



## Crustacean Community in Anchar lake, Kashmir

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### ABSTRACT

The paper deals with the species composition and population dynamics of Crustacea in Anchar lake of Kashmir under the influence of certain environmental factors. The Crustacean fauna was represented by eleven species. The group showed maximum numerical surge during warm periods and minimum in colder periods. The species diversity was composed of Daphnidae followed by Bosminidae, Moinidae and Macrothricidae in decreasing order. The population dynamics was mainly influenced by water level fluctuations and macrophytic density.

**Key words:** Anchar Lake, Cladocera, Crustacea and Kashmir

### INTRODUCTION

The importance of Crustacea in the trophic dynamics of freshwater ecosystems has long been recognized. They are the consumers of first order, directly drawing energy from primary producers of the ecosystem, viz., phytoplankton and in turn form the food of a large number of planktivorous fishes, other invertebrates and thereby help in transferring energy to the higher trophic levels. Because of varied response to ecological features by different species, many of them act as reliable indicators of the trophic status of water bodies. A detailed limnological study of Anchar Lake (Kashmir) was conducted during June 2010 to May 2011 and the study is based on a part of the data collected during this study and describes the diversity and distribution pattern of Crustacea in response to environmental characteristics in this wetland.

### STUDY SITES

Anchar lake is a shallow basined lake with fluvial origin, situated near Soura 12 km to the north west of Srinagar city at an altitude of 1583 m.s.l and lies within the geographical coordinates of 34° 20' - 34° 36' N latitude and 74° 02' - 74° 05' E longitudes in a semi urban conditions. The site I is situated almost in the centre of the lake in the open water area with a maximum depth of 1.73 m and with little submerged vegetation growth. **Site-II** lies near the outlet of the lake towards the Sangam village lying in the west. The site has a maximum water depth of 1.23 m. **Site- III** is slightly away from the site II with maximum water depth of 1.72 m. The site is near the inlet of river Sind into the lake and the vegetation is dominated by *Phragmites australis*, *Typha angustata* and *Sparganium erectum*. **Site-IV** has been selected towards the eastern side of the lake near SKIMS Hospital. The site has maximum water depth of 1.66 m and is recognized by the vigorous growth of pollution indicator species like *Myriophyllum verticillatum*, *Hydrocharis dubia* and *Potamogeton natans*. Small but stretched patches of lotus (*Nelumbo nucifera*) are separated by these networks of channels. Dominant forms of Macrophytes in the wetland include: *Ceratophyllum demersum*, *Myriophyllum spicatum*, *M. verticillatum*, *Nymphaea spp.*, *Potamogeton spp.*, *Polygonum spp.*, *Sparganium erectum*, *Nymphoides peltata*, *Utricularia flexuosa*, *Typha angustata* and *Phragmites australis*.

### MATERIALS AND METHODS

Qualitative and Quantitative samples of Crustacea were collected on monthly basis with the help of plankton net and were preserved in 4% formalin. Detailed taxonomic identification was carried out following [1], [2], [3], [4] and [5]

## RESULTS AND DISCUSSION

### Biological features

Different species of Crustacea were recorded from Anchar Lake (Table 1). Of these two belong to *Bosminidae*, two to *Daphnidae*, one each to *Moinidae*, *Macrothricidae* and *Chydoridae*. Species number was highest at site II and site III followed closely by site IV and site I. The peak population was observed in August and lowest population in colder periods (Fig 1). Almost similar results have been obtained by [6] in Manasbal Lake. The maximum population of crustaceans occurred in summer and spring time when temperature, dissolved oxygen were conducive and the food source in the form of phytoplankton and microbial organic matter was in abundance [7] [8]. A comparison of different families revealed that highest population density recorded follows sequence *Daphnidae* > *Bosminidae* > *Chydoridae* > *Moinidae* > *Macrothricidae* > *Cypridae* in decreasing order. The highest population density recorded seems to be related with the diverse macrophytic community sustaining rich periphytic algal growth at the different sites [9] [10] [11] [12] [13]. An analysis of the composition of the population of different families revealed that *Daphnidae*, *Cyclopoidae* and *Bosminidae* were the dominant components (79%), (73%) and (51%) respectively at site II. Dominance of *Chydoridae*, *Bosminidae* and *Daphnidae* seems to be related to the eutrophic nature of the water [14] [15]. On the whole sequence of dominance among the cladoceran groups in the wetland was:

