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Biodiversity and abundance of Zooplanktons in a pond of Madhepura district

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Abstract- In the present study, biodiversity and abundance of Zooplankton was studied in a pond of Singheshwar, Madhepura. Altogether, 16 genera of Zooplanktons out of which 4 belongs to Protozoa, 4 belongs to Copepoda, 3 to Rotifera, 3 to Cladocera and 2 belongs to Ostracoda. Maximum abundance of Zooplanktons was observed in summer season and minimum in winter season.

Key words: Abundance, Protozoa, Rotifera, Cladocera, Copepoda, Ostracoda

INTRODUCTION

Ponds are fresh water ecosystem which maintain biodiversity of aquatic plants and animals. Planktons are the pioneer component of a freshwater ecosystem. Zooplankton form a grazing chain in pond. Zooplanktons feed on Phytoplanktons. The diversity and density of Zooplanktons depend upon physicochemical characteristics of water. Every pond has unique type of Zooplanktons, which fluctuate seasonally. Zooplanktons are indicators of physicochemical parameter of pond water as well as secondary productivity potential of aquatic ecosystem. The common fresh water Zooplanktons belongs to Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda. Locomotion is absent in Protozoa but other group can move in water. As Zooplanktons feed on Phytoplanktons they are link in between Phytoplanktons and fish. Physicochemical parameters such as pH, Temp., DO, BOD are affected by seasonal variation in water body so these factors influence

distribution, abundance and species diversity of Zooplanktons. Species diversity and abundance of Zooplanktons influences fishery.

The study of Zooplanktons was undertaken by several investigators like Chitra (2013)¹, Khan (2003)², Ramesh and Shashikanth (2016)³, Sinha and Islam (2002)⁴.

MATERIAL & METHODS

In the present study, a pond near Singheshwar block office was selected for study. Singheshwar is one of the blocks of Madhepura district. It is most important religious place of Madhepura district where a temple of God Shiva is situated. It is believed that the Shivlinga was established by Shringi rishi in ancient time. The selected pond area is about 2 to 2.5 acres and it is surrounded by several residences. Water depth at the center is about 5.7 feed in this pond.

Water samples were collected in each season i.e. summer, winter and rainy seasons in the morning in between 7am to 9am at four different sites of pond. Water samples

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were filtered through Plankton net (mesh size 25mm). Samples were fixed at the spot in 4% formaldehyde and brought to the laboratory. Identification of Zooplanktons was done according to Ward and Whipple (1959)⁵. Sidgwich-Rafter was used for cell count.

$$Abundance = \frac{\text{Total no. of individual in all sampling unit}}{\text{Total no. of sampling unit in which species occurred}}$$

RESULT

Altogether 16 general of Zooplanktons were identified out of which four belongs to Protozoa (*Amoeba*, *Arcella*, *Vorticella*, *Paramecium*), four belong to Copepoda (*Nauplius*, *Heliodiaptomous*, *Mesocyclops*,

Thermocyclops), three belongs to Rotifera (*Keratella*, *Lecane*, *Brachionus*), three belongs to Cladocera (*Bosmina*, *Daphnia*, *Monia*) and two belongs to Ostracoda (*Cypris*, *Lothonura*). The number of individuals were highest in summer for each group and lowest in winter.

Abundance of Protozoa was highest and that of Ostracoda was lowest. Seasonal variation in density of each group is represented in Table 01 and abundance of each group in summer, winter and rainy season is represented in Fig. 01. Protozoa showed maximum abundance in all seasons followed by Rotifera. Ostracoda showed minimum abundance. Abundance of all groups was maximum in summer season and minimum in winter season.

