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ZOOPLANKTON VARIETY IN A SALINE WATER: A CASE STUDY OF CHICKAN LAKE, DISTRICT DADU, SINDH

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Author's contribution
ZAP designed the study and wrote the paper, SB, NAA performed the experiments, SM, SAB, KHL complied the data RS performed statistical analysis.

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Zooplankton, saline lake, Chickan Lake, population Rotifera, Cladocera, Copepoda, Dominant

ABSTRACT

Zooplankton is a multi-species organism that evolved to survive in a saline lake. This research aims to look at the monthly changes in a variety of Zooplankton in Chickan Lake Dadu. The research took place in the sample area for a year, from January to December 2017. The Zooplankton population at Chickan Lake was made up of 20 genera divided into three main groups: Rotifera, Cladocera, and Copepoda. Furthermore, Rotifera made up 17 percent of the Zooplankton collection, Cladocera made up 55 percent, and Copepoda made up just 28 percent. The dominant Zooplankton group included in the sample region was Rotifera.

1. INTRODUCTION

Because of their filtering operations, algal and microbial processing activities, and nutrient cycling, Zooplankton plays an essential role in providing clean water [1]. Many saline water zooplankton, such as copepods, cladocerans, and rotifers, develop diapason or "resting" larvae [2]. The zooplankton population benefits from the food supply, favorable social, and environmental conditions [3]. The zooplankton population is critical to the aquatic ecosystem [4]. Zooplankton is a form of Zooplankton that transfers energy from suppliers to potential consumers, such as crustaceans, invertebrates, and fish [5].

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Despite extensive research on Pakistan having been done on different aspects of zooplankton diversity, few studies are found in these regions [1].

2. MATERIALS AND METHODS

Study Area

Chickan Lake is in the Dadu district of Palh Village [6]. It is about 25 kilometers from Dadu city and is located between 26° 57'33.94 N and 67° 51'06.10 E. This lake is made up of three interconnected wetland units that, during the monsoon, merge into a single sheet of water [6].

Zooplankton Sampling

The research was carried out for a year, from January to December 2017. The site's Zooplankton was

collected monthly using traditional methods [7]. After filtering the sample, it was placed in a Tarson (100 ml) container, filled with Lugol's solution, and placed in a perfect, dark spot [8]. The sample was taken in a department of Fresh Water Biology and Fisheries at the University of Sindh and examined under a light microscope at the necessary magnification (X 10, then X 40) to study the variety of Zooplankton. The species were described using classic literature from various researchers [7, 9-11].

3. RESULTS AND DISCUSSION

The lake yielded 20 genera of Zooplankton, divided into three groups: Cladocera, Copepoda, and Rotifera, during the current research. There are eight Cladocera genera, four Copepoda genera, and 15 Rotifera genera among the recorded genera (Table 1). Many researchers worldwide [12] made a similar discovery, reporting 26 species of Zooplankton from the Cachar Lake in Assam. Additionally, [13] researchers examined Zooplankton diversity in the chilia hatchery Thatta and found that Rotifera had the most diversity, followed by Cladocera and Copepoda, which had the least diversity. A study [14] in the Satara district of India uncovered 66 species of fish living in ponds and lakes that had previously unknown to exist there.

Figure 2 depicts the abundance status of the Zooplankton community found in Chickan Lake. Cladocera (8 genera), Copepoda (4 genera), and Rotifera (15 genera) were included in the saline water body studied, with Rotifera accounting for 55 percent of total Zooplankton, Cladocera 28 percent, and Copepoda 17 percent. Various zooplankton species were abundant depending on the optimal conditions. The zooplankton population density status reported from Chickan Lake. During the research time, for Cladocera, only Sida sp., Diaphanosoma sp., Ceriodaphnia sp., Chydorus sp., Bosmina sp., Moina sp., and Alona sp. and were found in the Chickan lake Dadu. Furthermore, for Copepoda, only Neodiaptomus sp., and Mesocyclops sp. were recorded and in last, for Rotifera, Plationus sp., Brachionus sp., Ascomorpha sp., Keratella sp., Lecane sp., Testudinella sp., Anuraeopsis sp., Asplanchna sp., Scaridium sp., and Trichocerca sp. were recorded throughout the year. The current study shows that species abundance has a high value, indicating that the lake is suitable for the dominant species [14]. According to the results, the report shows a greater variety of Zooplankton during the monsoon season.This is how it was discovered that the Rotifer is the only class prevalent among the other Zooplankton classes in the study. The dominance of the Rotifera group in saline water lakes is a general feature; related findings have been published in studies of saline water lakes [15]. Cladocera density was highest, followed by Rotifera and Copepoda, as reported by [6] in their study of Zooplankton diversity in a Chickan lake. Cladocera was followed by Rotifera and Copepoda, with these four genera accounting for 20percent of the total of all Zooplankton.

