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ZOOPLANKTON DIVERSITY IN A FRESHWATER LAKE OF PENTALKI, Maharashtra

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ABSTRACT

Zooplankton is an important component of an aquatic ecosystem's trophic structure and plays an important role in energy transmission. The present study work has been conducted at Pentakli lake , district Buldana. Because of their fast responsiveness to environmental changes, zooplankton biodiversity serves as an ecological indicator of the aquatic environment. The impact of seasonal fluctuations on zooplankton biodiversity was investigated in the Pentakali Lake in this study. water sample were collected for the period of one year in monthly sampling from June 2019-May 2020.A total of 40 species belongs to three groups such as Rotifer(22 species),cladocera (14 species) and copepod (4 species)

From the study,the physico-chemical parameters of the Pentakli Lake was positively correlated with the zooplankton. Rotifera was the dominant group throughout the study period among the groups of zooplankton.

Keywords : species, zooplankton, impact ,biodiversity Pentakli, Buldana

INTRODUCTION :

Zooplankton is a worldwide organism that can be found in all freshwater tropical wetlands. The current study focuses on the monthly fluctuations in Zooplankton variety and density in the Pentakali Lake, Buldana ,Maharashtra. From June 2019 to May 2020 the work was completed over a one-year period. Pentakli Lake there were four different populations of Zooplankton. Zooplankton are heterotrophic organisms that eat phytoplankton, replenish nutrients through metabolism, and transport energy to higher trophic levels (Steinberg and Robert, 2009). It is critical for the recycling of nutrients and the cycling of energy in their respective environments. These are the most important natural food sources for fish, as they are directly tied to their survival and growth, and they form the foundation of all aquatic ecosystems' food chains and food webs (Miah etal., 2013)

These are the most important natural food sources for fish, as they are directly tied to their survival and growth, and they form the foundation of all aquatic ecosystems' food chains and food webs (Miah et.al., 2013). They are the most important food source for omnivorous and planktivorous fishes, as well as for fish larvae culture (Alam et.al., 1987).

Because zooplankton differs from site to site within the same area with similar ecological parameters, both qualitative and quantitative studies of zooplankton in a waterbody are critical for running a successful aquaculture business (Boyd, 1982) Zooplankton is a vital link in the energy transmission from producers to aquatic carnivores (Thayer et.al., 1974)Because it is heavily influenced by environmental factors and responds fast to changes in physical and chemical conditions as well as environmental conditions, zooplankton is an excellent indicator of changes in water quality.

Because it is significantly affected by environmental factors and responds fast to changes in physical and chemical conditions as well as environmental conditions, zooplankton is a useful indicator of changes in water quality. Nutrient loading, acidity, sediment input, and other disturbances all have an impact on zooplankton ecosystems. It's an excellent tool for comprehending. Despite the fact that numerous works on Zooplankton diversity have been reported from various parts of India, there are few reports from freshwater bodies in Northeast India, with the exception of Sharma and Sharma (2008), Kar and Barbhuiya (2004), Kar (2007), Kar and Kar (2013), So, the present study was an attempt for reporting Zooplankton diversity of Pentakli Lake of Buldana district.

MATERIALS AND METHODS

Pentakli Lake is a man-made lake on the Penganga River near Mehkar in the Buldana district of Maharashtra, India. Pentakali Lake is located in the Buldana district. It is located between the latitudes of 20.2706815°N and 76.4749182°E.

Zooplankton sampling:

From June 2019 to May 2020, zooplankton sampled collected over a year. Zooplankton was sampled regularly from the site using Battish's normal procedures (1992). The sample was then filtered and placed in a Tarson (100 ml) container, which was then fixed in Lugol's solution and stored in a cool, dark location.

Samples were taken in a Sedgwick-Rafter counting chamber and inspected under a light microscope at required magnification (X 10 initially, followed by X 40) to explore the variety of Zooplankton. Specimens were recognised using standard literature from Battish (1992), Edmondson (1959), and others. The sample was then filtered and placed in a Tarson (100 ml) container, which was then fixed in Lugol's solution and stored in a cool, dark location. Samples were taken in a Sedgwick-Rafter counting chamber and observed under a light microscopet the required magnification (X 10 initially, then X 40) to study the diversity of Zooplankton. Specimens were identified using standard literature of Battish (1992); Edmondson (1959); Michael and Sharma (1998); Sharma (1998); Sharma and Sharma (2008).

RESULTS AND DISCUSSION

During the current investigation, 40 species of Zooplankton from the wetland were discovered, divided into three groups: Rotifera, Copepoda, and Cladocera. Among the species that were identified Many researchers across the country have made similar observations. Kar & Kar (2013) identified 26 Zooplankton species in an oxbow lake in Cachar, Assam; Tyor et al. (2014) investigated Zooplankton diversity in a shallow lake in Gurgaon, India. Pawar (2014) identified 66 species of Zooplankton in certain freshwater bodies near Satara district of Maharashtra, India, with Rotifera having the most diversity, Cladocera having the second highest diversity, and Copepoda having the lowest diversity. The Zooplankton population density status recorded from Sat Beel is presented in table . Our remarks are affirmed by higher richness known than the reports from lakes and reservoirs of Guthiataal, wetland of Bahraich (U.P),India INDIA (Ashok K.V. and Sadguru P. 2020), During the research period, Cladocera Throughout the year, Diaphanosoma sp., Sida sp., Chydorus sp., Ceriodaphnia sp., Bosmina sp., Alona sp., and Moina sp. were discovered; among Copepoda, Mesocyclops sp., Neodiaptomus sp. were discovered; and among Rotifera, Brachionus Anuraeopsis sp., Asplanchna sp., Ascomorpha sp., Testudinella sp., Trichocerca sp., and Scaridium sp. are some of the species that have been identified. The current study demonstrates that species richness has a high value, indicating that the wetland is suitable for the dominating species (Arora and Mehra 2003). The research site in this study was

