

Qualitative study of Zooplankton fauna of Satara Bhosale and Satara Tukum Lakes of Pombhurna Tehsil in different Seasons

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ABSTRACT

The present research paper deals with the zooplankton fauna composition in two different fresh water lakes Satara Bhosale and Satara Tukum located in Pombhurna tehsil of Chandrapur district in Maharashtra state, during the period Feb 2016 to Jan 2017 in three different seasons. The studies were focussed on qualitative aspect of zooplankton during 3 different seasons viz. summer, winter and monsoon at different sampling locations. In satara Bhosale lake 34 different species were recorded while in Satara tukum lake waters there are 38 different species thriving. The recorded groups of zooplankton belonged to Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda. The beautiful biodiversity of the animal fauna is represented through these diverse zooplanktonic forms. Through these qualitative studies a beautiful picture of biodiverse zooplanktonic forms of nature emerge on which the world of fishes sustain.

Keywords: Zooplankton, Satara Bhosale, Satara Tukum, Lakes, Qualitative study, Seasons.

I. INTRODUCTION

Water is an essential component for all living organisms. The freshwater ecosystems of the world include pond, lake, river and dams which conserve the nature and other living organisms. Aquatic ecosystems are known to support a wide range of living organisms. Among these zooplankton are the free floating and microscopic animals found in aquatic ecosystem. The zooplankton are important link for fishes as they are used as source of food for life. Zooplankton play an important role in water purification and serve as bio-indicators of water quality (Gannon and Stemberger, 1978; Gajbhiye and Desai, 1981). Abundance of zooplankton depends on the availability of bacterio-plankton and phytoplankton as food.

The zooplankton are broadly classified in various groups as Protozoa, Cladocera, Copepoda, Rotifera and Ostracoda. Many Researchers have studied various aspects of the zooplanktons of water bodies both in India and abroad. Zooplankton are playing important role in biomonitoring of water pollution.

The Zooplankton community fluctuates according to Physico-chemical parameters of the environment and the abundance and composition of zooplankton depends upon the characteristic of water bodies. During last 15 years Indian studies on zooplankton are done by Sehgal *et al.*, (2013), Sharma (2007), Thilak (2009), Sharma and Thilak (2000), Thirupathiah *et al* (2012), Pawar and Pejaware (2014), Mahajan and Harney (2016), Sarwade and Kamble (2014), Suresh *et al* (2009), Jadhav *et al* (2012), Kadam and Tiwari (2012), Jeelani *et al* (2005), Kamble *et al* (2013), Dede

and Deshmukh (2015), Sitre and Thakare (2013), Joshi (2011), Kumar (2001).

As no previous studies were done by any of the researchers on these two fresh water bodies the present research was undertaken in order to

II. MATERIAL AND METHODS

Study Area

The lakes of Satara Bhosale and Satara Tukum are freshwater perennial lakes located in village Satara Bhosale and Satara Tukum in Pombhurna tehsil of Chandrapur district in Maharashtra state (Fig. 1 and 2). The catchment area of the Satara Bhosale lake is 34 acres while that of Satara Tukum is 39 acres. The water of both the lakes is perennial and is utilized for irrigation, washing purpose as well as for pisciculture activities. A large number of major and minor carps are present in waters of both the lakes.



Figure 1. (a) Satara Tukum Lake



Figure 1. (b) Satara Bhosale Lake

III. RESULT AND DISCUSSION

The present research work reports the zooplankton diversity composition from the lake of village Satara Bhosale and Satara Tukum of Pombhurna tehsil of Chandrapur district. In total of 34 different species of zooplankton were found in Satara Bhosale lake and 38 species in Satara Tukum lake. The species belongs to rotifer, copepod, protozoa, cladocera and ostracoda groups in both the lakes. According to diversity, Rotifers indicated maximum diversity during the

