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Zooplankton based trophic assessment of Mathadivagu Dam District Adilabad Telangana State, India

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ABSTRACT

Madhadivagu Dam near located Adilabad district Telangana studied for zooplankton from July 2018 to June 2019 and data obtained from the present investigation revealed of a total of 28 zooplankton species comprising of 11 species of rotifers, 6 copepods, 8 cladocerans and 2 ostracod. Occurrence of zooplanktons throughout the year of all the four sampling sites indicates oligotrophic nature of dam.

Keywords: Zooplankton, trophic assessment, Madhadivagu Dam.

INTRODUCTION

Zooplanktons are minute aquatic organisms that are non-motile or are swimmers and they drift in water columns of an ocean, sea or fresh water bodies to move any great distance. They are heterotrophic in nature and play important role in food web by linking the primary producers and higher trophic levels. The fresh water zooplanktons comprise of rotifers, *Cladocera,* copepods and ostracodes reported by Sharma (2012). They occupy an intermediate position in the food web. Zooplankton mediate the transfer of energy from lower to higher trophic level studied by Waters (1987), thus zooplankton represent an important link in aquatic food chain and contribute significantly to secondary production in fresh water ecosystem observed by Sharma *et al.,* (1998). The zooplankton concentration and distribution are sensitive to physical and chemical changes in the water studied Ahmad *et al.,* (2011). Zooplanktons also play an important role as indicators of trophic condition in cold, temperate and tropical waters reported by Sharma *et al.,* (1998). Sukand and Patil (2004) recorded four major groups of zooplanktons in their studies on Fort lake Belgaum, Karnatka. Rotifers constituted (52.38%) number of zooplanktons followed by *copepods* 26.5%, *Cladocera* 16.45% and ostracodes 4.67%. In the present investigation we have studied on seasonal variations of Zooplanktons.

MATERIALS AND METHODS

Studies on zooplanktons were carried out during study periods to study the seasonal variations in the zooplankton diversity. Both qualitative and quantitative studies were under taken. Samples were collected, once in a month, in the morning hours between 8.00 A.M. to 11.00 A.M. Samples were collected by filtering 50 litre surface water through a plankton net made up of bolting silk cloth no. 20. Extreme care was taken in order to keep water undisturbed at the time of sampling. The collected samples were preserved in 4% formalin. The preserved samples were brought to the laboratory for qualitative and quantitative analysis. Zooplanktons were identified by using the methods given by Battish (1992) and Dhanapati, (2000). Quantitative studies were made by using Sedgwick rafter cell. Sampl was properly agitated to distribute the organisms evenly. By using a pipette, one ml of sample was transferred onto the cell. The cover slip was placed properly, avoiding any air bubble. The planktons were allowed to settle for some time and counting was made under microscope. All the planktons, present in the cell were counted by moving the cell, vertically and horizontally, covering the whole area.

RESULT AND DISCUSSION

In the present investigation we have observed there are 4 types of phyla such as Rotifera, Copepoda, Cladocera and Ostracoda simultaneously we have determined population density. In the Rotifera there are 11 species, 06 species in Copepoda, 08 species in Cladocera and 02 species in Ostracoda were observed and list will given in the last page of this paper.

Rotifera:

A total of 11 genera such as *Brachionus caudatus, B. diversicornis, B. calyciflorus, B. forticula, B. bidentata, B. falcatus, Keratella tropica, K. quadrata, Filinia longiceta, Lecane leontina* and *Asplanchana brightwelii* were recorded during the period of study. The *Keratella tropica* was more in number during March, 2019 (10 individuals/ml). *Brachinous diversicornis* was more in number recorded during month of February and March, 2019 (10 and 12 individuals /ml) *Lecane leontiana* was recorded more number in February 2019 (9 individuals/ml). *Testudinella* was recorded only in November 2018 and March 2019. Taxonomic dominance of rotifera was reported in several water bodies (Nogueira 2001; Cavlli *et al.,* 2001; Sampaio *et al.,* 2002; Neves *et al,* 2003; Kudari *et al.,* 2005). This pattern is common in tropical and subtropical fresh waters, whether in lakes, ponds, reservoirs, rivers or streams (Neves *et al.,* 2003). The rotifers play a vital role in the trophic tiers of fresh water impoundments and they serve as living capsules of nutrition (Suresh Kumar *et al.,* 1999). The species *B. calyciflorus* is considered to be a good indicator of eutrophication (Sampaio *et al.,* 2002). Kudari *et al.,* (2005) have identified 4 species of zooplankton in 19 water bodies of Haveri district.