The Rotifera group was shown to be dominating among all other Zooplankton groups in the current investigation. The dominance of the rotifera group is a common feature in tropical freshwater wetlands, according to Mwebaza-2005 Nadwula's research. The current study discovered that the population density of Rotifera group reported from the study site varies according on the season. Its density was maximum in December, according to reports

Rotifera was followed by Cladocera, then Copepoda, as reported by Tyor et al. (2014) in their study of Zooplankton diversity in a shallow lake in Gurgaon, Haryana, where Rotifera was followed by Cladocera, then Copepoda, with only four taxa accounting for 20% of the total Zooplankton population. Zooplankton diversity reflects the water quality and they are the good indicator of changes taking place in the water resources, Kobra et.al., (2016) carried out a research work to analyse zooplankton of fresh water ecosystem in the Washim town, Maharashtra, India

As a result, taking in mind the significance of :-

Following the findings of the study, actions should be done to conserve and maintain the freshwater wetland.

Observation during study period June 2019 to May 2020

Zooplankton	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May
Cladocera												
Diaphanosoma sp.	+	+	+	+	+	+	+	+	+	+	+	+
Scapholeberis sp.	+	–	–	+	+	+	+	+	+	+	+	+
Ida sp	+	+	+	+	+	+	+	+	+	+	+	+
Simocephalus sp.	+	–	–	+	–	–	–	–	+	–	–	+
Macrothrix sp.	–	+	–	–	+	–	–	+	+	+	+	+
Chydorus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Ceriodaphnia sp.	+	+	+	+	+	+	+	+	+	+	+	+
Bosmina sp.	+	+	+	+	+	+	+	+	+	+	+	+
Bosminopsis sp.	–	–	–	+	–	–	–	–	–	+	–	–
Alona sp.	+	+	+	+	–	+	+	+	+	+	+	+
Alonella sp	+	–	–	–	+	–	–	–	+	–	–	–
Daphnia sp.	–	–	+	+	+	+	–	+	+	+	+	–
Moinodaphnia sp	–	–	–	+	–	–	–	+	–	–	–	–
Moina sp .	+	+	+	+	+	+	+	+	+	+	+	+
Copepod												
Mesocyclops sp.	+	+	+	+	+	+	+	+	+	+	+	+
Thermocyclops sp.	+	+	+	+	+	–	–	+	+	+	+	+
Neodiaptomus sp.	+	+	+	+	+	+	+	+	+	+	+	+

Heliodiaptomus sp.	+	+	+	–	+	+	+	–	–	+	+	+
Rotifera												
Brachionus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Polyarthra sp.	–	+	–	+	–	–	–	+	–	–	–	+
Plantionus sp.	+	+	+	+	+	+	+	+	+	+	+	+
Lecane sp.	+	+	+	+	+	–	+	+	+	+	–	–
Lepadella sp.	+	–	–	–	+	–	–	–	–	+	–	–
Keratella sp.	+	+	+	+	+	+	+	+	+	+	+	+
Anuraeopsis sp.	+	+	+	+	+	+	+	+	+	–	+	+
Asplanchna sp.	+	+	+	+	+	+	+	+	+	+	+	+
Ascomorpha sp.	+	+	+	–	+	+	+	+	+	+	+	+
Testudinella sp.	+	+	+	+	+	+	+	+	+	+	+	+
Trichocerca sp.	+	+	+	+	+	+	+	+	+	+	+	+
Cephalodella sp	+	–	+	+	–	–	+	+	+	+	+	+
Macrochaetus sp.	–	–	+	–	–	–	–	–	+	–	–	+
Mytilina sp.	–	–	–	–	–	–	–	–	–	+	–	–
Horaella sp.	–	–	–	–	+	–	–	–	–	+	–	+
Filinia sp.	+	+	+	+	+	+	–	–	–	+	+	–
Colurella sp.	–	+	+	–	–	–	–	–	+	–	+	+
Conochilus sp.	–	–	–	–	–	+						
Rotaria sp.	–	+	–	–	–	–	–	+	–	–	+	+
Scaridium sp.	+	+	+	+	+	+	+	+	+	+	+	+
Pompholyx sp.	–	+	–	–	+	–	–	–	–	+	+	+
Platyias sp.	–	–	–	–	–	–	–	–	–	–	–	–

CONCLUSION

Throughout the study period, the present study on Pentakli Dam indicates a rich and diverse Zooplankton that is dominated by Rotifera, indicating that the wetland is particularly appropriate for aquaculture as Zooplankton. This research contributes to the understanding of Zooplankton diversity in tropical floodplains in general, which is beneficial to aquaculture in natural floodplains in particular

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