

RESEARCH ARTICLE

Seasonal Variations in Zooplankton Diversity of Railway Pond, Gondia, District Gondia (M.S.)

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Manuscript details:	ABSTRACT
<p>Date of publication 18.10.2014</p> <p>Available online on http://www.ijlsci.in</p> <p>ISSN: 2320-964X (Online) ISSN: 2320-7817 (Print)</p> <p>Editor: Dr. Arvind Chavhan</p> <p>Cite this article as: Gadekar GP (2014) Seasonal Variations in Zooplankton Diversity of Railway Pond, Gondia, District Gondia (M.S), <i>Int. J. of Life Sciences</i>, Special Issue A2: 169-171.</p> <p>Copyright: © Gadekar GP, This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derives 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>Zooplankton community is cosmopolitan in nature and they inhabit all freshwater habitats of the world. These are not only useful as bioindicators, but are also helpful for ameliorating polluted waters. Hence qualitative and quantitative studies of zooplankton diversity are of great importance. An ecological study on a tropical pond situated in the centre of the Gondia city, was conducted with special reference to zooplankton diversity in relation to trophic status. In the present study, monthly changes in diversity and density of zooplankton assemblages had been recorded during January 2013 to December 2013, at three selected sites of Railway pond situated near Gondia railway station of Gondia city, Maharashtra. The population at Railway pond consisted of 20 genera of zooplankton. The recorded genera were categorized into 5 different groups – Protozoa, Cladocera, Rotifera, Copepoda and Ostracoda,</p> <p>Keywords- Zooplankton, diversity, seasonal variation, Railway pond</p>
	<h2>INTRODUCTION</h2> <p>All the aquatic system and their biota affect directly or indirectly human beings. All forms of life, on the Earth depend upon water for their mere existence. Among all the freshwater aquatic biota, zooplankton population is able to reflect the nature and potential of any aquatic systems (Kumar <i>et al.</i> 2010). Zooplankton are microscopic, free floating organisms occurred in all natural water bodies. They are a major mode of energy source between phytoplankton and other aquatic animals. They occupy an intermediate position in the aquatic food web (Altaff, 2004). Zooplankton diversity is one of the most important ecological parameters in water quality assessment. Different environmental factors that determine the characteristics of water have great importance upon the growth and the abundance of zooplankton (Thirumala <i>et al.</i> 2007). According to Dadhich and Sexena (1999) the zooplankton plays an integral role and serves bio indicators and it is a well suited tool for understanding water pollution status (Ahmad, 1996; Contreras <i>et al.</i>, 2009). Hence for any scientific utilization of water resources plankton study is of primary interest.</p> <p>A number of studies has been carried out on the condition of ecology and freshwater bodies in various parts of India (Smitha <i>et al.</i>, 2007) but in some parts of Vidarbha region (M.S), the ecological studies of freshwater bodies especially zooplankton studies is very scanty. So that the present investigation made an attempt to study the zooplanktons species in Railway pond.</p>

MATERIALS AND METHODS

Study area: The area selected for the present study is the Railway pond which is a large aquatic body with a depth of about 20 feet. It has less human interference and is situated in a Gondia city near railway station. They possess fishes such as major carp and Tilapia. The water is used for pooja purposes only.

This work is resulted from limnological investigations undertaken between January 2013– December 2013. Various aquatic plants common in these pats included *Eichhornia*, *Hydrilla*, *Lemna*, *Pistia*, *Azolla*, and *Sagittaria* sp.

Zooplankton sampling: Zooplankton samples were collected by filtering 200 litres of water from the surface of the water body through plankton net (40 µm mesh size) and was fixed immediately with 4% formalin. The systematic identification of zooplankton was made by using standard keys of Dhanapathi (2000) and Altaff (2004). The quantitative analysis of planktonic organisms was carried out using Sedgwick Rafter's plankton counting chamber.