4. CONCLUSION

The current research on Chickan Lake revealed a diverse and rich zooplankton population. Rotifera predominated during the study period, suggesting that the lake is suitable for aquaculture, as Zooplankton, especially Rotifer, is the optimal food source for aquaculture fish larvae. This study is critical for elucidating the Zooplankton diversity of tropical floodplains in general, which, in turn, aids aquaculture in natural floodplains. As a result, considering the study's significance, measures should be taken to protect and preserve the freshwater wetland.

5. ACKNOWLEDGEMENTS

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6. CONFLICT OF INTEREST

All authors have declared that there is no conflict of interests regarding the publication of this article.

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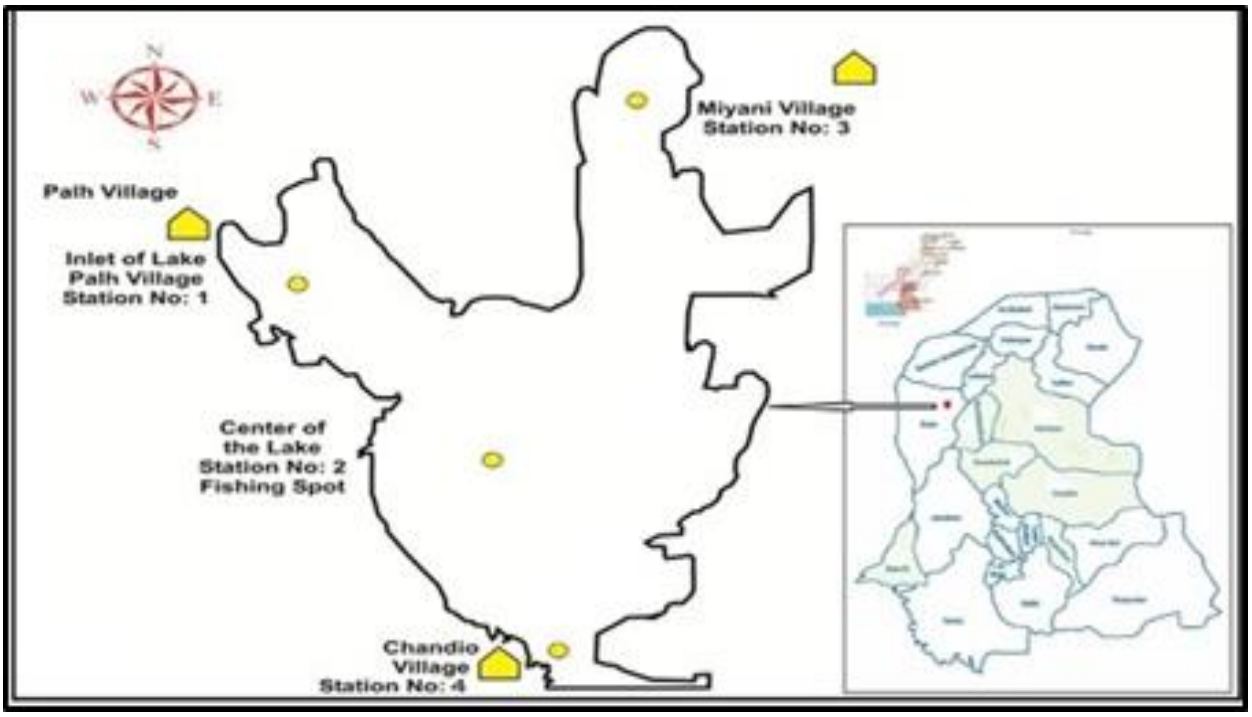

