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ZOOPLANKTON BIODIVERSITY AND POLLUTION INDICATOR SPECIES IN NASPUR LAKE, ADILABAD DISTRICT, TELANGANA STATE. INDIA.



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ABSTRACT

The present investigation period deals with the diversity of zooplankton of Naspur lake. It's situated eastern part of the district. The sample were collected during morning hours at monthly wise. During the study was formed 16 zooplankton species they are four groups like .Rotifer, cladocera, copepoda and Ostracoda. The zooplankton community was maximum in summer season and minimum in the monsoon season due to high temperature and low turbidity in summer season. The composition of zooplankton(Rotifer's)was dominant (46.98%) followed by cladocera(26.19%)copepod(16.01%)and ostracod(5.63%).The dominant trend of zooplankton in the present investigation Rotifer> >Cladocera >Copepod >Ostracod. Town sewage water, coalmine pollutants water consult to the lake physico-chemical parameters of this lake was near the pollution .Because of that lake protection purpose some precautions to be taken for further generation.

KEYWORDS :Naspur lake, physico chemical parameters, Zooplankton diversity.

INTRODUCTION

The aquatic ecosystem biodiversity depends largely on the quality of the water. In turns is dependent upon the extent of mining and industrial operation, agricultural practices and the manner of management of waste product in the vicinity. The abundance of zooplankton in a waterbody is regarded as an indicator of productivity nature closely related to nutrition value

temperature of water body. Dutta and Verma (2010) have reported limnological characteristics of any waterbody alter the zooplankton diversity. Deivanai et al., (2004) zooplanktons are a major link in the transfer of energy from autotrophs to heterotrophs. Zooplankton provide the main food items of and can be used as indicator of the trophic status of waterbody present day coal mining is a developmental activity in this district, which is bound to damage the natural ecosystem by all activities. The present paper deals with zooplankton diversity of Naspur lake Adilabad district during the period from September 2012- August -2013

MATERIAL AND METHODS:

Naspur lake is situated about 5 km away from Manchiryal town, it's a manmade lake. The lake receives water through surface runoff during monsoon from surrounding upland coalmine extra by product were consult to the waterbody. The zooplankton sample was started from period of sep 2011 to Oct 2013. Sample were collected early morning hours during 7-00am to 9-00am only. Sample were collected using plankton net made by bolting nylon cloth (mesh size 50µm). Zooplankton samples were preserved in 4% formaldehyde solution and sample were observed and identified modern research binocular microscopes by using standard key and literature (Tonapi 1980, Kodarkar et al., 1998). For zooplankton counting the Sedgewick rafter cell was used which is 50mm long 20mm width and 1mm deep Total number of zooplankton in the S-R Cell was derived from the following formula.

$$\text{No. M}^{-12} = \frac{CX100X\text{mm}^2}{LXDXWXS}$$

Where:

C=Number of organism counted
L=length of each strip
D=Depth of strip
S=Number of strips counted
W=Width of S-R cell

RESULTS & DISCUSSION:

The present study report the zooplankton diversity community of Naspur lake. In the investigation period sixteen zooplankton were identified in this species of which eight species of rotifer three species of copepod three cladocera and two species of Ostracod species were identified. During the present investigation class Rotifer was dominated among all the zooplankton group in all the research showed. However the diversity of zooplankton varied from season to season and the maximum diversity was observed in winter season and minimum was observed in monsoon season. Ostozic (2000) reported eutrophication affect structure and composition of zooplankton community zooplankton responds quickly to environment stress, while they widely considered as bio indicator of pollution. The patterns of most dominated species of zooplankton were different table Rotifer species showed their peaks in ostracod, while lowest density was found in investigation period.

Rotifer:

Rotifers commonly called as 'wheel animalcules' are a group of small usually microscopic, pseudocoelomate animals. In the present investigation period rotifer species varied from 91 to

247 Num/lit. The species rotifers found during the period of investigation the minimum number of rotifers was observed in monsoon and maximum in summer season. The following rotifers were identified during the investigation *Branchionus angularis*, *Branchionus caudatus*, *Branchionus falcatus*, *Branchionus rubens*, *Branchionus quadridentatus*, *Keratella tropica*, *Cipodella gibba*. The rotifer are one of the zooplankton belong to class rotifer. These have a short lifespan of 14 days. Rotifera species as best indicators of different kind of aquatic pollution (Mahajan1981, Kolkwitz and Marsoon 1902&1909) Dadhich and & Saxena (1999) have reported abundant population of Branchious in both eutrophic and mesotrophic lakes. Suresh kumar et.al.,(1999) The rotifers play a vital role in the tropic tiers of fresh water impoundments and they serve as living capsules of nutrition.