The sampling of zooplankton in Satara Bhosale and Satara Tukum lakes was carried out for a year span. Water samples were collected in morning hours between 8 am to 10.00 am every month. The data was recorded seasonally as summer, winter and Monsoon. The zooplankton samples were collected by filtering 50 to 60 litres of water through plankton net made up of bolting silk cloth no.22 and collected samples were fixed in 4% formalin. The qualitative analysis of the organisms is carried out using microscopic study. Samples were examined under the microscope in 10x and 3.2X magnification for identification of zooplankton. The Zooplankton are identified with the help of standard literature up to generic level by using standard keys of Edmondson(1963), Pennak (1978), Dhanapathi (2000) and APHA (2005).

study period followed by protozoa, cladocera, copepod, ostracoda. Occurrence of indicator species like *Filinia longiseta* and *Brachionus forficula* points out that the lake ecosystems are getting organically enriching due to man made activities.

In Satara Bhosale lake of Pombhurna tehsil of Chandrapur district 10 different species of protozoa are observed, 10 different species of rotifera are observed, 9 different species of cladocera are

observed, 4 different species of copepod and 1 species of ostracoda are observed and recorded (Table 1). In Satara Tukum lake of Pombhurna tehsil of Chandrapur district 12 different species of protozoa are observed, 11 different species of rotifer are observed, 9 different species of cladocera are observed, 4 different species of copepod and 2 species of ostracoda are observed and recorded in one year span

(Table 2). The total recorded forms are shown in Table No.3. In Satara Bhosale only one type of Ostracod was observed *Heterocypris sp.* While there are 2 different forms present in Satara Tukum lake. The zooplankton communities respond to a wide range of changing environmental conditions like nutrient input, acidification, sediments and have an immense significance in fisheries sector (Jhingran, 1991). The rotifers have long been identified as indicators of water quality (Arora, 1962). Due to short life cycles rotifers respond quickly to changing environmental conditions and their species composition and standing crop indicates the quality of water in which they are thriving (Chandrasekhar and Kodarkar, 1995; Dhanpathi 1974 b).

In any aquatic ecosystem limnological characteristics can affect both fauna and flora. Biodiversity contributes both directly and indirectly to human needs like food. In the last decade people interfere with

ecosystem and over exploitation of natural resources resulting in that biodiversity decrease. Biodiversity of zooplankton in lake of Satara Bhosale and Satara Tukum. Clearly show that both lakes are rich in biodiversity of zooplankton and need conservation for future generation.

IV. CONCLUSION

In the present research study a total 34 zooplankton were recorded in Satara Bhosale lake and 38 zooplankton were recorded in Satara Tukum lake classified by protozoa, rotifer, cladocera, copepod and ostracoda. Maximum species found in Satara Tukum lake showing pollution.

V. ACKNOWLEDGEMENT

The authors are thankful to Principal, N.S. Science and Arts college, Bhadrawati for permitting and providing necessary laboratory facilities for conducting this research work in CHLR in Zoology affiliated to Gondwana University, Gadchiroli.

Table 1. Species composition of Zooplankton recorded in lake of Satara Bhosale lake during different seasons.

Sr. No.	Group	Species	Season		
			S	M	W
1	Protozoa	Amoeba radiosa	+	-	-
2		Arcella discoides	+	-	+
3		Arcella vulgaris	+	-	+
4		Chilodonella sp.	+	-	+
5		Diffugia lobostoma	+	-	+
6		Diffugia pyriformis	+	-	+
7		Actinophrys sol.	-	+	+

8		Centyropyxis sp.	+	-	+
9		Paramecium sp.	+	+	+
10		Vorticella sp.	+	-	-
11	Rotifera	Brachionus calyciflorus	+	-	-
12		Brachionus falcatus	+	-	-
13		Brachionus caudatus	+	+	-
14		Brachionus forficula	+	-	-
15		Filinia longiseta	+	+	-
16		Keratella tropica	+	-	+
17		lecanella bulla	+	+	+
18		Polyarthra vulgaris	+	-	+
19		Trichocerca ruttneri	+	+	+
20		Rotaria neptunia	+	-	+
21		Cladocera	Alonella nana	+	-
22	Bosmina longirostris		+	-	+
23	Chydorus sphaericus		+	+	+
24	Ceriodaphnia sp.		+	-	+
25	Macrothrix rosea		+	-	+
26	Moina dubia		+	+	+
27	Alonopsis sp.		+	+	+
28	Diaphanosoma sarsi		+	+	+
29	Simocephalus exspinosus		+	-	+
30	Copepods	Copepod nauplius	+	+	+
31		Cyclops sp.	+	-	+
32		Diaptomus	+	+	+
33		Mesocyclops leucarti	+	-	+
34	Ostracoda	Heterocypris sp.	-	+	-

S= Summer, M= Monsoon, W= Winter

Table. 2: Species composition of Zooplankton recorded in lake of Satara Tukum lake during different seasons.