Fig.1. Study Area Map

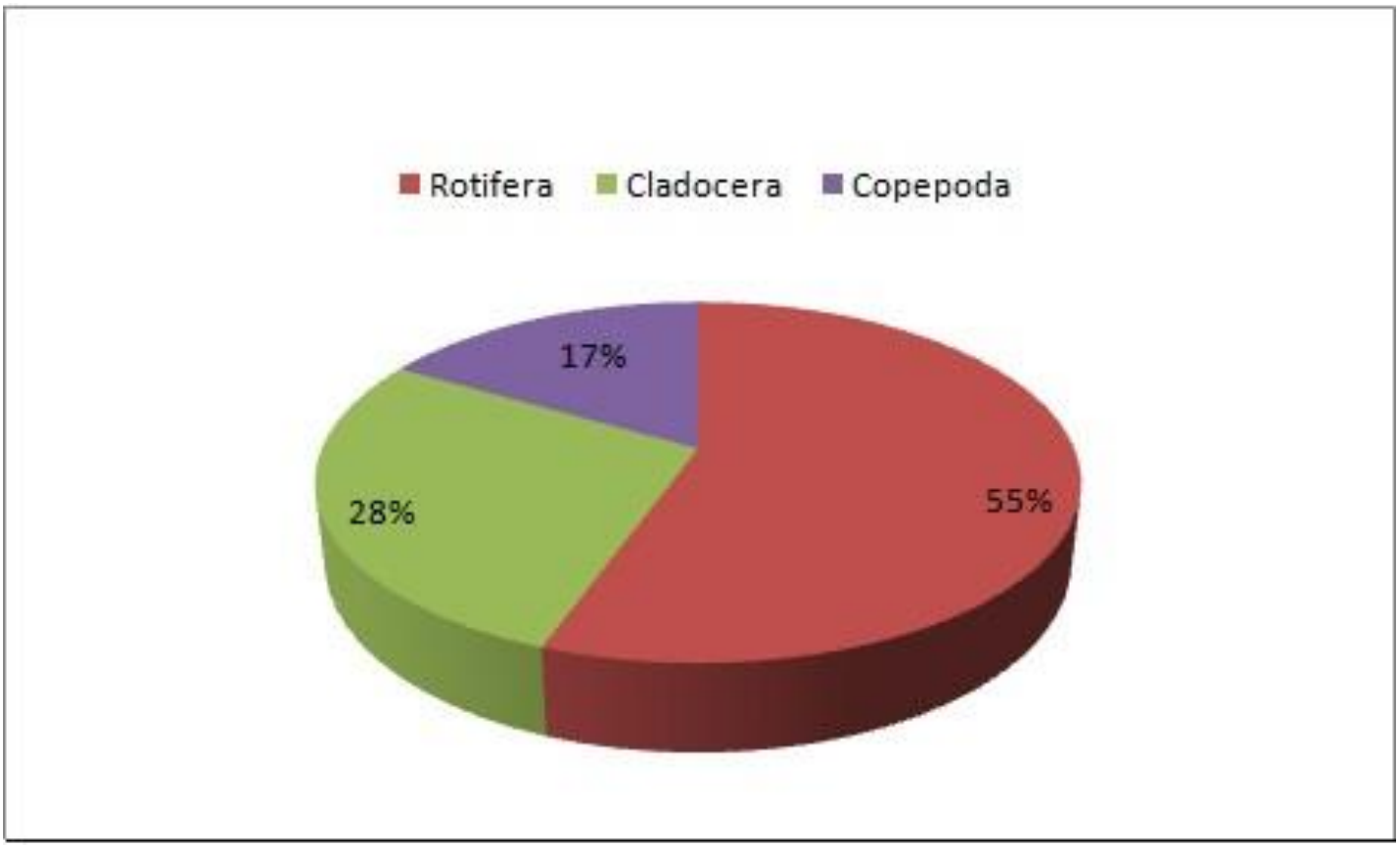

Fig.2. The abundance of Zooplankton of Chicken Lake

Table 1: Abundance of Zooplankton species of

ZOOPLANKTON	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
CLADOCERA												
***Diaphanosoma* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Scapholeberis* sp.**	+	-	-	+	+	+	+	+	+	+	+	+
***Macrothrix* sp.**	-	+	-	-	+	-	-	+	+	+	+	+
***Chydorus* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Ceriodaphnia* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Bosmina* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Bosminopsis* sp.**	-	-	-	+	-	-	-	-	+	-	+	-
***Alona* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
COPEPODA												
***Mesocyclops* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Thermocyclops* sp.**	+	+	+	+	+	+	-	+	-	+	+	+
***Neodiaptomus* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Heliodiaptomus* sp.**	+	+	+	-	+	+	-	+	+	+	+	+
ROTIFERA												
***Brachionus* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Polyarthra* sp.**	-	+	-	+	-	-	-	-	+	-	-	+
***Plationus* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Lecane* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Lepadella* sp.**	+	-	-	-	+	-	-	-	-	+	-	-
***Keratella* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Trichocerca* sp.**	+	+	+	+	+	+	+	+	+	+	+	+
***Cephalodella* sp.**	+	-	+	+	-	-	+	-	+	+	+	+