RESULTS AND DISCUSSION

The seasonal variations in water quality parameters of the pond have a marked influence on the numerical abundance of zooplankton. Jeppesen *et al.* (2002) has stated that the abundance and diversity of zooplankton vary according to limnological features and the trophic state of freshwater bodies. Zooplankton provides the main food for fishes and can be used as indicators of the trophic status of water body (Verma and Munshi, 1987; Rao and Muley, 1981).

The present study was undertaken to investigate the seasonal variations in zooplankton diversity of Railway pond of Gondia city. A total 20 zooplanktonic fauna were encountered during the present study. Out of 20 species of zooplankton, 3 species belonged to Protozoa, 10 species to Rotifera, 3 species to Cladocera, 3 species to Copepoda and only 1 species to Ostracoda.

During the present investigation class Rotifera was dominated among all the zooplanktonic groups in all the seasons. However the diversity of zooplankton varied from season to season and the maximum diversity was recorded in winter season while minimum was observed in monsoon season (Table 1).

Table 1: Seasonal variation in zooplankton population of Railway pond, Gondia

Protozoa	Summer	Monsoon	Winter
<i>Arcella</i> sp.	+	-	+
<i>Diffugia</i> sp.	+	+	+
<i>Paramoecium</i> sp.	+	-	+
Rotifers			
<i>Brachionus calyciflorus</i>	-	+	+
<i>Brachionus caudatus</i>	-	-	+
<i>Brachionus terminalis</i>	+	+	+
<i>Brachionus angularis</i>	+	+	+
<i>Brachionus forficula</i>		+	+
<i>Brachionus falcatus</i>	+	+	+
<i>Cephalodella gibba</i>	+	+	+
<i>Keratella tropica</i>	+	+	+
<i>Lecane</i> sp	+	+	+
<i>Lepadella</i> sp	-	+	+
Cladocera			
<i>Bosmina</i> sp	+	+	+
<i>Daphnia</i> sp	+	+	+
<i>Moina</i> sp.	+	-	-
Copepoda			
<i>Cyclops</i> sp.	+	+	-
<i>Diaptomus nauplius</i>	+	+	+
<i>Heleodiptomus viduus</i>	+	-	+
Ostracoda			
<i>Cypris</i> sp	+	-	+

Only 1 species of Protozoa species were recorded during monsoon season along with 9 species of Rotifera, 2 species of Cladocera, 2 species of Copepoda and no species of Ostracoda. The maximum contribution was made by Rotifera (Table 1).

Class Protozoa contributed 3 species during the winter season. Class Rotifera showed its present with 7 species and Cladocera 2 species and, Copepoda 2 species and Ostracoda 1 species of the total zooplankton population during winter season (Table 1).

On the basis of qualitative study, species of *Diffugia* was the most common species which occurred throughout the study period among the class Protozoa while as among the Rotifera *Brachionus terminalis*, *Brachionus angularis*, *Brachionus falcatus*, *Cephalodella gibba*, *Keratella tropica*, *Lecane* sp were the dominant species. *Bosmina* sp. and *Daphnia* sp were dominant among Cladocera. *Diaptomus nauplius* was recorded during all the seasons among Copepoda and no species of class Ostracoda namely was found throughout the study period.

A marked seasonal variation in zooplankton population was recorded during the present investigation. In general, the maximum density was observed in winter season (18 species) and summer season (16 species), while low density was observed in monsoon season (14 species). The winter season is most favorable period for the growth and multiplication of zooplankton species. The period of August to November is the most favorable for growth of zooplankton population and this may be due to increase of phytoplankton population. The same result has been also reported by Kumar, (2001). Less zooplankton population during monsoon season is due to high turbidity which restricts growth of the planktonic population. Besides this, regular flash out of pond water during the rain is also a major cause of less plankton diversity as well as density

CONCLUSION

Zooplanktonic population of the Railway pond reveals the eutrophic condition of the pond which is an account of activities such as domestic waste disposal in the form of sewage and solid wastes, disposal of wastes materials of railway station, dumping of dead animals, human wastes etc.

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