Copepoda:

This group was represented by 6 genera such as *Copepode cyclopes, Microcyclops varicans. Calanus copepod, Mesocyclops, Diaptomus, Thermocyclops sp*. The *Copepode cyclopes* was found more in number during February (8 individuals/ ml). The number of *Mesocyclops* was more in December (15 indivials/ml). About 120 species of fresh water free-living copepods are known from India. Patil and Goudar (1989) reported seven species of copepods in Dharwad district. Where serve food for many fish and play a vital role in ecological pyramids was reported by Shivshankar et al., (2013).

Cladocera:

This group was represented by 8 genera such as *Macrothrix* sp., *Simocephalus serrulatus, S. vetulus Diaphanosoma brevireme, D. birgei, D. tropicum, Diaphanosoma* sp., *Chydorus eurynotus* and *Daphnia ambigua.* The *Daphnia ambigua* was found more in number during January 2019 (17 individuals / ml). About 600 species of fresh water cladocerans have been reported (Korovchinsky, 1996), to occur throughout the world and in India 110 species have been recorded (Patil and Goudar, 1989), Uttangi (2001) reported eight species of cladocerans from 54 tanks of Haveri district. Cladocera is an order of small crustaceans commonly they are called by “water fleas” was reported by Shivshankar et al., (2013).

Ostracoda:

Stenocypris and Cyprinotus sp. was the only representative genus during the investigation period. Their population recorded minimum only during October 2018 and March 2019 (1 and 2 individuals/ml. Patil and Goudar (1989) the reported occurrence of seven species of ostracods in Dharwad district.

Table l: Occurrence of zooplankton at four collection sites

Zooplankton	A	B	C	D
Rotifera				
Brachionus cavdatus	+	+	+	+
B. diversicomis	+	+	+	-
B. calycifloms	+	-	+	-
B. forticula	+	+	-	+
B. bidentata	-	+	-	+
B. Falcatus	-	+	+	+
Keratella tropica	+	+	+	+
K. quadrata	+	+	+	+
Fllinia longiceta	+	+	+	+
Lecane leontina	+,	-	-	+
Asplanchana brightwelii	+	+	+	+
Copepoda				
Copepode cyclopes	+	+	+	+
Microcyclops varicans	-	+	+	+
Calanus copepod	+	-	-	+
Mesocyclops	-	+	+	-
Diaptomus	+	+	+	+
Thermocyclopssp.	-	+	+	-
Cladocera				
Macrothrixsp.	+	+	+	+
Simocephalus sermlatus	+	-	-	+
S. vetulus	-	+	+	+
Diaphanosoma brevireme	+	+	-	+
D. birgei	-	+	-	-
D. tropicum	-	+	-	-
Diaphanosoma sp.	+	+	+	+
(Jhydoms eurynotus	+	+	+	-
Daphnia ambigua	-	+	+	-
Ostracoda				
Cyprinotus Sp.	+	-	-	+
Stenocypris	+	-	+	+

CONCLUSION

Zooplankton diversity of Mathadivagu dam is somewhat high and occurrence of *Keratella tropica, K. quadrata* and *Filinia longiseta* throughout the year at all the four sampling sites indicates oligotrqphic nature of Mathadivagu dam.

Conflict of Interest

The author declares that there is no conflict of interest.

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