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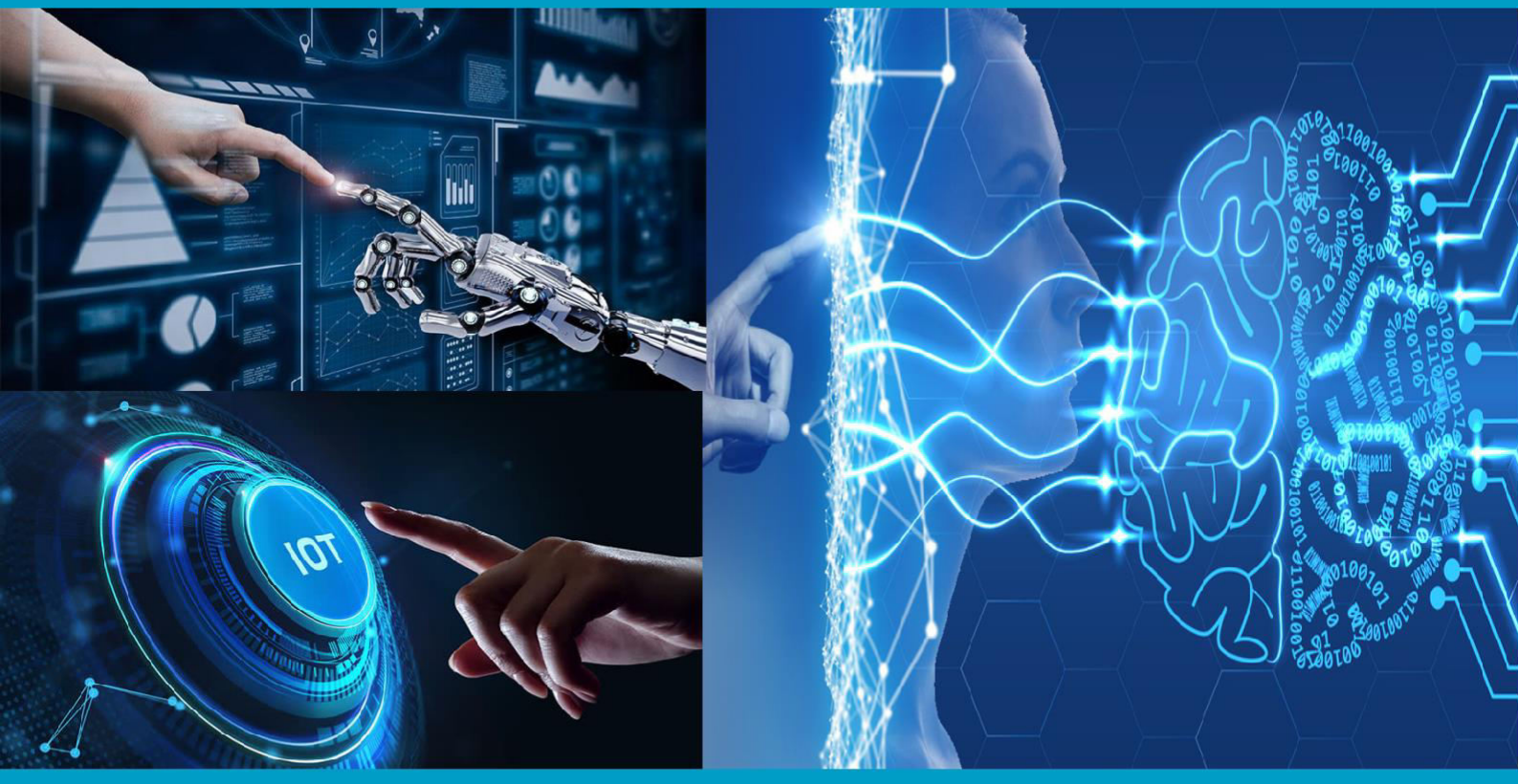

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Qualitative Studies on Zooplankton Fauna of Two Freshwater Perennial Lakes in Different Seasons

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ABSTRACT: The present research paper highlights qualitative studies on zooplankton fauna composition in two perennial fresh water lakes located in Pombhurna tehsil of Chandrapur district in Maharashtra State, during the period Feb. 2022 to Jan. 2023 in three different seasons of the year. The studies were focused on finding out qualitative nature of zooplankton species during summer, winter and monsoon seasons at different sampling locations of Satara Bhosale and Satara Tukum lakes. In Satara Bhosale lake 29 different species were recorded while in Satara Tukum lake 26 different species were recorded. The recorded zooplankton species are classified as Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda. The beautiful biodiversity of the freshwater fauna is represented through these varied zooplanktonic forms thriving in these two freshwater lakes. Through these qualitative studies a beautiful picture of biodiverse zooplanktonic forms of nature emerge on which the world of fishes sustain and food chain operates.

