed much diversity. The lake is one of ancient, historical, man made water body, constructed by Gond Raja of Chandrapur. Monthly variation in the abundance of zooplankton were studied during the study period of 12 months. Total 18 zooplankton species were recorded, out of which 10 rotifera species, 02 copepoda species, 01 ostracoda and 05 cladocera species were found. The rotifer *Brachionus* was dominated throughout the study period.

Key words:- *Zooplankton, copepoda, rotifera, Ramala lake.*

Introduction

Zooplankton are most fascinating group of microorganism found in aquatic body. Diversity refers to the range of variation of difference among some set of entities, zooplankton diversity thus refers to variety within their community. They include a varied assemblage of taxonomically unrelated microscopic organism. Their common ecological characteristic being their habitat, they are found freely drifting in the epilimnion. They are abundant in shallow water areas of reservoir. They play a vital role as primary consumer which feed upon phytoplankton. The occurrence and abundance of zooplankton in a pond depends on its productivity which in turn is influenced by physico-chemical parameter and nutrients. Zooplankton has been used as indicators of water quality, trophic status and pollution level. They provide food for fishes in the freshwater ponds & play major role in the fish production. Zooplankton has been an interesting subject of study in India and several workers worked on are, Ganapati (1943) Sharma & Patnaik (1985), Chandrashekhar and Kodarkar (1996), Pawar & Madlapure (2002) Patil *et al.* (2005).

The paper deals with diversity of zooplankton in Ramala lake which was studied for a period of twelve months from June 2006 to May 2007. The lake is one of chief lakes, within the municipal limits of Chandrapur city, running along the north, east section of the historical city wall of Gondraja's fort. It is situated 761 feet above the sea level in 19° 57' north latitude and 79° 22' east longitude.

Materials and Method

The present study was conducted for the period of twelve months from June 2006 to May 2007. Monthly samples of zooplankton were collected from three different sampling sites, S₁, S₂ and S₃, far apart from each other. The zooplankton were collected with the help of a plankton net of standard bolting silk cloth No. 25 (mesh size 0.03 – 0.04 mm) by filtering 50 liters of water by a plastic container of 05 liters capacity. The collected samples then centrifuged and volume was adjusted to 30 ml. The samples then preserved by

using 4% formaline solution. Detailed microscopic examination of zooplankton under compound binocular microscope has been carried out. As per as possible the zooplankton were identified up to species level. Preliminary identification of zooplankton was made by using standard key & other literature like Ward and Whipple (1992), Tonapi (1980) Battish (1992) Chandrashekhar and Kodarkar (1995) and taxonomic notes on rotifers, copepods etc. (IAAB Publication). For the quantitative analysis of plankton a Sedgwick Rafter counting cell of 1 ml capacity was used.

Results and Discussion

The zooplankton of Ramala lake composed of four major groups (classes) rotifer, ostracoda, copepoda and cladocera. The number of species that were identified during the study period were rotifer 10 species, copepods 02 species, ostracoda 01 species and cladocera 05 species. The rotifers were found to be dominant. It was noted that the total number of zooplankton varied from 24 to 65 number per litre at sampling site I, 05 to 45 number per lit. at sampling site III. The zooplankton population showed depletion in the month of Dec. - March and maximum number of zooplankton was found to be in the month of July -August.

The seasonal variation of zooplankton in the order of abundance at three sites were as follows:-

S₁ Cladocera > Rotifera > Copepoda > Ostracoda
 S₂ Rotifera > Cladocera > Copepoda > Ostracoda
 S₃ Rotifera > Cladocera > Copepoda > Ostracoda

