


## ZOOPLANKTON DIVERSITY IN A FRESHWATER LAKE OF CACHAR, ASSAM

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**ABSTRACT:** Zooplankton are cosmopolitan in nature and they are found to inhabit all freshwater tropical wetlands. The present investigation deals with the study of monthly changes of diversity and density of Zooplankton in Sat beel of Cachar, Assam. The work was carried out for a period of one year from September 2014 to August 2015. The population status of Zooplankton at Sat beel consisted of 40 genera, categorized into three major groups, viz, Rotifera > Cladocera > Copepoda. The Zooplankton sample consisted of 53% Rotifera, 25% Cladocera and 22% Copepoda respectively. Rotifera were the dominant group of Zooplankton recorded with respect to diversity and population density status.

**Key words:** Zooplankton, Beel, Rotifera, Density, Population.

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## INTRODUCTION

Zooplankton are a diverse group of heterotrophic organisms that consume phytoplankton, regenerate nutrients via their metabolism, and transfer energy to higher trophic levels (Steinberg and Robert, 2009). It plays an important role in recycling nutrients as well as cycling energy within their respective environment. These are the main sources of natural food for fish which is directly related to their survival and growth and are base of food chains and food webs in all aquatic ecosystem (Miah et.al., 2013). They are the essential food item of omnivorous and planktivorous fishes and the most essential for fish larvae culture (Alam et.al., 1987). Zooplankton vary from site to site within the same location with similar ecological conditions and as such both qualitative and quantitative studies of zooplankton in a waterbody are of great importance in managing successful aquaculture operation (Boyd, 1982). Zooplankton are often an important link in the transfer of energy from producers to aquatic carnivores (Thayer et.al., 1974). Zooplankton is a good indicator of changes in water quality because it is strongly affected by environmental conditions and responds quickly to changes in physical and chemical conditions as well as environmental conditions. Zooplankton communities respond to a wide variety of disturbances including nutrient loading, acidification, sediment input etc. It is a well-suited tool for understanding water pollution status (Contreras et al., 2009).

Though numerous works on Zooplankton diversity are being reported from different parts of India but there is scarcity of report from freshwater bodies of different parts of Northeast India except some worth mentioning of Sharma and Sharma (2008); Kar and Barbhuiya (2004); Kar (2007); Kar and Kar (2013) and Kar (2013). So, the present study was an attempt for reporting Zooplankton diversity of Sat Beel of Cachar district, South Assam.

## MATERIAL AND METHODS

**Study area:** Sat beel is located at Cachar district of Assam. It lies between 24°50'03.8"N and 92°49'21.4"E. It is about 8 km from the main town of Silchar. This wetland is situated in the Rongpur village of Silchar, Cachar district of Assam. This Beel is an aggregation of seven wetland units closely applied to each other and they become a single sheet of water during monsoon. Sat Beel is situated at c 25 m MSL.

**Zooplankton sampling:** The study was conducted for a period of one year from September 2014 to August 2015. Zooplankton were sampled weekly from the site following standard methods of Battish (1992). Then the sample were filtered and placed in Tarson (100 ml) container, subsequently fixed in Lugol's solution and stored in cool and dark place. For studying the diversity of Zooplankton, sample were taken in a Sedgwick-Rafter counting chamber and observed under a light microscope under required magnification (X 10 initially, followed X 40) and the specimens were identified following standard literature of Battish (1992); Edmondson (1959); Michael and Sharma (1998); Sharma (1998); Sharma and Sharma (2008).

## RESULTS AND DISCUSSION

During the present study, 40 genera of Zooplankton were recorded from the wetland belonging to the three groups viz, Cladocera, Copepoda and Rotifera. Among the recorded genera, 14 belongs to Cladocera, 4 belongs to Copepoda and 22 genera belongs to Rotifera group (Table 1). Similar observation was made by many researchers throughout the country Kar and Kar (2013) reported 26 species of Zooplankton from an oxbow lake of Cachar, Assam; Tyor et al. (2014) studied Zooplankton diversity in a shallow lake of Gurgaon, Haryana revealing Rotifera with highest diversity followed by Cladocera and then Copepoda showing least diversity; Pawar (2014) reported 66 species of Zooplankton in some freshwater bodies around Satara district of Maharashtra, India.

