



Zooplankton diversity in three water bodies of Satara District (M.S.) India

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Abstract

The present study deals with the diversity of zooplankton and physico-chemical parameters of fresh water bodies from the Satara district. The present work is carried out for 2 years from June 2006 to May 2008. A total of five major groups of zooplankton namely rotifers > copepods > cladocercans > protozoan > ostracods were reported during course of study. The study reports 66 species of zooplankton where rotifers dominates all other groups.

Keywords: Plankton, water body, rotifer, diversity.

Introduction

The reservoirs play an important role in maintainances of ecological balance. They need to be investigated for their biological parameters. Zooplankton plays a key role in transferring energy from one trophic level to other in the aquatic habitat. Zooplankton comprising of rotifers, cladocerans, copepods and ostracods are considered to the most important in terms of population density, biomass productivity grazing and nutrient generation in any ecosystem. Their diversity and density is mainly controlled by availability of food as favorable water quality (Chandrasekhar and Kodarkar, 1997). In recent years reservoirs have received their attention because of environmental crises. Zooplankton has been considered as indicators of organic pollution of reservoirs. From point of view, enlisting of the species of zooplankton is interesting.

Material and Methods

The selected fresh water bodies receive about 6,226 mm rainfall annually. The present investigation reports on physico-chemical parameters such as pH, E.C., BOD, DO., COD, hardness, alkalinity and biodiversity of zooplankton of three reservoirs from Satara district. The water from these reservoirs is used for drinking, domestic purpose,

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irrigation, power generation and aquaculture practices. The selected reservoirs are located Kas(N 17°43 05 ° 90; E73 ° 46 42 ° 61), Kanher (N17 ° 44 16 ° 02; E 73 ° 53 43 ° 10) and Mahadare(N17 ° 40 58 ° 43; E 73 ° 58 22 ° 92) reservoir from Satara district. From these reservoirs, water samples were collected for analysis of physic-chemical parameters and diversity of zooplankton.

Zooplankton samples were collected with plankton net and preserved by using 0.5 ml of formalin in 50 ml sample collected after filtration of 50 liters of water. The water samples were brought to the laboratory for physico-chemical analysis in separate plastic cans. The phytoplankton was studied under the microscope and micrographs were taken using Nikon L-20camera. They were identified using standard literature such as APHA (1992), Fritsch (1965), Hutchinson (1957), Biswas (1980), and Edmondson (1963). The physico- chemical parameters were studied by using APHA (1992) and Trivedy and Goel (1986).

Result and Discussion

In the present study 66species of zooplankton were found. Out of these 29 belong to rotifers, 9 belong to copepods, 18 belong to cladocercans, 07 belong to protozoan, 3 belong to ostracods table 2. The zooplankton diversity is highest at Mahadare and lowest at Kas reservoir. Summer abundance of rotifers was observed with *B. falcatus*, *B. calyciflorus*, and *Lecane species* were pollution indicator mostly dominated in Mahadare reservoir



as compared to Kas and Kanher reservoir. Summer peak of copepods was due to diatoms and blue green algae where winter peak of cladocerans was due to stable water conditions, favorable conditions and availability of food material (Edmondson 1963).The highest pH is recorded at Mahadare (6.51), the highest E.C. is recorded at Mahadare (0.28 ohms/ cm), the highest DO is recorded at Kanher (9.44 mg/l), the highest BOD is recorded at Kanher (13.99 mg/l), the highest COD is recorded at Mahadare (16.46 mg/l), highest alkalinity is recorded at Mahadare (136 mg/l), The highest totalhardness is recorded at Mahadare (98 mg/l). The highest free CO₂ (9.25 mg/l).& chloride is recorded at Mahadare (47.62 mg/l). The highest nitrate is recorded at Kanher dam (25.19 mg/l). The

highest total dissolved solids are recorded at Mahadare (1581 mg/l) Table 1. From the investigation, it was found that some of the parameter like pH, dissolved oxygen, hardness and chloride are within permissible limits but others like TDS, BOD, exceeded slightly above permissible limits laid by WHO (1983) &ICMR (1975). The results indicate excellent status of water body. But in future there is a need by municipal corporation and state government authorities to take some concrete steps for maintaince of reservoir for better health of people residing in that area. The reservoirs show rich zooplankton diversity due to stable water condition, availability of food material and favorable pH and temperature.

Table .1 Records the physico-chemical parameters of three water bodies

Parameters	Kas reservoir	Kanher dam	Mahadare reservoir
pH	6.02±0.015	6.16±0.02	7.38±0.24
E.C.	0.02±0.001	0.13±0.001	0.28±0.001
DO	6.51±0.011	6.23±0.025	9.44±0.761
Free CO ₂	6.53±0.030	6.31±0.184	9.25±0.030
Acidity	8.06±0.871	7.22±0.13	23.70±1.286
Alkalinity	32.83±1.607	55.03±6.98	136.33±1.527
Hardness	38.22±0.344	67.02±4.02	98.00±2.000
Calcium	7.43±1.258	8.03±0.64	24.66±2.427
Magnesium	4.35±0.902	12.05±0.97	8.68±2.452
BOD	8.43±0.278	13.99±1.895	10.32±0.09
COD	8.10±0.091	12.83±0.08	16.46±0.413
Chloride	27.11±1.124	35.01±0.69	47.62±2.083
Hydrogen Sulphide	3.04±0.175	4.59±0.13	4.12±0.251
Sodium	6.33±0.081	11.07±0.60	24.63±3.42
Nitrate	5.96±0.646	25.19±1.19	12.45±0.101
Total dissolved solids	705±7.424	1211±35.062	1581±12.666