*Daphnidae* > *Cyclopoidae* > *Bosminidae* > *Macrothricidae* > *Moinidae* > *Cypridae*

The lake is readily divisible into two distinct areas, i.e. (i) area with sparse vegetation (site I and site II) and (ii) area having dense macrophytic vegetation (site III and site IV). Most of the crustacean species recorded from the lake was common in both the areas as they are free swimming forms and have better locomotory power than Rotifers [1] and only few species are restricted to the sparsely vegetated areas. *Moina brachiata*, *Cypris subglobosa*, *Bosmina coregoni*, *Bosmina longirostris* and *Cyclops scutifera* were absent at sites II, III, and I respectively. However the most dominant forms in the lake were *Daphnia magna*, *Daphnia pulex*, *Chydorous sphaericus*, *Bosmina longirostris*, *Macrothrix rosea* and *Cyclops bicuspidatus*. All these are true representatives of shallow eutrophic habitats and were widely distributed in the lake almost throughout the year. Others were only seasonal in their occurrence.

According to [3] crustacean plankton in a freshwater habitat at a particular moment is generally composed by one dominant species, one or two sub dominant species and the remaining species make up only the small fraction of the whole population. The present data do not support this view. This is probably due to the fact that the shallow nature of the lake supports a rich population of macrophytic community, which in turn provides varied microhabitats for the different animal associations including Cladocera. It may be concluded that the Crustacean fauna of the wetland is characterized by typical littoral Crustacean community mainly influenced by the fluctuations in the water level and the macrophytic density.

#### List of Crustacean species observed in Anchar Lake

- **Family: CLADOCERA**
  - *Alona affinis*
  - *Bosmina longirostris*
  - *Bosmina coregoni*
  - *Daphnia magna*
  - *Daphnia pulex*
  - *Moina brachiata*
  - *Chydorous sphaericus*
  - *Macrothrix rosea*
- **Family: COPEPODA**
  - *Cyclops scutifera*
  - *Cyclops bicuspidatus*
- **Family: OSTRACODA**
  - *Cypris subglobosa*