Sr. No.	Group	Species	Season		
			S	M	W
1	Protozoa	<i>Arcella discoides</i>	+	+	+
2		<i>Arcella vulgaris</i>	+	+	+
3		<i>Centropyxis aculeate</i>	+	-	+
4		<i>Chrysamoeba</i> sp.	+	+	+
5		<i>Diffugia corona</i>	+	-	+
6		<i>Diffugia pyriformis</i>	+	+	+
7		<i>Paramecium bursaria</i>	+	-	+
8		<i>Paramecium caudatum</i>	+	12+	+
9		<i>Pelomyxa palustris</i>	+	-	+
10		<i>Spathidium spathula</i>	+	-	+
11		<i>Urocentrum turbo</i>	+	-	+
12		<i>Vorticella campanula</i>	+	-	+
13	Rotifera	<i>Brachionus falcatus</i>	+	+	-
14		<i>Brachionus forficula</i>	+	-	-
15		<i>Brachionus quadridentatus</i>	+	-	-
16		<i>Filinia longiseta</i>	+	+	+
17		<i>Horaella brehmi</i>	+	-	-
18		<i>Keratella</i> sp.	+	-	-
19		<i>Monostyla bulla</i>	+	-	-
20		<i>Lecane</i> sp.	+	+	+
21		<i>Lecane bulla</i>	+	+	+
22		<i>Platylabus quadricornis</i>	+	+	+
23		<i>Rotaria neptunia</i>	+	+	+
24	Cladocera	<i>Alonella nana</i>	+	-	+
25		<i>Bosmina longirostris</i>	+	-	+
26		<i>Chydorus sphaericus</i>	+	+	+
27		<i>Ceriodaphnia</i>	+	+	+
28		<i>Macrothrix rosea</i>	+	-	+
29		<i>Alonella</i> sp.	+	-	+
30		<i>Moina dubia</i>	+	-	+
31		<i>Sida crystalline</i>	+	+	+
32		<i>Simocephalus</i> sp.	+	-	+
33	Copepoda	Copepod nauplius	+	+	+
34		<i>Cyclops</i> sp.	+	-	+
35		<i>Diaptomus forbesi</i>	+	+	+
36		<i>Mesocyclops leuocarti</i>	+	-	+
37	Ostracoda	<i>Cypris</i> sp.	+	+	-
38		<i>Stenocypris</i> sp.	+	+	-

S= summer, M= Monsoon, W= Winter

Table 3. Total Recorded Forms in Both the Lakes in a Year.

Sr. No	Group	S.B.	S.T.
1	Protozoa	10	12
2	Rotifera	10	11
3	Cladocera	9	9
4	Copepoda	4	4
5	Ostracoda	1	2
	Total Forms Recorded	34	38

S.B-Satara Bhosale Lake , S.T. = Satara Tukum Lake

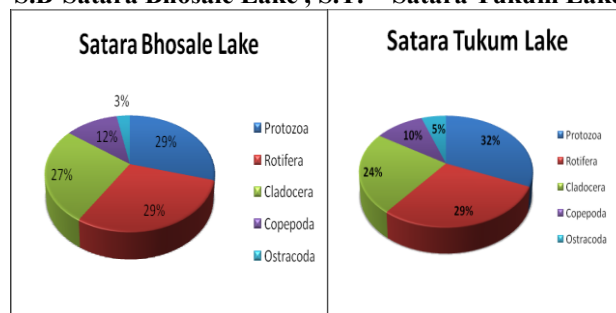


Figure 3. Showing zooplankton species in both lake.

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