Table 01: Seasonal variation in Zooplanktons

Group	No. of genera	Representative genera	Density			
			Summer	Winter	Rainy	Total
Protozoa	4	<i>Amoeba</i>	82	62	43	187
		<i>Arcella</i>				
		<i>Vorticella</i>				
		<i>Paramecium</i>				
Rotifera	3	<i>Keratella</i>	78	57	48	183
		<i>Lecane</i>				
		<i>Brachionus</i>				
Cladocera	3	<i>Bosmina</i>	75	65	54	194
		<i>Daphnia</i>				
		<i>Monia</i>				
Copepoda	4	<i>Nauplius</i>	71	52	38	161
		<i>Heliodiaptomous</i>				
		<i>Mesocyclops</i>				
		<i>Thermocyclops</i>				
Ostracoda	2	<i>Cypris</i>	32	18	12	62
		<i>Lothonura</i>				

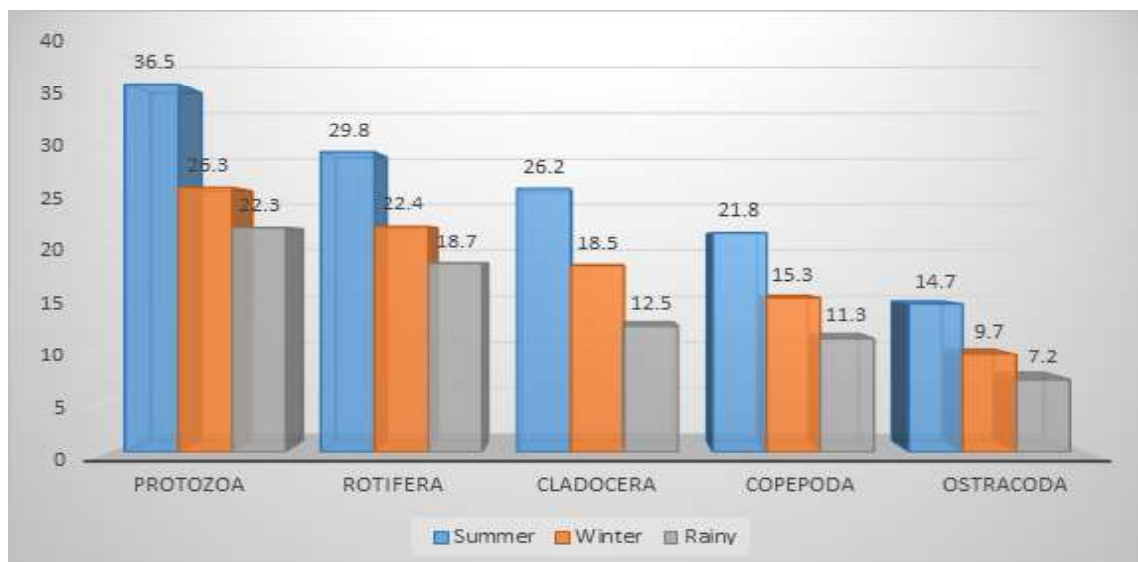


Fig. 01: Abundance of different Zooplanktons

DISCUSSION

Zooplanktons are the important biotic component of pond which influence all functional aspect of aquatic ecosystem such as food chain, energy flow and cycling of matter.^{1,6}

In the present study five groups of Zooplanktons, Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda were identified. A total of 16 genera of Zooplanktons were identified. Protozoa was dominant in all seasons followed by Rotifera. Similar result was observed by Pandit and Sharma (2020)⁷.

Abundance of Zooplanktons was highest in summer and lowest in rainy season. The pH of water remains high in summer and lowest in rainy season. Mishra *et al.* (2014)⁸ also reported higher abundance of Zooplanktons at high pH.

CONCLUSION

In the present study, Zooplanktons were collected and identified from a fresh water pond of Singheshwar. Collection was made in summer, winter and rainy seasons. Abundance of Zooplanktons was calculated. Altogether 16 genera of Zooplanktons belonging to Protozoa, Rotifera, Cladocera, Copepoda and Ostracoda were identified. Out of 16 genera, 4 belongs to Protozoa, 4 belongs to Copepoda, 3 to Rotifera, 3 to Cladocera and 2 belongs to Ostracoda.

Maximum no. of individuals was observed in summer while minimum in rainy season.

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