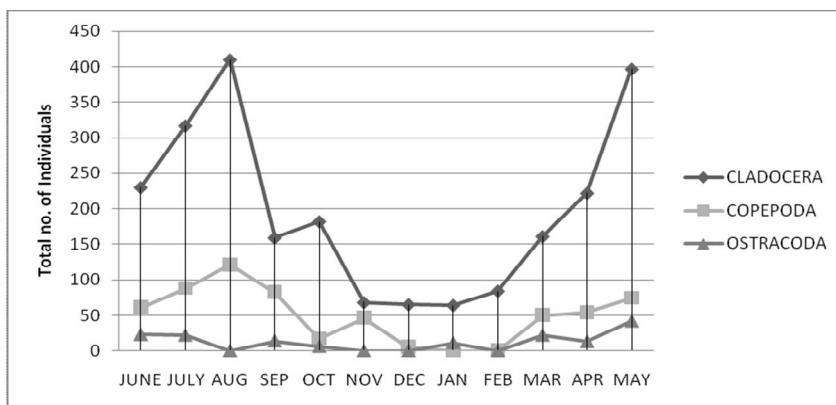


Fig 1: Monthly fluctuations in the population of Crustacea in Anchar Lake

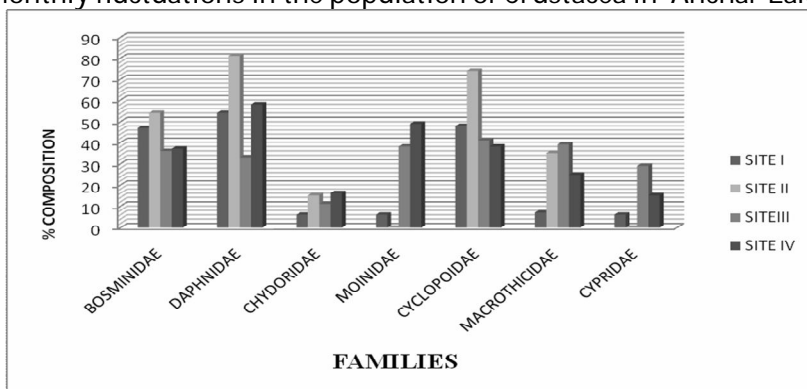


Fig 2: Percentage composition of different families of Crustacea in Anchar Lake

Table 1: List of species family wise recorded in Anchar lake.

<p>Family: <b>Bosminidae</b></p> <ul style="list-style-type: none"> <li><i>Bosmina longirostris</i></li> <li><i>Bosmina coregoni</i></li> </ul> <p>Family: <b>Daphnidae</b></p> <ul style="list-style-type: none"> <li><i>Daphnia magna</i></li> <li><i>Daphnia pulex</i></li> </ul> <p>Family: <b>Macrothricidae</b></p> <ul style="list-style-type: none"> <li><i>Macrothrix rosea</i></li> </ul>	<p>Family: <b>Chydoridae</b></p> <ul style="list-style-type: none"> <li><i>Chydorous sphaericus</i></li> </ul> <p>Family: <b>Moinidae</b></p> <ul style="list-style-type: none"> <li><i>Moina brachiata</i></li> </ul> <p>Family: <b>Cyclopoida</b></p> <ul style="list-style-type: none"> <li><i>Cyclops scutifera</i></li> <li><i>Cyclops bicuspidatus</i></li> </ul> <p>Family: <b>Cypridae</b></p> <ul style="list-style-type: none"> <li><i>Cypris subglobosa</i></li> </ul>
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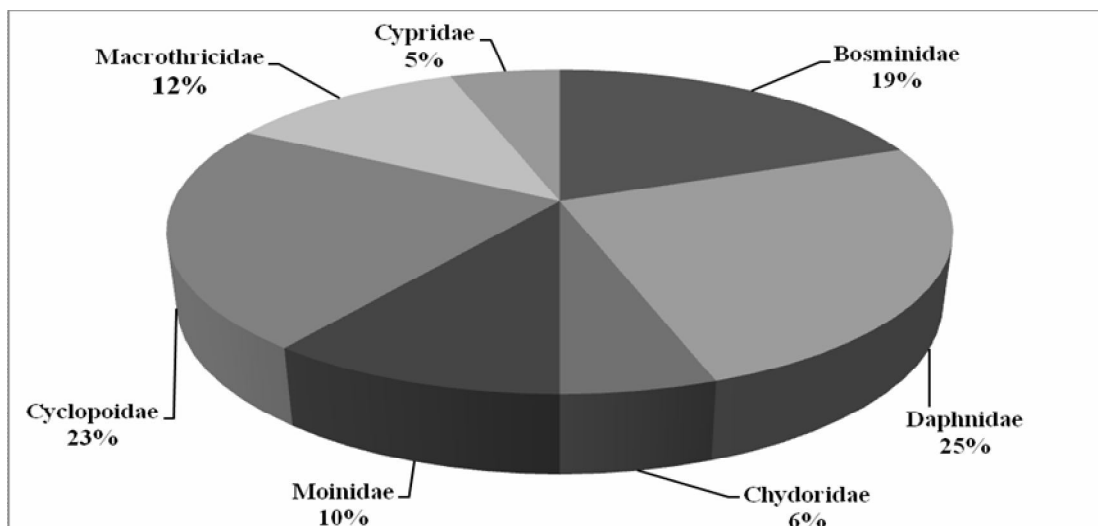


Fig 3 : Dominance pattern of different Crustacean families in Anchar lake.

## CONCLUSION

The maximum population of crustacea occurred in summer and spring time when temperature, dissolved oxygen were conducive and the food source in the form of phytoplankton and microbial organic matter was in abundance. Most of the crustacean species recorded from the lake was common in both the areas as they are free swimming forms and have better locomotory power than Rotifers.

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