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Zooplankton diversity in Balsamudra lake of Pauni, Dist. Bhandara, Maharashtra, India

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ABSTRACT

Zooplanktons are cosmopolitan in nature and inhabit all freshwater habitats of the world, including polluted, industrial and municipal waste waters. Zooplankton forms an important link in the food chain, food webs, energy flow and cycling of matter. The present investigation made an attempt to study the zooplanktons in Balsamudra lake during the year 2013-2014. Quantitative study of plankton was done by Sedgwick-Rafter cell method. In the present investigation, Rotifera is dominant followed by Protozoa, Cladocera, Copepoda and Ostracoda.

Keywords: Water, Zooplanktons, diversity, Balsamudra Lake, Pauni.

INTRODUCTION

Hensen in 1887 coined the term 'plankton' for all organisms which float in water and do not execute individual movements of any importance..Zooplankton play an integral role and serve as bioindicators and is a well suited tool for understanding pollution status of water (Rajagopal et.al. 2010). Different environmental factors that determine the characters of water have great importance upon the growth and abundance of zooplankton. Zooplanktons are cosmopolitan in nature and inhabit all freshwater habitats of the world, including polluted, industrial and municipal waste waters. Zooplanktons form an important link in the food chain, food webs, energy flow and cycling of matter. Zooplanktons do not form an integral part of the lentic community but also contribute significantly to the biological productivity of the fresh water ecosystem (Wetzel and Likens, 1979). A number of studies has been carried out on the condition of ecology and freshwater bodies in various parts of India (Smitha *et al*, 2007) but in some parts of Vidarbha region (M.S), the ecological studies of freshwater bodies especially zooplankton studies is very scanty(Gadekar, 2014). The present investigation made an attempt to study the zooplanktons in Balsamudra Lake during the year 2013-2014.

METHODOLOGY

Balsamudra lake is located at the South-east side of Pauni, is at 20⁰47 ˡ31ˡˡ N. latitude and 79⁰38ˡ7ˡˡ E. longitude. It receives water from the surrounding catchment area during the monsoon period as well as from municipal drainage. The area of Balsamudra is spread over 4.92 hector. The depth of water is 10 to 12 feet during monsoon and 5 to 6 feet during summer season.

Fig 1. Map of Pauni town

Fig 2. Location map and the sampling stations in Balsamudra Lake

Sample for planktonic study were collected monthly. The samples were collected in the morning hours between 8.30 to10.30 a.m. 50 Lt of water sample was filtrated through the plankton net made 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. For the quantitative study, the concentrated sample was shaken and immediately one drop of sample was taken on a clear micro side with the help of a standard dropper, the whole drop was then carefully covered with the cover glass and observed. Quantitative study of plankton was done by Sedgwick-Rafter cell method. Plankton identification up to genera and whenever possible up to species level was classified according to keys given Edmondson (1959), Sehgal (1983), Adoni (1985) and APHA (2005) and standard analysis was undertaken as per Zar (2005).

RESULTS AND DISCUSSION

The Zooplanktons in group are represented by Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda. The data is tabulated in Tables 1. In the present investigation during the year 2013-14 Rotifera is dominant followed by Protozoa, Cladocera, Copepoda and Ostracoda. In Rotifera 14 species were recorded among which *Brachionus calyriflorus* (107 no./lit) is dominant followed by *Cephallodella gibba* (74 no./lit), *Monostyla bulla* (49 no./lit), *Brachionus falcatus* (48 no./lit), *Keratella tropica* (32 no./lit), *Keratella serrulata* (25 no./lit), , *Trichocera similes* (23 no./lit), *Trichocera sp.*(23 no./lit), *Keratella cochleris*(22 no./lit), *Brachionus caudata* (18 no./lit), *Lecane luna* (17 no./lit), *Monostyla clasterocera* (16 no./lit), *Lepadella patella* (16 no./lit), *Monostyla species*(15 no./lit),. Sharma *et al*. (2011) reported 49 species in Pichhola lake, Jaipur, Rajasthan. Harney *et al*. (2013), reported 30 species in Kanhala pond and 24 species in Pindavani pond, Bhadrawati. maximum Rotifera during winter may be due to favorable temperature and availability of abundant food. In Protozoa 11 species were recorded among which *Amoeba proteus*(35 no./lit) is dominant followed by *Actinophrys sol.* (26 no./lit), *Difflugia lebes* (18 no./lit), *Centrophyxis aculeata* (15 no./lit), *Difflugia corona*(15 no./lit), *Arcella vulgaris* (13 no./lit), *Bursaria truncatella* (12 no./lit), *Paramecium caudatum* (9 no./lit),