A: Rotifera

The monthly average and total number of rotifers varied from 02 to 19 per liter at S₁, 01 to 15 at S₂ and 03 to 20 at S₃. Rotifer populations are very useful in indicating the water quality particularly in pollution studies (Shadecek 1983). Rotifers play an important role as grazers, suspension feeder and predators within zooplankton community. Rotifer species exhibit marked differences in their tolerance and adaptability to changes in physico-chemical and biological parameters. Among Rotifers, Hutchinson (1967) observed that *Brachionus spp.* are very common in temperate and tropical waters, which indicate alkaline nature of bodies. Ferenska and Lewkowiez (1996) and Schindler and Noven (1971) have mentioned in their treatise that the enormous growth of rotifers in lakes and reservoirs are indicators of autotrophic condition. Rotifers are commonly termed as 'Wheel-Animalcules'. The significance of rotifera is based on their abundance and their role in aquatic food web. According to Peijler (1957) there is no direct effect of pH on rotiferan population. Edmondson (1959) and Baker (1979) observed that the high rotifer population in winter could be attributed with favorable temperature and availability of abundant food. Chandrashekhar (1996) observed that in summer and monsoon, the factors like water temperature, and availability of abundant food. Chandrashekhar (1996) observed that in summer and monsoon, the factors like water temperature, turbidity, dissolved oxygen play an important role in controlling the rotifer population. In present study, the rotifer population was found to be maximum in the month of July 2006 at station S₃.

B-Copepoda

The monthly average and total number of copepods varied from 02 to 20 number per lit. at S₁, 02 to 14 at S₂ and 04 to 22 per lit. at S₃. Water temperature and availability of food organism affect the copepods. Allan (1976) observed the inverse, relationship between high population of rotifers and cladocera and low population of copepods. Sharma and Hussain (2001) have reported low copepode population in summer season. The quantitative dominance of copepods is also reported by Sharma and Hussain (2001). The copepod population was found maximum in August (19/lit) at S₁ sampling station whereas in May the number was comparatively less. The water with copepod abundance were regarded to be at a lower trophic stage than those with rotifer abundance (Yousuf, 1988). Lakes rich in organic matter support higher number of cychopoids (Subbamma 1992), suggesting their preponderance in higher trophic state of water.

C-Cladocera

Most of the cladocera species are primary consumers and feed on microscopic algae and fine particulate matter in the detritus. The monthly average and total number of cladocera varied from 02 to 19 per liter at S₁, 01 to 12 at S₂ and 04 to 20 at S₃. Quadari and Yusuf (1980) investigated the influence of some physico-chemical parameters like temperature, dissolved oxygen, turbidity on the population density and diversity of cladocera. The monsoon population was observed maximum in the present study, this may be due to favourable condition of temperature and availability of abundant food in the form of bacteria, nanoplankton and suspended detritus or due to thick deposit of organic matter in aquatic ecosystem. Usha Choubey (1997) found the similar result i.e. high density of cladocera in the month of July.

D-Ostracoda

The monthly average and total number of ostracoda varies from 01 to 18 per liter at S₁, 07 to 12 per lit. at S₂ and 02 to 20 per liter at S₃. The abundance of ostracodes provides a good food for aquatic organism. In the present study only one species of ostracoda was found i.e. cypris, having the maximum number in the month of July.

List of Zooplankton species :

Rotifer

Asplanchna spp., *Asplanchna intermedia*, *Keratella tropia* (with one spine), *Keratella* spp. *Brachionus calyciflorus*, *B. caudatus*, *B. durgae*, *B. bidentata*, *Beauchampiella cudactylotum*, *Filinia* spp., *Tricocera* spp.

Cladocera

Moina micrura, *Moinodaphnia macleayi*, *Chydorus sphaericus*, *C. faviformis*, *Ceriodaphnia* spp.

Copepoda

Cyclop, *Mesocyclops* spp.

Ostracoda

Cypris.

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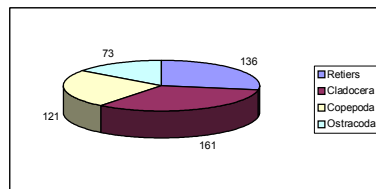
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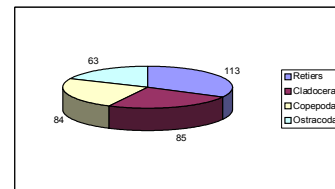
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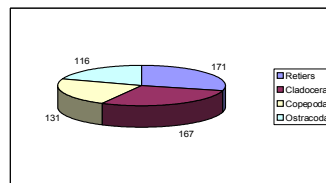
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Sampling site S₁



Sampling site S₂



Sampling site S₃