All parameters are in mg/l except pH and E.C. (µmhos/cm)

Similar type of work has been reported by no. of workers. Hujare (2005) reported absences of any seasonal trend in ostracads on the basis of their work on Talsande&Attigare reservoir. Pawar and Pulle (2005) recorded 60 species of zooplankton from Prthwadaj dam of Nanded. Pai and Berde reported 48 & 50 species of zooplankton from Sadoba pond of Kolhapur district and Santacruzlake from Goa respectively. Kamble and

Meshram (2005) recorded 11 species of zooplankton from Khatijapur tank from Amaravati district. Pailwanet *al.*, (2008) recorded 35 species of zooplankton from 3 fresh water Tanks of Kolhapur. Rajagopalet *al.*, (2010) recorded 47 species of zooplankton inChinnapperkovil pond, 39 sp. in Nallanchettipatti pond & 24 in Kadabamkulam pond of Tamilnadu. Shaikhet *al.*, (2010) recorded 26 species of zooplankton in fresh water bodies around Aurangabad.



Table . 2. Diversity of zooplankton in three reservoirs of Satara district.

S.no.	Plankton	Kas	Kanher	Mahadare
A. Rotifers				
1	<i>Brachionusangularis</i>	+	+	+
2	<i>Brachionusbidentata</i>	+	-	-
3	<i>Brachionuscaudatus</i>	-	-	+
4	<i>Brachionuscalafertus</i>	+	+	+
5	<i>Brachionusclayciformis</i>	+	+	+
6	<i>Brachionusdiversicornis</i>	+	+	-
7	<i>Brachionusdurgae</i>	-	-	+
8	<i>Brachionusfalcatus</i>	-	-	+
9	<i>Brachionusforficula</i>	-	+	+
10	<i>Brachionuspallas</i>	+	+	+
11	<i>Brachionusquadridentata</i>	+	+	+
12	<i>Brachionusrubens</i>	+	-	-
13	<i>Euchlanisdilatata</i>	+	+	-
14	<i>Filiniabory</i>	+	-	-
15	<i>Filiniaterminales</i>	-	-	+
16	<i>Filinialongistea</i>	+	-	+
17	<i>Keratellabory</i>	+	+	+
18	<i>Keratellacochleraris</i>	+	-	-
19	<i>Keratellaprocurca</i>	+	-	-
20	<i>Keratellaquadrata</i>	-	-	+
21	<i>Keratellatropica</i>	+	+	+
22	<i>Lecane sp.,</i>	-	-	+
23	<i>Lecaneclosterocerca</i>	+	+	+
24	<i>Lecanehamata</i>	+	+	+
25	<i>Lecaneluna</i>	+	-	-
26	<i>Lecanestichaea</i>	-	+	-
27	<i>Natholca acuminata</i>	+	+	+
28	<i>Polyarthra vulgaris</i>	+	+	-
29	<i>Trichocera porcellus</i>	+	+	-
B. Copepods				
30	<i>Argulusfoliaceus</i>	-	-	+
31	<i>Cyclops sp.,</i>	+	+	+
32	<i>Dioptomus sp.,</i>	-	-	+
33	<i>Heleodiptomusvidaus</i>	-	-	+
34	<i>Mesocyclops.sp.,</i>	+	+	+
35	<i>Mesocyclopsleukartii</i>	+	+	-
36	<i>Microcyclops sp.,</i>	+	-	-
37	<i>Nauplius larva</i>	+	+	+
38	<i>Phyllodiptomusblanci</i>	-	-	-
C. Cladocerans				
39	<i>Alona sp.,</i>	-	-	+
40	<i>Alonapulchella</i>	-	+	+
41	<i>Bosminia sp.,</i>	+	+	+
42	<i>Bosminiadeiteri</i>	+	-	-
43	<i>Bosminialongirostris</i>	+	-	
44	<i>Ceriodaphniacornuta</i>	+	+	+
45	<i>Ceriodaphnialaticaudata</i>	-	-	+
46	<i>Daphnia longirimis</i>	+	+	+
47	<i>Daphnia lumholtzi</i>	+	-	+
48	<i>Daphnia pulex</i>	+	+	+



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49	<i>Daphnia vosea</i>	-	-	+
50	<i>Diaphnasamaexcisum</i>	-	-	+
51	<i>Indialonaganapati</i>	+	+	-
52	<i>Monia sp.,</i>	-	+	+
53	<i>Moniabrachiatajurine</i>	-	+	+
54	<i>Moniamacrocopa</i>	+	+	-
55	<i>Moniamircrura</i>	+	+	+
56	<i>Sidacrystallina</i>	-	-	+
D. Ostracods				
57	Cypris sp.,	+	+	+
58	Cyclocyprisglobosa	+	+	+
59	Stenocypris sp.,	-	+	+
E. Protozoans				
60	<i>Amoeba sp.,</i>	+	+	-
61	<i>Amoeba radiosa</i>	+	+	+
62	<i>Arcella sp.,</i>	+	+	-
63	<i>Diffugia sp.</i>	-	+	+
64	<i>Paramecium sp.,</i>	+	+	-
65	<i>Trinema sp.,</i>	+	+	-
66	<i>Vorticella sp.,</i>	+	+	+

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