Table No.1: Total number of Zooplankton from Balsamudralake During 2013-14

Sr. No.	Components	Summer				Monsoon				Winter				Min	Max
		Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan		
1	Protozoa	15	11	10	15	14	3	0	10	21	31	23	22	**0**	**31**
2	Rotifera	28	30	29	32	28	13	14	33	66	64	97	92	**13**	**97**
3	Cladocera	27	22	26	21	9	20	15	12	61	56	36	32	**9**	**61**
4	Copepoda	8	4	3	6	7	5	5	6	6	10	13	13	**3**	**13**
5	Ostracoda	17	25	28	21	12	6	4	3	40	40	41	42	**3**	**42**
	Total	**95**	**92**	**96**	**95**	**70**	**47**	**38**	**64**	**194**	**201**	**210**	**201**	**38**	**210**

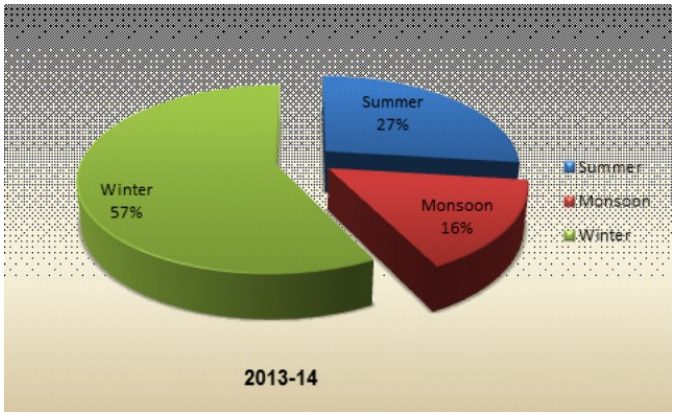

Fig 3: Distribution of Zooplanktons in Balsamudra Lake during the study period.

Spathidium sp. (9 no./lit), *Vorticella* (9 no./lit), *Paramecium bursaria* (6 no./lit). Harney *et al*., (2013), recorded 41 species of protozoa in Kanhala pond and 39 species in Pindavani pond, Bhadrawati, district Chandrapur, Maharashtra. Bera, Dutta *et al*. (2014), recorded 4 species at Kangsabati Reservoir, West Bengal. , the dilution of water caused by monsoon rain explains low Protozoan count in monsoon. The maximum population during winter may be due to favorable temperature and availability of abundant food in the form of bacteria and suspended detritus.

In Cladocera 8 species were recorded among which *Bosmina longirostris* (107 no./lit) is dominant followed by *Moina dubia* (57 no./lit), *Ceradaphnia* (46 no./lit), *Chydorus sphacricus* (26 no./lit), *Daphnia laevis* (22 no./lit), *Alona sp.* (19 no./lit), *Simocephalus vetalus* (13 no./lit), *Macrothrix rosea* (10 no./lit). Kedar (2002) recorded 9 species of Cladocera in Rishi lake, Karanja (Lad) of Washim district. Pawar and Phulle (2005) reported 20 species of Cladocera in Petwadaj dam, district Nanded, Maharashtra. , maximum Cladocera was recorded during winter season and minimum during monsoon season. In Copepoda 5 species were recorded among which *Cyclops sp.* (27 no./lit) is dominant followed by *Diaptomus forbesi* (18 no./lit), *Naupli* (15 no./lit), *Phyllodiaptomus female* (14 no./lit), *Microcyclops varicans* (12 no./lit). Sharma *et al*. (2011), recorded 11 species in Pichhola lake, Jaipur, Rajasthan.

In Ostracoda 3 species were recorded among which *Cypris species* (122 no./lit) is dominant followed by *Stenocypris malcomsonil* (97 no./lit), *Centrocypris* (70 no./lit). Harney *et al*. (2013), recorded 2 species in Kanhala pond Pindavani pond and Malhara pond, Bhadrawati, district Chandrapur, Maharashtra. Bera, Dutta *et al*. (2014), reported 2 species at Kangsabati Reservoir, West Bengal. In present study, maximum Ostracoda was recorded during winter season and minimum during monsoon season.

CONCLUSION

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

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