The abundance status of Zooplankton group recorded from Sat Beel were depicted in Fig 1. The present study revealed that the freshwater body that was investigated comprised of Cladocera (14 genera), Copepoda (4 genera) and Rotifera (22 genera) where Rotifera constituted the most dominating group contributing 53% to the total Zooplankton followed by Cladocera contributing 25% and Copepoda contributing 22% to the total Zooplankton. Different species of Zooplankton showed their abundance according to the favourable conditions.

The population density status of the Zooplankton recorded from Sat Beel is depicted in Fig 2. During the study period, among Cladocera, *Diaphanosoma* sp., *Sida* sp., *Chydorus* sp., *Ceriodaphnia* sp., *Bosmina* sp., *Alona* sp. and *Moina* sp. were recorded throughout the year; among Copepoda, *Mesocyclops* sp., *Neodiantomus* sp. were recorded throughout the year and among Rotifera, *Brachionus* sp., *Plationus* sp., *Lecane* sp., *Keratella* sp., *Anuraeopsis* sp., *Asplanchna* sp., *Ascomorpha* sp., *Testudinella* sp., *Trichocerca* sp. and *Scaridium* sp. were recorded throughout the year. Present investigation reveals high value of species richness reflecting the suitability of the wetland for the dominant species (Arora and Mehra 2003). In the present study, the study site was characterized by a greater diversity of Zooplankton taxa during winter season.

During the present study, Rotifera group was reported to be dominant among all other Zooplankton groups. In tropical freshwater wetlands, dominance of rotifera group is a common characteristic, similar was reported from the studies of Mwebaza-Nadwula, 2005. The present investigation revealed that the population density of Rotifera group reported from the study site vary in different seasons. Its density was reported to be highest in the month of December (Fig 2). Rotifera density was followed by that of Cladocera and then that of Copepoda as similar as it was reported by Tyor *et al.* (2014) during their study of Zooplankton diversity in a shallow lake of Gurgaon, Haryana where Rotifera was followed by Cladocera and then Copepoda showing least diversity and dominance with only 4 genera constituting 20% of the total Zooplankton population.

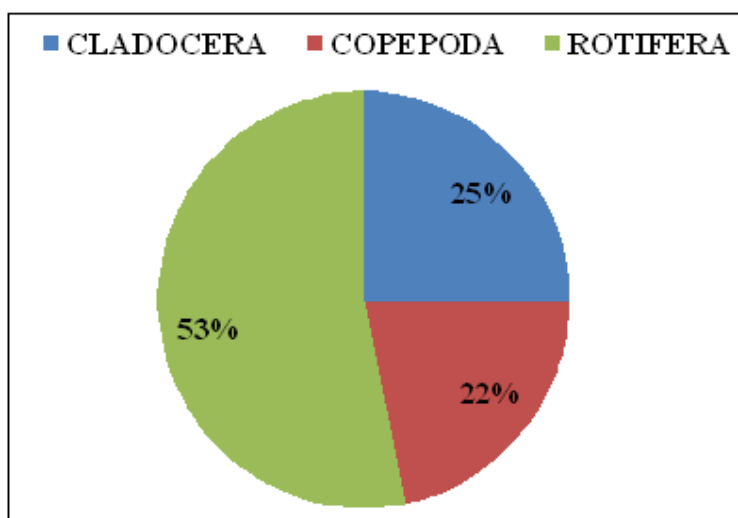
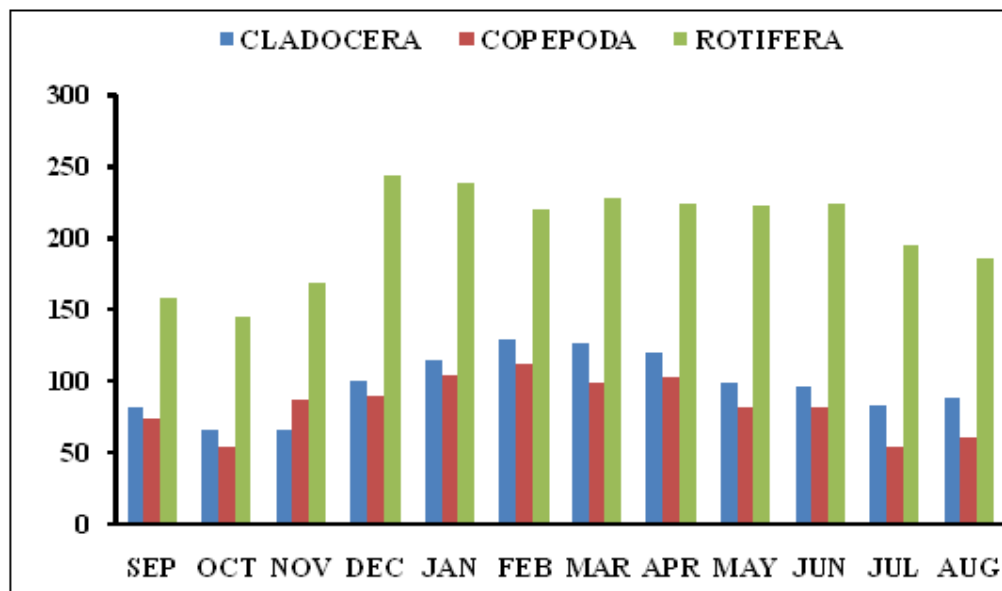