KEYWORDS: Qualitative studies, Zooplankton, Satara Bhosale Lake, Satara Tukum Lake, different Seasons, freshwater lakes.

I. INTRODUCTION

The pond, lake, river and dams provide hospitable environment for living organisms residing in it. Aquatic ecosystems of the world are known to support a rich and varied range of living organisms. Among these microscopic organisms zooplankton are the free floating and microscopic animals found in all the aquatic ecosystem's of the world. The zooplankton serve as an important source for sustainance of fisheries resources as they are used as source of food for sustaining fish life. Zooplanktons play an important role in water purification too and serve as bio-indicators of water quality (Gajbhiye and Desai, 1981). Zooplankton fauna depends on the availability of phytoplankton as food present in aquatic ecosystems.

The zooplanktons are classified into Protozoa, Rotifera, Cladocera, Copepoda, and Ostracoda. Many Researchers have investigated zooplanktons of water bodies both in India and abroad. The Zooplankton community fluctuates according to Physico-chemical parameters of the environment. The composition and structure of zooplankton fauna depends on the characteristics of water bodies. During last 20 years Indian studies on zooplankton are undertaken by researchers, Gajbhiye and Desai (1981), Chauhan (1983), Sharma and Thilak(2000), Kedar (2002), Jeelani et al (2005), Suresh et al, (2009), Joshi (2011), Baghela (2006), Sharma (2007,2009), Thilak (2009), Suresh, et al (2009), Dutta and Verma (2010), Bazmi, et al (2011), Sehgal, et al., (2013), Deothale, et al (2016), Murkute and Chavhan (2016), Kumar (2001), Jadhav et al, (2012), Kadam and Tiwari (2012), Thirupathaiah et al, (2012), Kamble et al,(2013), Sitre and Thakare (2013), Pawar and Pejawar (2014), Sarwade and Kamble (2014), Dede and Deshmukh (2015), Mahajan and Harney (2016), Pawar and Pejawar (2017).

As no previous studies were done by any of the researchers on these two fresh water rural lakes of Vidarbha region the present research work focus on qualitative level species identification and compilation undertaken in order to found out the zooplankton diversity in three different seasons of the year from February 2022 to January 2023.

II. MATERIALS AND METHODS

The lakes 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. The catchment area of the Satara Bhosale lake is 34 acres approximately while that of Satara Tukum is 39 acres. The water of both the lakes 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.

The sampling of zooplankton in both the lakes was carried out for a year span from February 2022 to January 2023. 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 100 litres of water through plankton net made up of bolting silk cloth no.22 and collected samples were fixed in 4% formalin on the spot. The qualitative analysis of the zooplankton is carried out using microscopic study in the Department of Zoology laboratory of Nilkanthrao Shinde Science and Arts College, Bhadrawati, Dist. Chandrapur. Samples were examined under the microscope in 10 x and 3.2 X magnification for identification of zooplankton. The Zooplankton are identified with the help of Standard literature Edmondson(1963), Pennak (1978) , Tonapi (1980), Dhanapathi (2000) and APHA (2005).

III. RESULT AND DISCUSSION

In all about 29 different species of zooplankton were recorded in Satara Bhosale lake and 26 species in Satara Tukum lake. The species belongs to Rotifera, Copepoda, Protozoa, Cladocera and Ostracoda groups in both the lakes. According to diversity, Rotifers indicated maximum diversity during the study period followed by protozoa, cladocera, copepod and ostracoda. Occurrence of indicator species like Filinia longiseta and Brachionus forficula points out that the lake ecosystems are getting organically enriching due to manmade activities.

In Satara Tukum lake of Pombhurna tehsil of Chandrapur district 8 different species of protozoa are observed, 09 different species of rotifera are obsereved, 08 different species of cladocera are observed, 03 different species of copepod and 1 species of ostracoda are observed and shown in Table No. 1.

