



# Cladocera diversity of three water bodies of Bhadrawati, dist- Chandrapur (M.S.), India

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## ABSTRACT

Cladocera is a primarily-freshwater monophyletic group, an important component of the microcrustacean zooplankton. They inhabit most types of continental fresh and saline water habitats, occurring more abundantly in both temporary and permanent stagnant waters. The present paper describes the biodiversity of Cladocera fauna of Kanhala, Pindavani and Malhara pond, located near the Bhadrawati town of Chandrapur district. Qualitative and quantitative analysis of Cladocera community was undertaken on monthly basis from October 2005 to September 2007. A total of 12, 8 and 10 cladocera species were identified during the period of Oct. 2005 to Sep. 2006, while a total of 10, 11 and 9 cladocera species were identified from Oct. 2006 to Sep 2007 in Kanhala, Pindavani and Malhara pond respectively. In the present investigation, Cladocera was maximum during the winter season and minimum during the monsoon season in all the ponds.

**Key words-** Kanhala, Pindavani and Malhara pond, Cladocera diversity, Seasonal variation.

## INTRODUCTION

The Cladocera component of zooplankton plays an important role in the benthic trophodynamics. Most of the Cladocerans are primary consumers and feed on microscopic algae and fine particulate matter in the detritus thus influencing the cycling of matter and energy in benthos. Cladocera is an important component of zooplankton and form the most dominant groups of fish food organisms. The present investigation has been undertaken to study the statistical qualitative and quantitative analysis of cladocera community at the Kanhala, Pindavani and Malhara pond located near Bhadrawati town of Chandrapur district.

## MATERIAL AND METHODS

The three ponds selected for study viz. Kanhala, Pindavani and Malhara pond. They are principal freshwater bodies located in the rural area, around the vicinity of Bhadrawati town, located in the Chandrapur district of Maharashtra State, India. It is situated at about 211 m above MSL and at 20°06' 35.67" N latitude and 79°07' 17.33" E longitude.

Samples for plankton were collected monthly in the morning hours between 8.30 to 10.30 a.m. About 50 Lt. of water sample was filtrated through the plankton net made up of bolting silk number 25 with mesh size 64 lime. The collected samples were allowed to settle down by adding Lugol's iodine. Normally, sedimentation requires 24 hrs. After which supernatant was removed and concentrate was made up to 50 ml depending the number of plankton and preserved in 5% Formalin for further studies.

The quantitative study of rotifers was done by Sedgwick – Rafter cell method, the concentrated sample was shaken and immediately one drop of sample was taken on a clear micro slide with the help of a standard dropper, the whole drop was then carefully covered with the cover glass and observed. Identification up to genera and whenever possible up to species level was classified according to keys given by Prescott (1954), Edmondson (1959), Sehgal (1983), Adoni (1985) and APHA (1985).

## RESULTS AND DISCUSSION

A total of 12, 8 and 10 cladocera species were identified during the period of Oct. 2005 to Sep. 2006, while a total of 10, 11 and 9 cladocera species were identified from Oct. 2006 to Sep 2007 in Kanhala, Pindavani and Malhara pond respectively.

**Table 1 : Seasonal variation of Zooplankton in Kanhala Pond During year 2005-06**

Sr. No.	Components	Winter		Summer		Monsoon	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1	Cladocera	29.750	± 5.309	25.750	± 12.477	24.000	± 4.062

**Table 2 : Seasonal variation of Zooplankton in Kanhala Pond During year 2006-07**

Sr. No.	Components	Winter		Summer		Monsoon	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1	Cladocera	27.250	± 10.848	23.750	± 14.703	20.250	± 3.562

**Table 3 : Seasonal variation of Zooplankton in Pindavani Pond During year 2005-06**

Sr. No.	Components	Winter		Summer		Monsoon	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1	Cladocera	30.250	± 13.718	22.000	± 3.937	15.750	± 4.815

**Table 4. : Seasonal variation of Zooplankton in Pindavani Pond During year 2006-07**

Sr. No.	Components	Winter		Summer		Monsoon	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1	Cladocera	24.500	± 5.766	18.750	± 0.433	18.250	± 3.961

**Table 5 : Seasonal variation of Zooplankton in Malhara Pond During year 2005-06**

Sr. No.	Components	Winter		Summer		Monsoon	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1	Cladocera	13.500	± 1.118	12.250	± 1.479	7.250	± 1.299

**Table 6 : Seasonal variation of Zooplankton in Malhara Pond During year 2006-07**

Sr. No.	Components	Winter		Summer		Monsoon	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1	Cladocera	15.000	± 0.707	14.500	± 1.658	11.750	± 3.767

In Kanhala pond during 2005-06, 12 species were recorded among which *Bosminalongirostris* (124 no./lit) is dominant followed by *Moinadubia* (52 no./lit), *Moinabanchiata* (34 no./lit), *Chydorussphaericus* (21 no./lit), *Simocephalusvetulus* (21 no./lit), *Sidacrystallina* (14 no./lit) and *Kurzialatissima* (13 no./lit.), *Macrothrixlaticornis* (10 no./lit), *Alonella nana* (10 no./lit), *Macrothrixrosea* (8 no./lit), *Dunbevediacrassa* (6 no./lit) and *Pleuroxusprocurvus* (5 no./lit) and during 2006-07, 10 species were recorded among which *Bosminalongirostris* (109 no./lit) is dominant followed by *Moinadubia* (35 no./lit), *Moina branchiate* (28 no./lit.), *Chydorussphaerius* (27 no./lit), *Simocephalusvetulus* (25 no./lit) and *Sidacrystalline* (21 no./lit), *Kurzialatissima* (14 no./lit), *Alona nana* (10 no./lit), *Macrothrixrosea* (8 no./lit) and *Pleuroxusprocurvus* (8 no./lit).

