

RESEARCH ARTICLE

Zooplankton Diversity of a freshwater Pond in a Cachar district of Assam, India

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Manuscript details:	ABSTRACT
<p>Received: 25.12.2015 Revised 30.01.2016 Accepted: 09.03.2016 Published : 11.04.2016</p> <p>Editor: Dr. Arvind Chavhan</p> <p>Cite this article as: Kar S and Kar D (2016) Zooplankton Diversity of a freshwater Pond in a Cachar district of Assam, India, <i>International J. of Life Sciences</i>, 4(1): 125-128.</p> <p>Acknowledgement: First author is very much thankful to the Department of Life Science and Bio-informatics, Assam University, Silchar for providing the laboratory for working and Department of Zoology, Ballygunge Science College, Calcutta University for the help and assistance during the study. First author is also thankful to Assam University for providing her the scholarship as a Research Scholar.</p> <p>Copyright: © 2016 Author(s), This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.</p>	<p>Narsingtola pond is located at Silchar, Cachar district of Assam having rich diversity of aquatic vegetation though situated amidst the highly polluted area of the town. The present study deals with the Zooplankton diversity of the Narsingtola pond in Cachar district of Assam. The survey was carried out four times in a month during morning hours from September 2014 to August 2015. During the study, 42 genera of Zooplankton were recorded from the site of which 13 genera belongs to Cladocera, 4 genera belongs to Copepoda and 25 genera belongs to Rotifera. Abundance status and population density of the Zooplankton groups were also recorded. Rotifera was the dominant group among Zooplankton community constituting 42% of the Zooplankton population. Higher population density of Zooplankton were recorded during winter season and lower during the summer season.</p> <p>Keywords: Diversity, Narsingtola pond, Zooplankton, Rotifera.</p>
	<h2>INTRODUCTION</h2> <p>Zooplankton are a group of important organism of key importance in regulating patterns and mechanisms through which matter, energy and pollutants are transferred from the base to the upper levels of an aquatic food webs. It plays a crucial role in aquatic ecosystem as they are cosmopolitan in nature and they inhabit all freshwater habitats of the world (Gadekar, 2014). 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 (Dadhick and Sexena, 1999; Park and Shin, 2007). Their fluctuations in occurrence and abundance can be used to estimate the fishery potential of a water body (Hutchinson, 1967). Zooplankton includes most favourite prey of fish which, at least during early life stages, substantially feed on them. Predation by fish and vertebrates is, in general, visual, therefore depending on prey size and visibility (de Bernardi <i>et al.</i>, 1987). Thus, for better understanding of life in any aquatic body, knowledge of Zooplankton diversity is a must requirement.</p>

Various works on Zooplankton are being reported from throughout India and also on freshwater bodies of different parts of Northeast India (Sharma and Sharma, 2008) but in Cachar, Assam there is very scarcity of report on Zooplankton diversity except some worth mentioning of Kar and Barbhuiya (2004) and Kar (2007). So, the present study was an attempt for investigating Zooplankton diversity of Narsingtola pond, Cachar, Assam.

MATERIAL AND METHODS

Study area: Narsingtola pond is situated at Silchar town of Cachar district, Assam. It lies between 24°49'36.6"N and 92°47'58"E. It has large human interference as situated at highly polluted market area of Silchar town, surrounded by various kinds of shops and vendors.

Zooplankton sampling: The study was conducted for a period of one year from September 2014 to August

2015. The sampling protocol included weekly sampling of Zooplankton from the site following standard literature of Battish (1992). After collection, Zooplankton were filtered, placed in Tarson (100 ml) container and 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 intially , followed X 40) and the specimens were identified following Battish (1992); Edmondson (1959); Michael and Sharma (1998); Sharma (1998); Sharma and Sharma (2008).

RESULTS AND DISCUSSION

During the present investigation, 42 genera of Zooplankton were recorded from the site belonging to three major groups. Among the recorded species, 13 genera belongs to Cladocera, 4 genera belongs to Copepoda and 25 genera belongs to Rotifera (Table 1).

Table 1: Zooplankton species abundance of Narsingtola pond, Cachar, Assam

Zooplankton	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
CLADOCERA												
<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>Moina sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
COPEPODA												
<i>Mesocyclops sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Thermocyclops sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Neodiaptomus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Heliodiaptomus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
ROTIFERA												
<i>Brachionus sp.</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Philodina sp.</i>	-	-	-	+	-	-	-	-	-	-	+	-
<i>Plationus sp.</i>	+	+	+	-	+	-	+	-	-	+	-	+

Table 1: Continued...

Zooplankton	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
ROTIFERA												
<i>Lecane</i> sp.	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lepadella</i> sp.	-	+	-	+	-	+	+	+	+	-	+	+
<i>Keratella</i> sp.	+	+	+	+	+	+	+	+	+	+	+	+
<i>Anuraeopsis</i> sp.	-	+	+	+	+	+	+	+	+	+	+	+
<i>Asplanchna</i> sp.	+	+	+	+	+	+	+	+	-	+	+	+
<i>Ascomorpha</i> sp.	+	+	+	+	+	+	+	+	+	+	+	+
<i>Testudinella</i> sp.	+	+	+	+	+	+	+	+	+	+	+	+
<i>Trichocerca</i> sp.	+	+	+	+	+	+	+	+	+	+	+	+
<i>Trichotria</i> sp.	-	-	-	-	-	-	-	-	-	-	+	-
<i>Taphrocampa</i> sp.	-	-	-	+	-	-	-	-	-	-	-	-
<i>Cephalodella</i> sp.	+	+	+	+	+	+	+	+	+	-	+	+
<i>Macrochaetus</i> sp.	-	-	-	-	-	-	-	-	-	-	-	+
<i>Mytilina</i> sp.	-	-	-	-	+	-	-	-	+	-	+	+
<i>Horaella</i> sp.	-	-	-	-	+	-	-	+	-	-	-	+
<i>Filinia</i> sp.	+	+	-	+	+	+	-	+	+	+	+	+
<i>Colurella</i> sp.	-	+	-	+	-	+	-	+	-	+	-	+
<i>Trochosphaera</i> sp.	-	+	-	-	-	-	-	-	-	-	+	-
<i>Conochilus</i> sp.	-	-	-	+	-	-	-	-	-	-	-	-
<i>Rotaria</i> sp.	-	-	-	+	-	-	-	-	+	-	-	+
<i>Scaridium</i> sp.	+	+	+	+	+	+	+	+	+	+	+	-
<i>Platyias</i> sp.	-	-	-	+	-	-	-	-	-	+	-	-
<i>Synchaeta</i> sp.	-	-	-	-	-	-	+	-	-	-	-	+