Fig 1: Abundance of Zooplankton of Sat Beel, Cachar, Assam

Table 1: Abundance of Zooplankton species of Sat Beel, Cachar, Assam

ZOOPLANKTON	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
<b>CLADOCERA</b>												
<i>Diaphanosoma sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scapholeberis sp.</i>	+	-	-	+	+	+	+	+	+	+	+	+
<i>Sida sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Simocephalus sp.</i>	+	-	-	+	-	-	-	-	+	-	-	+
<i>Macrothrix sp.</i>	-	+	-	-	+	-	-	+	+	+	+	+
<i>Chydorus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ceriodaphnia sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Bosmina sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Bosminopsis sp.</i>	-	-	-	+	-	-	-	-	+	-	+	-
<i>Alona sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Alonella sp.</i>	+	-	-	-	+	-	-	-	+	-	-	-
<i>Daphnia sp.</i>	-	-	-	+	-	-	-	-	-	-	+	-
<i>Moinodaphnia sp.</i>	-	-	-	+	-	-	-	-	+	-	-	-
<i>Moina sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<b>COPEPODA</b>												
<i>Mesocyclops sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Thermocyclops sp.</i>	+	+	+	+	+	+	-	+	-	+	+	+
<i>Neodiantomus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Heliodiantomus sp.</i>	+	+	+	-	+	+	-	+	+	+	+	+
<b>ROTIFERA</b>												
<i>Brachionus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Polyarthra sp.</i>	-	+	-	+	-	-	-	-	+	-	-	+
<i>Plationus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lecane sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lepadella sp.</i>	+	-	-	-	+	-	-	-	-	+	-	-
<i>Keratella sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Anuraeopsis sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Asplanchna sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ascomorpha sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Testudinella sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Trichocerca sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Cephalodella sp.</i>	+	-	+	+	-	-	+	-	+	+	+	+
<i>Macrochaetus sp.</i>	-	-	+	-	-	-	-	+	-	-	-	+
<i>Mytilina sp.</i>	-	-	-	-	-	-	-	-	-	+	-	-
<i>Horaella sp.</i>	-	-	-	-	+	-	-	-	-	+	-	+
<i>Filinia sp.</i>	+	+	+	+	+	+	+	-	+	-	+	+
<i>Colurella sp.</i>	-	+	+	-	-	-	-	-	+	-	+	+
<i>Conochilus sp.</i>	-	-	-	-	+	-	-	-	-	+	-	+
<i>Rotaria sp.</i>	-	+	-	-	-	-	-	+	-	-	+	+
<i>Scaridium sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pompholyx sp.</i>	-	+	-	-	+	-	-	-	-	+	+	+
<i>Platyias sp.</i>	-	-	-	-	-	-	-	-	-	-	-	-



**Fig 2: Population density status of Zooplankton of Sat Beel, Cachar, Assam**

## CONCLUSION

The present study on Sat Beel exhibits rich and diversified Zooplankton which is dominated by Rotifera throughout the study period which reveals that the wetland is very much suitable for aquaculture as Zooplankton particularly rotifer are known to be the best food for the fish larvae for aquaculture. This study is a useful contribution to reveal the diversity of Zooplankton in tropical floodplains in general which on the other hand is useful in maintaining aquaculture in natural floodplain in particular. Thus, keeping in view the importance of the study, steps should be taken for the conservation and maintenance of the freshwater wetland.

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