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Analysis of Some Zooplanktons with respect to Seasonal Variation from River Vena Distt. Nagpur, Maharashtra, India

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Abstract

Zooplankton plays an important role in the early monitoring and detection of water density and the pollution. They also detect the absence or presence of certain species of larvae and fishes. Zooplanktons occupy the major role of primary consumer in the aquatic food web. The present piece of work has been made to investigate the density of Zooplanktons in Vena River. Analysis of Zooplankton has been carried out at 4 site of Vena river samples were collected monthly. Population of Zooplankton is represented by group's viz. protozoa, Copepoda, Cladocera and Rotifera. The present investigation was recorded the maximum of Zooplankton in the month of February and minimum density of Zooplankton in the month of March. Density fluctuation was seen due to the concentration of water, Temperature fluctuation, industrial and domestic sewage.

Keywords: Analysis, zooplankton, population, density, Vena River.

Introduction

God has created the most wonderful and unusual compound in nature i.e., "Water". It is an abundant and most useful chemical compound gifted with physico-chemical properties and unique characteristics. It is essential for the survival of all organisms on the planet earth.

The word plankton was derived from the Greek word planktons meaning the wander and weak swimming movement of organisms. Planktons can be divided into two i.e., animals or zooplankton and plants or phytoplankton Anita Slotwinski[1]. Zooplanktons are occupying the role of primary consumer in the aquatic food web. Primary consumer it autotrophs and they obtain their energy from inorganic sources. Some zooplanktons become the food of fishes.

Zooplanktons constitute an important food item of many Omnivorous and Carnivorous fishes. The larvae of carps will feed mostly on zooplanktons. Zooplanktons also play a very important role in the food chains but they are from second trophic level.

Material and Methods

The samples for Zooplankton analysis were collected from four sites i.e., Site A, Site B, Site C and Site D of Vena River at every month from June 2013 to May 2014. For Zooplankton analysis 50 liters volume of water samples was collected and passed through plankton net. Plankton net is made up of silk bolting cloth No. 25 and gets a 30 ml of concentrated water sample. Then 30 ml of water sample was preserved in 5% formalin solutions. Water samples were collected from 7.00 am to 9.00 am.

The Zooplanktons quantitative analysis was carried out with the help of S. R. Cell. Zooplanktons were identified and observed under the electron microscope by using a standard key and literature of Kodarkar[2]. Zooplanktons were calculated by using a formula

$$n = \frac{a \times c}{l}$$

Where, n= No. of Zooplankton / liter of water. a= No. of Zooplankton in 1 ml. c= ml. of plankton concentrate. l= Vol. of original water sample taken

Results and Discussion

According to the findings and the present study results in summer season, the Zooplanktons community how total 20 species resulted. Out of which 03 taxa of Copepoda, 10 taxa of cladocera and 07 taxa of Rotifera were found in Vena river of Nagpur region. Quantitative analysis of Zooplanktons for summer seasons of investigation presented in table 1, 2, 3 and 4. Average result of quantitative analysis Zooplankton presented in table-5. Qualitatetive analysis of Zooplankton investigation presented in table.

Protozoa: The present study reports of Zooplankton showed that not a single species of protozoans were found.

Copepoda: Several workers have studied the seasonal variations of copepods in water bodies of India. They are the primary food source of planktonivorous fishes and hence

constitute an essential link with food chain. As the pollution level increased the copepods they get dissappred in stable environmental conditions. In the present investigations copepods were recorded in summer seasons and they are maximum in the month of March at site-A

Cladocerons: This group of Zooplankton plays an important role in the benthic growth. They are the primary consumers which feed on microscopic algae and fine particulate matter in the detritus. In the present investigations claodcerons were recorded maximum in the month of February at site-D

Rotifers: Rotifers are considered as the most important Zooplanktons and this is one of the oldest group commonly termed as wheel animalcule. Rotifers have the ability to change the water quality and respond more quickly to the environmental changes amongst the Zooplanktons. The present investigation of summer seasons, they were recorded maximum in the month of February at site–A.