In Pindavani pond during 2005-06, 9 species recorded among which *Bosminalongirostris* (142 no./lit) was dominant followed by *Chydorussphaericus* (27 no./lit), *Alonella nana* (26 no./lit), *Sida crystalline* (25 no./lit) and *Moina branchiate* (19 no./lit), *Kurzialatissima* (10 no./lit), *Macrothrixrosea* (9 no./lit), *Pleuroxusprocurvu* (8 no./lit) and *Macrothrixlaticornis* (6 no./lit) and 2006-07, 11 species were recorded among which *Bosminalongirostris* (103 no./lit) is dominant followed by *Chydoroussphaericus* (30 no./lit), *Alonella nana* (23 no./lit), *Sidacrystalina* (20 no./lit), *Moinabrachiata* (17 no./lit), *Kurzialatissima* (13 no./lit), *Pleuroxusprocurvus* (8 no./lit), *Macrothrixrosea* (7 no./lit), *Dunbevediacrassa* (6 no./lit) and *Macrothrixlaticornis* (5 no./lit).

In Malhara pond during 2005-06, 10 species were recorded among which *Bosminalongirostris* (36 no./lit) is dominant followed by *Sida crystalline* (18 no./lit), *Moinabanchiata* (18 no./lit), *Miona dubia* (18 no./lit), *Macrothrixrosea* (13 no./lit), *Chydorussphaericus* (10 no./lit), *Alonella nana* (8 no./lit), *Macrothrixlaticornis* (5 no./lit), *Pleuroxusprocurvus* (4 no./lit) and *Dunbevediacrassa* (4 no./lit) and during 2006-07, 9 species were recorded among which *Bosminalongirostris* (48 no./lit) is dominant followed by *Sidacrystallina* (30 no./lit), *Moinadubia* (24 no./lit), *Moina branchiate* (18 no./lit), *Macrothrixrosea* (15 no./lit), *Alonella nana* (12 no./lit), *Macrothrixlaticornis* (8 no./lit), *Chydorussphaericus* (6 no./lit) and *Pleuroxuprocurvus* (4 no./lit).

The Cladocera component of zooplankton plays an important role in the benthic trophodynamics. Most of the Cladocerans are primary consumers and feed on

microscopic algae and fine particulate matter in the detritus thus influencing the cycling of matter and energy in benthos.

In Cladocera, a total of 12 species are recorded at all the sampling sites of the three ponds under study. In Kanhala pond, Cladocera is represented by 12 species (2005-06) and 10 species (2006-07), in Pindavani pond, Cladocera is represented by 9 species (2005-06) and 11 species (2006-07) and in Malhara pond, Cladocera is represented by 10 species (2005-06) and nine species (2006-07). Kamble and Meshram (2005) reported two species of Cladocera of Khatijapur tank, Achalpur, Amravati district of Maharashtra. Pawar and Pulle (2005) reported 20 species of Cladocera in Petwadaj dam, Nanded, Maharashtra. Sahoo and Jameson (2006) reported three species of Cladocera in cattle waste fed fish pond of Thoothukudi, Tamilnadu. Patil *et al.*, (2008) reported nine species of Cladocera in Rishi lake and 8 species in Yedshi lake of Karanja (Lad), Maharashtra.

Among the different species of Cladocera species in Kanhala pond, *Bosminalongirostris* was dominant followed by *Moinadubia*, *Chydorussphaericus*, *Simocephalusvetulus* and *Sidacrystalina*. In Pindavani pond, *Bosminalongirostris* was dominant followed by *Chydorussp.*, *Alonella nana*, *Sidacrystalina* and *Moina branchiate* and in Malhara pond *Bosminalongirostris* was dominant followed by *Sidacrystalina*, *Moinabranchiata*, *Moinadubia* and *Macrothrixrosea*.

In the present investigation, Cladocera was maximum during the winter season and minimum during the monsoon season in all the ponds. Rajanet *al.*, (2007) observed minimum cladocerans population in premonsoon and monsoon and maximum in post monsoon in three polluted water bodies of Virudhnagar district, Tamilnadu. The maximum population of Cladocerans in winter can be attributed to favorable temperature and availability of abundant food in the form of bacteria, nonplanktons and suspended detritus. In contrast, Choube (1997) found high density of cladoceran in the month of June and low in the month of December. In the present investigation, maximum Cladocerans in winter is linked to favorable temperature and availability of abundant food.

**Conflicts of interest:** The authors stated that no conflicts of interest.

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