Copepod: In the present investigation period copepod species varied from 19 to 88 Num/lit. The species rotifers found during the period of investigation the minimum number of rotifers was observed in monsoon and maximum in summer season. The following rotifers were identified during the investigation *Paracyclops frimbriata*, *Mesocyclops lucarte*, *Tropocyclops*. Kambale et.al.,(2005) reported zooplankton diversity of Khatijapur tank. They recorded copepod abundance of 35.57% and copepod were represented by two species Cyclops and mesocyclops.

Cladocera: In the present investigation period Cladocera species varied from 30 to 139 Num/lit. The minimum number of Cladocera was observed in monsoon and maximum in summer season. The following Cladocera were identified during the investigation *Moina branhiata*, *Moina macrocopa*, *Daphnia spe* Sharma (2001) reported that

Rotifers	12-Sep	Oct	Nov	Dec	13-Jan	Feb	Mar	April	May	Jun	July	Aug	TOTAL
<i>Branchionus angularis</i>	12	12	11	10	13	12	24	30	34	30	11	14	213
<i>Branchionus caudatus</i>	12	12	11	15	12	12	23	26	26	14	14	16	193
<i>Branchionus falcatus</i>	11	12	14	11	13	19	26	28	35	28	11	13	221
<i>Branchionus rubens</i>	13	10	12	13	15	13	19	30	32	26	14	15	212
<i>Branchionus quadridentatus</i>	10	11	13	14	15	18	17	23	30	24	17	23	215
<i>Keratella tropica</i>	9	10	12	9	10	13	15	22	30	21	12	12	175
<i>Cipodella gibba</i>	9	10	13	10	12	13	16	17	21	15	11	12	159
<i>Lecane luna</i>	8	6	6	4	6	8	14	16	21	15	11	13	128
<i>Asplancha spee.</i>	7	8	8	6	7	12	10	12	18	16	13	10	127
TOTAL	91	91	100	92	103	120	164	204	247	189	114	128	1643
COPEPOD													
<i>Paracyclops frimbriata</i>	9	10	4	20	24	25	34	44	30	21	13	10	244
<i>Mesocyclops lucarte</i>	5	6	4	10	11	14	22	31	31	12	8	6	160
<i>Tropocyclops</i>	8	10	11	13	14	18	17	13	12	12	13	15	156
TOTAL	22	26	19	43	49	57	73	88	73	45	34	31	560
CLADOCERA													
<i>Moina branhiata</i>	10	16	13	22	42	45	62	45	48	31	30	13	377
<i>Moina macrocopa</i>	13	12	12	22	30	37	35	34	38	22	12	10	277
<i>Daphnia spe.</i>	10	14	12	14	25	36	42	37	35	18	12	7	262
TOTAL	33	42	37	58	97	118	139	116	121	71	54	30	916
OSTRACOD													
<i>Cypris spe.</i>	2	6	8	8	10	13	14	15	16	11	6	4	113
<i>Stenocypris spec.</i>	3	4	6	6	8	9	8	10	8	9	8	5	84
	5	10	14	14	18	22	22	25	24	20	14	9	197
OTHERS													
<i>Nauplius larva</i>	14	15	18	16	18	21	16	12	12	10	15	14	181
Grand total	192	184	188	223	285	338	414	445	477	335	231	212	3497

Zooplankton diversity of Naspur lake during the year September 2012 - August 2013.

Cladoceras reported as indicators of eutrophic water. Varadharajan *et.al.*, (2013) zooplanktons are highly sensitive to environmental variation. Dutta *et.al.*, (2013) stated that cladoceran was dominated group and represented by *Daphnia* species, *Moina* species, *Cerodaphnia* species and *Bosminia* species.

Ostracod:

Ostracod is one of the important group of zooplankton and commonly known as "Seed shrimps". The body has a laterally compressed body and a bivalve carapace enclosing the head. In the present investigation period Ostracod species varied from 5 to 25 Num/lit. The species rotifers found during the period of investigation the minimum number of rotifers was observed in monsoon and maximum in summer season. The following Ostracod were identified during the investigation *Cypris spe*, *Stenocypris spe*. Mohank and Patra (2000) Bahera *et.al.*, (2004) also reported highest number of ostracods recorded in summer and lowest in the winter season.

CONCLUSION:

The present investigation the composition of zooplankton species during the year 2012-2013. It was rotifer 46.98% cladocera 26.19% copepod 16.01% and Ostracod 5.63%. Among all these zooplankton species rotifer is dominant followed by cladocera, copepod, Ostracoda and Nematode species. The trend of zooplankton species with respect to number Rotifera > Cladocera > Copepoda > Ostracoda. The lake ecosystem is suitable for fish culture. Town sewage water, coalmine pollutants water consult to the lake physico-chemical parameters of this lake increase pollution influents some precautions to be taken from further generation.

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