In Satara Bhosale lake of Pombhurna tehsil of Chandrapur district 07 different species of protozoa are observed, 09 different species of rotifer are observed, 07 different species of cladocera are observed, 02 different species of copepod and 01 species of ostracoda were observed and recorded in one year span. The total recorded forms are shown in Table No.2.

In Satara Bhosale only one type of Ostracoda was observed Cypris spp. and same found 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).

Due to their 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, Arora, 1962).In any aquatic ecosystem limnological characteristics can affect both fauna and flora. Biodiversity contribute both directly and indirectly to human needs like food. In last decade people interfere with ecosystem and over exploitation of natural resources resulting in biodiversity loss. The present qualitative studies clearly show that both lakes are rich in biodiversity of zoo plankton. In the present study dilution of water caused by rain water results in low population of protozoa in monsoon and maximum in summer season indicates a positive relation to temperature and also may be due to lower dissolved oxygen content in the season. Similar observation recorded by Kedar (2002) who recorded minimum population in rainy season in rishi lake of Karanja lad.

Paulose and Maheshwari (2008) recorded 49 Protozoa in Ramgarh lake of Jaipur and Ahangar et al (2012) recorded6 species of Protozoa at Anchar lake of Kashmir supporting our findings. Cladocera are primary consumers and feed on microscopic algae and fine particulate matter in debris which is influencing transformation of matter and energy in benthic forms. The Cladocera are most useful zooplankton and form the most dominant group of fish food organisms. The rotifers play an important role in aquatic environment as scavengers. Copepoda are one of the major zooplankton in freshwater and occur in all types of water bodies. They are called water fleas. Ostracods commonly known as seed shrimps belong to class crustacea are found in wide variety of aquatic habitat. The Ostracods occur in both standing and running waters. The Ostracods serve as very good food for fishes and aquatic organisms (Tonapi, 1980).

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Table.1.: Different Zooplankton species recorded in Satara Tukum Lake during Summer, Monsoon and Winter Season.

Sr. No	Groups	Name of species	Summer	Monsoon	Winter
1	Protozoa	Actinophyris sol.	+	+	+
2		Amoeba spp.	+	+	+
3		Arcella vulgaris	+	+	+
4		Centyropyxis spp.	+	+	+
5		Difflugia lobostoma	+	+	+
6		Paramoecium spp.	+	+	+
7		Urocentrum spp.	+	+	+
8		Vorticella spp.	+	+	+
1	Rotifera	Brachionus calyciflorus	+	+	+
2		Brachionus falcatus	+	+	+
3		Brachionus forticula	+	+	+
4		Filinia longiseta	+	+	+
5		Keratell tropica	+	+	+
6		Monostyla bulla	+	+	+
7		Lecane bulla	+	+	+
8		Polyarthra vulgaris	+	+	+
9		Rotaria neptunia	+	+	+
1	Cloadocera	Allonella spp	+	+	+
2		Bosmina longirostris	+	+	+
3		Chydorussphaericus	+	+	+
4		Ceriodaphnia spp.	+	+	+
5		Macrothrix rosea	+	+	+
6		Moina dubia	+	+	+
7		Sida spp.			
8		Simocephalus spp.	+	+	+
1	Copepoda	Cyclops spp	+	+	+
2		Ceriodaphnia spp.	+	+	+
3		Diaptomus forbesi	+	+	+
1	Ostracoda	Cypris spp.	+	+	+