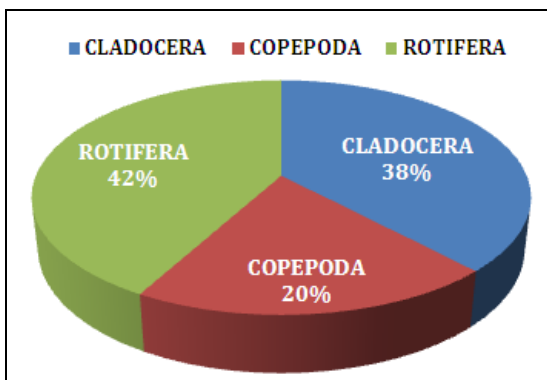


Fig 1: Abundance status of Zooplankton species of Narsingtola pond, Cachar, Assam

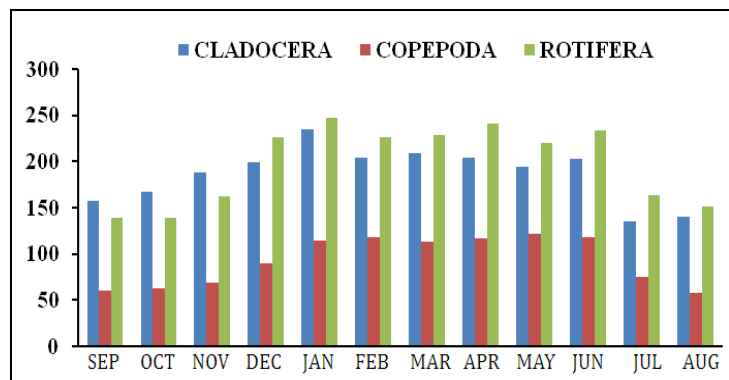


Fig 2: Groupwise population density status of Zooplankton of Narsingtola pond, Cachar, Assam

The abundance status of Zooplankton groups were also recorded (Fig 1). During the present study, Cladocera constituted 38% of the total identified Zooplankton of which *Diaphanosoma* sp., *Sida* sp., *Simocephalus* sp., *Chydorus* sp., *Ceriodaphnia* sp., *Bosmina* sp., *Alona* sp. and *Moina* sp. were recorded in all seasons. Copepoda constituted 20% of the total identified zooplankton of which recorded four groups from the site viz, *Mesocyclops* sp., *Thermocyclops* sp., *Neodiaptomus* sp. and *Heliodiaptomus* sp. were

recorded in all seasons. Rotifera constituted 42% of the total identified Zooplankton of which *Brachionus* sp., *Lecane* sp., *Keratella* sp., *Ascomorpha* sp., *Testudinella* sp. and *Trichocerca* sp. were recorded in all seasons. In the present study Rotifera group of Zooplankton community was found dominant with 25 genera constituting 42% of the total Zooplankton population. Similar observation was made by Tyor *et al.* (2014) during their study of Zooplankton diversity in a shallow lake of Gurgaon, Haryana. Rotifera was

followed by Cladocera and then Copepoda showing least diversity and dominance with only 4 genera constituting 20% of the total Zooplankton population.

Population density status of the recorded Zooplankton were depicted in Fig 2. Higher population density of Zooplankton were recorded during winter season and low during the summer season. Density of Cladocera was found to be higher in the month of January and lowest in the month of July, similarly Rotifera showing peak at the month of January and lowest at the month of September and October. Density of Copepoda were recorded to almost similar throughout the study period except slightly lower in summer season and slightly higher in winter season.

Many researchers from South Assam such as Kar and Kar (2013) reported 26 species of Zooplankton from an oxbow lake of Cachar, Narzary *et al.*(2015) reported 20 genera of Zooplankton from three different wetlands of Cachar district, Sonowal *et al.*(2015) reported 19 species of Zooplankton from three sites of Southern Assam, Suganthi *et al.*(2014) on a study on Zooplankton in 5 freshwater ponds of Cuddalore district, Tamil Nadu, reported 25 species of Zooplankton, a total number of 78 Zooplankton species were reported from a reservoir of West Bengal by Bera (2014), Pawar (2014) reported 66 species of Zooplankton in some freshwater bodies around Satara district of Maharashtra, India.

CONCLUSION

Zooplankton diversity of the Narsingtola pond revealed during the present study confirm the habitat to be rich for Zooplankton population and suitable for aquaculture, as Zooplankton are known to be the best food for fish larvae in aquaculture. Although the aquatic habitat of the Pond is being highly disturbed by different anthropogenic disturbances like washing clothes and utensils, direct bathing in the pond, dumping of different kinds of waste materials from the shops and vendors nearby the Pond etc., yet there is diverse presence of the Zooplankton in Narsingtola pond. Thus, keeping the above in view, steps should be taken for maintenance and conservation of Narsingtola pond.

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