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Zooplankton diversity of Tadoba lake, Tadoba Andhari tiger reserve (TATR) Dist. Chandrapur, (M.S.)

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Abstract

Tadoba Andhari Tiger Reserve exhibits rich floral and faunal diversity. However, no consolidated account is available on its rich biodiversity. In considering the view of great Tadoba Lake, the present density was investigated; the study reveals that the biodiversity of zooplanktonic organisms has been fairly good which is evident from the identification of four groups with 33 species. The rich faunal density indicates highly productive nature of pond.

Keywords:- *Tiger reserve, Biodiversity, Zooplanktonic*

Introduction

Tadoba Andhari Tiger Reserve (TATR) in the Chandrapur District in Eastern Maharashtra represents a unique habitat for wildlife in central India and oldest National Park of the state. Tadoba has been named after the local Gond Chieftan "Taru", locals offer prayer to *Tadoba Deo* located on the edge of the Tadoba Lake. There is a belief that sprinkling water of Tadoba Lake on their farmland deeps pests and disease under control. Tadoba Lake is a big lake about 120 ha. and it is a very prominent tourist spot of Maharashtra State.

Zooplankton are the most fascinating group of micro- organism found in aquatic body. The zooplankton in water belongs to four main taxonomic groups such as Rotifera, Copepoda, Cladocerans and Ostracoda. They are abundant in the shallow area of the lake; they play a vital role as primary consumers. The occurrence and abundance of zooplankton in a lake depends on its productivity. Zooplankton occupies an intermediate position of food webs.Zooplankton has been used as an indicator for monitoring the water quality. The zooplankton that plays a role of converting phytoplankton into food, it is suitable for fish and aquatic animals. Zooplankton has been a subject of study in India and several worked by some workers, Dhanpati (2000), Tonapi (1980), Pennak (1955), and Kodarkar (1992). The paper deals with studies on zooplankton diversity in Tadoba Lake. Seasonal qualitative and quantitative analysis of zooplankton diversity were carried out.

Materials and method

During the period of investigation, samples were collected by plankton net made by silk bolting cloth no. 25 (mesh size 56), water sample was filtered through the net from littoral and open water zone, carefully transferred to 50 ml. bottle and preserved in 4% formaline. Preserved samples were examined under a binocular microscope by using Sedgwick Raffter Cell. Qualitative analysis was done by Tonapi (1980), Pennak (1989), Dhanpati (2000) and Kodarkar (1992).

Results and discussion

The seasonal abundance of zooplankton average were noted in table – (1 and 2). Seasonal zooplankton study shows that qualitatively 33 species were identified, these belonging to different taxonomic groups, 15 were Rotifera, 9 Cladocerans, 8 Copepoda and one from Ostracoda. In present investigation, Rotifera shows dominance and Ostracoda shows their least appearance, Cladocerans and Copepoda were moderate.

In seasonal variation, the maximum average density of total zooplankton (238 ± 34.59) ind/lit. was noted during the winter season of 2005-06 and minimum seasonal average density (100 ± 12.44) ind/lit. was noted during summer season of 2005-06.

Table-1: Average seasonal values of zooplankton in Tadoba lake during 2005-06

Sr. No.	Zooplankton	MONSOON	WINTER	SUMMER
	Rotifers			
1	T. cylendrica	1.25 ± 1.118	2.50 ± 1.12	1.50 ± 1.12
2	T. longiseta	5.25 ± 1.920	6.75 ± 3.269	1.50 ± 1.12
3	B. calyciflorus	2.75 ± 1.479	7.50 ± 2.693	2.50 ± 1.500
4	B. fulcatus	4.75 ± 3.112	10.2 ± 6.300	3.75 ± 2.487
5	B. quadricornis	5.00 ± 2.345	10.5 ± 2.291	2.25 ± 1.479
6	B. forficula	2.25 ± 2.487	5.50 ± 3.041	3.25 ± 1.920
7	B. rubens	2.25 ± 2.487	7.75 ± 2.278	1.50 ± 1.12
8	B. plicatus	2.50 ± 2.598	7.75 ± 2.947	5.25 ± 3.112
9	B. diversicornis	3.50 ± 1.803	4.25 ± 2.681	2.75 ± 2.165
10	F. longiseta	0.75 ± 0.829	1.75 ± 1.785	0.00 ± 0.00
11	Monostyla	5.25 ± 1.920	9.00 ± 7.450	3.75 ± 2.487
12	Keratella	3.00 ± 2.236	12.2 ± 5.974	1.50 ± 1.658
13	Asplanchna	2.00 ± 0.707	1.80 ± 1.12	2.00 ± 1.871
14	Lecane	3.00 ± 1.871	7.00 ± 1.358	3.50 ± 1.118
15	Epiphanes	0.00 ± 0.00	0.25 ± 0.50	0.00 ± 0.00
	Ostracoda			
1	Cypris	9.50 ± 7.500	0.00 ± 0.00	10.5 ± 10.595
	Cladocera			
1	Moinodaphnia	7.50 ± 7.826	13.0 ± 4.301	4.25 ± 1.090
2	M.branchiata	2.75 ± 1.479	8.50 ± 3.571	4.25 ± 3.832
3	B.longirostris	2.25 ± 2.487	0.00 ± 0.00	0.00 ± 0.00
4	Simocephalus	4.25 ± 2.278	4.50 ± 2.50	5.50 ± 1.803
5	Alona	4.00 ± 2.915	7.50 ± 3.20	3.50 ± 1.80
6	Chydorus	4.75 ± 1.92	6.00 ± 1.41	1.75 ± 1.48
7	P. denticulatus	4.75 ± 2.385	7.25 ± 2.947	3.75 ± 1.299
8	C. reticulata	3.25 ± 4.548	7.75 ± 5.309	4.25 ± 3.031
9	Macrothrix rosea	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
	Copepoda			
1	Cyclops male	3.25 ± 2.947	1.75 ± 1.785	0.00 ± 0.00
2	Cyclops female	6.75 ± 1.479	9.00 ± 4.64	3.25 ± 1.785
3	Mesocyclops	1.00 ± 1.25	0.00 ± 0.00	0.00 ± 0.00
4	Microcyclops	1.50 ± 0.866	9.25 ± 2.17	2.25 ± 2.278
5	Eucyclops	4.00 ± 3.317	11.0 ± 4.12	3.00 ± 1.225
6	Diaptomus male	3.25 ± 2.861	2.50 ± 1.50	1.75 ± 1.920
7	Diaptomus female	6.75 ± 4.815	10.2 ± 3.63	2.25 ± 1.920
8	Nauplius	1.00 ± 1.225	1.50 ± 1.12	0.00 ± 0.00

