

ZOOPLANKTON DIVERSITY IN MANSAGAR LAKE, JAIPUR, RAJASTHAN

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ABSTRACT

*Zooplankton are the grazers on the phytoplankton and a food base for the carnivorous as well as omnivorous fishes. The diversity of various type of zooplankton was studied of Mansagar Lake, Jaipur. The sample were collected and identified using standard keys of APHA (2005). The zooplankton communities in the Mansagar lake beloged to five major groups, such as Protozoa, Rotifera, Cladocera, Ostracoda and Copepoda. It was observed that some 5 genera of **Protozoa**, 10 genera of **Rotifera**, 5 genera of **Cladocera**, 5 genera of **Copepoda** and 3 genera of **Ostracoda** are available with monthly variation in the Mansagar lake.*

Keywords: Zooplankton, Mansagar Lake, Water Quality.

Introduction

Plankton is a part of aquatic life, which is composed of tiny organism living and drifting in direction of water current. It acts as the main source of food for most fauna, both in lotic and lentic water ecosystems. Zooplanktons are microscopic animals that eat other plankton. Zooplanktons occupy a central position between the autotrophs and other heterotrophs and form an important link in food web of freshwater ecosystem. Zooplanktons constitute the food source of organisms at higher trophic levels. The zooplankton and fish production depend to large degree on phytoplankton (Ferdous and Muktadir, 2009). Zooplankton is a good indicator of changes in water quality because it is strongly affected by environmental conditions and responds quickly to changes in environmental quality. The major zooplankton groups vary in their relative abundance and they belong to these groups Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda.

Rajasthan inspite of being recognized as a state of arid conditions is characterized by large number of water bodies both natural and manmade. These water bodies of arid and semi arid region are characterized by very low precipitation largely confined to the rainy season and extremely high temperature. Mansagar lake is an important water body of Jaipur, Rajasthan, India. This water body is under constant threat due to scanty rains and increased human activities. The water bodies also affected tourism in Jaipur (Sharma *et.al.* 2016). It is therefore, essential to manage scientifically this water body to tap it maximum potentiality.

Thus, in the present study zooplankton has been studied qualitatively and quantitatively of this importance aquatic ecosystem during July 2008 to December 2008.

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Material and Methods

Study area - The Mansagar lake is a large manmade water body that forms a significant environmental feature and lies to North of historical City Jaipur between 26°48'15" to 27°00'15" N Latitude and 75°41'15" to 75°53'45" E Longitude. The lake at present is approximately 130 hec. In its full spread and has a catchment area of 23.5 Sq.km. Out of the total catchment falls inside the dense urban area for analysis of water quality 4 sites located towards Amber road (two corners), Dam and bank of lake facing karbala region of the lake were selected for sampling.

For the collection of zooplankton, 24 liter of water was filtered through a zooplankton net made up of bolting silk (No. 25; mesh size 55 μ). The samples were then transferred to narrow mouthed bottles 100 ml capacity and preserved in 4% formaldehyde. Zooplankton samples were identified and counted under a microscope using a zooplankton counting chamber. Zooplankton were identified with the help of APHA (2005).

**Table 1: List of Zooplanktons Present in the Mansagar Lake
(July 2008 to December 2008)**

S.NO.	Taxon
Protozoa	
1	<i>Arcella discooides</i>
2	<i>Arcella vulgaris</i>
3	<i>Amoeba proteus</i>
4	<i>Paramecium caudatum</i>
5	<i>Stentor species</i>
6	<i>Vorticella campanula</i>
Rotifera	
7	<i>Asplanchnainintermedia</i>
8	<i>Brachionuscalyciflorus</i>
9	<i>Brachionusfalcatus</i>
10	<i>Brachionusforficula</i>
11	<i>Brachionusrubenus</i>
12	<i>Filinalongiseta</i>
13	<i>Keratellatropica</i>
14	<i>Lecane luna</i>
15	<i>Philodina species</i>
16	<i>Platylasquadriocornis</i>
17	<i>Polyarthramultiappendiculata</i>
18	<i>Rotaria vulgaris</i>
19	<i>Testudinella species</i>
cladocera	
20	<i>Ceriodaphnia reticulate</i>
21	<i>Daphnia carinata</i>
22	<i>Daphnia lunholtzi</i>
23	<i>Diaphanosomaexcisum</i>
24	<i>Macrothrix species</i>
25	<i>Monia species</i>
Copepoda	
26	<i>Cletocamptusalbuquer</i>

S.NO.	Taxon
27	<i>Heliodyptomusviriduus</i>
28	<i>Mesocyclopsshyalinus</i>
29	<i>Mesocyclopsleuckart</i>
30	<i>Pylloidiaptomusanna</i>
31	<i>Rhinediaptomus indicus</i>
32	<i>Rhinediaptomusviduus</i>
Ostracoda	
33	<i>Cypris shell</i>
34	<i>Heterocypris shell</i>
35	<i>Stenocypris malcomsoni</i>

**Table 2: Overall Mean Density of Different Groups of Zooplankton Ofmansagar Lake
(in No./L x 10³) (July 2008 to December 2008)**

Months	Proto-zoa	Roti-fera	Clado-cera	Ostra-coda	Cope-poda
JULY-08	2.65	2.88	2.96	2.13	2.91
AUG-08	3.07	3.51	3.41	2.70	3.42
SEP- 08	3.32	3.68	3.55	2.04	3.52
OCT, 08	2.96	3.78	3.98	2.49	3.94
NOV-08	3.28	3.95	4.09	3.26	4.28
DEC-08	3.96	3.83	3.94	3.59	4.27

Note- The values are average of samples collected from 4 sites of lake monthly. The average rainfall during the year 2008 was 462.84 mm.

Result And Discssion

The sample were collected from four sampling sites of lake. The present study was conducted in Mansagar lake from July 2008 to December 2008.

- **Protozoa** –The protozoa fluctuated between 2.65 to 3.96 No./ L x 10³ with the maximum value was observed in winter and the minimum value was observed in monsoon season. Vandysh (2004) observed that numerically low number in protozoan count is attributed to reduced detritus and relatively increased water flow.
- **Rotifera**- The contribution of rotifer was varying from 2.88 to 3.95 No./ L x 10³Rotifers are prominent group among the zooplankton of a water body irrespective of its trophic status. This may be due to the less specialized feeding, parthenogenetic reproduction and high fecundity (Sampaio *et.al.* 2002).
- **Cladocera** -The mean density of cladocera varied between 2.96 to 4.09 No./ L x 10³. Stated that dominance of cladocerans in eutrophic environment is through to be directly related to their ability to effectively avoid cyanobacteria and feed on smaller algal particle. These aspects could be related with higher abundance of cladocerans.
- **Ostracoda**- Observation of data revealed that ostracoda ranged between 2.04 to 3.59 No./ Lx10³ with the maximum value was observed in winter and minimum value was observed in monsoon season. Similar results were obtained by Yousuf (1989) in the Manasbal lake.
- **Copepoda**–Observation of data revealed that copepod ranged between 2.91 to 4.28 No./ L x 10³.Copepods are high in stable environmental conditions and they disappear as pollution level increased (Das *et.al.*1996).

Copepods density were least in the monsoon seasons. This was due to dilution effect, high turbidity and less photosynthetic activity by the primary producers.

Conclusion

The minimum zooplankton was in monsoon and maximum were in the winter season. The zooplankton form were represented in phylum like protozoa, rotifera, cladocera, ostracoda and copepoda. Higher amount of nutrient leads to an increasing trend of eutrophication. Nutrient enrichment in lake changes the conductive environment of the Mansagar lake.

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