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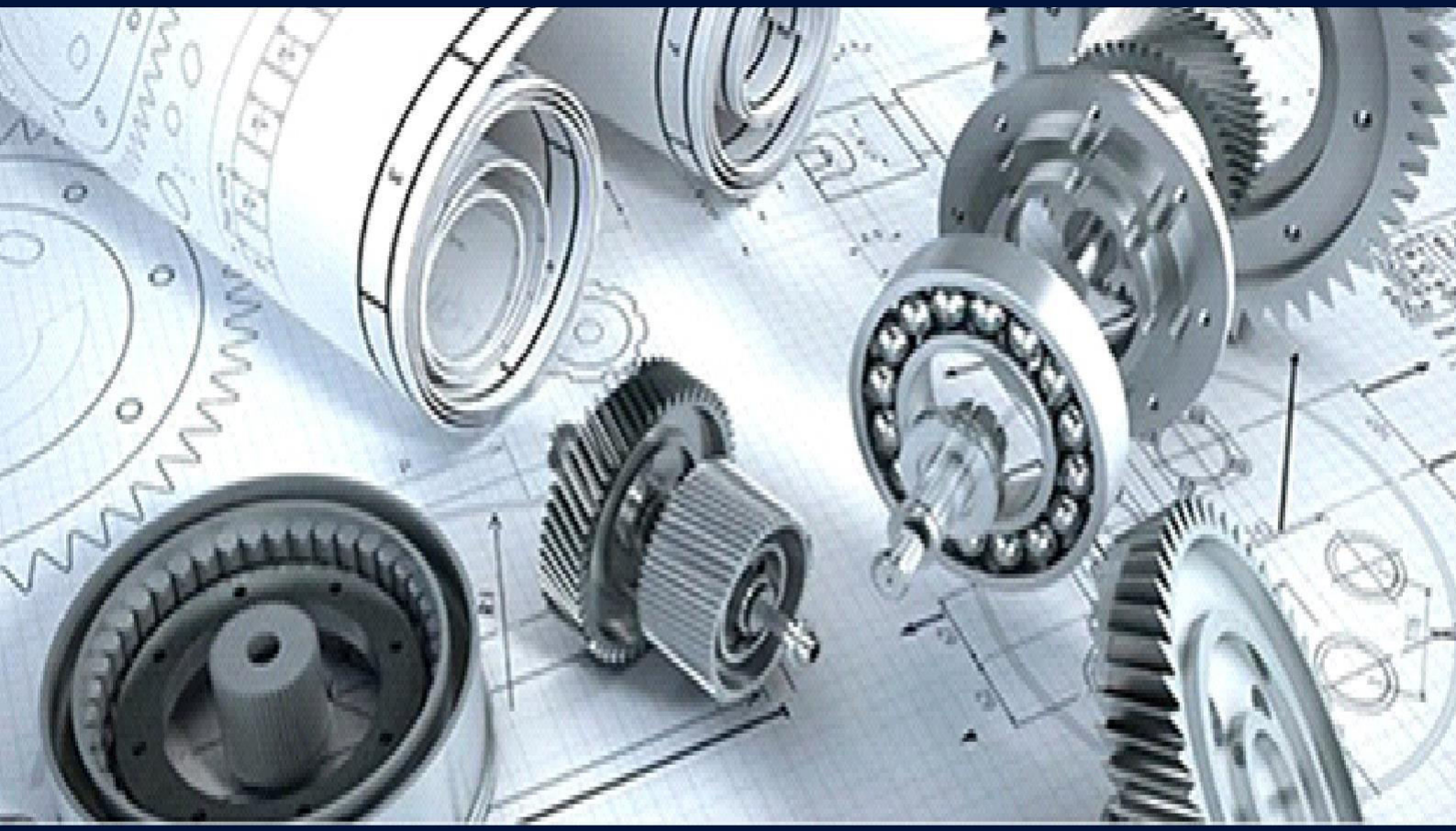
Table.2.: Different Zooplankton species recorded in Satara Bhosale Lake during Summer, Monsoon and Winter Season.

Sr. No	Groups	Name of species	Summer	Monsoon	Winter
1	Protozoa	Actinophyris sol.	+	+	+
2		Arcella vulgaris	+	+	+
3		Centyropyxis spp.	+	+	+
4		Difflugia lobostoma	+	+	+
5		Paramoecium spp.	+	+	+
6		Urocentrum spp.	+	+	+
7		Vorticella spp.	+	+	+
1	Rotifera	Brachionus calyciflorus	+	+	+
2		Brachionus falcatus	+	+	+
3		Brachionus forticula	+	+	+
4		Filinia longiseta	+	+	+
5		Keratell tropica	+	+	+
6		Monostyla bulla	+	+	+
7		Lecane bulla	+	+	+
8		Polyarthra vulgaris	+	+	+
9		Rotaria neptunia	+	+	+
1	Cladocera	Allonella spp	+	+	+
2		Bosmina longirostris	+	+	+
3		Chydorussphaericus	+	+	+
4		Ceriodaphnia spp.	+	+	+
5		Macrothrix rosea	+	+	+
6		Moina dubia	+	+	+
7		Simocephalus spp.	+	+	+
1	Copepoda	Cyclops spp	+	+	+
2		Diaptomus forbesi	+	+	+
1	Ostracoda	Cypris spp.	+	+	+



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