Table-1: Average seasonal values of zooplankton in Tadoba lake during 2005-06

Season	MONSOON	WINTER	SUMMER	AVERAGE
Rotifers	43.50 ± 11.41	129.00 ± 27.74	35.00 ± 11.81	69.17 ± 42.45
Ostracoda	9.50 ± 7.50	0.00 ± 0.00	10.50 ± 50.59	6.67 ± 4.73
Cladocera	33.50 ± 11.19	54.50 ± 8.08	27.25 ± 4.38	38.42 ± 11.65
Copepoda	33.50 ± 11.19	45.25 ± 7.79	12.50 ± 4.56	30.42 ± 13.54
Total Zoo	120.0 ± 18.17	238.00 ± 34.59	100.0 ± 12.44	152.6 ± 60.88

Discussion

The Study of zooplankton fauna especially zooplankton, even of a particular area is an extensive and complicated phenomenon due to environment, physical, geographical, and chemical variations involving ecological, extrinsic and intrinsic factors. The members of zooplankton community are important for their role in trophic dynamics and in energy transfer in the aquatic ecosystem. The seasonal fluctuations of the zooplankton population are a well-known phenomenon. Welch (1952) mention that, the fluctuation in zooplankton population is greatly influenced by the variation in temperature along with many other factors. Among the several factors, temperature seems to exhibit the greatest influence on the periodicity of zooplankton (Battish and Kumari, 1996). In the present investigation, seasonal zooplankton study shows that qualitatively 33 species were identified, these belonging to different taxonomic groups, 15 were Rotifera, 9 Cladocerans, 8 Copepoda and one from Ostracoda. In present investigation, Rotifera shows dominance and Ostracoda shows their least appearance, Cladocerans and Copepoda were moderate. Similar findings were observed in Jagtunga samudra reservoir, Kandhar, Dist. Nanded (Ugale, 2002). The zooplankton population in Tadoba Lake was higher magnitude during winter season and the lower magnitude during summer. Their diversity and density is mainly controlled by availability of food as favourable water quality (Chandrashekher, 1997).

In the present study, the results indicate that the maximum number of species occurred during winter season than summer and monsoon, which was also reported by Abdus Saboor and Altaff (1995), Kumar (2001). The less number of genera might be attributed to the less nutrient in the pond which consequently result in less productivity or might be due to the depletion important factors such as dissolved oxygen and pH. According to Welch (1952) in most of the tropical fresh water bodies, pH is always correlated with photosynthetic activity and phytoplanktonic biomass.

Rotifera group shows their dominance, maximum population densities were observed during winter season and minimum population density was during summer season. Dhanapathi (1997) had suggested that, temperature plays a conspicuous role in the occurrence of variations in rotifers in tropical region.

Cladocerans species were shows maximum population density during winter season and minimum population density during monsoon. The success of Cladocerans mainly depends on ability to feed efficiently on a wide range of particular organic matter. Number of Copepods Species recorded in present study were eight. Maximum population density of copepods occurs in winter season. Among the copepods Cyclops sp. and Diaptomus sp. were dominant. Ostracoda species presence was least in number; only Cypris species was recorded during investigetion. Maximum population density of Ostracoda was observed during monsoon and total absence during winter season. Environmental factors like temperature, salinity, DO, and sediment composition seem to influence cumulatively the distribution of Ostracods. The higher population of Ostracoda during monsoon could be due to abundance of fine detritus to which omnivorous

organism switch over during this period from their natural benthic habitat and bacteria, mould and algae as food (Tonapi,1980).

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