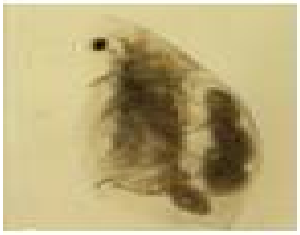
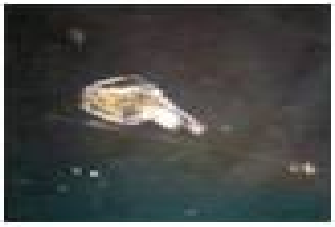


Figure-1
Eurycercus

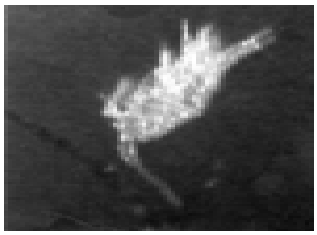
Figure–2
Bosmina



Figure–3
Herringia

Figure–4
Keratella Sp.

Figure–5
Nauplius



Figure–6
Cyclops

Figure–7
Alonella

Figure-8
Diaphanosoma

Table –1
Quantitative analysis of Zooplankton (ORG/L) at different station in summer season of Vena river (Month -February)

Sample No	Location	Zooplankton no./m³	Copepoda	Cladocera	Rotifera	SWI
1	Site – A	513000	41%	40%	19%	1.514%
2	Site – B	25800	55%	34%	11%	1.366%
3	Site – C	29400	56%	29%	15%	1.398%
4	Site – D	15600	40%	58%	02%	1.096%

Table–2
Quantitative analysis of Zooplankton (ORG/L) at different station in summer season of Vena river (Month - March)

Sample No	Location	Zooplankton no./m³	Copepoda	Cladocera	Rotifera	SWI
1	Site – A	201600	89%	10%	01%	0.531%
2	Site – B	51000	80%	18%	02%	0.808%
3	Site – C	30300	55%	43%	02%	1.109%
4	Site – D	25500	35%	53%	12%	1.380%

Table–3
Quantitative analysis of Zooplankton (ORG/L) at different station in summer season of Vena river (Month - April)

Sample No	Location	Zooplankton no./m³	Copepoda	Cladocera	Rotifera	SWI
1	Site – A	21300	56%	30%	14%	1.369%
2	Site – B	20100	54%	31%	15%	0.808%
3	Site – C	36300	85%	14%	01%	0.881%
4	Site – D	13500	56%	33%	11%	1.351%

Table–4
Quantitative analysis of Zooplankton (ORG/L) at different station in summer season of Vena river (Month - May)

Sample No	Location	Zooplankton no./m³	Copepoda	Cladocera	Rotifera	SWI
1	Site – A	59400	58%	25%	16%	1.387%
2	Site – B	33300	59%	27%	14%	1.346%
3	Site – C	292200	79%	10%	11%	0.933%
4	Site – D	14700	59%	24%	17%	1.362%

Table–5
Average result of Quantitative Analysis of Zooplankton

Sample No	Location	Months	Zooplankton no./m³	Copepoda	Cladocera	Rotifera	SWI
1	Site – A	February	198825	61%	26%	13%	1.200%
2	Site – B	March	32550	62%	28%	11%	1.082%
3	Site – C	April	97050	69%	24%	07%	1.080%
4	Site – D	May	17325	48%	42%	11%	1.297%

Qualitative Analysis of Zooplankton

Sr. No.	Order	Name of Species
1	Copepoda	Cyclops , Nauplius , Diaptomus
2	Cladocera	Alonella , Daphnia , Comptocercus , Diaphanosoma , Eurycercus , Moina , Bosmina , Alona , Ceriodaphnia , Polythemus
3	Rotifera	Brachionus bidentata, Keratella, Herringia, Filinia logiseta, Brachionus angularis, Filinia, Keratella tropicana

Conclusion

The above study shows the variation in zooplanktons with respect to density, which was recorded maximum in the month of February due to favourable temperature. Temperatures are favourable for phytoplanknonic growth and as a abundance of food. Whereas the minimum density of Zooplankton was recorded in the month of May due to rising temperature, domestic sewage, industrial sewage and concentration of water.

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